

Reclamation Advisory Memorandum

From: Carl E. Campbell, Commissioner

C.E.C.

Date: July 18, 2008

Subject: Blasting

RAM # 140

During calendar year 2007, the Commonwealth of Kentucky had a total of thirteen (13) flyrock events on surface coal mining sites, including one (1) that resulted in a fatality. To date, in calendar year 2008, there have been nine (9) flyrock events, including one (1) that resulted in a minor injury that very easily could have resulted in a fatality. The Department for Natural Resources believes that one flyrock event is too many, and to that end, has prepared this RAM to further define steps this Department will require of the coal industry in eliminating flyrock events.

“Flyrock” is defined as “blasted material cast into the air, or traveling along the ground, that is cast from the blasting site more than half the distance to the nearest dwelling, public building, school, church; commercial, community or institutional building; or any occupied structure; or that is cast beyond the permit boundary.” Flyrock events historically have not been limited to blasting operations within the distances which require the submission and approval of an “anticipated blast design” (SMP-61) prior to blasting. Rather, flyrock events have occurred and impacted dwellings, vehicles, persons, animal life, and other physical structures thousands of feet from the blast site resulting in death and the destruction of property.

The following actions are being taken by the Department with regard to blasting and the permitting process. Additional information is provided concerning certain enforcement procedures currently being utilized relating to flyrock events and individual enforcement actions against blasters.

I. Permitting

A. Blasting Plans

The best method to eliminate or reduce flyrock events is to address the problem before blasting begins. 405 KAR 8:030, Section 26 and 405 KAR 8:040, Section 38 require the submission and approval of blasting plans in the applications for both surface and underground coal mines to describe how the applicant proposes to comply with the requirements of 405 KAR 16:120 and 405KAR 18:120. In addition to the general requirements contained in 405 KAR 8:030, Section 26 and 405 KAR 8:040, Section 38, the Division of Mine Permits is now requiring blasting plans to include the following:

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1. A statement that the certified blaster in charge will be in control of all blasting activities, and will be the person on site solely responsible for ensuring safe detonation. Activities under the blaster's control should include, but not be limited to, determining the blast area and safety zones, the location and identification of all protected structures, all measures necessary to protect structures and people, drill patterns, blast orientation, blast design, blast hole loading, timing of the pattern and time of detonation.
2. A statement that the driller will produce a log of each hole drilled that will include, at a minimum, the true depth; diameter; burden and spacing; slant of each hole; the type and relative hardness of each layer of rock or unconsolidated material encountered, and any voids, fractures or anomalies detected, including the depth and thickness of each. The applicant will also state that the blaster will be responsible for reviewing the drill log prior to loading the holes and that the drill log will be attached to the shot record for the blast.
3. A statement that the blaster will visually inspect the condition of all holes prior to loading and that explosives will only be placed in holes of solid competent rock, in addition to, reviewing the drill log.
4. A statement that the blaster will examine the overall condition of the highwall; determine the true burden; check for the presence of overhangs, irregularities and toe, back breaks, voids, weathering, or other variations in the bench geology prior to designing and loading all blasts in order to control flyrock and prevent adverse impacts from blasting.
5. A statement that the applicant will provide a complete copy of the approved blast plan to the blaster, and that anytime a new blaster is placed in charge, that blaster will receive a complete copy of the approved blasting plan prior to any blast being detonated.
6. A statement that unless a more hazardous condition would result, all blasts will be designed and detonated so that the open face and delay pattern directs movement of the overburden in a direction other than toward the direction of the nearest protected structures or roads.
7. A statement defining the measures that will be taken by the blaster in the event that holes are drilled into either an active or abandoned underground mine or other void.

8. A statement that the blaster will ensure that each shot is configured and designed so that adequate burden relief is present to allow the swell to have sufficient space to expand with a minimum amount of vertical movement.
9. A statement that whenever possible, the applicant will construct and utilize catch benches of sufficient size to prevent blasted material from moving off of the permit area.
10. A statement that in the event of a flyrock, the permittee will immediately notify the Division of Mine Reclamation and Enforcement pursuant to 405 KAR 7:040, and that it will not disturb or remove the muck pile generated by the blast until an investigation is concluded by Division of Mine Reclamation and Enforcement.

Historically, DNR investigations of many flyrock events have indicated that communication between mine management, blasters and drillers has been lacking, and that the lack of communication is a contributing factor in many of those events.

All of the above measures are considered to be either standard Best Management Practices for all blasting operations, or have been proven in past flyrock events to be instrumental in prevention of accidents and helpful in determining the exact cause of an accident. The Department believes that the addition of the above measures to the approved blasting plan will lead to better communication between on-site personnel and the blaster, and will impose upon mine management and the blaster the clear understanding of their responsibility to pay greater attention to important components of each blast, thereby minimizing the possibility of flyrock events.

B. Anticipated Blast Designs (SMP-61)

405 KAR 16:120, Section 1(4) and 405 KAR 18:120, Section 1(4) require permittees to submit anticipated blast designs to the Department if blasting operations are to be conducted within 1000 feet of a dwelling; public building; school; church; or commercial, community, or institutional building; or within 500 feet of an active or abandoned underground mine. The anticipated blast design may be included in the application, or submitted to the Department at least thirty (30) days prior to blasting within the specified distance to the protected structure. However, the Department believes that some components of the anticipated blast design should be included in the blasting plan, including but not limited to appropriate scaled distances, limitation of drill sizes, and all special measures and procedures to be used. Therefore, if the SMP-61 is submitted with the application, the permit reviewer will ensure that those components of the anticipated blast design that are not affected by varying conditions on ground will be included in the application's blasting plan.

If the anticipated blast design is not submitted until after permit issuance, the Division of Mine Permits currently includes a condition on the permit face sheet that prohibits blasting within 500 feet of an active or abandoned underground mine until the SMP-61 is submitted, joint approval between the Division of Mine Permits, the Explosives and Blasting Branch, and the Mine Safety and Health Administration is granted (where applicable) and a new permit face sheet is issued to remove the condition. In addition to this current condition, the Division of Mine Permits will extend that condition to prohibit blasting within 1000 feet of the other listed protected structures until the SMP-61 is submitted and the condition is removed. Upon submission of the SMP-61 and the granting of joint approval (where applicable), the Division of Mine Permits will compare the approved Blasting Plan to the SMP-61 to determine if those components of the SMP-61 that are not affected by varying on-ground conditions are included in the approved Blasting Plan. If they are not, then the Division of Mine Permits will re-issue the permit face sheet with a new condition identifying those items of the SMP-61, by number, that are not affected by varying on-ground conditions and requiring compliance with those items.

The SMP-60 (MSHA Joint Approval Form) is still required for those operations blasting within 500 feet of any portion of an active underground mine. Nothing herein affects the manner in which those are reviewed.

II. Enforcement

A. Flyrock investigations

Currently, the Department requires the cessation of all blasting operations on the permit after a flyrock event occurs. Blasting cannot resume until approved by the Department. The blasting inspectors, in conjunction with other personnel from other regulatory agencies, then conduct an investigation to determine why the event happened. Based upon the results of the investigation, the permittee is then required to submit a Blast Remediation Plan to address what happened and how the situation will be addressed in the future (including requiring specifics on additional measures to be taken to prevent additional flyrock). **Blasting in the area of the flyrock event will not be allowed to resume until the DMRE has approved the Blast Remediation Plan.**

B. Individual actions against blasters

In addition to the issuance of Notices of Non-Compliance to permittees and operators for violations of 405 KAR 16:120 or 405 KAR 18:120, the Division of Mine Reclamation and Enforcement will issue Notices of Non-Compliance to blasters, individually, in the event that circumstances warrant. KRS 350.130(1) authorizes the Cabinet to issue a Notice of Non-Compliance to any "permittee, person, or operator" who violates the provisions of KRS

Chapter 350, the regulations, or orders of the Cabinet. The Division of Mine Reclamation and Enforcement will continue to utilize this provision to cite blasters for violations. Such Non-Compliances also have resulted in the imposition of civil penalties against the blaster individually.

III. Conclusion

The Department believes that most flyrock events are caused by lack of communication, complacency on the part of blasters and mine management and lack of proper blasting safety training. Compliance with the provisions in this RAM should improve all areas of concern by taking both proactive measures and strong enforcement actions. As a result, the frequency of flyrock events should diminish.

If you have questions about the issues discussed in this RAM , please contact the Director of Mine Permits, # 2 Hudson Hollow, Frankfort, Kentucky 40601 or call (502) 564-2320.