

ATTACHMENT 5

U.S. Department of Labor

Mine Safety and Health Administration
4015 Wilson Boulevard
Arlington, Virginia 22203-1984



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PROCEDURE INSTRUCTION LETTER NO. I99-V-3

FROM: MICHAEL J. LAWLESS
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SUBJECT: Evaluating Breakthrough Potential and Impact of an Protection
Unintentional Release of Water or Slurry From an
Impoundment; District Response Procedures

Scope

This procedure instruction letter applies to Coal Mine Safety and Health (CMS&H) enforcement personnel, impoundment specialists, and Technical Support personnel.

Purpose

The purpose of this procedure instruction letter is to provide guidance for district personnel responsible for evaluating impoundments that were previously identified to have a potential for breaking into an active or abandoned coal mine(s). This letter also sets forth precautionary measures to be instituted by the Agency to ensure the stability of mine waste disposal facilities.

Also, this letter identifies the Agency's responsibility when a potentially dangerous unintentional release of water or slurry from an impoundment has occurred.

Procedure Instruction

A Flowchart and Categorization Criteria have been developed to enable district specialists to classify all impoundments identified with some breakthrough potential. The classification is based on the category of the potential and the impact that a breakthrough might have on an adjacent or underlying

mine. The criteria to be used for categorizing the breakthrough potential of each site is found in Attachment 1. When the criteria references Information Circular 8741 (IC 8741) the flowchart in Attachment 2 is used. The flowchart was prepared to enable district specialists to easily classify any site when IC 8741 must be used.

Once the breakthrough category and potential have been determined, the impact potential should be determined by assigning a value from the table provided in Attachment 3. Also, a priority code listed on the same table should be assigned to each site.

Since it is possible for an impoundment site to have more than one area with breakthrough potential, each location must be categorized and the most severe potential used for prioritization. Impoundment sites where the embankment itself could be affected by the sudden outrush of water or slurry are to be given the highest priority. Once all sites have been identified on a priority listing, the pertinent information is to be reported to the Pittsburgh Safety & Health Technology Center. For this submittal, the format below should be used on a hard copy form as well as in an electronic spreadsheet structure:

Site Name, State, District, Impoundment I.D., Category, Potential, Highest Level of Impact, Priority Level (an example of the reporting format would be as follows: Brushy Fork Impoundment, KY, 07, xxxxxxx-xx, III, High, 1, A).

Where a mine's impoundment plan does not adequately address the breakthrough potential, the mine operator responsible for that impoundment shall be notified that the plan must be revised. This plan modification shall be done in accordance with the plan revision procedures described in MSHA's Program Policy Manual, Volume V, Page 3c, 4/1/90 (Release V-2).

The technical review of all newly submitted impoundment plans will include an emphasis on evaluating the potential of a water or slurry breakthrough into adjacent mines prior to the district manager granting approval of such a plan.

If an unintentional breakthrough does occur at an impoundment site, then the mine operator is required to immediately notify the district manager and submit a Mine Accident, Injury and Illness Report, MSHA Form 7000-1, in accordance with 30 CFR 50.10 and 50.20. When the district manager is notified, enforcement personnel shall be sent to the site immediately and issue the appropriate citations or orders to ensure the safety of miners and the public.

Background

The Agency's classification criteria for this evaluation was developed by a joint committee consisting of CMS&H and Mine Waste and Geotechnical Engineering Division personnel. The criteria to identify the breakthrough potential of an impoundment is derived from general rules of practice and from the Bureau of Mines Information Circular 8741 (IC 8741).

Renewed emphasis was placed on the potential safety and health concerns when the potential of water or slurry breaking into underground mine workings was again realized when two unintentional releases of slurry occurred in a two-month period. In both instances the accident inundated adjacent, abandoned underground mines. In each case the slurry rapidly discharged from old mine portals that were located in hollows adjacent to the impoundment sites.

The potential for such events occurring in the future remains a concern for the Agency, especially since active impoundments continue to increase in elevation and may overtop worked-out coal seams

or seams that are presently being mined. If the extent of mine workings is not adequately mapped, the safety barriers left in place may not be substantial enough to resist the hydraulic pressure of the material impounded in the future.

Authority

Federal Mine Safety and Health Act of 1977, 30 CFR 77.216, 30 CFR 75.1716, 30 CFR 50.10, and 30 CFR 50.20.

Filing Instruction

This letter should be filed behind the tab marked "Procedure Instruction Letters" in the binder entitled Program Handbooks and Procedure Instruction Letters.

Issuing Office and Contact Person

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Distribution

PPM Holders Within Coal Mine Safety and Health and Technical Support

Attachment 1

Breakthrough Potential

The following criteria should be used to assign a breakthrough potential rating.

I. Deep mining where the coal seam does not intersect the surface at the impoundment	
High Potential	Any site where mining is located vertically within 100 feet beneath any portion of the impoundment.
Moderate Potential	Any site where the distances outlined in Bureau of Mines Information Circular 8741 are not met.
Low Potential	Any site where the distances outlined in Bureau of Mines Information Circular 8741 are met or exceeded.

The primary concern in this situation is sinkhole formation in the pool area. Although sinkhole formation is difficult to predict, it is more likely where the separation between mine and ground surface contains less than 100 feet of intact rock. A secondary concern is slurry and water flow through subsidence cracking. We do not believe a sudden inrush of slurry will occur through subsidence cracks; however, cracks may be enlarged by water flow.

II. Deep mining where the coal seam intersects the surface at the impoundment

<p>High Potential</p>	<p>Any site where a vertical column of intact rock between the mine and the original ground surface in the impoundment is less than or equal to 100 feet.</p> <p>OR</p> <p>Any site where the coal barrier thickness at the outcrop is less than 50 feet.</p> <p>OR</p> <p>Any site where no manmade barrier has been designed for the anticipated maximum hydraulic head (for example, where a site is only sealed for compliance with 30 CFR §75.1711)</p>
<p>Moderate Potential</p>	<p>Any site where a vertical column of intact rock between the mine and the original ground surface in the impoundment is less than the criteria specified in IC 8741, but exceeds 100 feet.</p> <p>OR</p> <p>Any site where the coal barrier thickness equals or exceeds 50 feet, but is less than 50 feet + hydraulic head.</p> <p>OR</p> <p>Any site where a manmade barrier has been designed, but actual hydraulic head on the barrier exceeds the design value.</p>
<p>Low Potential</p>	<p>Any site where the vertical distance between the mine and the original ground surface in the impoundment meets or exceeds the criteria specified in IC 8741.</p> <p>AND</p> <p>Where the coal barrier thickness at least equals 50 feet + hydraulic head.</p> <p>OR</p> <p>Any site where a manmade barrier has been designed for the maximum anticipated hydraulic head.</p>

Once again, the formation of sinkholes played an important role in the selection of this criteria. It is envisioned that a mine under a gently sloping ground surface could have an overburden of less than 100 feet in the impoundment area. The 50 foot barrier thickness rule is simply a general rule of thumb in use by the mining industry. This criteria for barrier thickness is mentioned in several references. Where a mine entry exists, we believe the manmade barrier should be designed by a qualified engineer for the maximum anticipated hydraulic head that the barrier will be exposed to. Typical manmade barriers would include any structure constructed to separate the impoundment

from the mine environment. These structures could be soil, rock, or other construction materials such as reinforced concrete.

III. Auger mining where the coal seam intersects the surface at the impoundment	
High Potential	<p>Any site where a manmade barrier has not been designed as a cover for the auger holes.</p> <p>AND</p> <p>Where the coal barrier thickness (between the end of the auger holes and any deep mine) is less than 50 feet.</p>
Moderate Potential	<p>Any site where a manmade barrier has not been designed or has not been designed for the maximum anticipated hydraulic head.</p> <p>AND</p> <p>Where the coal barrier thickness (between the end of the auger holes and any deep mine) equals or exceeds 50 feet but is less than 50 feet + hydraulic head.</p> <p>OR</p> <p>Any site where a manmade barrier has been designed for the maximum anticipated hydraulic head.</p> <p>AND</p> <p>Where the coal barrier thickness (between the end of the auger holes and any deep mine) is less than 50 feet + hydraulic head.</p>
Low Potential	<p>Any site where a manmade barrier has been designed for the maximum anticipated hydraulic head.</p> <p>AND</p> <p>Where the coal barrier thickness (between the end of the auger holes and any mine) equals or exceeds 50 feet + hydraulic head.</p>

Attachment 2 - Flowchart for Application of IC 8741 [PDF]

Attachment 3

Impact Potential

In addition to a site's breakthrough potential, a breakthrough impact should be indicated. The following items should be considered when assessing a site's breakthrough impact:

1. Breakthrough impacts the safety of miners on mine property.

2. Breakthrough impacts the safety of the general public.
3. Breakthrough impacts property (major roads, utilities, structures).
4. Breakthrough impacts the environment.
5. Breakthrough floods and is safely retained within abandoned mine.

Evaluation Priority

After a breakthrough potential and impact potential have been assigned to a site, an evaluation priority rating can be assigned. The following table provides the assignment criteria.

Priority Level	Category	Potential	Impact
A	I, II, III	High	1, 2
B	I, II, III	High	3
C	I, II, III	Moderate	1, 2
D	I, II, III	High	4
E	I, II, III	Moderate	3, 4
F	I, II, III	Low	1, 2, 3
G	I, II, III	Low	4
H	I, II, III	High	5
I	I, II, III	Moderate	5
J	I, II, III	Low	5

Flowchart for Application of IC 8741

