

TECHNICAL MEMORANDUM

Utah Coal Regulatory Program

September 9, 2005

TO: Internal File

FROM: Peter H. Hess, Environmental Scientist III/Engineering, Team Lead

RE: #3 Mine Escarpment Failure, Co-Op Mining Company, Bear Canyon Mine, Permit C/015/0025, Task ID #2322

SUMMARY:

This amendment is relative to allowing pillar recovery in the Blind Canyon Seam of the Bear Canyon #3 Mine (6 Right South section off the east sub-mains). This area lies in Section 30, T16S, R8E, SLBM. There are no escarpments; one ledge approximately fifteen feet in height does exist in the proposed pillar extraction area. In the interest of utilizing the resource to its full extent, the Permittee has and continues to propose to mine as close as possible to the outcrop, (i.e., edge of the burn) thus removing any stable coal barrier which would be necessary to protect any escarpment, as per Stipulation #13 in Federal coal lease U-020688. The surface management agency in Section 30 is the U.S.F.S., Manti LaSal National Forest.

TECHNICAL ANALYSIS:

OPERATION PLAN

SUBSIDENCE CONTROL PLAN

Regulatory Reference: 30 CFR 784.20, 817.121, 817.122; R645-301-521, -301-525, -301-724.

Analysis:

Subsidence Control Plan

The Permittee's first submittal did not meet the minimum requirements for the subsidence control plan. That application was a request to modify the mine plan to allow for the

TECHNICAL MEMO

extraction of pillars in an area where escarpments had been originally thought to exist. This amendment also made note that a change in the orientation of the mining panel was necessary to maximize coal recovery in that area of the Blind Canyon seam (#3 Mine).

The Permittee does not want to change the barrier pillar requirement on page 1-4 of the MRP. The Permittee wants to maximize the coal recovery in that area of the #3 Mine where, based upon topographic maps, aerial photographs and surface photography, no escarpments exist. A minor ledge approximately fifteen feet in height does exist in the area. However, based upon an analysis by the USFS, Manti LaSal National Forest Price office, no surface resources would be impacted, even if a minor failure of the sandstone ledge occurred.

Therefore, the Permittee has proposed that pillar extraction be initiated at the coal burn /Blind Canyon seam interface and allowed to retreat back. Barrier pillar requirements in neither the Bear Canyon MRP nor Federal lease U-020668 are being changed or modified in any way.

Federal lease U-020668 stipulation #13 (escarpment failure) calls for “preventing mining induced subsidence in certain areas that would result in hazardous conditions such as escarpment failure”. As there are no escarpments in this area, no protection barriers are required.

The U.S.D.O.I., Bureau of Land Management / Utah State Office has provided the following evaluation of the area under analysis; “the BLM has inspected this general underground area a number of times (3/31/05 and 12/28/04) and the configuration of the burn and the hot zones have been noted. We agree that the burn/hot zone areas have now allowed access to the proposed pillar area. The information provided by C.W. Mining showing the surface area above the proposed pillar panels, has been evaluated. Based on the topographic maps, aerial photographs, and surface photography, the BLM agrees that the **surface area above the proposed mining panels is mostly slopes with no escarpments or cliffs, except for one or two small ledges.....the BLM believes that the proposed mining under the area in question would not create a hazardous condition.** The 200-foot barrier requirement (See page 1-5 of the Bear Canyon MRP) that has been established through agreement between the Permittee and the Division is of little meaning here because of the following reasons:

- a) The coal burn that is known to exist in the area has more than likely affected the structural integrity of the 200-foot width of this barrier, rendering its supporting characteristics meaningless.
- b) Second, a barrier of 200 feet would be ineffective in the prevention of escarpment failures in mining areas where average overburden thickness averages 1200 feet (See Table 5C-1, page 5C-4, Appendix 5C, Bear Canyon MRP). The permittee uses an angle of draw of 22.5 degrees to predict subsidence (See Appendix 5C, page 5C-13, paragraph 3). Using this parameter and a depth of 1200 feet, a barrier adequate to protect an escarpment from

TECHNICAL MEMO

- subsidence due to mining would have to be 497 feet in width. The 200-foot barrier is only forty percent of the barrier needed to effectively protect the escarpment.
- c) Although aerial photographs above the proposed pillar extraction panel only show one sandstone escarpment approximately fifteen feet in height, the structural integrity of the Castle Gate sandstone ensures that the amount of subsidence in this area will be minimal. The critical width for subsidence-related impacts exceeds the projected 700-foot pillar extraction panel width. The BLM has estimated that “less than two feet of actual (partial) subsidence should occur above the room and pillar panel.”
 - d) Based upon information contained in Table 5C-1, Estimated Maximum Subsidence (See Bear Canyon MRP, Appendix 5C-4) the average depth of Federal lease U-020668 is listed as 1200 feet. The maximum calculated subsidence in that lease is 3.2 feet, which concurs with the BLM’s estimated two feet of subsidence. Thus, in consideration of the 1200 feet of cover, the extraction of the nine feet of coal from the Blind Canyon seam would only cause a maximum of 2-3.2 feet of subsidence. Any escarpment failures (one ledge, 15 feet in height) would be minor.

The deficiency document generated by the Division (Task ID #2268) in response to the first application contained the following deficiency; “The Permittee must state what the requirements are for protecting steep escarpments or reference on page 1-4 where that information can be found.” The Permittee’s response dated August 15, 2005 states under section **R645-301-121.200** that additional information is not needed in the MRP relative to barrier pillars. As previously noted, the requirement to protect escarpments is required in stipulation #13 of Federal coal lease U-020668. The Permittee is not proposing to change this requirement. Thus, it is not necessary to modify the information in the MRP.

The information on page 1-4 about barrier pillars contradicts some of the information on page 3-18 of the submittal. On page 1-4, the Permittee states that 200-foot barrier pillars will be used along coal outcrops. On page 3-18, the Permittee states that 200-foot barrier pillars along outcrops will be used where required by the lease stipulations or to protect streams and wildlife. The information about barrier pillars along coal outcrops on page 1-4 is not consistent with the information on page 3-18. This information appears to be conflicting. Page 3-17, section **3.4.2.2 Outcrop Protection** indicates the following; “Outcrops are either covered to some depth with overburden, or in many areas, the coal has been burned for some distance from the surface. Where neither of these conditions exist, routine tests of the coal may show that it has been “weathered” or “oxidized” and mining will be stopped within 200 feet of the outcrop”. Thus, this 200 foot thick area is not being left for protection of the outcrop area, but for reasons of protecting the quality of coal being produced, i.e., the Permittee does not want to mix coal burn, or weathered or oxidized coal with quality product.

TECHNICAL MEMO

On page 3-18 of the June 2, 2005 submittal, the Permittee states:

“C. W. Mining will maintain minimum 200 foot width barrier pillars to protect outcrops where required by lease stipulations, or protection of streams and wildlife **to minimize** the possibility of escarpment failure and resulting detrimental impacts to down stream water quality or nesting raptors.” These 200-foot wide barriers are depicted on Plate 3-3, and are included in the escarpment protection zone.

The Division’s deficiency document (Task ID #2268) indicated that the Permittee must state how removing the requirements that barrier pillars be left on fee land to protect escarpment and how removing the requirement that barrier pillars be left along coal outcrops will still protect the public and the environment. The Permittee is not proposing to remove any barrier pillar requirement. Page 3-18, section **3.4.2.3 Protection of Natural Surface Structures & Streams** indicates that these naturally existing surface features will be protected with the minimum 200-foot width barrier pillars whether they exist on private land or Federally owned surface.

Findings:

The information provided in the amendment is considered adequate to meet the requirements of this section.

MAPS, PLANS, AND CROSS SECTIONS OF MINING OPERATIONS

Regulatory Reference: 30 CFR Sec. 784.23; R645-301-512, -301-521, -301-542, -301-632, -301-731, -302-323.

Analysis:

Mine Workings Maps

The Division’s Task ID #2268 deficiency response indicated that the Permittee did not meet the minimum requirements for mine maps. The mine maps were inadequate because:

- **The Permittee projected mine workings outside the permit boundary. That occurs in Section 13, (See Plate 3-4A).**
- This was corrected on the revised Plate 3-4A submitted in response to Task ID #2268 (new Task ID #2322).
- **The Permittee projected the mine workings outside of the coal outcrop line. That occurs in Section 25, (See Plate 3-4A).**

TECHNICAL MEMO

- This reviewer cannot find that deficiency. It appears that the listed deficiency may be in error, as the line depicting the interface between good coal and the coal burn area may have been mistaken for the outcrop line.
- **The Permittee projects full extraction mining outside of the potential subsidence zone. That occurs in Section 19 and Section 20.**
- There is no mining projected for Section 20. The 6th Right South off of east sub-mains in the #3 Mine lies in Section 30, not Section 20. Two pillar panels are projected in Section 19; however, full extraction is not depicted as reported in the initial review. What is depicted is the leaving of two rows of pillars to protect the two bleeder entries that are required by MSHA. Therefore, in consideration of the 22.5-degree angle of draw, and the line where full extraction will be initiated, full extraction mining is not depicted as being outside of the potential subsidence zone.

The Permittee's August 15, 2005 deficiency response indicates under section **R645-301-525.420** that the discrepancies depicted on Plates 3-3 and 3-4A has been corrected.

The Task ID #2322 submittal is relative to secondary extraction in Section 30 of T16S, R8E. Therefore, none of the above deficiencies are relative to this secondary extraction approval.

The Division's initial review of the Task ID #2268 application contained the following deficiency:

- R645-301-121.200, -525, •** The Permittee needs to clarify and consistently represent the location and extent of the potential subsidence zone or zones on Plates 3-3, 3-4A, and 3-4C. • The Permittee needs to clarify whether the plan is to pull or leave pillars under the escarpment on the east side of Bear Canyon in Section 30.

Relative to the first concern, the Permittee has responded by submitting revised Plates 3-3 and 3-4A. Plate 5-3 is the SUBSIDENCE MAP in the reformatted version of the Bear Canyon MRP. Plate 5-3 shows an escarpment surrounding approximately seventy-five percent of the perimeter surrounding the 6th Right mining area. Plate 5-3 is incorrect in showing this escarpment location. Plate 3-3 correctly depicts the surface of the 6th Right mining area surface, in that NO escarpments are shown. As stated in the BLM letter dated August 18, 2005, it has been determined that based upon topographic maps, aerial photographs, and surface photographs, "the BLM agrees that the surface area above the proposed mining panels is mostly slopes with no escarpments or cliffs except for one or two small ledges.

Plate 3-4A depicts the mining panel orientation, with the potential subsidence zone; also depicted is the coal burn area in the 6th Right mining area.

TECHNICAL MEMO

An examination of Plate 5-1C (reformatted Bear Canyon MRP, unapproved as of 9/9/2005) indicates that there will be no mine development in the Tank seam above the 6th Right area (in the #3 Mine / Blind Canyon seam). This is depicted as a **LOW COAL AREA**. Therefore, any mining induced subsidence will only occur from the extraction of coal in the #3 Mine in this area. An update of Plate 3-4C to clarify the location and extent of the potential subsidence zone is not necessary, as the Permittee has revised Plate 3-4A to reflect this.

It is not necessary for the Permittee to clarify whether or not the plan is to pull or leave pillars under the escarpment on the east side of Bear Canyon in Section 30. There is no escarpment on the east side of Section 19 nor on the east side of Section 30.

The #3 Mine 6th Right South panel has been developed to the coal burn on the east end. The Permittee intends to initiate pillar recovery in that area, only leaving pillars to maintain a bleeder entry. No pillars will be left for the purpose of supporting the surface (i.e., there are no escarpments in this area). As pillars are recovered, new pillars will be developed on the south side. This is traditional room and pillar mining, where pillars are retreated and developed at the same time.

Findings:

The information provided in the amendment is considered adequate to meet the requirements of this section.

RECOMMENDATIONS:

The USDOJ / BLM / Utah State Office and the USFS / Manti LaSal National Forest have reviewed the Permittee's application to initiate secondary coal extraction activities in Section 30 T16S, R8E (6 Right South section off the east sub mains, #3 Mine) where no major escarpments exist. Both agencies are in agreement that pillar extraction in that area can be accomplished without impacts to the surface resources in that area.

The Division should approve the amendment.