Proposed Decision
and
Findings of Compliance
for the

Bear Mine
C-1981-033

Reduced Inspection Frequency

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COLORADO
Division of Reclamation, Mining and Safety
Department of Natural Resources

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Introduction

This document presents the findings and proposed decision of the Colorado Division of Reclamation, Mining and Safety ("Division") for a reduction in the inspection frequency of the Bear Mine. The Bear Mine was an underground coal mine operated by Bear Coal Company, Inc. (BCC) where mining activities were conducted under mining and reclamation permit C-1981-033. The permit was revoked on June 6, 2013.

The site is located in Gunnison County, Colorado, just east of the town of Somerset. The permit area is accessible from Colorado Highway 133, by crossing the North Fork of the Gunnison River. The permit area is located on the USGS 7.5 minute quadrangle map entitled "Somerset". The permit area comprises 1108.4 acres, 1079.6 acres of which are privately owned and 28.8 acres of which are federally owned. The total surface disturbance amounts to 9 acres, 7.5 acres of which received Phase I bond release with Bond Release No. 4 (SL-4) which was issued on May 9, 2011. The Division issued the most recent, and final, Permit Renewal (RN-5) on August 4, 2009.

History of Permit and Operations

Permit no. C-1981-033 was issued on July 19, 1982, to the Bear Coal Company. The permit was for the Bear No. 1, No. 2 and No. 3 Mines.

Prior to the issuance of C-1981-033, the Bear No. 1 and No. 2 Mines had been operated under the Extraction and Development Permit No. 77-244, but had been in continuous operation since 1934. Their combined permit area was approximately 1,360 acres, with a surface disturbance of approximately 19 acres.

The initial application for C-1981-033 was amended while under the initial review to add the new Bear No. 3 Mine on the site of the abandoned Edwards Mine (also known by various other names including the Lone Pine Mine, the Anchor Mine and the Clark Mine). The amended application increased the permit area by approximately 287 acres to approximately 1,647 acres, and increased the surface disturbance by approximately 8 acres to approximately 27 acres.

Mining operations at the Bear No. 1 and No. 2 Mines ceased in 1981. Reclamation activity of the associated surface disturbance took place in 1982-83. Mining operations at the Bear No. 3 Mine began in 1981.

A Permit Revision was issued on September 18, 1985, which was thought at the time to increase the size of the permit area by 264 acres. Inconsistencies concerning the delineation and size of the permit area was identified with Mid-term Review No. 2 (MT-2, March 20, 1990); when the issue was resolved the permit area was determined to be approximately 1684 acres.

Permit Revision No. 1 (PR-1) was issued on April 29, 1994, and expanded the permit area by approximately 205 acres to approximately 1889 acres – this was the largest extent of the permit area. PR-1 did not increase the surface disturbance.

Mining operations ceased at the Bear No. 3 Mine in November, 1996, due to unfavorable geologic conditions in the mine. The mine portals were permanently sealed in January, 1997. On November 15, 1997, a landslide occurred in an area located immediately west of the Bear No. 3 Mine portals.

The decision to approve Bond Release No. 1 (SL-1) was first proposed on December 15, 1997. An objection was made to the proposed decision which delayed the issuance of SL-1 by over two years; the amended decision and Findings of Compliance were ultimately issued on April 6, 2000. SL-1 granted Phase I, II and III release of a total of approximately 789.5 acres (associated with the Bear No 1 and No. 2 mines), including all but approximately 9 acres of surface disturbance.

Applications for Bond Releases No. 2 and No. 3 (SL-2 and SL-3) were withdrawn in 2001 and 2005 respectively.

Bond Release No. 4 (SL-4) was issued on May 9, 2011. SL-4 granted Phase I release for 7.5 acres of the total remaining 9 acres of surface disturbance.

Permit C-1981-033 was revoked, and the reclamation bond forfeited, on June 6, 2013, by order of the Mined Land Reclamation Board (MLRB) in accordance with the Division's recommendation, following a failure on the part of BCC to (i) apply for a renewal of the permit, and (ii) complete reclamation of the mine. At the time of revocation, the permit area was determined to comprise 1108.4 acres, and the disturbed area 9.0 acres. The total amount of bond forfeited was $160,000.

Reclamation Completed

As noted, BCC achieved final reclamation, and the Division approved Phase III bond release, of approximately 789.5 acres. The current permit area consists of 1108.4 acres, 9 acres of which are disturbed. 7.5 acres of the disturbed area received Phase I bond release with SL-4. The remaining 1.5 acres had not been reclaimed at the time of revocation.

The Division prepared a bid packet for contractors to complete the remaining reclamation of the site in June, 2016. The winning contractor completed most of the work in November 2016, with shrub planting delayed until the spring of 2017. Work undertaken during the reclamation project included: excavating a diversion ditch to redirect discharge from the groundwater seep away from the existing treatment pond to the North Fork of the Gunnison River; draining and backfilling the treatment pond; dredging and stockpiling the accumulated sediment from the sediment pond (for use as topsoil); removing and reclaiming the primary and emergency spillways of the sediment pond; and revegetating an estimated total of 4.5 acres of disturbed land.

The remaining balance of the forfeited bond is held by the Division, to be used for weed treatment, maintenance and supplemental seeding as necessary.

General Stability of Reclaimed Area

Generally, the Division's recent normal I&E inspections have found no changes on the Bear Mine site from month-to-month. Since the 2016 reclamation project, the site has been secured against vehicle access by a locked gate. The site is accessible on foot, and there is evidence that members of the public enter the site via the bridge on a regular basis.

There remain three known issues related to the stability of the reclaimed area at the Bear Mine.

1. Landslide

   In a memo dated February 17, 1998, in which he presented an analysis of the November 15, 1997 landslide, Jim Pendleton of the Division stated that:

   > "The Bear III mine permit area has been characterized by frequent and extensive mass wasting events since 1983. The Bear mine portals and portal fan were damaged by mudflow events on several occasions. Rotational landslides have damaged the portal access road and portal bench on several occasions. The valley slope above the landslide under consideration evidences several large ancient scarps and an extensive mudflow complex."

   In the memo Pendleton concluded that:

   a. The 1997 landslide was initiated by groundwater emanating from the bedrock beneath the failed colluvium and saturating the clay-rich colluvial material;
   b. The groundwater flow at that location was the result of a recent change in the local groundwater flow regime; and
   c. The groundwater seep (discussed in greater detail in item 3, below) at the toe of the hill slope, just east of the toe of the slide mass, is a surface expression of the same groundwater flow that initiated the landslide.

   Pendleton did not make any conclusion as to what had caused the change in groundwater flow regime, or if anyone could or should be held responsible for it.

2. Underground coal fire

   Evidence of an underground coal fire is clearly observable from Highway 133 during cold weather, when smoke/steam can be seen issuing from vents around and above the landslide escarpement. The fire was investigated twice by the Division's underground coal fire experts: first by Steve Renner in 2003, and later by Tara Tafi in 2017. The record of correspondence following these investigations shows that it has not been possible to draw firm conclusions regarding the precise location of the fire (specifically whether the coal that is

burning is in the C or B seam, and whether the fire is located in the workings of the Bear Mine or the Edwards Mine). As of the date of these Findings, there is no available funding for a project to attempt to extinguish the fire, and it has not been determined whether such a project would be technically feasible.

The 2017 investigation was prompted by a member of the public reporting smoke/steam to the Gunnison County Sherriff, who in turn alerted the Paonia Fire Department and the landowner (Mountain Coal Company, LLC). Following the investigation, the Division contracted with McCollum's Excavating LLC to remove vegetation from around the vents in order to mitigate the risk of wildfire. Given that the site is so easily seen by members of the public it is reasonable to assume that the Division would be made aware of any changes in the state of the fire soon after it occurred and could respond as necessary.

3. Groundwater seep

A groundwater seep is clearly visible in aerial imagery of the site, located near the toe of the hill slope, approximately 20 feet east and 20 feet up-slope from the eastern terminus of the slide mass. A memo dated March 7, 2012, written by Mike Boulay of the Division, summarizes the Division's investigations into the seep.

In the memo Boulay concluded that:

a. The source of the water and the heat source for the elevated temperature have not been fully explained, and may never be fully understood without a substantial subsurface investigation which is probably economically and technically unfeasible;
b. It is likely that the primary source of the water is groundwater discharge from bedrock, although there may be some component of mine water discharge resulting from inflows to abandoned B-seam and C-seam mine workings;
c. It is likely that geothermal energy is the heat source for the elevated temperature, rather than heating from the underground coal fire;
d. The water quality of the seep is benign; and
e. The potential impacts to the North Fork of the Gunnison River are negligible.

The Colorado Water Quality Control Division terminated the discharge permit associated with the groundwater seep (Permit No 000044377) on June 27, 2012.

It is reasonable to assume that groundwater will continue to seep from the current location unless and until the local groundwater flow regime is altered by any potential future landslide activity.

The reclaimed area is generally well-vegetated, although a substantial infestation of cheatgrass (*Bromus tectorum*) has been noted during inspections and is expected to be

treated during 2020/21. Other noxious weeds including white-top (*Cardaria draba*), Canada thistle (*Cirsium arvense*) and Tamarisk (*Tamarix*) have been noted at the site and continue to be treated as necessary.

Impoundments and Earthen Structures Remaining on the Site

There are no impoundments within the remaining Bear Mine permit.

A diversion ditch (known as the "Sinuous Channel") was created during the 2016 reclamation project, to convey groundwater expressing from a seep at the eastern edge of the landslide toe, west to the North Fork of the Gunnison River. The Sinuous Channel does not convey surface water other than precipitation that falls directly into it. The channel itself is stable and well-vegetated

Coal waste was never stored at the Bear Mine, so no waste piles or other earthen structures exist on the site.

Risks to Public Health, Safety and Environment

Potential risks to public health and safety and to the environment exist at the Bear Mine, and are detailed below:

1. The site is directly adjacent to the town of Somerset, and easily visible and accessible from Highway 133. Although the ownership of the land is private, the site has long been, and continues to be, accessed by members of the public. Although vehicles can no longer access the bridge, pedestrians can gain access. The bridge continues to fall into disrepair, with streambank erosion at the entry and points, and rotting of the timbers on the bridge itself presenting hazards to those who would cross it. The bridge is currently understood to be the property of Mountain Coal Company, LLC; it was built in 1934 (see page 4.03-1 of the PAP) and is therefore an "Existing structure", as defined in Rule 1.04(45); and removal of the bridge is not contemplated in the approved reclamation plan. The Division does not have authority over, or responsibility for, the bridge.
2. The possibility of a landslide poses a potential hazard to public health and safety. A large landslide could potentially impact the North Fork of the Gunnison River.
3. The existence of the underground coal fire is a hazard to individuals who choose to walk on the steep unstable hillside above the fire, given the possibility of subsidence caused by the fire and the existence of open vents to the subsurface. The hot gases venting from the fire also present a potential wildfire hazard.

Sediment and Erosion Control Function

Most of the remaining disturbed area at the Bear Mine is flat and stable. The majority of the reclaimed areas are stabilized with vegetation. No temporary sediment or erosion control features remain at the site.

Estimate of Continuing Safety, Health or Environmental Problems

It is the Division's determination that the safety, health, and environmental concerns at the Bear Mine have been reduced to the extent possible. The site remains stable and poses no imminent threats to human safety or the environment. Due to the remaining features of the mine, the site should be periodically inspected to ensure that there is no off-site impact from sediment transport or noxious weeds and for monitoring the continuing function of the Sinuous Channel. The Division will continue to monitor the geologic stability of the site, and the state of the underground fire.

Proposed Inspection Frequency

The Division proposes to reduce the statutory inspection frequency to four complete inspections per year to occur on a quarterly basis. This inspection frequency will be sufficient for monitoring erosion, noxious weeds, the continuing function of the Sinuous Channel, and for identifying maintenance needs before they develop into more serious concerns.