



State of Utah
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS AND MINING

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August 13, 2001

TO: Internal File
THRU: Daron R. Haddock *DARON*
FROM: James D. Smith, Reclamation Specialist and Team Lead *JDS*
RE: Ball Park Drainage, CO-OP Mining, Bear Canyon Mine, C/015/025-AM01A-1, Internal File.

TECHNICAL ANALYSIS

INTRODUCTION

SUMMARY:

On March 14, 2001 the Division received an amendment to the Bear Canyon Mine MRP that proposes to add an undisturbed drainage diversion across the upslope side of the Ball Park Topsoil Pile. The purpose is to divert water that originates at springs located above the ball park: during 2000, the flow from these springs was higher than in the past and this water flowed across the ball park and deposited sediment on the field, eroded the outslope of the topsoil pile, and carried sediment over or through the silt fence and straw bales at the boundary of the permit and disturbed area. This amendment was instigated by the operator to eliminate the potential for erosion of topsoil from the south slope of the pile and deposition of that sediment outside the disturbed area and permit area boundary.

Co-Op Mining	Date of Action	Division	Date of Action
Initial Submittal	Received March 14, 2001	AM01A	TA - Sent May 7, 2001
First Revision	Received August 6, 2001	AM01A-1	TA - This document

TECHNICAL ANALYSIS:

OPERATION PLAN

HYDROLOGIC INFORMATION

Regulatory Reference: 30 CFR Sec. 773.17, 774.13, 784.14, 784.16, 784.29, 817.41, 817.42, 817.43, 817.45, 817.49, 817.56, 817.57; R645-300-140, -300-141, -300-142, -300-143, -300-144, -300-145, -300-146, 300-147, -300-147, -300-148, -301-512, -301-514, -301-521, -301-531, -301-532, -301-533, -301-536, 301-542, -301-720, -301-731, -301-732, -301-733, -301-742, -301-743, -301-750, -301-761, -301-764.

Analysis:

Diversions

Undisturbed drainage ditch RC-BP1 is to be added to the plan. RC-BP1 will remain after reclamation and is listed in Table 7.3-2 with the other post-mining drainage ditches.

This ditch is not intended to capture and divert precipitation runoff, but rather to divert water from springs on the steep, undisturbed slope north of the Ball-Park Topsoil Pile. During 2000, flow from the springs on this slope was higher than in the past and the water breached an embankment along an old road that crosses the slope, flowed across and deposited sediment on the Ball-Park Topsoil Pile, eroded the outslope of the Ball-Park Topsoil Pile, and carried sediment over or through the silt fence and straw bales at the boundary of the permit and disturbed area.

An estimated spring flow of 15 to 20 gpm (0.044 cfs) was used in the ditch design. The design is certified by a licensed professional engineer. Channel flow and cross-section were analyzed using "Flowmaster" channel design software, which uses Manning's formula to determine required depth. Results of the calculations are on pages 7H-124 through 7H-126. Slopes of 0.01 and 0.05 ft/ft were analyzed: the steeper slope produced the greater velocity, 2.03 fps, and the smaller slope produced the greater depth, 0.24 feet. The proposed channel design, tabulated on page 7H-124 and shown in cross-section on page 7H-127, includes an additional foot of freeboard for a depth of 1.24 feet. The predicted maximum velocity indicates riprap will not be required in the channel, according to the table on page 7H-17.

Findings:

The information in this section is sufficient to meet the requirements of the coal mining rules.

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:

Mining facilities maps

Plates 2-4A – Surface Facilities, 3-2A – Post-mining Topography, and 7-1A – Hydrology Map - have been updated to show undisturbed drainage diversion RC-BP1, which is within the present disturbed area boundary. The map also shows additional silt fence along the toe of the south slope of the Ball Park Topsoil Pile.

Findings:

The information in this section is sufficient to meet the requirements of the coal mining rules.

RECLAMATION PLAN

HYDROLOGIC INFORMATION

Regulatory Reference: 30 CFR Sec. 784.14, 784.29, 817.41, 817.42, 817.43, 817.45, 817.49, 817.56, 817.57; R645-301-512, -301-513, -301-514, -301-515, -301-532, -301-533, -301-542, -301-723, -301-724, -301-725, -301-726, -301-728, -301-729, -301-731, -301-733, -301-742, -301-743, -301-743, -301-750, -301-751, -301-760, -301-761.

Analysis:

Diversions

Undisturbed drainage ditch RC-BP1 is to be added to the plan. RC-BP1 will remain after reclamation and is listed in Table 7.3-2 with the other post-mining drainage ditches.

This ditch is not intended to capture and divert precipitation runoff, but rather to divert water from springs on the steep, undisturbed slope north of the Ball-Park Topsoil Pile. During 2000, flow from the springs on this slope was higher than in the past and the water breached an embankment along an old road that crosses the slope, flowed across and deposited sediment on the Ball-Park Topsoil Pile, eroded the outslope of the Ball-Park Topsoil Pile, and carried sediment over or through the silt fence and straw bales at the boundary of the permit and disturbed area.

An estimated spring flow of 15 to 20 gpm (0.044 cfs) was used in the ditch design. The design is certified by a licensed professional engineer. Channel flow and cross-section were analyzed using "Flowmaster" channel design software, which uses Manning's formula to determine required depth. Results of the calculations are on pages 7H-124 through 7H-126. Slopes of 0.01 and 0.05 ft/ft were analyzed: the steeper slope produced the greater velocity, 2.03 fps, and the smaller slope produced the greater depth, 0.24 feet. The proposed channel design, tabulated on page 7H-124 and shown in cross-section on page 7H-127, includes an additional foot of freeboard for a depth of 1.24 feet. The predicted maximum velocity indicates riprap will not be required in the channel, according to the table on page 7H-17.

Findings:

The information in this section is sufficient to meet the requirements of the coal mining rules.

MAPS, PLANS, AND CROSS SECTIONS OF RECLAMATION OPERATIONS

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

Analysis:

Final surface configuration maps

Plate 3-2A – Post-Mining Topography - has been updated to show undisturbed drainage diversion RC-BP1, which is within the present disturbed area boundary. The map also shows additional silt fence along the toe of the south slope of the Ball Park Topsoil Pile.

Maps 3-2B, 3-2C, 3-2D, 8-5B, 8-5C, and 8-5D have been modified to show the changes in projected top-soil volumes and reclamation topography.

Findings:

The information in this section is sufficient to meet the requirements of the coal mining rules.

CUMULATIVE HYDROLOGIC IMPACT ASSESSMENT

Regulatory Reference: 30 CFR Sec. 784.14; R645-301-730.

A CHIA was completed for the Wild Horse Ridge significant revision to the Bear Canyon Mine plan. This amendment does not require a revision of the CHIA; the proposed modification is within the existing CIA. This ditch is expected to reduce the probability of impacts to the

hydrologic balance, both inside and outside the mine permit area, by diverting undisturbed drainage away from the mine permit area.

RECOMMENDATION:

The proposed amendment should be approved for insertion into the Mine Plan.