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

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June 8, 2001

Wendell Owen, Mine Manager
Co-Op Mining Company
P.O. Box 1245
Huntington, Utah 84528

Re: Extension Granted to Submit a Response to the Deficiencies for the Ballpark Drainage Amendment, Co-Op Mining Company, Bear Canyon Mine, C/015/0025-AM01A, Outgoing File

Dear Mr. Owen:

The Division received your request for an extension to submit a response for the Ballpark Drainage amendment on June 7, 2001. Your request is hereby granted. You know have until July 2, 2001 to address these issues. Please make every effort to complete this requirement.

If you have any question, please call me at (801) 538-5325 or Jim Smith at (801) 538-5262

Sincerely,

Susan M. White

for Daron R. Haddock
Permit Supervisor

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cc: Price Field Office
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# State of Utah

Utah Oil Gas and Mining

## Coal Regulatory Program

Bear Canyon Mine
Ballpark Drainage
C/015/025 AM01A
Technical Analysis
May 4, 2001

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# TECHNICAL ANALYSIS

# INTRODUCTION

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 Substitute Topsoil Pile. The purpose for the new ditch is to divert water that originates at springs located above the ballpark: during 2000, the flow from these springs was higher than in the past. The water flowed onto and across the ball park, deposited sediment on the ballfield, 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 proposed amendment was instigated by the operator as a response to erosion of topsoil from the south slope of the substitute topsoil pile and deposition of that topsoil outside the disturbed and permit area boundary. Except for a minor correction to the maps that is needed, the hydrology portion of the amendment is adequate.

The submittal also deletes the 3, 400 cubic yards of Ball Park Substitue topsoil from the mining and reclamation plan. Elimination of the Ball Park Substitute Topsoil from the MRP is not recommended for the following reasons:

- The 1992 study of the soils within the disturbed area concludes that 4,100 yards of substitute soil resources are available from within the coal storage pad, assuming that the soils remain uncontaminated during the life of the mine as demonstrated by resampling five years before final reclamation.
- The 1992 soil study did not include analysis of the selenium, boron, hydrocarbon or acid/base accounting of the substitute soils.
- The reclamation plan (App. 3-L) indicates that material from a depth of 10 to 15 feet will be utilized, however, the soil within the coal storage pad was only sampled to a depth of 5 to 8 feet.
- Five inches of substitute topsoil will be redistributed over the entire site. This is a very minimal amount of topsoil. The native soils have about a foot of loam over subsoil. Rather than deleting this substitute topsoil resource, the mine operation should seek to preserve it.

It appears to be pre-mature to remove the ballpark soils from the MRP. Details of reclamation are very sketchy at this time. The ballpark soils have already been moved to the site and vegetated and are available if needed for reclamation. In-situ soils have been tested for some but not all suitability parameters. In-situ soils will be tested five years prior to final reclamation for suitability. Parameters to test for should include Boron, Selenium, Acid/Base Accounting, and Total Petroleum Hydrocarbons.

## INTRODUCTION

There is an adequate amount of fill material to reclaim the site, however the reclamation plan does not adequately differentiate between spoil and substitute topsoil. The results of the 1991 soil sampling have not been utilized to identify and quantify the available substitute topsoil within the operations pad.

The amendment is not ready for insertion into the MRP and approval of this amendment is not recommended. The permittee needs to adequately respond to the deficiencies found in this TA before the amendment can be approved.

# SUMMARY OF OUTSTANDING DEFICIENCIES

*The Technical Analysis regarding the proposed permit changes is not complete at this time, pending submittal of additional information by the permittee and further review by the Division, to address outstanding deficiencies in the proposal. A summary of those outstanding deficiencies is provided below. Additional comments, concerns and deficiencies may also be found within the analysis and findings made in this Draft Technical Analysis which have not been presented in this summary. Upon finalization of this review, any outstanding deficiencies will be evaluated for compliance with the regulatory requirements. Such deficiencies may be conditioned to the requirements of the permit issued by the Division, result in denial of the proposed permit changes, or may result in other executive or enforcement action as deemed necessary by the Division at that time to achieve compliance with the Utah Coal Regulatory Program.*

*Accordingly, the permittee must address those deficiencies as found within this Draft Technical Analysis and provide the following, prior to approval, in accordance with the requirements of:*

***Regulations***

**R645-301-133.100** Plate 8-5 requires some work: Plate 8-5 B and C do not match in the vicinity of TS-3 and the boundary between TS-4 and TS-5 needs to be identified on Plate 8-5C. ..... 14

**R645-301-233.100 and R645-301-241** Using the information available, identify the planned recovery depth and volume of substitute topsoil to be generated from TS3 through TS 9 (TS designations are identified on Plates 8-5 A-E) and correlate this information with the cut and fill calculations laid out in Appendix 3-L. ..... 14

**R645-301-233.100 and R645-301-542.200** In the backfilling plan, identify the location and depth of substitute topsoil material to be recovered from the grading cuts of the coal storage pad ..... 11

**R645-301-234,** Further define the commitment on page 8-29, Section 8.9.1, to state that the proposed substitute topsoil within the sediment pond embankments, upper and lower operations pads, in the vicinity of the scalehouse and shop will be tested in the final five years of operations according to Table 3K-1 (Analytical Parameters for Overburden) of the MRP and including Total Petroleum Hydrocarbons by EPA Methods 8015 and 418.1 ..... 7

**R645-301-512.120 and R645-301-542.300 and R645-301-521.140** Correct the inconsistency between Plate 3-2 and Appendix 3-L with regard to the disturbed area boundary and have the cross-sections in Appendix 3-L as well as Plate 3-2 certified by a registered, professional engineer or land surveyor ..... 12

**R645-301-521.140, -521.150** – see comment under MAPS, PLANS, AND CROSS SECTIONS OF MINING OPERATIONS ..... 16

**R645-301-521.140, -521.150** – the permit area boundary at the Ball Park Topsoil Pile is shown and identified on Plates 2-4A, 3-2A, and 7-1A, but the disturbed are boundary is not identified; although the disturbed area boundary and the permit area boundary coincide at the Ball Park Topsoil Pile, the maps need to identify this boundary as both the permit and disturbed area boundary ..... 10

**TECHNICAL ANALYSIS:**

# ENVIRONMENTAL RESOURCE INFORMATION

Regulatory Reference: Pub. L 95-87 Sections 507(b), 508(a), and 516(b); 30 CFR 783., et. al.

## SOILS RESOURCE INFORMATION

Regulatory Reference: 30 CFR 783.21; 30 CFR 817.22; 30 CFR 817.200(c); 30 CFR 823; R645-301-220; R645-301-411.

**Analysis:**

Native soil types are identified on Plate 8-1 as Datino-Sheepcan-Winetti bouldery loams, 5 – 20% slopes (DZE) in the vicinity of the coal storage yard, and Travessilla-Rock outcrop Strych complex (TR) in the upper pad location. Appendix 8-B contains the 1980 soil survey.

*Datino-Sheepcan-Winetti bouldery loams, 5 – 20% slopes (DZE)*

In a typical profile of both the Datino and Sheepcan bouldery loams, the soil survey in Appendix 8-B indicates that above the B horizon there is about a foot of loam (page 8B-7). The narrative in Chapter 8 also indicates that there is a foot or more of loam in the surface layer. In the Datino profile, the four-inch topsoil layer is underlain by a seven-inch thick ($B_W$) loam layer which differs from the A horizon only in color and structure. The Sheepcan bouldery loam also has a five- inch topsoil layer underlain with an eleven-inch subsoil loam.

The Datino bouldery loam is classified as a loamy skeletal, mixed Typic Haploborall. The Sheepcan bouldery loam is classified as a fine-loamy, mixed (Calcareous), frigid Typic Ustorthent.

The Winetti is classified as Loamy-skeletal, mixed (calcareous), frigid, Typic Ustifluvents. It occurs along stream banks and is subject to flooding and erosion. As a result, a shallow topsoil horizon (one inch) lies over the recently deposited alluvium.

Rooting depth of these soils is approximately 60 inches and the available water capacity is 5 – 8 inches to a depth of 60 inches.

*Travessilla-Rock outcrop Strych complex (TR)*

The Travessilla very bouldery fine sandy loam occurs on ridges and side slopes. It is classified as a loamy mixed, calcareous, mesic, Lithic Ustic Torriorthent. The typical profile

has a two-inch A horizon over the fine sandy loam C horizon and bedrock at approximately 14 inches.

The Strych soils are found in the draws and concave positions. Strych soils are loamy-skeletal, mixed, mesic Ustollic Calciorthids. They typically have a four-inch thick loam horizon over a four-inch ($B_W$) loam layer. A layer of clay accumulation($B_k$) lies from 8 – 36 inches below. The C horizon extends to 60 inches.

**Substitute topsoil**

In 1985, 3,400 cubic yards of soil was imported to the mine site and stored in the "Ball Park." The soil was deposited over the 1.28 acres to a depth of 24 inches. Appendix 8-A contains the results of soil sampling of the Ball Park Substitute Topsoil. Section 8.9.3 discusses the rationale for importing the substitute topsoil and concludes on page 8-31 with the statement, **"If reclamation can be completed without this material, the ball park will not be disturbed."**

In 1991 a search for other substitute topsoil (Section 8.9.1) identified the downcast material from the road cuts (App 8-A and 8-D); the "in-place" soil covered over by pad development (App 8-E); the reclaimed outslope of the coal storage pad (page 8-29). The in-place soils were sampled and analyzed (Appendix 8-E). The soil sampling conducted in 1991 of the substitute topsoil did not include analysis of acid/base accounting, selenium, or boron levels. These analyses have been standard for the use of overburden as substitute topsoil since the implementation of the Division's 1988 guidelines.[1]

Most of these soils are buried beneath the operations pad, which is in continual use. Therefore, a commitment in the plan (page 8-29), states, **"Testing will be conducted again on the areas area [sic] to determine impacts continued mining has had on suitability in the final five year permitted period before reclamation."** The MRP does not indicate what analyses will be run at that time, but the Division requests that at that time, the buried soil is sampled and analyzed for selenium, boron, total organic carbon and acid/base accounting according to the methods described in Table 6 of the Division's 1988 Guidelines and as included in the MRP Table 3K-1 Analytical Parameters for Overburden. In addition, total petroleum hydrocarbons should be measured using EPA Methods 8015 for diesel fuel and 418.1 for waste oil.

The above two commitments (written in bold) seem to address the situation nicely. Removing the ballpark topsoil from the plan is pre-mature at this date.

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[1] Leatherwood, James and Dan Duce. 1988. Guidelines for Management of Topsoil and Overburden for Underground and Surface Coal Mining. State of Utah. Department of Natural Resources. Division of Oil, Gas and Mining.

**Findings:**

Information provided in the proposed amendment is not considered adequate to meet the requirements of this section. Prior to approval, the permittee must provide the following in accordance with:

**R645-301-234,** Further define the commitment on page 8-29, Section 8.9.1, to state that the proposed substitute topsoil within the sediment pond embankments, upper and lower operations pads, in the vicinity of the scalehouse and shop will be tested in the final five years of operations according to Table 3K-1 (Analytical Parameters for Overburden) of the MRP and including Total Petroleum Hydrocarbons by EPA Methods 8015 and 418.1

# 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**

Diversion RC-BP1 has been designed to divert a flow of 0.13 cfs, three times the current observed flow from the springs. Channel flow and cross-section were analyzed using "Flowmaster" channel design software, which uses Manning's formula. Calculation results are on pages 7H-78 through 7H-81 and in Table 7.3-1: pages 7H-78, 7H-79, and 7H-80 are certified. No riprap is needed in the diversion.

**Findings:**

The proposed amendment is adequate to meet the requirements of this section of the regulations.

## 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 - 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.

These maps no longer show the disturbed area boundary, which coincides with the permit area boundary that is shown on the maps.

**Findings:**

The information in this section is not sufficient to meet the requirements of this coal mining rules. Prior to approval, the applicant must respond adequately to the following deficiency:

**R645-301-521.140, -521.150** – the permit area boundary at the Ball Park Topsoil Pile is shown and identified on Plates 2-4A, 3-2A, and 7-1A, but the disturbed are boundary is not identified; although the disturbed area boundary and the permit area boundary coincide at the Ball Park Topsoil Pile, the maps need to identify this boundary as both the permit and disturbed area boundary

# RECLAMATION PLAN

## BACKFILLING AND GRADING

Regulatory Reference: 30 CFR Sec. 785.15, 817.102, 817.107; R645-301-233, -301-537, -301-552, -301-553, -302-230, -302-231, -302-232, -302-233.

**Analysis:**

Appendix 3-L, Cut and Fill Calculations, page 3L-14, indicates that for a complete highwall recovery in section J-J' on the upper storage pad; section E-E' on the portal pad area; and section H-H' on the portal access and tipple access roads an additional 4,285 cubic yards of material will be hauled from the coal storage pad. An excess of 4,120 cubic yards will be generated from the grading of the coal storage pad and will be used for highwall elimination (Table 3L-2 and page 3L-14).

Table 3L-2 indicates that most of the substitute topsoil will be coming from the coal storage pad in the vicinity of stations 4 – 7. It appears from the cross-sections in Appendix 3-L that all the material in the cuts is considered to be suitable as substitute topsoil and there has been no identification of substitute topsoil being retrieved from a particular zone or depth within the pad. Such identification is required due to the variability in the analyses located in Appendix 8-E (discussed under Topsoil and Subsoil below). Once the available substitute topsoil is accurately identified, the usefulness of the Ball Park Substitue Topsoil can be evaluated.

Looking closely at the cross sections at stations 5, 6, and 7 and the corresponding Cut and Fill Reference Map, Figure 3L-1, one sees that the reclamation will reach outside of the disturbed area boundary to the stream to achieve the final outcome. This puts the reclamation work outside of the disturbed area boundary and to the perimeter of the permit area. Plate 3-2, Reclamation contours does not reflect this reach outside of the disturbed area boundary. This inconsistency between Plate 3-2 and Appendix 3-L must be reconciled.

**Findings:**

Information provided in the proposed amendment is not considered adequate to meet the requirements of this section. Prior to approval, the permittee must provide the following in accordance with:

**R645-301-233.100 and R645-301-542.200** In the backfilling plan, identify the location and depth of substitute topsoil material to be recovered from the grading cuts of the coal storage pad

**R645-301-512.120 and R645-301-542.300 and R645-301-521.140** Correct the inconsistency between Plate 3-2 and Appendix 3-L with regard to the disturbed area boundary and have the cross-sections in Appendix 3-L as well as Plate 3-2 certified by a registered, professional engineer or land surveyor.

## TOPSOIL AND SUBSOIL

Regulatory Reference: 30 CFR Sec. 817.22; R645-301-240.

**Analysis:**

**Redistribution**

Page 8-38 indicates that five inches of topsoil or substitute topsoil will be redistributed over the entire site. This is a very minimal amount of topsoil replacement. As mentioned in the Appendix 8-B and discussed in this technical analysis in the Soils Resource Information section, native soils have about a foot of loam over the subsoil.

The details of the reclamation plan as presented in the MRP are sketchy. From Table 8.9-1, we know there will be 26 acres graded. If 5 inches of topsoil is replaced over 26 acres, then 17,450 cubic yards of topsoil will be necessary for reclamation. (If one foot of topsoil were replaced, there would be a need for 41,946 cubic yards.) The following yardage of topsoil has been segregated for reclamation:

1,000 cubic yards from the tank house road
+1,200 cubic yards from the shower house
+1,480 cubic yards from the main topsoil pile
3,680 cubic yards Total in storage

Assuming the need for 17,450 cubic yards total, there is a topsoil deficit.

17,450 cubic yards required
- 3,680 cubic yards in storage
13, 770 cubic yards deficit.

The Deficit of topsoil will be made up from reclamation areas as discussed below (see Plate 8-5 A - E for TS designation locations):

cubic yards
Deficit 13,770

TS 6, the portal access road outslope
(sampled down to 7 feet)
2.62 acres x 2 foot depth recovery = **8,454** cubic yards

Deficit 5,316

TS 5, the 10.8 acre coal storage pad and shop area
(sampled to a depth of 6 - 8 feet)
substitute material to come from the outer, eastern edge of the pad
the analyses show high EC and Mg levels in the top four feet at location CSP-1.
What is the planned recovery depth and volume to be generated from this location?
Table 3L-2, Appendix 3L indicates there may be **19,453** cubic yards of substitute topsoil to place over the 18,939 cubic yards of excess spoil. The determination of this figure needs some explanation. How is the substitute topsoil being differentiated from the rest of the fill? How is the yardage of spoil being estimated? ? In Appendix 3L, there appears to be no substitute topsoil generated from station 1, but this material represented by sample SP-1 was suitable as topsoil substitute (App 8-E).

Surplus +14,137

TS-3, sediment pond B (sampled to a depth of 2 feet)
and scale house (sampled to a depth of 5 feet)
This area may require additional topsoil as Sediment pond B (6-48 inch sample) had high EC and Mg values and Scalehouse soil samples had higher than average EC and SAR values in the top foot (see Appendix 8-B). These high values are not suitable as topsoil. They are comparable to the subsoil values found at undisturbed locations LB-1 through LB-3. Therefore, additional topsoil may be required for cover in TS-3.
Plate 8-5 B and C do not match in the vicinity of TS-3.

TS-4, sediment ponds A embankments (sampled to a depth of 2 feet)
What is the planned recovery depth and volume to be generated from this location?
Where is the boundary between TS-4 and TS-5 on Plate 8-5?

TS-7, the portal pad (sampled to a depth of 10 feet
What is the planned recovery depth and volume to be generated from this location?

TS-8, the upper storage pad (sampled to a depth of 10 feet)
Appendix 3-L indicates that highwalls will require importation of fill from the lower coal storage pad.
What is the planned recovery depth and volume to be generated from this location?

TS-9, the showerhouse/office (sampled to a depth of 2 feet)
What is the planned recovery depth and volume to be generated from this location?

**Findings:**

Information provided in the proposed amendment is not considered adequate to meet the requirements of this section. Prior to approval, the permittee must provide the following in accordance with:

**R645-301-233.100 and R645-301-241** Using the information available, identify the planned recovery depth and volume of substitute topsoil to be generated from TS3 through TS 9 (TS designations are identified on Plates 8-5 A-E) and correlate this information with the cut and fill calculations laid out in Appendix 3-L.

**R645-301-133.100** Plate 8-5 requires some work: Plate 8-5 B and C do not match in the vicinity of TS-3 and the boundary between TS-4 and TS-5 needs to be identified on Plate 8-5C.

## POSTMINING LAND USES

Regulatory Reference: 30 CFR Sec. 784.15, 784.200, 785.16, 817.133; R645-301-412, -301-413, -301-414, -302-270, -302-271, -302-272, -302-273, -302-274, -302-275.

**Analysis:**

The planned postmining land use for this area is wildlife, grazing, and recreation. This amendment will not change the postmining land use.

**Findings:**

The proposed amendment does not change or affect postmining land use.

# 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, -301-750, -301-751, -301-760, -301-761.

**Analysis:**

**Diversions**

The diversion has been designed to carry a flow of 0.13 cfs, three times the current observed flow from the springs. Channel flow and cross-section were analyzed using "Flowmaster" channel design software, which uses Manning's formula, and designs are certified.

**Findings:**

The proposed amendment is adequate to meet the requirements of this section of the regulations.

# STABILIZATION OF SURFACE AREAS

Regulatory Reference: 30 CFR Sec. 817.95; R645-301-244.

**Analysis:**

The purpose of the proposed diversion is to protect and stabilize the Ball Park Topsoil Pile and adjacent areas, to control erosion and stop formation of rills and gullies in areas that have been regraded and topsoiled, to protect and maintain land for the approved postmining land, protect the vegetative cover, and prevent violation of water quality standards for receiving streams.

**Findings:**

The proposed amendment is adequate to meet the requirements of this section of the regulations.

# 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.

This map no longer shows the disturbed area boundary, which coincides with the permit area boundary that is shown on the map.

**Findings:**

The information in this section is not sufficient to meet the requirements of this coal mining rules. Prior to approval, the applicant must respond adequately to the following deficiency:

**R645-301-521.140, -521.150** – see comment under MAPS, PLANS, AND CROSS SECTIONS OF MINING OPERATIONS.

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