



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

Michael O. Leavitt
Governor
Kathleen Clarke
Executive Director
Lowell P. Braxton
Division Director

1594 West North Temple, Suite 1210
PO Box 145801
Salt Lake City, Utah 84114-5801
801-538-5340
801-359-3940 (Fax)
801-538-7223 (TDD)

ok

September 7, 2001

TO: Internal File

THRU: Jim W. Smith, Hydrologist and Team Lead *JWS*

FROM: Priscilla W. Burton, Reclamation Soils Scientist *PB*

RE: Ballpark Drainage, CO-OP Mining Company, Bear Canyon Mine,
C/015/025-AM01A-1

SUMMARY:

Of the total 36.4 acres within the disturbed area boundary, there will be approximately 27 acres to be regraded. Of these 27 acres, 18 acres will either receive a layer of substitute topsoil or utilize the in-place soil as substitute topsoil. The remainder, nine acres, will receive topsoil which was salvaged prior to disturbance.

The plan calls for a cover of 12 inches of suitable topsoil substitute over most of the site with the tipple and coal yard receiving 18 inches of suitable topsoil substitute.

Several inaccuracies with the submittal have stifled review of the plan to utilize pad material as substitute topsoil, which in concept should be workable.

TECHNICAL ANALYSIS:

GENERAL CONTENTS

COMPLETENESS

Regulatory Reference: 30 CFR 777.15; R645-301-150.

Analysis:

This submittal revised the acreages to be regraded during final reclamation (see Table 8.9-1). The sum total of regraded acres listed in Table 8.9-1 should also have been revised, but was not.

Table 8.9-6 Summary Table retains the 3,400 cu yds in the Ball Park Topsoil Pile. This table should be revised to sum the available topsoil at the mine site for reclamation.

Page 8-26 of the submittal refers to Table 8.5-4, Substitute Topsoil Generated from Cuts. This table was not listed in the Table of Contents and was not found with the submittal or with the MRP.

Table 8.9-1 Reclamation Area Summary includes the Ball Park Topsoil Pile to be re-contoured. If the intent of this submittal is to withdraw these soils from reclamation use and to retain the ball park for recreation, then the area TS-1 should not be included in this summary chart.

The Total substitute topsoil available column of Table 8.9-3 is very misleading and should be deleted as the numbers do not reflect the reality that the volumes of soil tallied in the total substitute topsoil column are necessary as backfill to cover the waste and highwalls. The soil is not available as substitute topsoil.

Page 3L-13 indicates that 16 inches of substitute topsoil will be placed over the tipple and loadout area (TS-5). However all tables in chapter 8 assume an eighteen inch cover depth. Information provided in Appendix 3-L should agree with that given in Chapter 8 for substitute topsoil cover depths, please adjust the information and calculations accordingly.

Some confusion exists between Table 3L-1 and Table 3L-2 for the Area TS-3 Cut & Fill Summary. In Table 3L-1 the fill volume for Area TS-3 is given as 1,454 cu yards and the cut as 1,468 cu yds. In Table 3L-2, for Area TS-3 Cut & Fill Summary, the total cut is given as 2,691 cu yards and the total fill is given as 2,679 cu yards.

Also in Appendix 3-L, the information provided in Table 3L-6 Area TS-7 Cut & Fill Summary does not sum correctly for Cut Volumes.

Findings:

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

R645-301-150, Please make the eight corrections listed below:

1. The sum total of regraded acres listed in Table 8.9-1 should be revised to reflect recent changes.
2. Table 8.9-6 Summary Table should not retain the 3,400 cu yds in the Ball Park Topsoil Pile.
3. Page 8-26 of the submittal refers to Table 8.5-4, Substitute Topsoil Generated from Cuts. This table was not listed in the Table of Contents and was not found with the submittal or with the MRP.
4. Table 8.9-1 Reclamation Area Summary includes the Ball Park Topsoil Pile to be re-contoured. If the intent of this submittal is to withdraw these soils from reclamation use and to retain the ball park for recreation, then the area TS-1 should not be included in this summary chart.
5. Page 3L-13 indicates that 16 inches of substitute topsoil will be placed over the tipple and loadout area (TS-5). However all tables in chapter 8 assume an eighteen inch cover depth. Information provided in Appendix 3-L should agree with that given in Chapter 8 for substitute topsoil cover depths, please adjust the information and calculations accordingly.
6. Correct the discrepancy between Table 3L-1 and Table 3L-2 for the Area TS-3 Cut & Fill Summary.
7. Correctly sum the information provided in Table 3L-6 Area TS-7 Cut & Fill Summary.
8. Eliminate misleading information in Table 8.9-3 concerning the volume of soil tallied in the total substitute topsoil column.

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 imported ballpark topsoil. Currently the reclamation plan does not propose the use of the ball park soil. Rather, reclamation will utilize buried soil within the operations pads as substitute topsoil.

In 1991 a search for other substitute topsoil (Section 8.9.1) identified the downcast material from the road cuts (further information is in Appendix 8-A and 8-D); the "in-place" soil covered over by pad development (information in 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 8-26), states that the proposed substitute topsoil material will be re-tested in the final five years of operations according to Table 3K-1 and will include Total Petroleum Hydrocarbons by EPA methods 8015 for diesel fuel and 418.1 for waste oil. Table 3-K includes the analysis of selenium, boron, total organic carbon and acid/base accounting according to the methods described in Table 6 of the Division's 1988 guidelines.

Table 8.9-2, Available Substitute Topsoil Material, reports a volume available based upon utilization of the entire depth of the drill sample. i.e. Drill Depth X Area = Volume Available. (Drill hole and sample locations are illustrated on Plates 8-5 B through G.) This information assumes that all soils tested are equally valuable for substitute topsoil usage and that the entire reclamation area (acreage) will be recontoured (which is not the case according to Tables 8.9-3 and 8.9-4).

The Minimum Cut Depth column in Table 8.9-2 indicates the depth of soil to be excavated to arrive at the proposed cover depth for each reclamation area. On page 8-26, the reader is referred to Appendix 3-L for further descriptive information about regrading.

In Appendix 3-L (page 3L-6) the reader is referred to sections 8.9 and 8.10 for information on topsoil depths and sources. Section 8.10 indicates the volume of soil required from each section to achieve the cover depths, but does not discriminate the depths of recovery of the most suitable soil for the reader. So the following questions come to mind: After reviewing the soils information available, are there any soils which should be isolated and buried? Are there any soils should be selectively sorted because of qualities which would make

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.

them superior? Or were all soils tested equally valuable for substitute topsoil use.

Patrick Collins of Mt. Nebo Scientific evaluated the soil test results in 1992. His conclusion (found in Appendix 8E) was that “no significant problems exist in the spoils that were sampled.”

The Division has reviewed the soil tests and makes the following recommendations:

Area TS-3

Sediment Pond B and Scalehouse Pad

- The west embankment will be used to fill the pond and substitute topsoil will come from the removal of culvert C-10U.
- Sediment pond B surface soils (from 0 – 2 feet) have a lower Electrical Conductivity (2.68 mmhos/cm) and are therefore better than those soils sampled between 2 – 4 feet deep (EC 6.24 mmhos/cm), probably due to contact with the salts diffusing into the soil from pond waters.
- The top six inches of soil in the vicinity of the Scalehouse should not be used as substitute topsoil resource due to high SAR (7.98 and 8.2) and EC (4.68 – 5.64 mmhos/cm) values.

Area TS-4

Sediment Pond A

- Eastern and western embankments will be used to fill sediment pond A.
- This soil is represented by SEDA-2 in Appendix 8-3.
- This soil was sampled to a depth of 2 feet, but the cross-sections show that there will be about ten feet of cut from the sediment pond banks.

Area TS-5

Tipple and Loadout Area

- Coal storage pad samples are represented in Appendix 8E as CSP1-5.
- EC values are between 1 and 3.5 mmhos/cm with the exception of a higher value (5.04 mmhos/cm) recorded at CSP-1 in the top four feet. However, the SAR values are all very low (less than 1.0) due to the fact that the salt creating the conductivity appears to be magnesium.
- Cuts shown in cross-sections provided in Appendix 3-L are deeper than testing of the soils. Soils remaining on the surface as substitute topsoil must be tested at the time of reclamation for the parameters described in Table 3K-1.

Area TS-6

Portal Access Road

- Portal access road samples are represented by sample PAR – 1 at station 8+00 in Appendix 8-3.
- 2,553 cubic yards of material will be generated from the cuts and taken to areas TS – 7

and TS-8.

- 7,111 cubic yards of substitute topsoil will come mainly from station 14+00 and station 26+00. Station 8+00 will yield only 52 cubic yards of substitute topsoil. The next sampling undertaken should correlate sampling locations with the areas generating the most substitute topsoil.

Area TS-7

Blind Seam Portal Pad

- This area was sampled down to a depth of 10 feet and is represented by LHP-1 in Appendix 8-3.
- Sample location LHP-1 as shown on Plate 8-5C represents the material from cross section station 2+00 where according to Table 3L-6, 578 cubic yards of substitute topsoil will be generated. This soil has high SAR values and is not recommended for surface cover.

Area TS-8

Upper Storage Pad

- This area was sampled down to a depth of 10 feet and is represented by USP-1 in Appendix 8-3. No problems were noted below 6 inches where EC is elevated.

Area TS-9

Sediment Pond C and Bathhouse Pad

- 1,008 yards of topsoil were salvaged and are stored for use in the location of TS-9.
- 1,762 cubic yards of soil from the bathhouse parking area will be used to fill the ditch leading to sediment pond C and also sediment pond C.
- Samples REF-1 and 2 represent the quality of the topsoil salvaged from this location.
- A sample of the bathhouse pad parking lot should be taken within five years of reclamation.

In summation, pad material samples provide an idea of the quality of the material to be found on the surface, but specifics will not be available until final reclamation grading brings the subsoils which will function as substitute topsoil to the surface. The Permittee should note that there are some areas which have high salts: TS3, TS7 and TS8. There is no information on area TS 9 for the bathhouse pad and little information on TS6, portal access road soils. It is imperative that sampling is conducted according to the parameters outlined in Table 3K-1 prior to reclamation concentrating the areas that are to yield substitute topsoil. Sampling after reclamation grading should also be conducted on the exposed surface soils for a limited number of parameters outlined in Table 3K-1.

Findings:

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

R645-301-200, Include in the commitment on page 8-26 of the submittal that the next sampling undertaken will correlate sampling locations will the areas generating the most substitute topsoil as described in Appendix 3-L and also provide a commitment to sample soils remaining on the surface as substitute topsoil at the time of reclamation for pH, EC, and Total Organic Carbon by methods described in Table 3K-1 of the MRP and Total Petroleum Hydrocarbons by EPA methods 8015 for diesel fuel and 418.1 for waste oil.

OPERATION PLAN

TOPSOIL AND SUBSOIL

Regulatory Reference: 30 CFR Sec. 817.22; R645-301-230.

Analysis:

Removal and Storage

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

Material on the outslope of the coal storage pad has been designated as substitute topsoil. Section 8.9.1, On-Site Material, states that this material will be protected from contamination by berms and retaining walls and slopes will be stabilized with erosion control matting until a good vegetative cover is established. Any coal spilled onto the outslope will be removed. This material should be posted as substitute topsoil with a sign.

Findings:

Information provided in the proposed amendment considered adequate to meet the operations plan topsoil and subsoil requirements of the Regulations.

RECLAMATION PLAN

BACKFILLING AND GRADING

Regulatory Reference: 30 CFR Sec. 785.15, 817.102, 817.107; R645-301-234, -301-537, -301-552, -301-553, -302-230, -302-231, -302-232, -302-233.

Analysis:

General

Table 8.9-1 outlines that approximately 27 acres will be regraded during reclamation. Of these, approximately 18 acres will receive substitute topsoil.

In Appendix 3-L, Table 3L-1 is a cut and fill summary of reclamation areas TS-3 through TS-9. (Reclamation areas are illustrated on Plates 8-5 B through G.) The relationship between Table 3L-1 and Table 8.9-4 showing Substitute Topsoil Generated from Cuts (cu yd) is established by using the cut and fill summary tables for each reclamation area. For instance Area TS-5 requires 21,948 cubic yards of fill and will generate 34,392 cubic yards of cut of which 21,861 cubic yards will be substitute topsoil.

Cross sections provided in Appendix 3-L do not match the contours provided on Plate 3-2B & C for Area TS-5 or TS-4. The Division does not have time to check all the contours and cross-sections. It is recommended that the Permittee check the accuracy of all the cross-sections in Appendix 3-L and resubmit the information.

Provide a commitment in the plan that all acid/toxic forming materials will be buried four feet deep in the fill.

Findings:

Information provided in the proposed amendment is not considered adequate to meet the reclamation plan backfilling and grading requirements of the Regulations. Prior to approval, the permittee must provide the following in accordance with:

R645-301-234, Cross sections provided in Appendix 3-L do not match the contours provided on Plate 3-2B & C for Area TS-5 or TS-4. The Permittee must check the accuracy of all the cross-sections in Appendix 3-L and resubmit the information.

R645-301-553.252, Provide a commitment in the plan that all acid/toxic forming materials will be buried four feet deep in the fill.

TOPSOIL AND SUBSOIL

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

Analysis:

Redistribution

It appears from a comparison of Table 8.9-3 and Table 8.9-1 that of the approximately 27 acres to be re-contoured, only 18.32 acres will receive substitute topsoil, the remainder is post-law disturbance where topsoil was salvaged. Table 8.9-3, Substitute Topsoil Summary A, shows that all areas will receive 12 inches of substitute topsoil, except TS-4 (sediment Pond A) and TS-5 (main pad area). TS-4 will receive 10 inches and TS-5 will receive 18 inches of substitute topsoil. (TS designations are identified on Plates 8-5 A-E.)

The Total substitute topsoil available column of Table 8.9-3 is very misleading and should be deleted as the numbers do not reflect the reality that the volumes of soil tallied in the total substitute topsoil column are necessary as backfill to cover the waste and highwalls. The soil is not available as substitute topsoil.

A cover depth of twelve inches over areas TS-3, TS-6, TS-7, and TS-8 (8.77 acres in all) will require 14,449 cubic yards of good quality soil. For TS-5 (8.8 acres) eighteen inches of cover is planned, consequently 21,296 cubic yards of good quality soil is required. For TS-4 (0.75 acres) a ten inch topsoil replacement will require 1,008 cubic yards of good quality soil. The total requirement for good quality substitute topsoil to be applied to the recontoured ground is $14,149 + 21,296 + 1,008 = 36,453$ cubic yards.

Table 8.9-4, Substitute Topsoil Summary B, tallies the volume of substitute topsoil to be excavated at each location to meet the need outlined in Table 8.9-3. This table has two sub-headings listed under Substitute Topsoil Generated from Cuts (cu. yd): "substitute topsoil" and "substitute topsoil not regraded." The heading of "substitute topsoil not regraded," shows that 2,563 cubic yards of in-place subsoil in reclamation area TS-3 will serve as substitute topsoil. In area TS-5 approximately 4,537 cubic yards of in-place subsoil will become the substitute topsoil.

The Deficit of topsoil will be made up from reclamation areas as discussed in Appendix 3-L and summarized below (see Plate 8-5 A - E for TS designation locations):

TS-3

Sediment Pond B and Scalehouse areas

- Sediment pond B embankment was sampled to a depth of 4 feet.
- The six to 48 inch sample had an EC of 6.24 mmhos/cm (represented by sample site SHP-1 in Appendix 8-E).
- Scalehouse soil samples (sampled to a depth of 5 feet) had higher than average EC and SAR values in the top foot (represented by samples SEDB-1 and SEDB-2 in Appendix 8-E).
- Therefore, based upon 1991 sampling, the top foot should be avoided for use as substitute topsoil in the scalehouse area and the top four feet should be avoided in the area of sediment pond B.
- Table 8.9-4 indicates that 2,080 cubic yards of substitute topsoil will be regraded on the site and 2,562 cubic yards of in-place soils will be prepared as substitute topsoil.

The present submittal states on page 3L-8 that

1. The west embankment will be removed and used as fill for sediment pond B.
2. Additional substitute topsoil will come from soil backfilled over culvert - C10U.

TS-4

Sediment Pond A

- Sediment pond A was sampled to a depth of two feet.
- The material in the top two feet is adequate for substitute topsoil, as the Electrical Conductivity values of 3.67 – 4.23 mmhos/cm were not accompanied by elevated SAR values.

The present submittal states on page 3L-11 that

1. Fill for sediment pond A will come from the embankment.
2. Substitute topsoil (1,008 cubic yards) will also come from the embankment.

TS-5

Tipple and Loadout Area

- Represented by samples CSP1 -3 in Appendix 8-3 (sampled to a depth of 6 – 8 feet).
- The present submittal indicates in Appendix 3-L that
 1. Sixteen inches of substitute topsoil material will be placed over the coal mine waste.
 2. Areas where operational contours (shown on Plate 8-5C) and reclamation contours (shown on Plate 3-2C) match will utilize the surface soil as substitute topsoil and no additional material will be brought to the location for cover (page 3L-13). After matching contour lines, the Division concludes that the west half of the tipple and yard and loadout area will not receive further cover. Please clarify this by providing a map

outlining areas of topsoil replacement.

3. Where cuts created the reclamation contours, the exposed soil will become the substitute topsoil.
4. Total volume of waste to be buried in location TS-5 is 15,669 cubic yards. This material will be covered with a minimum of sixteen inches of substitute topsoil material (pages 3L-4 and 5).
5. 12,444 cubic yards of excess soil will be moved from TS -5 for use in TS-7 and TS-8.
6. According to Table 3L-4, there will be 21,861 cubic yards of cut which will be utilized as substitute topsoil. This soil will come mostly from the eastern side of the pad as stations 1+00, and 4+00 through 9+00.

TS 6

Portal access road

- The portal access road outslope is represented by sample PAR-1 in App 8-3. (sampled down to 7 feet).
- The present submittal indicates in Appendix 3-L, page 3L-29 that
 1. The revegetated outslope shown on cross-sections at station 11+00, 12+00, 15+00 and 16+00 will remain undisturbed through final reclamation. This extremely steep slope is shown as BTCA Area G on Plate 7-1D, Hydrology Map.
 2. 2,553 yards of material will be generated from this area for use in TS-7 and TS-8. The soil to be taken as fill to TS-7 and 8 will come from stations 14+00 and 26+00.

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, Areas where operational contours (shown on Plate 8-5C) and reclamation contours (shown on Plate 3-2C) match will utilize the surface soil as substitute topsoil and no additional material will be brought to the location for cover (page - 13). After matching contour lines, the Division concludes that the the slopes on the west half of the tipple and yard and loadout area will be backfilled to cover mine waste, graded, ripped and prepared for seeding and that no further cover in the form of substitute topsoil will be applied to the west half of the tipple yard. Please clarify this by providing a map outlining areas to receive substitute topsoil replacement.

RECCOMENDATIONS:

In concept, use of the pad material should be acceptable with the commitment that testing of the soil will be conducted prior to reclamation and again (to a limited extent) after grading to ensure that the soil is not contaminated by salts, mine waste, oil or grease.

This submittal is not ready for approval. There are several inaccuracies that have been pointed out by this review.