



**State of Utah**  
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August 9, 2002

TO: Internal File

THRU: *JDS* James D. Smith, Sr. Reclamation Specialist/Hydrogeology, Team Lead

FROM: *PB* Priscilla Burton, Sr. Reclamation Specialist/Soils

RE: Reclamation Plan – Lower Pad (Phase 2), Energy West Mining Company, Des-Bee-Dove Mine, C/015/017-AM01D-1

**SUMMARY:**

Phase 1 reclamation was completed in May 2002. Phase I involved reconstruction of three drainages in the location of the Little Dove/ Beehive pads and reshaping the water tank pad and the substation pad and access roads.

Phase 2 reclamation covers 22 acres (Section 310) of (mostly) pre-SMCRA disturbance. Substitute topsoil will be reapplied to approximately 8.4 acres of reconstructed fill slopes on the bathhouse pad and in the lower main drainage and at the Deseret portal and access road to the Beehive portal.

During Phase 2, a drainage will be carved out of the Deseret Mine pad and Tipple yard and the storage yard area (where coal mine waste was recently removed, see AM01B). The Bathhouse pad and outslope will be the repository of coal mine waste and a source of cover material, including substitute topsoil. An undisturbed area to the west of the tipple yard will also supply cover material. These plans supersede those in the currently approved MRP, Volume 2 for the salvage of substitute topsoil.

**TECHNICAL ANALYSIS:**

**GENERAL CONTENTS**

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## PERMIT APPLICATION FORMAT AND CONTENTS

Regulatory Reference: 30 CFR 777.11; R645-301-120.

### Analysis:

The Table of Contents identifies the Phase 2 Reclamation Plan as a separate booklet (binder) that is Appendix XVI of Volume 5. A page has been created for insertion into Volume 2, Part 4, Reclamation Plan to indicate that information in Appendix XVI supercedes that in Volume 2, Part 4.

However, the submittal also includes a laminated title page indicating that Appendix XV is the Phase 2 Reclamation Plan. And, the binder cover indicates that the submittal is Appendix XV. The Permittee must consistently identify the location of the Phase 2 Reclamation information, is it Appendix XVI or XV?

The Phase 2 Plan refers frequently to Appendix XIV Phase 1 Reclamation Plan for soils information from trenching of the site during the week of December 3, 2001. The Permittee should revise page 11 to indicate that all soils information is found only in Appendix XIV Phase 1 Reclamation Plan.

Cut and fill information provided in Appendix C of Section R645-500 has been recalculated for this submittal.

### Findings:

Information provided in the proposed amendment is not considered adequate to meet the requirements of the Permit Application Format and Contents section of the regulations. Prior to approval, the Permittee must provide the following in accordance with:

**R645-301-120.122**, The Permittee must consistently identify the location of the Phase 2 Reclamation information, is it Appendix XVI or XV? See laminated title page in submittal and front of binder.

## REPORTING OF TECHNICAL DATA

Regulatory Reference: 30 CFR 777.13; R645-301-130.

### Analysis:

Mr. Dan Larsen, Soil Scientist, EIS Environmental & Engineering Consulting, conducted the soils investigations as a basis of forming a reclamation salvage and replacement strategy.

Mr. Larsen's report is found in Appendix XIV Phase 1 Section 200, Appendix C. Appendix C is referred to in the submittal under "Reporting of Technical Data.

As reported in Appendix C of Appendix XIV Phase 1, laboratory work was performed by Intermountain Laboratories, Inc., Sheridan Wyoming.

**Findings:**

Information provided meets the requirements of Reporting of Technical Data section of the Regulations.

## 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:**

Elevation is 7,630 feet on a southeast exposure and slopes of 1½ H:1V to 2H:1V. The plant community is Utah juniper and pinyon pine. Plants within this community include Salina wildrye, western wheatgrass, and Indian ricegrass.

Soils have been described in the MRP as either

- Typic Ustochrepts (50%) which are characterized by a 35 cm thick (13 inches) sandy loam surface layer with 25% coarse fragments. Underlying this layer is a stony loam layer 100 cm thick (39 inches) with up to 50% coarse fragments
- or
- Lithic Ustorthents (25%) which are characterized by rock within 50 cm or 19 inches.

Also present are small areas of Mollisols on the north and east facing slopes. In general, Mollisols are deep, well drained, with a well developed A horizon. See the General Soil Map of the Permit Area, Drawing #CE-10502-DS.

*Deseret Pad and Tipple Area Soils information*

Soil and Refuse sample sites are shown on Map 200-1. The following samples have been taken of the soils adjacent to the Deseret pad and represent undisturbed soil quality: SS8A, collected in 1990 and SS5 and SS10 collected in 2001. Laboratory Data Sheets for these sites

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are found in Appendix A. The 1990 soil samples were collected by Val Payne in April 1990 and analyzed by ACZ Laboratories in Steamboat Springs, CO. The 2001 samples were collected by Dennis Oakley and Chuck Semborski in March 1990 and analyzed by Inter-Mountain Laboratories in Sheridan, WY.

Sample depths were not reported for the 1990 samples and profile descriptions are not available. Information from the year 2001 indicates that samples were taken from 0 – 6 inches, 6 – 12 inches and 12 – 18 inches of the surface at each sample site. No field notes were taken and it is not known whether a lithic contact was encountered at eighteen inches.

The undisturbed soils of the Deseret Pad are represented by sample sites SS5, SS8A, and SS10 as shown on Map 200-1. Qualities of the undisturbed soils are summarized in the Deseret Pad and Tipple Area Soils Information Summary table below. The Deseret pad soils in the location of SS10 were found to have much less sand (21%) than the other sites with texture bordering on clay loam (28% clay and 51% silt). As expected, this site had the highest saturation percentage.

Disturbed soils in the Deseret pad area are described by samples SS8 and SS9. The characteristics of these sites are also summarized in the Deseret Pad and Tipple Area Soils Information Summary table below.

Refuse quality is represented by sites SS6 and site 1117. Characteristics of the refuse are summarized in the Deseret Pad and Tipple Area Soils Information Summary table below. In some instances, the refuse is unsuitably high in pH, SAR, and EC. In most instances the refuse is too sandy for use in the top four feet of the reclaimed profile. Samples were taken of refuse/soil mixtures during trenching (December 3, 2001) and this combined mix may be more useful than straight refuse.

Deseret Pad and Tipple Area Soils Information Summary

	Undisturbed (sites SS5, SS8A, SS10)	Disturbed (sites SS8 and SS9)	Refuse sites (sites SS6 and 1117)
PH	7.2 – 7.6	7.0 – 7.3	7.0 – 10.0
EC			
mmhos/cm	0.32 – 0.63	0.55 – 3.0	2.1 – 13.3
SAR	0.5 – 0.6	0.81 – 1.76	8.5 – 9.1
NO <sub>3</sub> – N ppm	0.3 – 1.9	0.78 – 10.3	5.1 – 6.7
P ppm	2		2.46 – 10.1
NP (t/1000t)	180 -350	314 - 421	275
AP (t/1000t)		4	1.25
Texture	sl, ls, l, cl	loam	Sandy loam
%clay			

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	Undisturbed (sites SS5, SS8A, SS10)	Disturbed (sites SS8 and SS9)	Refuse sites (sites SS6 and 1117)
%sand	21 - 84	35 - 55	73
SP (%)	27 - 34	31 - 35	26
Coarse frag %	25 - 40	19 - 43	29 - 34%

*Bathroom pad soils information*

Bathroom pad soils are represented by sample sites SS2, SS4, #19, and #22 all taken in 2001. Site #19 is also known as DBD 3600, a composite taken from 0 – 18 inches, and site #22 is also known as DBD 3700, a composite taken from 0 – 5 feet. Undisturbed soils in the vicinity of the bathroom pad are represented by SS1, collected in 2000, and SS6A, collected in 1990. Laboratory Data Sheets for these sites are found in Appendix A. The 1990 soil sample was collected by Val Payne in 1990 and analyzed by ACZ Laboratories in Steamboat Springs, CO. The 2001 samples were collected by Dennis Oakley and Chuck Semborski and analyzed by Inter-Mountain Laboratories in Sheridan, WY.

Qualities of the pad soils and adjacent, undisturbed soils are summarized in the Bathroom Pad Soils Information Summary table below. The most significant difference between the pad soils and undisturbed sites was the SAR, percent coarse fragments, and the neutralization potential. Soils in the vicinity of site #20 or DBD3700 with high SAR can be avoided as a source of substitute topsoil.

Bathroom Pad Soils Information Summary

	Undisturbed (sites SS1 and SS6A)	Disturbed (sites SS2, SS4, #19 and #20)
PH	7.2 – 7.4	7.0 – 7.4
EC		
mmhos/cm	0.71 – 3.1	0.96 – 2.4
SAR	0.3 – 0.96	0.47 – 11.7
NO <sub>3</sub> – N ppm	0.8 – 7.84	0.74 – 4.8
P ppm	2 – 3.28	1 – 2.48
NP (t/1000t)	277 - 308	4.5 – 662
AP (t/1000t)	0 – 5.31	0 – 1.56
TOC	(2.6%OM) 2.9 – 3.6	1.5 – 5.9
Texture	SL	L - SL
%clay	9 – 16	12 – 20
%sand	54 - 63	40 - 64

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	Undisturbed (sites SS1 and SS6A)	Disturbed (sites SS2, SS4, #19 and #20)
SP (%)	27 - 30	23 - 29
Coarse frag %	29	24 - 40

*Main access road soils information*

Cut slope soils along the main access road are presented by samples SS3 (a 2001 sample) and SS5A (a 1990 sample). The qualities of the soil are shown in the table below entitled Main Access Road Soils.

Main Access Road Soils Information Summary

	Cut slope (sites SS3 and SS5A)
PH	6.8 – 7.3
EC mmhos/cm	0.67 – 2.17
SAR	0.22 – 2.17
NO <sub>3</sub> – N ppm	0.1 – 1.4
P ppm	0.38 - 2
NP (t/1000t)	155
AP (t/1000t)	0 – 5.62
TOC	(4.1%OM) 2.3
Texture	SL to L
%clay	14 – 16
%sand	46 - 57
SP (%)	29 - 30
Coarse frag %	14.8 – 34.5

The January 15, 2001 Technical Analysis resulted in the following deficiency:

**R645-301-122**, Please provide to the Division a copy of the soil survey report for the Des Bee Dove Mine site by Dr. A.R. Southard, as referenced in the submittal.

A soil survey of the Des Bee Dove mine site by Dr. A.R. Southard, Soil Scientist, Utah State University was included as Appendix B of Appendix XIV Phase 1 Reclamation.

**Findings:**

The information provided meets the requirement of Environmental Resources Soils section of the Regulations.

## **OPERATION PLAN**

### **TOPSOIL AND SUBSOIL**

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

**Analysis:**

**Removal and Storage**

The January 15, 2001 Technical Analysis resulted in the following deficiencies:

**R645-301-233 and R645-301-121.100**, Incorporate the response to AM01C (NOV 01-7-1-1 Abatement information) into the submittal and supply the soils information gathered (field notes and laboratory analysis as well as consultants analysis of the information) from the abatement plan into the submittal. Utilize this information to provide information on volumes of waste, volumes of potential substitute topsoil, locations of substitute topsoil, designated mine waste burial locations, designated topsoil placement locations, and depth of topsoil placement.

**R645-301-121.200**, Please explain the statement made on page 12 Section 240 that growth media segregated during the valley fill excavation project will be used as the final fill cover (section 240 Reclamation Plan, page 12). Since there was no growth material salvaged during the valley fill excavation project (see N.O.V. 01-7-1-1) the meaning of this statement is unclear.

Since there was no growth material salvaged during the valley fill excavation project (see N.O.V. 01-7-1-1), the statement on page 12, Section 240 was removed.

Trenching at various locations on the site (as required to abate N.O.V. 01-7-1-1) has provided the Permittee with information on the depth to bedrock, rock content and available soils material in the pad fills at the site. Trenching information was gathered during the week of December 3, 2001 and is presented in Appendices A and C of of Chapter 2 of Appendix XIV Phase 1 Reclamation Plan. During the last technical review of Phase 2 reclamation, the Permittee was asked to supply information on the the volumes of potential substitute topsoil, locations of substitute topsoil, designated topsoil placement locations, and depth of topsoil

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placement.

The Deseret Mine, Tipple and Bathhouse cover about 8.4 acres, not including the reconstructed drainages. To cover the 8.4 acres with six inches of substitute topsoil will require 6,900 cubic yards (Table 4 of Section 200 Soils). Sources of substitute topsoil are outlined in Table 5 Substitute Topsoil Excavation and shown on Drawing #200-1. In total, 20,500 cu yds of substitute topsoil may result from the sources identified in Table 5. These sources are

- 1) Substitute topsoil transferred from Phase 1 (500 cu yds);
- 2) Bathhouse outslope (8,700 cu yds);
- 3) Bathhouse trenches (8,400 cu yds);
- 4) Undisturbed island within the disturbed area (2,900 cu yds).

Five hundred cubic yards of substitute topsoil was transferred from the Phase 1 area to Phase 2. This material is identified with a sign and stored on the Deseret pad as shown on Drawing 200-1.

Drawing 200-1 shows a 50 foot wide band along the length of the bathhouse pad as a source of substitute topsoil. This swath is expected to yield 8,700 cu yds from 1.02 acres, which calculates to a salvage depth of 5.5 feet from the 50 wide band. The band, as shown on Drawing 200-1 encompasses about 20 feet of the outslope and the remainder is from the pad surface, overlapping two proposed excavations. Table 5 indicates that the two excavations in the Bathhouse pad may yield 8,400 cubic yards of soil. This estimate may be overstated by about 500 cubic yards due to the overlap.

The quality of the material within the proposed excavations is illustrated by the laboratory analyses for trenches T6, T7A, T8, T8A, see Appendix C, Chapter 2 of Appendix XIV Phase 1 of the MRP. The surface 2-3 feet of soil on the bathhouse pad outslope is the best available material in the permit area. Below this depth, the bathhouse pad material was rated only marginal by the soils consultant due to its high carbonate content, SAR, and EC. Although marginal as a surface soil, this material may be a good source of clean fill.

Using only the surface soil from the bathhouse pad as substitute topsoil, approximately 5,000 cu yds could be salvaged and stored, based upon a swath that is 900 ft x 50 ft x 3 ft deep. This surface soil, along with the 500 cu yds brought down from Phase 1 reclamation, could supply 80% of the six inch topsoil requirement for the 8.4 acres. Since this has been identified as the best available material in the permit area, the Division will require that this material is separately salvaged and stored from the other subsurface colluvial material to be excavated from the bathhouse pad.

A third area proposed for substitute topsoil salvage is the undisturbed "island" below the access road and west of the bathhouse pad, represented by soil sample site SS5 (see Appendix XIV Drawing #CM-10336-DS and Appendix XIV Appendix A, Soils Analysis 2001). Disturbing 0.89 acres of this ground may yield approximately 2,900 cu yards of material,

assuming half of the material is useful as soil. This calculates to three additional inches to the entire 8.4 acre disturbed area. The Division hesitates to approve disturbance of this "island" for topsoil cover and would recommend that this area be utilized only after all other sources are exhausted. For instance, a similar amount of topsoil may be gained from increasing the reach of substitute topsoil salvage in the vicinity of the southern portion of the bathhouse pad (post-SMCRA disturbance), represented by sample sites SS1 and SS2 and Trench T6. These soils were rated as the best available in the permit area by the soils consultant.

The submittal indicates on page 14, Section 200 that the excavated topsoil will be segregated and stored separately from spoil material, in a location to be chosen by the contractor as the reclamation progresses. Division recognizes the need for flexibility in handling materials, and will not require a description of topsoil storage since prompt redistribution of substitute topsoil is expected (R645-301-234.100).

Such flexibility was permitted during Phase 1 Reclamation. However, the Division was surprised to learn that the substitute topsoil, so carefully handled during Phase I reclamation, was pushed over a 100 foot cliff to its resting place shown on Drawing 200-1. The Division would not have approved of this method of moving the soil, had it been discussed. Therefore, an overall concept of how the 20,500 cu yds of substitute topsoil will be handled is requested prior to commencing Phase 2 reclamation.

Given the approximate nature of the substitute topsoil projections and the necessity of providing adequate cover for the coal mine waste, the Division will require that the Permittee keep a weekly written accounting of the volume of substitute topsoil separated and stored; the volume of waste buried; and the volume of topsoil redistributed.

The Permittee should instruct the contractor to handle soils only when they are in a loose or friable condition or when the moisture content is an optimal 10 – 15%. Generally, two rules apply: 1) If the soil sticks to the equipment, wait until the soil has dried to a friable state. 2) If the soil is too dry and hard to handle, resembling flour, add water until the soil is wetted to a loose, friable condition.

**Findings:**

Information provided in the proposed amendment is not considered adequate to meet the requirements of Operations Plan Topsoil and Subsoil section of the regulations. Prior to approval, the Permittee must provide the following in accordance with:

**R645-201-232.200,** (1) The submittal must describe separate handling (removal & storage) of the surface three feet of bathhouse outslope soils. (2) The submittal must indicate the Permittee's intention to utilize the undisturbed "island" south of the Tipple yard for substitute topsoil as a last resort after other alternatives have been exhausted and after consulting with the Division and obtaining the

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Division's concurrence. (3) The Permittee must evaluate increasing the area of substitute topsoil salvage from the southern portion of the bathhouse outslope.

**R645-301-242.100**, The Division recognizes the need for flexibility between the submittal and field work, therefore, the submittal must include a commitment that Permittee will keep a weekly written accounting of the volume of substitute topsoil separated and stored; and the volume of topsoil redistributed at the site. The weekly accounting must be available on site for review by DOGM staff.

**R645-301-242.120, -242.130**, The Permittee should include in Section 500 Table 1, Procedural Steps of Reclamation Timetable instruction for the contractor to handle soils only when they are in a loose or friable condition or when the moisture content is an optimal 10 – 15%. Generally, two rules apply: a) If the soil sticks to the equipment, wait until the soil has dried to a friable state. b) If the soil is too dry and hard to handle, resembling flour, add water until the soil is wetted to a loose, friable condition.

## **SPOIL AND WASTE MATERIALS**

Regulatory Reference: 30 CFR Sec. 701.5, 784.19, 784.25, 817.71, 817.72, 817.73, 817.74, 817.81, 817.83, 817.84, 817.87, 817.89; R645-100-200, -301-210, -301-211, -301-212, -301-412, -301-512, -301-513, -301-514, -301-521, -301-526, -301-528, -301-535, -301-536, -301-542, -301-553, -301-745, -301-746, -301-747.

### **Analysis:**

#### **Coal mine waste**

Clean up of all coal waste is the second reclamation step described by Table 2, page 11 of Section 500, Engineering. The Division assumes that this process will be ongoing as the reclamation of the Deseret pad and the Tipple yard proceeds and pockets of waste and less desirable material are unearthed.

During a discussion held at the Energy West offices on December 18, 2001 between Division personnel (Priscilla Burton, Pete Hess, Dana Dean, Susan White, Pam Grubaugh Littig and Jim Smith); Brian McClelland, Geologist with the U.S. Forest Service; and Energy West Mining Co representatives (Dennis Oakley and Chuck Semborski), Division personnel inquired as to the following:

- Recalculation of the volume of refuse to be moved and buried as a result of the trenching operation.
- Calculation of the volume of material to be excavated from the bathhouse pad to be used as cover or fill.

The query was included in the first technical review of Phase 2 reclamation, dated January 15, 2002, wherein the Permittee was asked to provide information on the volumes of waste, designated waste burial locations and to provide a statement that all coal mine waste would be covered with four feet of non acid/non toxic material. The deficiencies were written as follows.

**R645-301-553.252**, Provide a statement that all coal mine waste will be covered with four feet of non acid/ non toxic material.

**R645-301-731.311**, Identify burial locations of all acid/toxic forming materials.

**R645-301-542.730**, Provide the calculated volume of the waste to be backfilled and buried in the fill as well as the volume of fill required to cover the waste (R645-301-553.252 and 553.300).

In response to the first deficiency, the Permittee has stated in the cover letter, dated April 29, 1992 and attached to this application, that underground development waste and coal processing waste does not exist at this mine site. The Permittee further states that coal spills at the site are pre-SMCRA.

The Division does not agree with this assessment. First, Drawing 200-1 shows a Valley Coal Waste Disposal Pile that is 400 feet long x 150 feet wide on the bathhouse pad. Second, this site has more area covered with coal spills, than area available as a source of clean cover.

Coal spills fall into the category of coal processing waste as a product of physical processing and preparation of the coal. The coal spills are required by general regulation, R645-301-542.730, to be placed in a controlled manner. Reclamation plans have more specific requirements: coal processing waste must be disposed of according to R645-301-553.260 which refers to R645-301-553.252 which requires that the coal mine waste will be covered with a minimum of four feet of the best available, nontoxic and noncombustible material. Regulation R645-301-553.510 clarifies that continuously mined areas subject to AOC provisions will comply with the requirements of R645-301-553.260. Lesser cover may be allowed if the Permittee can show that lesser cover will be adequate to prevent erosion and provide adequate soil stability.

In addition, the Division is required by R645-301-553.300 to ensure that combustible materials produced during mining will be adequately covered with nontoxic and noncombustible materials and to minimize adverse effects on plant growth.

In response to the second deficiency written under R645-301-731.311, the application indicates that areas of minor coal spills will be removed and buried in the cuts of the access road and portal pads and in the two trenches to be excavated from the bathhouse pad (Reclamation Plan, Engineering Section 542.730). The volume of the two trenches is 8,400 cu yds. The

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submittal indicates in Section 731.300 that material with a high carbon content excavated during the backfill and grading process will also be buried in the trenches and/or used to develop pad slopes. The submittal indicates in Sections 240 and 553.100 that excess yardage will be hauled from the Deseret pad and Tipple pads to the Bathhouse pad or to the waste rock site for disposal.

In response to the third deficiency written under R645-301-542.730, the application indicates there will be a net cut from the Deseret and Tipple pads of approximately 91,382 cu yds (Section 553.100). This will be partially offset by the requirement for 64,600 cu yds of net fill at the bathhouse pad. There is a requirement for 58,000 cu yds of fill in the main drainage between cross section 3 + 00 and 8 + 00 (based on the cross-sections of Drawing 500-4). The application does not clearly indicate the source of the fill in the drainage, but the Division assumes from the figures that the source of fill will be from the Tipple yard. Mr. Oakley confirmed this assumption during a conversation with Priscilla Burton on August 13, 2002. Mr. Oakley indicated that spoil and coal mine waste from the Tipple area would be pushed down to fill the low spot in the drainage, compacted, and covered with clean fill from the side slopes.

Potential sources of cover for the coal mine waste include the soil/coal mixture found in trench T4A, native soil beneath the access road to the tipple area in trench T5 and fill beneath the main access road in trench T10, and the Bathhouse pad (see Appendix C of Appendix XIV Phase 1 of the MRP).

A clean fill depth of 3.5 feet plus six inches of topsoil will provide adequate cover after the pocking procedure (described in Section 350, Performance Standards) to ensure that combustible materials produced during mining will be adequately covered with nontoxic and noncombustible materials and to minimize adverse effects on plant growth (R645-301-553.300).

To ensure this depth of cover, the Division requests that the reclamation plan describes a method to measure the depth of clean fill over all coal processing waste and underground development waste.

**Findings:**

Information provided in the proposed amendment is not adequate to meet the Spoil and Waste Materials requirements of the Regulations. Prior to approval, the following must be provided, in accordance with:

**R645-301-553.260, -553.252,** The application must include a commitment to cover coal processing waste with four feet of clean fill and indicate a method by which the depth of clean fill will be monitored over coal processing waste (coal spills) and underground development waste during grading.

## 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

During a discussion held at the Energy West offices on December 18, 2001 between Division personnel (Priscilla Burton, Pete Hess, Dana Dean, Susan White, Pam Grubaugh Littig and Jim Smith); Brian McClelland, Geologist with the U.S. Forest Service; and Energy West Mining Co representatives (Dennis Oakley and Chuck Semborski), Division personnel inquired after the fill sources that would be used to fill the drainage in the re-mined section of the "valley fill." Mr. Semborski suggested fill sources such as the abutment at cross-section 1+00 and material under the access road at the location of the last trench.

In the first Technical Analysis of this submittal, dated January 15, 2002, the Division requested the following:

**R645-310-535**, Determine the total volume of fill required to raise the level of the main drainage in the "Valley Fill" location and show sources of fill in Appendix C in Section R645-500 and on the cross-sections of Sheet 500-1 and 500-3 and 500-4.

The Permittee has indicated in the cover letter (dated April 29, 2002 and attached to the submittal) that there would be approximately 47,000 cu yds of fill required to establish the grade of the lower section of the main drainage. The sources of the fill as suggested during the December 18, 2001 meeting were not confirmed by this submittal, but during a conversation with Dennis Oakley on August 13, 2002, the Division learned that the Permittee's intention is to push refuse down the drainage and compact it beneath fill from the cut slopes above the drainage.

The Permittee should be mindful of the requirements for cover over the waste (R645-301-553.260) and that the waste must be placed in a controlled manner to minimize adverse effects of leachate on the surface and groundwater (R645-301-746.120, -731.310, -731.311). The waste in the Tipple yard was represented by Trench T4, T5, T7, T9 and T10 (Appendix C of Chapter 2 of Appendix XIV of the MRP) and the re-mined coal of the storage yard is represented by samples #5, #8, #9, and #17 from the 200 Soil Sampling Program (Appendix A of Chapter 2 of Appendix XIV of the MRP). Coal/spoil mixtures analyzed in the trench sampling program have SAR values around 3.5 to 4.0, but Acid Base Potential is positive. The trench sampling

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program did not include Boron or Selenium analysis, but the 2000 soil sampling program did. No elevated Boron or selenium values were noted in the four samples that were provided to the Division (out of fifteen taken from the waste). Based on the previous sampling, the Division will not require sampling of the coal processing waste as it is backfilled in the drainage. But the Division will require that the surface four feet of the drainage is sampled prior to placement of the Type II filter bedding as follows:

1. The surface four feet of the drainage will be composite sampled at the location of each cross section from 3+00 through 12+00 prior to placement of filter fabric.
2. Analysis will include laboratory measurement of pH, EC, SAR, acid/base accounting, Boron, Selenium and TCLP metals.

Also during the December 18, 2001 meeting, Division personnel inquired as to the location of slopes that would be steeper than 2h:1v, as these steeper slopes will not receive topsoil treatments.

And the following deficiency was written:

**R645-301-542**, Drawing 500-2 and the cross sections on Drawing 500-4 should be labeled to designate what fill areas are to be rock fill and what are to be earth fill. Slope gradients should also be depicted for the specific reclamation areas.

This submittal indicates that all **fill** slopes will be graded to 2h:1v. **Slopes formed by cuts may be steeper.** Areas of topsoil placement are shown on Drawing 200-2. The Division has noted that there are cut slopes at cross sections -1+00, 0+00, 1+00, 2+00, 3+00, 8+00, 9+00, 10+00 and 11+00 that are not shown on Drawing 200-2. During a conversation with Dennis Oakley on August 13, 2002, the Division learned that these areas will be cut to native soils which will be roughened and seeded without importation of substitute topsoil.

**Findings:**

Information provided in the proposed amendment is not adequate to meet the Reclamation Backfilling and Grading requirements of the Regulations. Prior to approval the following information must be provided in accordance with:

**R645-301-746.120, -731.310, -731.311**, The plan must include a commitment to sample the surface four feet of the drainage prior to placement of the Type II filter bedding as follows: (1)The surface four feet of the drainage will be composite sampled at the location of each cross section from 3+00 through 12+00 prior to placement of filter fabric. (2)Analysis will include laboratory measurement of pH, EC, SAR, acid/base accounting, Boron, Selenium.

## TOPSOIL AND SUBSOIL

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

### Analysis:

During the Technical Review dated January 15, 2001, the following deficiency was written:

**R645-301-233**, Please provide information from the trenching activity conducted during the week of December 3, 2001 and utilize the information to present a coherent plan for substitute topsoil salvage and redistribution.

The submittal indicates on page 14, Section 200 that the excavated topsoil will be segregated and stored separately from spoil material, in a location to be chosen by the contractor as the reclamation progresses. Sources of cover material have been discussed in the Operations Topsoil/Subsoil section of this technical review. Drawing #200-2 identifies substitute topsoil placement.

Phase II reclamation covers 22 acres (Section 310). The area of cut and fill activity is 8.4 acres as outlined in the submittal Section 553.100:

- Deseret Mine portal pad/material storage (1.1 acres)
- Bathhouse pad (2.0 acres),
- Tipple pads (3.4 acres),
- ancillary access roads (0.76 acres)
- access road from the mine site to the cattle guard (4.3 acres).

This leaves 10.44 acres out of the 22 acres total area that by default must fall within the reconstructed main drainage.

Drawing #200-2 shows substitute topsoil will be redistributed over 5.25 acres of reconstructed fill slopes on the bathhouse pad and in the lower main drainage and at the Deseret portal and access road to the Beehive. Another 3.16 acres of cut slope area may receive substitute topsoil depending upon the rock outcrop and "native ground" exposed.

### Redistribution

#### *Deseret Portal Area*

The Deseret Portal area is approximately 1.1 acres. The Deseret Portal area will be graded utilizing in place material. Six inches of substitute topsoil will be applied to the surface and the soil will be pocked to a depth of 18 inches.

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Bedrock exists at a depth of about 5 feet below the surface in the pad area. Little suitable substitute topsoil exists in this area (see field report dated December 17, 2001), although the soils consultant did comment that the soil/coal mixture found in trenches T4A would be suitable substitute topsoil.

*Tipple Area*

The Tipple area is approximately 3.4 acres. The Tipple area will be graded utilizing in place material. Six inches of substitute topsoil will be applied to the graded surface and the soil will be pocked to a depth of 18 inches.

A source of cover material exists beneath the access road to the tipple area in trench T5 and beneath the main access road in trench T10, see Appendix C of Appendix XIV Phase 1 of the MRP.

*Bathhouse Pad Area*

The Bathhouse Pad area is approximately 2.2 acres. The area will be filled using spoil and coal processing waste from the Deseret and Tipple pads. Six inches of substitute topsoil will be applied to the graded surface and the soil will be pocked to a depth of 18 inches.

*Pad access road*

The pad access road is an area of 0.73 acres. The area will be filled with spoil and coal processing waste from the Deseret pad and Tipple pad. No substitute topsoil will be replaced. The cover material will come from the adjacent berm and outslope.

*Main access road*

The main access road to be reclaimed is 4.3 acres. The area will be filled with the adjacent berm and outslope. No substitute topsoil will be replaced.

**Findings:**

Information provided in the submittal meets the Reclamation Plan Topsoil and Subsoil requirements of the Regulations.

**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:**

A deficiency written in the January 15, 2002 Technical Analysis reads as follows:

**R645-301-731.311**, Incorporate the results of the trenching soil sampling conducted during the week of December 3, 2001 to ascertain the chemical qualities of the material remaining on site and to identify potential acid/toxic forming materials requiring burial.

The Permittee has indicated in the cover letter, dated April 29, 2002, accompanying this submittal that no acid/toxic materials were identified during trenching.

The valley fill coal fines represented by samples #5, #8 and #9 of Chapter 2, Appendix A of Appendix XIV of the MRP was 87 to 92% sand, with a Total Organic Carbon content of 76 to 84% and Total Sulfur Acid Base Potential between 26 and 49 Tons/1000 Tons.

**Findings:**

Information provided in the submittal meets the Reclamation Plan Hyrdology Acid/Toxic requirements of the Regulations.

## **STABILIZATION OF SURFACE AREAS**

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

**Analysis:**

Erosion control will be by extreme gouging (Section 553.100, page 17) and rock placement (Section 553.110). These methods are more thoroughly discussed in the Reclamation Hydrology Sediment Control section of this Technical Analysis.

A deficiency written in the January 15, 2002 Technical Analysis reads as follows:

**R645-301-244**, Please utilize information from the trenching activity conducted during the week of December 3, 2001 to calculate the K-factors for soils on the surface of the slopes.

The information submitted was reviewed in this Technical Analysis under Reclamation Hydrology and a deficiency has been written.

**Findings:**

Information provided in the proposed amendment is not adequate to meet the Reclamation Stabilization of Surface Areas. A deficiency covering this issue has been written

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under the Reclamation Hydrology Sediment Control section of this TA.

**RECOMMENDATIONS:**

Prior to approval, the requirements of the Coal Mining Rules must provided as outlined above.

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