



Technical Analysis and Findings
Utah Coal Regulatory Program

PID: C0150019
TaskID: 4508
Mine Name: COTTONWOOD/ WILBERG
Title: UPDATE VOLUME 10

Summary

The updates submitted as Task ID # 4508 had one deficiency, that being an inadequate volume of subsoil to cover the waste rock pile. The submitted plan states that sufficient subsoil is available to cover the waste acreage to a depth of two feet, with one foot of topsoil. Four feet of non-toxic, non-combustible material is required to bury coal mine waste (See R645-301-553.252). The Permittee must somehow obtain an additional 5,900 cubic yards of acceptable subsoil.

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General Contents

Permit Application Format and Contents

Analysis:

All information provided in accordance with R645-301-100 such as ownership and control information, right of way information, surface and subsurface ownership is found in the PacifiCorps Legal/Financial Volume.

The particulars for the BLM ROW grant UTU-65027 are found in the introduction to Volume 10. The Right of Way area and permit boundary are 25.82 acres. The disturbed area acreage is outlined on Map 4-5 as 15.82 acres. It is also listed as 15.82 acres on page 2 of the Volume 10 Introduction, but is listed as 17.44 acres in the Disturbed Area Reconciliation Table page CTW-2 of App. G in the Legal and Financial Volume. Please verify whether information in App. G, Legal/Financial Volume is correct.

The 1991 air quality permit DAQE-835-91 was included in Chapter 1 of the approved MRP and should be included in the revision as an Appendix to Chapter 4, because the 1991 permit is not readily available through the DEQ website.

Deficiencies Details:

R645-301-121.100, The disturbed area acreage is outlined on Map 4-5 as 15.82 acres. It is also listed as 15.82 acres on page 2 of the Volume 10 Introduction, but is listed as 17.44 acres in the Disturbed Area Reconciliation Table page CTW-2 of App. G in the Legal and Financial Volume. Please verify whether information in App. G, Legal/Financial Volume is correct.

R645-301-400, The 1991 air quality permit DAQE-835-91 was included in Chapter 1 of the approved MRP and should be included in the revision as an Appendix to Chapter 4, because the 1991 permit is not readily available through the DEQ website.

pburton

Environmental Resource Information

General

Analysis:

The Permittee, Energy West Mining Company submitted a response to the deficiencies aired in the review of Task ID # 4329, UPDATE VOLUME 10 on February 10, 2014. Volume 10 is that section of the mining and reclamation plan which relates to the active waste rock disposal site.

Engineering....R645-301-500

Introduction....R645-301-510

General Requirements....R645-301-511

Coal Mine Waste....R645-301-512.230

Primary Roads....R645-301-512.250

Inspections....R645-301-514

Analysis:

The Task ID # 4508 submittal includes revisions of the sub-titles and identification of the appropriate R645 Coal Mining Rule for each of the Engineering sections listed under ENVIRONMENTAL RESOURCE INFORMATION.

These revisions to the R645 Coal Mining Rules format are shown in the Task ID # 4508 Chapter 5, Engineering section, Pages 1 and 2. This submittal is a total re-write of Volume 10, and it thus contains new text which addresses each pertinent section relative to Environmental Resource Information.

Findings:

The sub-title revisions contained in Pages 1 and 2 of the Chapter 5 section of the Environmental Resource Information section for the Volume 10. Cottonwood / Wilberg Mine active waste rock site adequately addresses the requirements of each R645 section and it should be approved.

Cross Sections and Maps....R645-301-512.100

Analysis:

PLATE 4-1, Waste Rock Site ROW and Permit Boundary has been submitted as part of the Task ID # 4508, Volume 10 revisions. PLATE 4-1 shows the plan view details of the waste rock disposal site and its associated sediment treatment pond.

PLATE 4-1 appears to be correct and it should be approved.

Plate 4-3, Pre-existing Surface Topography depicts the permit boundary and the location of the four test holes used to determine geology of the area.

Plate 7-1, Soils Map, depicts the types of soils in the waste rock construction site area via aerial or plan views.

Plate 8-1, Vegetation Map depicts existing vegetation in the area prior to disturbance.

Plate 9-1 Wildlife Habitat Map, depicts the location of both crucial and critical deer winter habitat areas surrounding the Cottonwood / Wilberg waste rock site as well as the elk winter range area for the Manti herd.

All Plates have a P.E. stamp location, but none are signed or dated by the Permittees registered professional engineer. This requirement can be completed prior to submittal of the finalized conditionally approved documents.

All Plates appear correct as they appear to meet all requirements prior to certification by a Utah registered professional engineer.

Findings:

Plates 4-1, 4-3, 7-1, 8-1 and 9-1 should be approved as part of the Task ID #4508 .

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Soils Resource Information

Analysis:

The Introduction describes a 17.44 acre disturbance for waste rock site. The permit boundary is shown on Map 4-1. The elevation is between 6,700 and 7,000 ft. (Section R645-30-300). Appendix A contains the soil survey was conducted in 1989 by T.H. Furst. No changes have been made to this survey. Five pedons are discussed in the narrative, but only three pedons were excavated and described in Appendix 1 of the survey and only three are marked on Soils Map 7-1 (dated

1989). Soils Map 7-1 is unchanged, but replaced in electronic format with this amendment. The predominant soil type is Lithic Ustic Torriorthents with slopes between 0 – 5%, and 5 – 30% corresponding to Carbon 1988 soil map unit of Badland/Rubbleland/Rock Outcrop complex. This shallow soil is only 4- 6 inches deep over shale. T.H. Furst concludes his report with the recommendation of crushing lower horizons (10 – 65 cm depth) to create suitable substitute topsoil.

Plate 8-1 outlines three vegetation types: pinyon-juniper, black sagebrush, and Gardner saltbush. Section R645-301-341.200 refers to Appendix B for the productivity analysis performed by George Cook, Soil Conservation Service (now NRCS) in 1990. Mr. Cook estimated the saltbrush ecological site was in good condition at 125 lbs/ac with the potential for 150 lbs/ac. The black sagebrush sites were in fair condition at 250 – 300 lbs/ac production and the potential for 500 lbs/ac. The pinyon-juniper sites were in fair condition with 400 lbs/ac production and the potential for 1,200 lbs/ac.

pburton

Hydro Baseline Information

Analysis:

The previous deficiency regarding section R615-301-724.100 requested that the operator clearly explain that there is a large amount of water monitoring data from well WCWR, located at the waste rock facility. The operator expanded the explanation of data collection at this well, to state that water monitoring data was collected previous to the operation of the waste rock facility as well as during operations. The operator has stated that sampling of the well will continue until final reclamation of the site on a quarterly basis.

This response has adequately addressed the previous deficiency.

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Operation Plan

Mining Operations and Facilities

Analysis:

The Cottonwood Waste Rock site was constructed in June 1990. Exhibit XXI illustrates the construction plan. Since 1990, three berms have been constructed, the area filled with waste rock material, and the side slopes reclaimed. Completed construction map Plate 4-5 was created after an aerial survey in 2013.

pburton

Topsoil and Subsoil

Analysis:

Six inches was salvaged from the roadway construction and stored on the road embankments (Section R645-301-526). Section R645-301-526, p. 13, Underground Development Waste, describes the salvage and live haul of 10 inches of soil from the north and west slope to the actively growing pile. It is thought that this material was used on the three existing reclaimed terraces of the pile. Plate 7-2 provides historical information on stripping depths from the site and does not show any further topsoil material available on the north and west slopes.

Plate 4-5 shows the site construction in 2013, made possible by an aerial survey in 2013. Plate 4-4 shows the contours in 1990 and the existing location of the topsoil and subsoil stockpiles. Plate 4-4 provides a calculation of the stockpile volumes based on cross sections shown on Plates 4-11a and 4-11b. Volumes contained in the piles are described as 31,629 CY topsoil and 40,317 CY subsoil on Plate 4-4.

The soil stockpiles are ASCA's, and the downhill slopes of the piles are protected by a silt fence (Section R645-301-234 and Section 526, pg 11).

Interim reclamation of topsoil stockpiles, sediment pond embankments and road outslopes is described in Section 341.200. Table 300-5 provides the interim seed mix of grasses, forbs and shrubs. Interim reclamation included seeding, raking seed, application of fertilizer and 2T/ac mulch as described on pages 11 and 12 of Section 341.200.

Deficiencies Details:

R645-301-121.200, Annual monitoring of the site is described in Section R645-301-333.100. As discussed with Mr. Oakley, this language will be revised as follows:
Remove protection items 2 through 5
Add #2 – An annual site visit shall be conducted by representatives from the permittee and the Division of Oil, Gas, and Mining. Representatives from the Division shall include a plant specialist and/or a soil specialist. The site visit shall occur between the months of May and September.

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Vegetation

Analysis:

The applicant has proposed to include the following language in section R645-301-331 Maintenance and Monitoring in chapter three of the MRP. "An annual site visit shall be conducted by representatives from Energy West or the assigned permittee and DOGM. Representatives from the Division shall include a biologist and soils scientist. The site visit shall occur between the months of May and September". Items 2 through 5 of that paragraph will be deleted. The application is recommended for approval.

jhelfric

Spoil Waste Refuse Piles

Analysis:

R645-301-520 Operation Plan
R645-301-521 General
R645-301-521.200 Signs and Markers
R645-301-521.240 Mine and Permit Identification Signs
R645-301-524 Blasting and Explosives
R645-301-526 Mine Facilities
R645-301-530 Operational Design Criteria and Plans
R645-301-531 General
R645-301-532 Sediment Control
R645-301-533 Impoundments
R645-301-533.200 Foundations
R645-301-536 Coal Mine Waste

Analysis:

R645-301-520 Operation Plan

Pages 3 through 15 of the submitted revised Chapter 5 section Engineering is a totally new re-write of these sections. The text of each subsection, (i.e., R645-301-521.200 Signs and Markers, Page 3, Chapter 5, Engineering) is well written, and it adequately addresses the requirements of each identified sub-section of the R645 Coal Mining Rules.

Each enumerated section on pages 3-15 should be approved for incorporation as each re-write adequately addresses the requirements of its particular section within the R645 Coal Mining Rules.

Findings:

The text re-writes for each of the above identified sections should be approved for incorporation as each adequately addresses the requirements in the R645 Coal Mining Rules for its particular section, Pages 3-15 should be approved as submitted.

R645-301-521 General

Analysis:

The following revised Plates, submitted with Task ID # 4508, as they relate to the Operation Plan are as follows;

- 1) Plate 4-10, Waste Rock Cross Section Locations "As-built";
- 2) Plate 4-11B, "As-built" Cross Sections for Subsoil Pile;
- 3) Plate 4-13, #1 of 2, "As-built" Conditions of Waste Rock Pond and Dam, contains a plan view of the sediment pond, a cross section of the pond spillway, and a cross-section of the dam;
- 4) Plate 4-13, #2 of 2, shows the cross-sections, which are located in Plate 4-13, #1 of 2.

- 5) Plate 4-14, Interim Waste Rock Surface Flow Pattern (operational phase);
 - 6) Plate 4-2, Hydrologic Water Shed Details;
 - 7) Plate 4-4, Waste Rock Initial Construction Map (actual existing condition of waste rock site and access road showing permit boundary, X-section locations and disturbed area boundary);
 - 8) Plate 4-5, Waste Rock Site, (completed construction map);
 - 9) Plate 4-8, Waste Rock Facility Access Road Cross Sections, Sheet 1 of 2 (actual "As-builts" based on latest aerial photography);
 - 10) Plate 4-8, Sheet 2 of 2, (access road cross sections 6 + 80 to 12 + 35 show cut and fill details);
 - 11) Plate 4-9, Profile / Center Line of Access Road;
 - 12) Plate 7-2, Topsoil Stripping Map with Mass Balance Tables.
- Once P.E. certification has been completed, all Plates should be approved.

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Reclamation Plan

Topsoil and Subsoil

Analysis:

Map 4-3 shows the pre-disturbance contours. Map 4-4 shows the topsoil pile construction and provides the volume of topsoil and subsoil stockpiled on site as 31,629 CY and 40,317 CY, respectively.

Exhibit XXI is a figure showing the typical berm and terrace construction and overall slope of 2.5h:1v for the waste pile. Section 242 and Section 541 p. 17 & 18 & 20 describe contemporaneous reclamation of the berms and final reclamation of the top surface of the pile. These two sections do not agree on the depth of subsoil and topsoil.

As built calculations of topsoil and subsoil on Plate 4-5 show that there is approximately 31,629 CY of topsoil and 40,317 CY of subsoil stored on site.

Drill cores and outcrop samples of the roof and floor showed little potential for acid generation and a few samples with high SAR (Section 536). Prior to final reclamation, graded waste and berms will be sampled and analyzed according to the Overburden and Topsoil Guidelines. Two samples will be taken for every 200 linear feet of berm (Sec 536) and two samples for every acre on the pile surface (Sections 541). Acid/Toxic waste will be covered with four feet of material. Non-toxic waste will be covered with eighteen inches of subsoil and six inches of topsoil (Sec 541).

Section 553 describes replacement of topsoil and subsoil from the road embankments on to the 5 acre road surface.

Soil sampling and analysis is not described in the revised Section 243 or Section 242, but after grading, Step 3 in the final reclamation plan (Section 341.200) states that fertilizer application will be determined by soil analysis.

Deficiencies Details:

R645-301-121.200, Section 242 and Section 541 p.17 & 20 both describe contemporaneous reclamation of the berms but do not agree on the depth of subsoil to be reapplied. Section 242 says 18 inches of subsoil and Section 541 p. 17 says 12 inches of subsoil and Sec 541 p. 20 says 24 inches of subsoil. Both sections also describe reclamation of the flat surface of the waste pile but do not agree on either the subsoil or topsoil depth. Section 242 states 18 inches of subsoil and 6 inches of topsoil. Section 541 p. 17 and 20 state 24 inches of subsoil and 12 inches of topsoil for the top of the pile. Please correct the plan accordingly.

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Hydrological Information Reclamation Plan

Analysis:

A response to a deficiency regarding section R645-301-760&765 was submitted to justify the removal of the sediment control pond sooner than two years after the last augmented seeding. The permittee conducted monitoring using the computer program RUSLE2 to compute values for erosion on the overland portion of the landscape. The modeling concluded that the reclaimed area will contribute significantly less sediment than the surrounding undisturbed and untreated areas, making additional sediment contributions minimal and less than what would normally occur on native undisturbed land. This is in part due to how the terraces are constructed on the berms during reclamation.

Deficiencies Details:

R645-301-711 To justify sediment pond removal, expand the narrative and give a more detailed description of reclamation work that will help control sediment loss and prevent additional suspended solids from leaving the reclamation site.

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Contemporaneous Reclamation General

Analysis:

Section 541 describes contemporaneous reclamation practices for the waste rock site. Rollins, Brown and Gunnell's 1989 stability report produced Figure XXI which illustrates the construction of bermed terraces to be reclaimed. Surface roughening will be used to control erosion (Section 552). Pocks will measure 1.5 ft deep by 3 ft. in diameter. Future interim and final revegetation will include fertilizer application based on soil analysis as described in Section 341.200, item 3. Section 243 states that all reclaimed areas will be fertilized, but no soil sampling is described.

Interim monitoring of soils after contemporaneous reclamation was removed from the plan as the interim reclamation did not show any symptoms of toxicity on the topsoil stockpiles or the outslopes of the reclaimed pile.

Deficiencies Details:

R645-301-121.200, Future interim and final revegetation will include fertilizer application based on soil analysis as described in Section 341.200, item 3. Section 243 states that all reclaimed areas will be fertilized, but no soil sampling is described. Please describe the method for sampling of the replaced topsoil prior to fertilizer application in Section 243 of the Plan.

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Revegetation General Requirements

Analysis:

R645-301-541 General
Discussion of Salvaged Soil Volumes

Analysis:

The sections above all pertain to the active waste rock site previously described and approved within Volume 10 of the Cottowood- Wilberg mining and reclamation plan.

Each of the aforementioned sections contain revised or new text discussed to address each of the areas pertinent to those engineering requirements of the R645 Coal Mining Rules.

Pages 16 to 21 of Chapter 5, Volume 10 of the revised Reclamation Plan for the waste rock site describes the method used to contemporaneously reclaim the outslope of each lift of the waste rock pile as its elevation is increased. Waste is used to construct a 10 foot high berm; samples of waste are collected to confirm the acid / toxic forming potential of the material within this berm. As the berm construction continues around the disposal site base perimeter 12 inches of subsoil and 6 inches of topsoil to the outslope of the berm for re-vegetation purposes.

When the waste pile meets its maximum elevation, the top will be graded to slope intercepted runoff to the SW. Sampling of the top four feet of waste will be performed before subsoil is placed on the sloped surface. If material is identified having high acid and toxic potential, that material will be removed and buried then covered with 4 feet of non-acid, non-toxic material.

Discussion of Salvaged Soil Volumes

Volume surveys of the salvaged subsoil and topsoil storage areas have determined that the waste rock disposal area will be able to be covered with 3.4 feet of subsoil and 1.7 feet of topsoil (5.1 feet total). The access road will be reclaimed with a

topsoil depth of 1.9 feet. The Permittee states that the soil volumes used to determine these material depths are slightly over estimated. The Permittee states that it has "a high level of confidence" that the placement of 2 feet of subsoil and 1 foot of topsoil is "certainly achievable".

A two foot subsoil depth with a one foot topsoil depth does not meet the requirement of R645-301-553.252, which requires that coal mine waste material be covered with four feet of the best available non-toxic and non-combustible material.

Findings:

In accordance with the requirements of ;

R645-301-553.252, a minimum of four feet of non-toxic, non-combustible material will be used to cover the waste rock facility acreage. The Permittee is approximately 5,900 cubic yards of subsoil short of meeting this requirement.

The Division has the authority to grant a variance to the requirements of this rule based on physical and chemical analyses which show that the requirements of R645-301-244.200 and R645-301-353 through R645-301-357 are met. It is not known whether the Permittee has submitted the analyses required to support a request for variance of the requirements of R645-301-553.252.

R645-301-542 Narratives, Maps and Plans

Analysis:

R645-301-550 Reclamation Design Criteria and Plans

Analysis:

The following revised maps were submitted to update the reclamation plan portion of Volume 10, Cottonwood / Wilberg waste rock storage facility;

1) Plate 4-12 Waste Rock Diversions Ditch DA & DB

2) Plate 4-5, Waste Rock Site Completed Construction Map (existing contours of site based on aerial survey of 9/18/2013)

3) Plate 4-7 Waste Rock Storage Facility (surface drainage and final surface topography at FINAL reclamation) (shows 2% slope to SW for top lift drainage)

R645-301-552 Permanent Features

Analysis:

All of the disturbance created by the construction of the waste rock site will be reclaimed. One permanent feature will be installed at the completion of topsoiling activities and that will be the construction of "pocks" (1.5 feet deep by 3.0 feet in diameter. This permanent feature is discussed on page 5-19 of the Task ID # 4508 submittal. The intent of using these small depressions is to harvest water and to control sediment laden runoff from the site.

R645-301-553 Backfilling and Grading

R645-301-542.600 Roads

Access Road

The access road reclamation process is described on page 5-20 of the application. Road surfacing material will be removed and buried on the inside toe of the road at its deepest elevation.

Waste Rock Storage Facility

As described under section titled Discussion of Salvaged Soil Volumes above the waste rock facility acreage will be fully reclaimed.

Volume surveys of the salvaged subsoil and topsoil storage areas have determined that the waste rock disposal area will be able to be covered with 2 feet of subsoil and 1 foot of topsoil (3 feet total).

R645-301-553.140 Minimization of Erosion and Water Pollution

Analysis:

The surface roughening "pocks" are the best technology available to harvest water for re-vegetation purposes, and reduce flow velocities preventing run-off from the site minimizing erosion. Terraces will also be provided to reduce flow velocities and subsequent erosive action.

A straw bale and silt fence filter will be installed in the natural drainage channel during the reclamation activities to reduce TDS and TSS levels in the undisturbed drainage below the waste rock facility.

R645-301-560 Performance Standards

Analysis:

This section of the revised Chapter 5 of Volume 10 is the commitment made by the Permittee to conduct all mining and reclamation activities in accordance with the approved permit and the requirements of R645-301-510 through R645-301-553.

Deficiencies Details:

Findings:

The application is deficient, being short of 5,900 cubic yards of subsoil in order to meet the requirement of;

R645-301-553.252, a minimum of four feet of non-toxic, non-combustible material will be used to cover the waste rock after final grading, (a minimum of four feet of the best available non-toxic and non-combustible material...)

The current plan requires two feet of subsoil and one foot of topsoil (3 feet total cover depth) over the waste rock material. The Permittee must develop a plan to provide another 5,900 cubic yards of subsoil materia

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Stabilization of Surface Areas

Analysis:

Section 341.200 describes interim reclamation of topsoil, road outslopes and the pond embankments, and describes the interim vegetation mix (Table 300-5).

Final reclamation treatments are described in Section 341.200 and include soil roughening (hand or mechanical breaking a soil crust, if any), seeding, fertilizer application based upon soil analysis, hand or mechanical raking, and application of 2T/ac mulch or an erosion control mulch blanket. The final seed mix is described in Table 300-6.

Terraces and berms (Section 553.140), and surface roughening (Section 552) will provide sediment control as vegetation becomes established. An annual inspection for rills and gullies and their repair is described in Section 301-350.

pburton