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

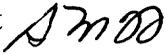
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October 12, 2001

TO: Internal Files

THRU: Priscilla w. Burton, Senior Reclamation Specialist/Soil Scientist/Team Lead 

FROM: Susan M. White, Senior Reclamation Specialist/Biologist 

RE: Contour Mining, Lodestar Energy, Inc, White Oak Mine, C/007/001-SR01A-1

SUMMARY:

On February 2, 2001, the Division received a proposal from Lodestar Energy, Inc., to surface mine the coal occurring along the contour of the White Oak Mine surface facilities. A second submission of the proposal was received September 10, 2001. The disturbed area boundary will be increased by 8.28 acres for this project. Total area affected by surface mining is 29.4 acres.

Paul Baker, Division Biologist, wrote the first technical analysis for this contour mining proposal, dated May 31, 2001. His technical analysis was modified to reflect the September 10, 2001 submission of mining plans.

The application to conduct contour mining does not meet the requirements of the regulations and should not be approved.

TECHNICAL ANALYSIS:

GENERAL CONTENTS

IDENTIFICATION OF INTERESTS

Regulatory Reference: 30 CFR 773.22; 30 CFR 778.13; R645-301-112

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Analysis:

The applicant and operator are Lodestar Energy, Inc., and the application includes the applicant's address, telephone number, employer identification number, and resident agent. It also shows who will pay the abandoned mine reclamation fee and lists the applicant's officers. Appendix 1-1 shows when the officers assumed their positions as required in R645-301-112.330.

All of the Lodestar Energy stock is owned by Lodestar Holding, Inc., which is owned by IRACOAL, Inc. Appendix 1-1 includes the names, addresses, social security numbers, and starting dates of the officers and directors of these companies. It also shows appropriate identification information for affiliated coal mining and reclamation operations. Some of the ownership and control information is new, and it needs to be checked in the Applicant/Violator System.

Tables 112.500 and 112.600 and Maps 112.500 and 112.600 of the current MRP show land ownership information. The address of the Oman's identified in Table 112.500 and Appendix 1-2 is different. The correct address on Table 112.500 must be verified.

Findings:

Information provided in the application is not considered adequate to meet the minimum Identification of Interests requirement of the regulations. Prior to approval, the permittee must provide the following in accordance with:

R645-301-112.500, the correct address and current name for the Oman's must be provided in Table 112.500.

RIGHT OF ENTRY

Regulatory Reference: 30 CFR 778.15; R645-301-114

Analysis:

The surface contour mining will increase the disturbed area by 8.2 acres. The mining will disturb an additional 17.3 acres already within the disturbed area boundary of 60.9 acres. Total surface disturbance within the permit area is 151.0 acres. The project is on surface land owned by the Omans and Madsens. Appendix 1-2 of the MRP contains detailed right of entry information. The lease agreements allow underground and surface mining, surface facilities and reclamation (Appendix 1-2).

The Oman's lease agreement, dated September 17, 1996 refers to the surface facilities area as the "40-acre parcel". The Division was concerned the additional surface mining disturbance might exceed the 40 acres allowed in the surface lease agreement. David Miller, Lodestar Mining, checked the acreages and reported that the surface disturbance on the Oman's land is a "generous" 36.2 acres.¹ The Oman's lease agreement requires that all trees cut by the mine which exceed 5 inches diameter must be trimmed and stacked on the west side of the state highway.

The coal is owned by Carbon County. Dennis Dooley, Carbon County, will monitor the coal lease for the county. Federal coal underlies the Madsen property in Pit 12 and 13. Lodestar does not own the rights to mine the federal coal. Plate 5-1C must show the federal coal boundary. The surface land must be surveyed and staked to clearly mark the boundary of federal coal.

Findings:

Information provided in the application is not considered adequate to meet the minimum Right of Entry requirements of the regulations. Prior to approval, the permittee must provide the following in accordance with:

R645-301-114, Plate 5-1C must show the federal coal boundary. The surface land must be surveyed and staked to clearly mark the boundary of federal coal. The application must commit to not mining the federal coal until leases are obtained.

ENVIRONMENTAL RESOURCE INFORMATION

VEGETATION RESOURCE INFORMATION

Regulatory Reference: 30 CFR 783.19; R645-301-320.

Analysis:

Much of the disturbed area was disturbed before vegetation measurements were taken. Drawing R645-301-323.100 shows vegetation communities in the area. Near the mine surface facilities are aspen, spruce/fir, and grass/forb/elderberry communities. Vegetation cover and productivity information for these communities is included in Appendix 321.

The upper Whisky Creek riparian area disturbed with the surface mining is less than one third acre in size. A quantitative study of the upper Whisky Creek area was conducted in August 2001, prior to disturbance. Three sub-types occurred within this zone:

¹ Phone conversation with David Miller and Susan White, October 12, 2001.

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Sub-type	Length (feet)	Width (feet)
Riparian	236	10
Spruce	204	*
Rock transition	844	*

* not determined

The three sub-types were intermixed throughout the length of Whisky Creek. Only the riparian subtype was considered to be different enough from the already described vegetation types to warrant separation and analysis. The riparian sub-type had 66 percent vegetative cover. Sixty-six percent cover seems low for this vegetation type. JBR² states in response to this low cover value:

“Aerial cover estimates for grasses, rushes, and sedges in particular are basically basal cover, and many times may be overestimated. The Daubenmire frame utilized in the Whisky Creek sampling is very useful for focusing on the specific quadrat to obtain an accurate estimate of cover.”

The report in Appendix 3-1 is unclear if shrubs and trees were included in the JBR sampling for vegetative cover as required. The comment that UDOGM (S. White) directed shrub and tree species to be not measured is incorrect and must be removed. The Division did state that sampling for tree and shrub density in this portion of Whisky Creek was not required.

Information in the plan about other vegetation communities is adequate.

Findings:

Information in the proposal is not adequate to meet the minimum Vegetation Resource Information requirements of the Regulations. Prior to final approval, the applicant must supply the following information in accordance with:

R645-301-321, cover analysis for the vegetation in Whisky Creek must include tree and shrub species in the total cover when they occur. Appendix 3-1 must be clarified to read that the Division did not require tree and shrub density sampling.

MAPS, PLANS, AND CROSS SECTIONS OF RESOURCE INFORMATION

Regulatory Reference: 30 CFR Sections 780.14; 779.24; 779.25. R645-301 Sections 323; 411; 521; 622; 722; 731.

² E-mail from Linda Matthews to Susan White, dated October 10, 2001.

Analysis:

Vegetation Reference Area Maps

Drawing R645-301-323.100 is a map of the vegetation communities in the permit area, and it also shows two specific reference areas near the mine complex (in addition to a reference area near the loadout). While this would be acceptable, it is in conflict with the text of the plan that indicates a large area could be used as a reference area. According to page R-32 of 37 and Table R-2, revegetation success will be judged on the basis of comparison with reference areas. For the mine complex, the reference areas are those areas devoid of man's activities that have at least a 100-foot buffer zone from disturbed areas. Specific reference areas will be chosen using a statistically based method from a grid of areas in proximity to the disturbed area and with similar characteristics, such as elevation, slope and aspect. Either the text or the map needs to be modified to be consistent.

Findings:

Information in the proposal is not adequate to meet the minimum Maps, Plans, and Cross Sections Resource Information requirements of the Regulations. Prior to final approval, the applicant must supply the following information in accordance with:

R645-301-323, the text that discusses the locations of the reference areas needs to be consistent with Drawing R645-301-323.100. The drawing shows specific reference area locations.

OPERATION PLAN

AIR POLLUTION CONTROL PLAN

Regulatory Reference: 30 CFR Sections 780.15; 816.95; 817.95. R645-301 Sections 244; 420.

Analysis:

Appendix 4-1 contains a copy of the cover letter submitting a Notice of Intent for an Air Quality Permit to the Division of Air Quality. The Notice of Intent should be replaced with the approved Air Quality Approval Order when available.

Section 420. Air Quality, is a fugitive dust control plan for the surface mining operations. The plan calls for:

- Watering of the pit and ramps out of the pit during warm weather.
- Controlling the size of blast according to MSHA.

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- Rocking and grading of the pit access to reduce fine airborne particulates. Watering of the pit and ramps during warm weather suggests watering will only occur in the summer. This statement must be modified so watering will occur at any time feasible.

Findings:

Information in the proposal is not adequate to meet the minimum Air Pollution Control Plan requirements of the Regulations. Prior to final approval, the applicant must supply the following information in accordance with:

R645-301-424, the fugitive dust control plan must be modified so pits and ramps will be watered when temperatures allow and not just during warm weather.

FISH AND WILDLIFE INFORMATION

Regulatory Reference: 30 CFR Sections 780.16; 784.21, 784.21; 816.97; 817.97. R645-301 Sections 322; 333; 342; 358.

Analysis:

Protection and enhancement plan

The plan contains several commitments about personnel training, reclamation habitat enhancement, and avoiding disturbances to streams and riparian areas. During surface mining and early reclamation all flow from upper Whisky Creek will pass through a sediment pond prior to entering the stream. This should control most downstream sediment.

Endangered and threatened species

Through water depletions, the mine has the potential of adversely affecting four threatened and endangered fish species of the upper Colorado River. The current mining and reclamation plan has some discussion about effects of underground mining on both water quality and the amount of water available. The surface mine is expected to use about 1.3 acre-feet of water annually from dust suppression³. A mitigation fee is required when the annual depletion exceeds 100 acre-feet.

There is little or no likelihood of adversely affecting any other listed threatened or endangered species, but, as discussed in the environmental resource information section of this review, there is a chance Williamson's sapsuckers, a sensitive species, could be in the area. Nearly all birds are protected by either state or federal law, so "taking" them, through killing them directly, by destroying an active nest, or other means, is illegal. Probably the easiest way

³ Acre-feet of water used provided by David Miller in a phone conversation with Susan White on October 4, 2001.

to avoid this problem is to do the mining outside the nesting season, but the application does not include a mining schedule. Because the applicant does not yet have approval for the mining operation, it may be difficult to establish a schedule, but it should be possible to commit to not beginning the operation or tree cutting associated with it between about April and July. If this is not possible, the Division will need to consider other protection and mitigation options that might be available.

Bald and golden eagles

Although bald eagles could occasionally fly through the area and some may winter in the Scofield area, the proposed operations are not expected to have effects on bald eagles. No golden eagle nests have been found in either helicopter or ground surveys in the immediate area although it is possible there are some nests nearby. Two raptor nests found in 1998 near Boardinghouse Canyon were classified as red-tailed hawk and unidentified buteo nests. Annual helicopter monitoring for cliff nesting raptors was conducted from 1993 through 2001. Helicopter surveys were suspended in 2001.

Wetlands and habitats of unusually high value for fish and wildlife

It appears there are small wetlands associated with Whisky Creek, but, as discussed in the resource information section of this technical analysis, they are not large enough to be regulated by the Army Corps of Engineers. The applicant will need to reclaim them as far as possible in the reclamation process.

Other habitats of unusually high value will either not be damaged, would be protected by following commitments in the existing mining and reclamation plan, or will be protected by following commitments the Division is requiring.

Findings:

Information provided in the application meets the minimum Fish and Wildlife Information requirements of the regulations.

VEGETATION

Regulatory Reference: 30 CFR Sections 816.100; 817.100; 817.121(c). R645-301 Sections 330; 331; 332.

Analysis:

Spoil and topsoil may be stockpiled a maximum of twelve to fourteen months. The spoil pile will be seeded with an annual grain such as barley at the rate of 100 PLS per acre. Annual grains are selected for seeding in the opposite season from which they would normally be

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planted for crops. For example winter wheat is planted in the fall for an early summer seed crop. A seed crop is undesirable for interim seeding therefore; spring wheat should be planted in the fall to prevent seed production. It is important that the grain seed be tested and purchased from a seed dealer rather than from an individual farmer.

The permittee must describe efforts made to minimize other disturbances and adverse impacts during mining. This could be done by committing to interim seeding all areas in which rough grading has been completed and will remain for longer than 3 months prior to topsoiling and final seeding.

The Division recommends an application of about one ton per acre of straw or hydromulch after seeding of the barley to further control erosion. The mulch should be certified as noxious weed free. Purchasing good quality seed and noxious weed free straw is far less expensive than trying to control weeds.

Findings:

Information provided in the application is not considered adequate to meet the minimum Vegetation requirement of the regulations. Prior to approval, the permittee must provide the following in accordance with:

R645-301-333, the plan must describe efforts made to minimize disturbances during mining. Interim seeding of rough graded spoil can minimize disturbance during surface mining operations.

RECLAMATION PLAN

POSTMINING LAND USES

Regulatory Reference: 30 CFR Sections 780.23; 784.12; 784.200; 785.16; 816.133; 817.13. R645-301 Sections 412; 413; 414. R645-302 Sections 270; 271; 272; 273; 274; 275.

Analysis:

The applicant is proposing no changes from the pre-mining land uses. The post-mining land uses are grazing and wildlife habitat. A grazing plan for the reclaimed area is detailed in section 412 of Chapter 4. The plan is based on a five year rest rotation cycle. This is similar to the Forest Service plan for the area.

Regulation R645-301-412.200 requires that the application include comments from the land owner and surface management agencies about the post-mining land use. The mining and

reclamation plan has a comment that any information related to land owner or surface manager comments is available for review at the office of Valley Camp of Utah.

The modified agreement, dated February 16, 2001, between Milton A. Oman, Ltd., and the applicant says:

"Lessor [Milton A. Oman, Ltd.] will construct or reconstruct an access road as a connection between the Access Road (also known as the Whisky Canyon haulroad) and the gas pipeline access road, from South Fork Canyon to Whisky Creek Canyon, which will provide continued access to the Property for the Lessor. Lessor agrees to sign, at Lessee's [Lodestar's] request, any and all documents required for Lessee to obtain the consent of all appropriate regulatory agencies for leaving such access road and the Whisky Creek Canyon haulroad as permanent roads not to be reclaimed as part of the final reclamation of the Property."

This agreement makes it clear the one landowner desires a road from above the mine coming on to the surface facilities area. The agreement states that the Oman's will construct the road. Justification for the road is property access (Chapter 4, section 412.200). The permittee states (not the land owner) the property will be used for grazing, cabin sites and annual hunts. No long-term maintenance agreement for the gravel road was provided nor is it needed if the Oman's construct the road.

Milton A. Oman, Ltd., is also willing to allow the road up Whisky Creek Canyon, but the application does not justify the road below the mine being left. In other words, it does not indicate for what purpose the road would be used if it remained following reclamation, it does not show that the road is necessary considering that there is other access to the canyon, and it does not show the desires of other entities over whose land the haulroad crosses. Although the applications alludes to the possibility the main part of the haulroad might remain for the postmining land uses, it commits to reclamation. Lacking adequate information for retaining the road, the Division anticipates the haulroad will be reclaimed.

Findings:

Information provided in the application is not considered adequate to meet the minimum Post Mining Land Uses requirement of the regulations. Prior to approval, the permittee must provide the following in accordance with:

R645-301-412.200, comments about the postmining land use from the landowners or the surface land management agencies must be provided.

R645-301-412, the "White Oak Mine Site Final Reclamation Contours" map and the agreement with Milton A. Oman, Ltd., show a 1200-foot section of road across the reclaimed area. The operator must remove all reference to constructing the 1200-foot section of road since the Oman's desire to construct it themselves.

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PROTECTION OF FISH, WILDLIFE, AND RELATED ENVIRONMENTAL VALUES

Regulatory Reference: 30 CFR Sec. 816.97; R645-301 Sections 333; 342; 358.

Analysis:

The planned wildlife habitat enhancement measures are to spread around rocks and brush and other woody debris on the reclaimed area to provide habitat enhancement. The upper portion of Whisky Creek will be reclaimed. French drains will be installed so that springs and seeps should resurface, although perhaps not in their original location. The primary wildlife habitat needs are to provide adequate forage and cover and to maintain water supplies. If the applicant follows the revegetation plan, the number of conifers in the reclaimed area will be reduced compared to adjacent spruce/fir areas. This additional foraging area will benefit most wildlife species.

The plan for reclaiming Whisky Creek will create a channel with more steep and flat sections and reduce the amount of moderate slopes than existed previously. Only 18 percent of the premining channel contained what was considered riparian vegetation. Creating greater flat sections should increase the amount of riparian type of vegetation. The permittee proposes to create a channel using similar material as the preexisting channel.

Findings:

Information in the proposal is adequate to meet the requirements of the Protection of Fish, Wildlife and Related Environmental Values section of the regulations.

CONTEMPORANEOUS RECLAMATION

Regulatory Reference: 30 CFR Sections 785.18; 816.100; 817.100.; R645-301 Sections 352; 553; R645-302 Section 280; 281; 282; 283; 284.

Analysis:

The surface mining operation is proposed to be completed in 14 to 20 months. Prior to this, all but a few loading and transportation surface facilities will be removed. Plate 5-1C shows the general sequence of mining operations on the site, and Table R-3 is a generalized reclamation timetable.

Surface mining of the barrier coal will create additional spoil. Spoil from the development of the first four months will be stockpiled on the coal stockpile pad as described in Sections 526.300 and 528 and shown on Figure 9-3, Temporary Spoil Storage in Chapter 9 of the application. This spoil will remain until the final pit is reclaimed (Section 528.200). The initial cell development will generate a "life of mine" temporary spoil storage pile of 305,049 cubic yards as indicated in Chapter 9. This spoil pile will not be utilized until final reclamation of the last pits and therefore must be vegetated and stabilized in the interim. The temporary spoil pile will be seeded with an annual grain at the rate of 100 PLS pounds per acre.

After the spoil is stockpiled from the first three pits any additional spoil removed will be directly placed in the previous pit and rough graded. Areas rough graded during the year will be topsoiled and seeded in the fall (page R-2 and R-35). Revegetation treatments will be applied on all lands as soon as possible after mining and in the first normal season for seeding and planting.

Findings:

Information provided in the application meets the minimum Contemporaneous Reclamation requirements of the regulations.

REVEGETATION

Regulatory Reference: 30 CFR Sections 816.111, 816.113, 816.114, 816.116; 817.111; 817.113; 817.114; 817.116. R645-301 Sections 244; 353; 354; 355; 356; R645-302 Sections 280; 281; 282; 283; 284.

Analysis:

Timing

Seeding will occur in the fall. Fall is the accepted seeding window for this area. The site is at 9000 feet elevation and that will limit late fall seeding. Transplants will be planted in the fall immediately after seeding. Cuttings will be planted as early in spring as possible. Transplants should be ordered now to insure availability in fall 2002.

Mulching, seeding, and other soil stabilizing practices.

Mulching

The soils surface preparation techniques are vital for both erosion control and for vegetation establishment.

The proposed surface mining operation will generate some slash and other woody debris that should be used on newly-graded areas. This material could be used in lieu of silt fences or

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berms around the base of stockpiles. Depending on the exact sequence of operations, the woody debris could either be stockpiled then spread later or it could be spread on graded areas as it is generated. Portions of the stream have a lot of woody debris, and some of this material could be used in reclaiming Whisky Creek. This is consistent with the current mining and reclamation plan in which the applicant commits to use brush, downed trees, rocks, etc., to place on the recontoured surface to achieve a more natural appearance and to enhance the habitat (page R-25).

This site has high precipitation, steep slopes, and long slopes so it is important for good mulching methods to be used to control erosion. In the experience of the Division and other mine operators, one of the best mulching methods is a combination of a noxious weed free straw and wood fiber mulch. The permittee should incorporate one to two tons per acre noxious weed free straw or hay when roughening the topsoil. The permittee commits to after seeding:

- Spreading straw at the rate of one to two tons per acre
- Gluing straw to the soil surface with 500 pounds per acre of wood fiber mulch and tackifier (page R-24).

Seed mixtures

Seed mixtures and shrub and tree transplants are listed in Table R-1. The upland seed and planting mixes in the plan are acceptable. Frequently modifications are needed to the seed mixtures at the time of ordering because of unavailability. This should be done with the Division's concurrence. The riparian seeded mixture for upper Whisky Creek contains sedges, grasses and forbs found occurring on site. Many of these species maybe difficult to obtain commercially and every effort should be made to collect seed and/or plugs from adjacent areas. The state's Lone Peak Nursery will custom grow specific species provided enough lead time. Information can be obtained from:

http://www.nr.utah.gov/slf/Forestry%20Fire%20&%20State%20Lands_files/lonepeak/Home2.htm

Bitterroot Restoration at: http://www.revegetation.com/BRIWeb/plant_prop.html also contract grows plants.

The seed mixture was designed to combine the south-west and north facing aspect seed mixtures into one. The seed mixture contains enough diversity so that species adapted to the different aspects will dominate. Shrub planting will also occur on all aspects. Aspens will be planted on the south-west facing aspects and conifers planted on north-east aspects. Some aspens should also be planted on the north aspects. The shrub plantings were removed from Table R-1 for the riparian area of upper Whisky Creek. These plantings should remain for added long-term stream stability.

Planting methods

All seeds will be broadcast seeded. Broadcast seeding methods include hand broadcasting with a cyclone type spreader or hydroseeding. The seeding rates shown with the seed mixes are for broadcast seeding.

Shrubs and trees will be grouped to develop an edge effect for wildlife. The groupings will be located near the riparian area and where previous trees were clumped. They can be placed in fairly large clumps, and for aesthetic purposes, these clumps should be placed to hide any terraces or other areas that do not appear natural. On north through east aspects, mountain lover should be planted with clumps of conifers with the other species in more open areas.

Pest control

Musk thistle is a state-designated noxious weed, and it is a serious problem in the mine area. The application says that, prior to any earth moving activity, all areas affected by noxious weeds will be sprayed. It is likely musk thistle will invade the newly revegetated area. There could also be some problems with whitetop, another noxious weed. The operator will spray after noxious weed emergence and prior to flowering in the spring and fall. 24D, Tordon, Escort or equivalent in direct application will be used. The County Weed Control will be consulted when needed (page R-25). It is crucial that the applicant be vigilant with the weed control program. The Weed Web at: <http://extension.usu.edu/coop/ag/crops/weedweb/index.htm> provides current information for weed control programs.

Standards for success

According to page R-32 of 37 and Table R-2 of the current mining and reclamation plan, revegetation success will be judged on the basis of comparison with reference areas. For the mine complex, the reference areas are those areas devoid of man's activities that have at least a 100-foot buffer zone from disturbed areas. Specific reference areas will be chosen using a statistically based method from a grid of areas in proximity to the disturbed area and with similar characteristics, such as elevation, slope and aspect.

While this is an unusual approach for establishing reference areas, it is acceptable as long as the precise areas chosen can be rated by the Natural Resources Conservation Service as being in fair or better range condition at the time of making comparisons for final bond release.

The text and maps in the current plan show different areas that will be used as reference areas. The section of this review discussing maps, plans, and cross sections of environmental resource information addresses this issue and includes a deficiency intended to rectify the problem.

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Baseline information was obtained on the upper Whisky Creek area in August 2001 (Appendix 3-1). No success standards for comparing the reclaimed Whisky Creek are provided. The success standards must be provided in the permit application.

To judge whether vegetation is adequate to control erosion, the applicant will place erosion pins on slopes at the time of reseeding (page R-28). These pins will be used as a guide to overall erosion characteristics of the reclaimed area. A discussion is not provided detailing numbers of pins or what quantitative information will be obtained from the pins. This reviewer questions the usefulness of these pins and any inferences made to amounts or rates of sediment loss. Any rills or gullies that disrupt the postmining land use or vegetation reestablishment, or that cause or contribute to a violation of water quality standards will be filled, regraded, revegetated, or otherwise stabilized.

Diversity will be judged by three different measures. These measures are the mean number of species encountered per sample, total number of species, and MacArthur's Index. Using three measures is acceptable to the Division. The reclaimed area does not need to meet or exceed all three measures but do need to show diversity similar to the undisturbed. Arguments will need to be made to support diversity in the revegetated community at the time of Phase III bond release. The plan does not discuss revegetation success standards for compatibility with the postmining land use. However, the seed mixtures proposed are commonly used for wildlife and grazing uses. The plan also does not mention seasonality, but since it does not appear there are any warm season species in the area, the standard can simply be that all reestablished species will be cool season species.

Findings:

Information provided in the application is not considered adequate to meet the minimum Revegetation requirement of the regulations. Prior to approval, the permittee must provide the following in accordance with:

R645-301-341.210, The application needs to include shrub transplants for the upper Whisky Creek riparian area.

R645-301-341.250, The application must provide specific revegetation success standard for the upper portion of Whisky Creek.

R645-301-341.250, The application must clarify the reference areas to be used in the revegetation success standards.

STABILIZATION OF SURFACE AREAS

Regulatory Reference: 30 CFR Sections 816.95; 817.95. R645-301-244.

Analysis:

The Division is very concerned about soil surface stabilization. Many of the reclaimed slopes will be graded to 2h:1v with 200 to 400 foot length slopes. An erosion control plan incorporating best management practices is critical. Concave and complex slopes erode less than convex or uniform slopes. Map R645-301-521.160, sheet A and B and the text do not show or discuss the use of slope shaping as a surface stabilization method. The slopes are so extensive at this site that a requirement to grade slopes to concave and complex shapes is required.

Straw bales will be utilized as well as other appropriate sediment control devices downstream of all construction (page R-9 and R-22 of 37). The permittee should consider using vegetative material, slash and salvaged debris windowed as a sediment barrier during operations. This material can then be spread during topsoiling to provide for addition surface stabilization and habitat enhancement.

Revegetation will occur promptly (page R-9 and R-22 of 37). Extreme surface roughening will be used on all slopes prior to the distribution of topsoil (page R-12 and R-25). The roughening process can occur during topsoil placement or while incorporating organic materials (i.e. hay). Proper roughening is so important that the commitment must be made to roughen as described in the technique sheets in the Division's reclamation manual, The Practical Guide to Reclamation in Utah, found at: ftp://dogm.nr.state.ut.us/PUB/MINES/Coal_Related/RecMan/Reclamation_Manual.PDF. The technique sheets are also useful to give to equipment operators to illustrate the degree of roughness required.

After seeding, straw will be spread at the rate of one to two tons per acre. The straw will then be glued to the soil surface with 500 pounds per acre of wood fiber mulch combined with a tackifier (page R-23). A surface bonding agent may be used to reduce slippage of the material (page R-12 of 37).

The Division recommends the following treatment:

- Application of one ton noxious weed free alfalfa hay incorporated during surface roughening.
- Application of one ton noxious weed free straw to cover seeded surface
- Application of 500 pounds hydromulch and 150 pound tackifier over straw to glue straw to surface.

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Erosion pins on slopes (R31 of 37) used to monitor erosion. All slopes will be monitored. Rills or gullies that disrupt the postmining land use or the re-establishment of vegetative cover or degrade water quality (Page R31 of 37) will be corrected within 60 days. Erosion monitoring will follow the 1990 Office of Surface Mining publication entitled "Erosion Condition Classification System - Technical Note - Method for Evaluation of Erosion of Reclaimed Coal Lands in Western United States."

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:

R645-301-244, Change the text to read all slopes will be roughened after topsoil placement instead of prior to topsoil placement.

R645-301-244, Cross section maps or the text of the plan must show or discuss grading slopes to concave and complex shapes.

R645-301-355, The plan must provide a commitment to roughen as described in the technique sheets in the Division's reclamation manual, The Practical Guide to Reclamation in Utah, found at:
ftp://dogm.nr.state.ut.us/PUB/MINES/Coal_Related/RecMan/Reclamation_Manual.PDF .

RECOMMENDATION:

Prior to approval, the above noted requirements must provide as outlined above.