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

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February 11, 2000

TO: Internal File

FROM: David Darby, Reclamation Specialist III, Project Lead

RE: Lila Canyon Significant Revision to the Horse Canyon Mining and Reclamation Plan, UtahAmerican Energy, Inc., Horse Canyon Mine, ACT/007/013-SR98A

SUMMARY:

UtahAmerican Energy, Inc., submitted a significant revision (SR) to the Horse Canyon Mine mining and reclamation plan (MRP). The new operation and facilities will be built near the mouth of Lila Canyon. Facilities will consist of a mine portal, mine pad, buildings , a refuse pile, hydrologic structures, including a sedimentation pond, and topsoil stockpiles.

This analysis evaluates the surface water control structures, surface and groundwater water characteristics, and potential hydrologic consequences of the SR. Hydrologic structures were assessed to ensure they are sized to control, contain and transmit disturbed and undisturbed runoff to ensure minimal contamination and off-site impacts.

The existing hydrologic resources of the proposed Lila Canyon SR are detailed under section 720. The proposed operations and potential impacts to the hydrologic balance are described in Sections 728 and 730. All methods and calculations utilized to achieve compliance with hydrologic design criteria and plans are described in Section 740 and Appendix 7-4. 30.

There are several technical issues that need to be resolved before the application can be approved.

TECHNICAL ANALYSIS:

CLIMATOLOGICAL RESOURCE INFORMATION

Regulatory Reference: 30 CFR Sec. 783.18; R645-301-724.

Analysis:

The proposed mine site is in an area with an annual precipitation of approximately 12 inches, as described by Lines and others (1984).

The applicant has provided mean annual temperatures on Page 19, Chapter 7, however seasonal temperature have not been submitted.

The closest weather station to the Lila Canyon Lease is located at Sunnyside, Utah. Based on relatively close proximity and similar locations, the west exposure of the Book Cliffs, the data from this station will be used to verify precipitation amounts and other weather conditions for the Lila Canyon Project.

Summer thunder storms are common to the area . Baseline data for seasonal precipitation should be provided.

Findings:

R645-301-724 The applicant should provide seasonal records of precipitation and temperature range data.

ALLUVIAL VALLEY FLOORS

Regulatory Reference: 30 CFR Sec. 785.19; R645-302-320.

Analysis:

An assessment of the permits area by the regulatory authority concludes there are no alluvial valley floors that could be affected by mining. The premining land use is undeveloped rangeland which is not significant to farming; There is no farming activity upstream or downstream of the pemit area, therefore, the proposed operations will not interrupt, discontinue, or preclude farming on an alluvial valley floor. The only potential of subirrigation is in very small area along upper perennial reaches of Little Park Wash , however these areas are very small with no chance of farming activities taking place.

Findings:

A determination of no alluvial valley floors exists in or adjacent to the permit area that can be impacted by mining operations.

HYDROLOGIC RESOURCE INFORMATION

Regulatory Reference: 30 CFR Sec. 701.5, 784.14; R645-100-200, -301-724.

Sampling and analysis

The surface-water monitoring point-source discharge monitoring will be conducted in accordance with 40 CFR Parts 122 and 123, R645-301-751 and as required by the Utah Division of Environmental Health for Utah Pollutant Discharge Elimination System (U.P.D.E.S.) permits. A U.P.D.E.S. discharge permit application has been submitted to the Division of Environmental Health for the proposed sediment pond and mine water for the Lila Canyon operation. Existing U.P.D.E.S. permit applications for the Lila Canyon Lease are provided in Appendix 7-5. parameters are shown in Table 7-4. Water monitoring locations and sample frequencies are described in Table 7-3 and on Plate 7-4 .

As indicated in Section 731.220, surface-water monitoring data will be submitted at least every 3 months for each monitoring location. When analysis of any surface water sample indicates non-compliance with the permit conditions, the company will promptly notify the Division and immediately take actions to identify the source of the problem, correct the problem and, if necessary, to provide warning to any person whose health and safety is in imminent danger due to the non-compliance.

Baseline information

Within the permit area, the surface water resources consist of three main drainages: Horse Canyon Creek, an intermittent stream, Little Park Wash, an intermittent stream and Lila Canyon Creek, an intermittent stream. Horse Canyon flows to Icelander Wash which, in turn, flows to Grassy Trail Creek and the Price River. Little Park Wash flows southward to Trail Canyon and the Price River. Lila Canyon flows southwest to Grassy Wash, then south to the Marsh Flat Wash and the Price River. (See Plate 7-1)

Generally, Horse Canyon, Little Park and Lila Canyon Creeks flow during the spring snowmelt runoff period and also as a result of isolated summer thunderstorms. Due to the limited drainage area and elevation of Lila Canyon, the duration of the snowmelt flows is quite short and is limited to the very early spring. Locations of all baseline data points are shown on Plate 7-1. Baseline data information is included in Appendix 7-1. There are no streams, lakes or ponds or irrigation ditches known to exist within the proposed permit or adjacent areas. By late spring to early summer, usually no flow is evident in Horse Canyon Creek, below the minesite or Lila Canyon Creek.

This will be an underground mine with approximately 39.81 acres of surface disturbance

for mine site facilities and roads. Runoff from the disturbed minesite area is proposed to be controlled by a system of ditches and culverts which will convey all disturbed area runoff to a sediment pond for final treatment prior to discharge.

Based on results of the PHC determination, base-line study and other available information, numerous small springs and seeps exist within, and adjacent to, the permit area. In addition, ephemeral drainages in the area flow in response to snow melt and precipitation events. The proposed surface-water monitoring program will monitor the significant surface water sources, including drainages above and below the disturbed mine site area, and all point-source discharges (i.e. sediment pond).

Ground-water information

Seeps, springs and potential mine water discharge will be monitored in accordance with the Ground Water Monitoring Plan in Chapter 7.

Surface-water information

The plan will provide data to show impacts to potentially affected springs, seeps, impoundments and drainages within and adjacent to the permit area, by comparison with relevant baseline data and with applicable effluent limitations

Surface-water quality will be protected by handling earth materials, ground-water discharges and runoff in a manner that minimizes the formation of acid or toxic drainage; prevents, to the extent possible using the best technology currently available, additional contributions of suspended solids to streamflow outside the permit area; and, otherwise prevent water pollution.

Surface-water quality protection is proposed to be accomplished by the plan described in Section 731 and the following methods:

(1) Minimizing surface disturbance and proper handling of earth materials to minimize acidic, toxic or other harmful infiltration to ground-water systems;

(2) Testing (as-necessary) to ensure stockpiled materials are non-acid and non-toxic;

(3) Controlling and treating disturbed area runoff to prevent discharge of pollutants into surface-water, by the use of diversions, culverts, silt fences, sediment ponds, and by chemical treatment if necessary;

(4) Minimizing and/or treating mine water discharge to comply with U.P.D.E.S. discharge standards;

(5) Establishing where surface-water resources exist within or adjacent to the permit area through a Baseline Study (done) and monitoring quality and quantity of significant sources through implementation of a Water Monitoring Plan (proposed);

(6) Proper handling of potentially harmful materials (such as fuels, grease, oil, etc.) in accordance with an approved Spill Prevention Control and Countermeasure Plan (SPCC).

Baseline cumulative impact area information

The Division will make a findings of the cumulative impacts when the Mining and Reclamation Plan is complete.

Modeling

Actual surface and ground water information is supplied in this application; therefore, modeling is not proposed. No surface water modeling has been conducted.

Alternative water source information

A search was conducted of the State of Utah Water Rights files for all rights occurring within, and adjacent to, the permit area for a distance of one mile. The location of those rights are shown on Plate 7-3. A description of each of the rights is tabulated in Table 7-2.

As noted in the table, the majority of rights are owned by Basic Management L.L.C. (I.P.A.) for industrial use. Other rights owned by the B.L.M. or individuals are primarily for stockwatering.

Basic Management L.L.C. owns the rights to approximately 1.50 cfs in this area. Although the PHC (Appendix 7-3) indicates little, if any, adverse effects on water resources resulting from the operation, if such effects should become evident, lost water sources would be replaced from the rights owned by the company.

Probable hydrologic consequences determination

The Probable Hydrologic Consequences (PHC) Determination is provided as a separate document in Appendix 7-3. This determination indicates negative impacts of the mining or reclamation operation on the quality and quantity of surface and ground water under seasonal flow conditions for the proposed permit and adjacent areas.

The applicant identifies potential adverse impacts in Chapter 7 which consist of :

1. Increasing sediment loading;
2. Diminution or interruption of water supplies on water rights;
3. Discharge of contaminated groundwater;
4. Erosion and streamflow alteration;
5. Deterioration of water quality.

Each of the above potential impacts have been evaluated in the PHC.

Water in this area is primarily used for stock or wildlife watering. Any impacts to the small surface springs or seeps as a result of mining would likely be offset by the emergence of new seeps or springs due to fracturing, mine water discharge or replacement of water rights as described under Sections 525, and 731.800.

With underground mining, there always exists a potential for impacting surface or ground water resources; however, as indicated in Section 525, subsidence effects are expected to be minimal due to the amount of cover and massive rock strata between the mining and the surface. Effects on underground water are also expected to be minimal, since this water is not presently issuing to the surface, and any necessary discharges of the water would be in accordance with U.P.D.E.S. requirements.

The applicant also addresses any potential impacts to receiving streams in the event mine water is discharged from the mine.

Findings:

The applicant submitted information to address this section.

MAPS, PLANS, AND CROSS SECTIONS OF RESOURCE INFORMATION

Regulatory Reference: 30 CFR Sec. 783.24, 783.25; R645-301-323, -301-411, -301-521, -301-622, -301-722, -301-731.

Analysis:

Affected Area Boundary Maps

All cross sections, maps and plans required by R645-301-722 as appropriate, and R645-301-731.700 have been prepared and certified according to R645-301-512. Contour Maps of the proposed disturbed area and mining areas are included as Plates 5-2A, 5-2B, 7-1 and 7-2. These maps are U.S.G.S. based contours and accurately represent the proposed permit and adjacent areas. Disturbed area maps are based on aerial photography for greater detail, and are tied to relevant U.S.G.S. elevations.

Monitoring Sampling Location Maps

The permit application package identifies that the location of all known seeps and springs, as well as watering ponds or tanks are shown on Plate 7-1. There are no streams, lakes or ponds or irrigation ditches known to exist within the proposed permit or adjacent areas.

Permit Area Boundary Maps

Several maps including Plate 5-1 show the location of the permit boundaries for the Horse Canyon mine. The permit boundary has been divided into Permit Area A and Permit Area B.

Surface and Subsurface Ownership Maps

A search was conducted of the State of Utah Water Rights files for all rights occurring within, and adjacent to, the permit area for a distance of one mile. The location of those rights are shown on Plate 7-3. A description of each of the rights is tabulated in Table 7-2.

Subsurface Water Resource Maps

As mentioned above, the old Horse Canyon Mine is known to have standing subsurface water. In addition, any drill holes that have encountered water have been noted. Relevant cross sections of drill holes are shown on Plate 6-5. Water monitoring wells are shown on Plates 6-5 and 7-1 and results are included in Appendix 7-1.

Surface Water Resource Maps

Locations of all baseline data points are shown on Plate 7-1. Baseline data information is included in Appendix 7-1.

Location of all known seeps and springs, as well as watering ponds or tanks are shown on Plate 7-1. There are no streams, lakes or ponds or irrigation ditches known to exist within the proposed permit or adjacent areas.

Well Maps

Three water monitoring wells were drilled in the area, IPA #1, IPA #2 and IPA #3, to monitor mine water levels. These wells are shown on Plate 7-1.

Contour Maps

Contour Maps of the proposed disturbed area and mining areas are included as Plates 5-2A, 5-2B, 7-1 and 7-2. These maps are U.S.G.S. based contours and accurately represent the

proposed permit and adjacent areas. Disturbed area maps are based on aerial photography for greater detail, and are tied to relevant U.S.G.S. elevations.

Findings:

R645-301-521, The applicant should identify the areas labeled on Plate 5-1 as the **Horse Canyon Permit** and the Lila Canyon Significant Revision to the Horse Canyon Permit or the **Lila Canyon Tract to the Horse Canyon Permit**.

- The applicant should identify the complete Wilderness Study areas on at least one Plate.

OPERATION PLAN

HYDROLOGIC INFORMATION

Regulatory Reference: 30 CFR Sec. 773.17, 774.13, 784.14, 784.16, 784.29, 817.41, 817.42, 817.43, 817.45, 817.49, 817.56, 817.57; R645-300-140, -300-141, -300-142, -300-143, -300-144, -300-145, -300-146, -300-147, -300-147, -300-148, -301-512, -301-514, -301-521, -301-531, -301-532, -301-533, -301-536, -301-542, -301-720, -301-731, -301-732, -301-733, -301-742, -301-743, -301-750, -301-761, -301-764.

Analysis:

Surface-water monitoring

Locations of all monitoring sites are shown on Plate 7-4 , "Water Monitoring Location Map".

Proposed monitoring methods, parameters and frequencies are described in Table 7-3, "Water Monitoring Stations", and Table 7-4, "Water Monitoring Parameters".

Monitoring reports will be submitted to the Division at least every 3 months, within 30 days following the end of each quarter.

The proposed surface-water monitoring plan is detailed in Section 731.220.
This plan is based on PHC determination and analysis of all baseline hydrologic, geologic and other information in this permit application. The plan provides for monitoring of parameters that relate to the suitability of the surface water for current and approved postmining land uses and to the objectives for protection of the hydrologic balance as set forth in 751 (see Table 7-4).

The applicant has committed verbally (communication with Kerry Flood, to the Bureau of Land Management to develop water monitoring plan for Range Creek, a perennial stream north-west of the mine, to assess any potential impacts from mining to the perennial stream. No monitoring plan has been proposed.

Discharges of water from this operation will be made in compliance with all Utah and federal water quality laws and regulations and with effluent limitations for coal mining promulgated by the U. S. Environmental Protection Agency set forth in 40 CFR Part 434. See Sections 731 and 742.

The surface-water monitoring parameters are shown in Table 7-4. Water monitoring locations and sample frequencies are described in Table 7-3 and on Plate 7-4. The operational water monitoring plan will be implemented upon approval of the MRP.

Acid and toxic-forming materials

Drainage from acid- and toxic-forming materials and underground development waste into surface water and ground water will be avoided by implementation of a Spill Prevention Control and Countermeasure (SPCC) Plan and by the following:

Potentially acid- or toxic-forming materials will be identified by use of Material Safety Data Sheets (MSDS), or by direct sampling and analysis in the case of underground development waste.

Any material which exhibits acid- or toxic-forming characteristics will be properly stored, protected from runoff, removed to an approved disposal site or buried on site beneath a minimum of 4' of non-acid, non-toxic material.

Storage of potentially acid- or toxic-forming materials, such as fuel, oils, solvents and non-coal waste will be in a controlled manner, designed to contain spillage and prevent runoff to surface or ground water resources.

All oils and solvents will be stored in proper containers within enclosed structures. Fuels will be stored in appropriate tanks, enclosed within concrete or earthen bermed areas designed to contain any spillage.

Non-coal waste (garbage) will be stored in a designated location, in dumpsters, and removed to an approved landfill (East Carbon Development Contractors - ECDC) on a regular, as-needed basis.

Unused or obsolete equipment or supplies will be stored in a designated area. Drainage from the storage area will be directed to the sediment pond as shown on the Sediment Control Map, Plate 7-5.

Underground development waste (if any) will also be stored in a designated area. Such waste will be tested for acid- or toxic-forming potential, and if found to be acid- or toxic-forming, the waste site will be protected from surface runoff by the use of earthen berms.

Transfer of wells

There are presently three monitoring wells on this permit. When these wells are no longer required, they will be sealed in a safe, environmentally sound manner in accordance with regulations .

Discharges into an underground mine

There are no plans to discharge any water into an underground mine.

Gravity discharges

Based on historical data from other mines in the area, some mine water can be expected to be encountered during the mining operation. Typically, such water is stored in "sumps" or designated areas in the mine and used for mining operations or discharged to the surface.

At the present time, there are no plans to divert water from the underground workings of this operation to any other underground workings. In the event this happens the applicant has stated that receiving channels will be studied before and during discharge to analyze any adverse impacts.

Water quality standards and effluent limitations

Any discharge from the sediment pond will be made in compliance with all Utah and federal water quality laws and regulations and with effluent limitations for coal mining promulgated by the U.S. Environmental Protection Agency set forth in 40 CFR Part 434.

Diversions

There is one undisturbed diversion planned for this site within the permit area. . This diversion consists of a bypass culvert beneath the sediment pond and the old road grade, which will allow undisturbed runoff to bypass the site without mixing with disturbed area runoff. The applicant has proposed to install a 60 inch culvert. The existing culvert in the old road will have to excavated and removed.

Other diversions planned consist of disturbed area ditches and culverts, as shown on Plate 7-5. Design details for all diversions are provided in Appendix 7-4.

All diversions will be constructed and maintained to comply with the requirements of R645-301-742.100 and R645-301-742.300. Details are described under those respective sections of this chapter.

Culvert details are provided in Appendix 7-4. All undisturbed culvert inlets will be provided with headwall protection, consisting of inlet sections, rock or concrete.

Stream buffer zones

No development or disturbance will take place within 100 feet of a perennial stream. The only perennial stream identified by the applicant is Range Creek approximately 6 miles north-east of the mine portal.

Sediment control measures

Sediment control measures within and adjacent to the disturbed areas are detailed in Appendix 7-4. These measures include, but are not limited to:

As discussed in Appendix 7-4, runoff from the disturbed area will be captured in a sediment pond and/or treated as necessary to meet effluent limitations prior to discharge.

Undisturbed diversions will consist of properly designed and protected channels and/or culverts as described in Appendix 7-4.

The primary means of velocity reduction is planned to be the use of rip-rap; however, other methods such as straw dikes, check dams and/or vegetative filters may be employed during the operational or reclamation phases as determined necessary, and with Diversion approval.

Siltation structures

As described in Appendix 7-4, the only siltation structures planned for this operation are a sediment pond and possible minor, temporary sediment traps such as straw dikes and/or catch basins.

Siltation structures will be designed, constructed and maintained in accordance with the following regulations.

Sedimentation ponds

The general plan for this site is to drain runoff from the disturbed area into a single sedimentation pond for treatment prior to discharge. Site drainage and design details are described in Appendix 7-4. The general plan includes the following, at a minimum:

The sediment control plan and proposed sediment pond designs have been prepared and certified by a Registered Professional Engineer, State of Utah.

Sediment pond locations, design plans and cross sections are provided on Plates 7-5 and 7-6 , respectively.

The pond is designed to contain the runoff from a 10 year - 24 hour precipitation event for the area in addition to a minimum of 2 years of sediment storage. See "Sediment Pond Construction Requirements" in Appendix 7-4;

The proposed pond is not located where failure would expect to cause loss of life or serious property damage. As shown in Appendix 7-4, the proposed pond embankment will have a minimum of 3H : 1V on the inside slope and 2H : 1V on the outside. These slopes, along with the 95% compaction requirement, will ensure a static safety factor in excess of 1.3, as required.

All discharges from sedimentation ponds, diversions and culverts will be protected from erosion by the use of adequately sized rip-rap, concrete or other approved protection. Details for outlet protection for all drainage control structures are provided in appendix 7-4. All discharge structures have been designed according to standard engineering design procedures.

The detailed designs for the sedimentation pond need to be clarified. Plate 7-6 needs to show more details of the features surrounding the sedimentation pond and provide information on measurements, structural slopes and function.

Other treatment facilities

Appropriate sediment control measures will be designed, constructed and maintained using the best technology currently available to:

Prevent, to the extent possible, additional contributions of sediment to stream flow or to runoff outside the permit area;

Meet the effluent limitations under R645-301-751.

Exemptions for siltation structures

No exemptions requested by the applicant.

Discharge structures

The Principle Spillway culvert is a corrugated, metal pipe, and the open channel spillway is proposed to be constructed of grouted rip-rap. Each one designed to carry sustained flows.

The sediment pond emergency spillway will be constructed of grouted rip-rap for erosion and velocity control. (See Appendix 7-4).

Diversions and culvert outlets that are expected to have flow velocities in excess of 5 fps will also be equipped with erosion and velocity controls as described in Appendix 7-4.

Impoundments

No other treatment facilities are planned for this operation.

Casing and sealing of wells

One well is identified on the site, but is not used. There are no plans for other water wells on this site; however, if any wells are installed in the future, requirements of this section will be met.

Findings:

R645-301-533.100, The applicant should submit information on Plate 7-6 which details the outslope embankments, slope and size of culvert, UD-2, beneath pond, roadway width and slope, locations and design of trash-racks, locations and design of discharge pads, emergency spillway design, path of emergency discharge, sediment cleanout marks and topographic relationship of sediment pond to undisturbed channel using scale of 1 foot intervals.

R-645-301-731.221, The applicant should submit plans to include monitoring sites Range Creek above and below the extent of the mine.

MAPS, PLANS, AND CROSS SECTIONS OF MINING OPERATIONS

Regulatory Reference: 30 CFR Sec. 784.23; R645-301-512, -301-521, -301-542, -301-632, -301-731, -302-323.

Analysis:

Affected area maps

The general area hydrology is identified in Plant 7-1. Plates 5-1 and 7-4 identify the effected area for the Lila Canyon area.

Mining facilities maps

The following is a list of cross-sections and maps provided in this section of the SR.

Plate 7-1	Permit Area Hydrology Map
Plate 7-2	Disturbed Area Hydrology/Watershed
Plate 7-3	Water Rights Locations
Plate 7-4	Water Monitoring Location Map
Plate 7-5	Proposed Sediment Control Map
Plate 7-6	Proposed Sediment Pond
Plate 7-7	Post-Mining Hydrology

Mine workings maps

The Mine working map is located on Plate 5-5. The map contains a legend that details site information. The map also identifies the mining sequence.
Monitoring and sample location maps.

Findings:

The applicant needs to address the following deficiencies prior to approval of the application this section.

R645-301-521, The applicant should submit detailed designs showing size slope and height of all features of the sedementation pond and adjacent area, see deficiencies under Operation Plan.

- Plates 7-5 and 7-2 show a "Refuse Pile" location above drainage DD-4. This has to be corrected.

- All the disturbed area culverts are not identified on Plate 7-2. Their size and length should be stated.

RECLAMATION PLAN

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:

Surface-water monitoring

Surface-water monitoring will continue through mining and reclamation until bond release. Locations, parameters and/or sampling frequency (other than U.P.D.E.S. discharge points) may be modified by the Division

Acid and toxic-forming materials

Any material which exhibits acid- or toxic-forming characteristics will be properly stored, protected from runoff, removed to an approved disposal site or buried on site beneath a minimum of 4' of non-acid, non-toxic material.

Transfer of wells

There are presently no plans to transfer any wells to any other party. There are presently three monitoring wells on this permit. When these wells are no longer required, they will be sealed in a safe, environmentally sound manner in accordance with regulations (see Section 631.200

Discharges into an underground mine

No discharges planned to underground mines.

Gravity discharges

Section 731.520 explains why gravity discharges from the mine are not expected after mine closure.

The coal seam to be mined dips away from the portal site at approximately 10%. If water is encountered in the mining, it will likely be at a static level far below the exposed outcrop or rock slopes. This may result in some possible mine discharge from pumping, but not from gravity.

Water quality standards and effluent limitations

A reclamation surface and groundwater was not submitted.

Diversions

All disturber and undisturbed area diversions will be removed during the backfilling and recontouring reclamation period.

Stream buffer zones

There will be no development within 100 feet of a perennial stream.

Sediment control measures

Upon completion of operations, the disturbed area will be reclaimed. All drainage and sediment controls are considered temporary and will be removed when no longer required. The sediment pond will remain in place until Phase II Bond Release requirements have been met. At that time, the pond will be removed and the area will be reclaimed in accordance with the approved plan.

Upon removal of the sediment pond, the area will be regraded and revegetated in accordance with the approved reclamation plan.

Siltation structures

See Appendix 7-4 for details on removal of siltation structures.

As indicated in Section 761, the sediment pond will remain in place until the stability and vegetation requirements for Phase II Bond Release are met. This will be a minimum of 2 years after the last augmented seeding. At this time, the pond will be removed and the area reclaimed.

Sedimentation ponds

The proposed sediment pond is considered temporary, and will be removed during final reclamation. The pond is designed in compliance with the requirements of the following sections, as required:

The pond will be maintained until the disturbed area has been stabilized and revegetated. Removal shall not be any sooner than 2 years after the last augmented seeding;

Upon removal, the pond area will be reclaimed and reseeded according to the reclamation plan.

Discharge structures

The sedimentation will be used until Phase II bond release is received. Then the pond will be removed, the area recontoured and revegetated.

Impoundments

No impoundments will be left on site after reclamation.

Casing and sealing of wells

The applicant has committed to reclaim any existing wells in an environmentally sound manner. No well will be transferred.

Findings:

R645-301-521, The surface reclamation map should show reclamation contours of the sedimentation pond and culvert UD-2 in place and removed.

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requirements of this section of the regulations. Prior to final approval, the applicant must supply the following in accordance with:

R645-301-411.110, Boundaries of the Turtle Canyon Wilderness Study area and the areas identified in the 1999 wilderness inventory as having wilderness characteristics need to be shown on a land use map, such as Plate 4-2.

R645-301-411, In Section 411.110, the application refers to Figure 1 for information on big game and raptor habitat, but this figure could not be found. This reference needs to be corrected.

MAPS, PLANS, AND CROSS SECTIONS OF RESOURCE INFORMATION

Regulatory Reference: R645-301-411.141, R645-301-323

Archaeological Site and Cultural Resource Maps

The locations of cultural and historic resources in the area are shown on Plate 4-3 and on maps in Appendix 4-1. This information is adequate but needs to be kept confidential.

Vegetation Reference Area Maps

The 1999 vegetation study includes a map showing the vegetation communities in relation to the proposed disturbance. Plate 3-2 shows vegetation communities of the proposed addition to the permit area.

Findings:

Information provided in the proposal is adequate to meet the requirements of this section of the regulations.

OPERATION PLAN

PROTECTION OF PUBLIC PARKS AND HISTORIC PLACES

Regulatory Reference: R645-301-140

Analysis:

The proposed addition to the permit area contains no known cultural resources listed or eligible for listing in the National Register of Historic Places, public parks, or units of the National System of Trails or the Wild and Scenic Rivers system. Therefore, no protection plan is needed.

The Turtle Canyon Wilderness Study Area overlaps with the proposed addition to the permit area in the following locations:

Township 16 South, Range 14 East
Section 13, E½ NW¼, NE¼
Section 24, NE¼ NW¼, N½ NE¼

Township 16 South, Range 14 East
Section 19, SE¼ SW¼, Lots 3 and 4
Section 30, SW¼ NE¼

The policy of the Bureau of Land Management is to not allow surface occupancy in wilderness study areas any more than absolutely necessary and only in cases where there are valid existing rights. The applicant has not proposed surface-disturbing activities in these areas, and considering the topography, the Bureau of Land Management feels it is unlikely exploration, ventilation shafts, or other disturbance would be practical. If the applicant proposes surface-disturbing activities in these areas, they will be scrutinized very carefully.

The Bureau of Land Management has prepared two environmental analyses discussing the anticipated effects of subsidence in these areas. If subsidence is expressed on the surface, it is likely to consist of a lowering of the land elevation with some surface cracks, and there could be some disruption of the hydrologic balance. Overall, however, the Bureau of Land Management felt the effects of undermining these areas would be small.

The "Land Use Resource Information" section of this analysis discusses the 1999 Utah Wilderness Inventory. According to information from the Bureau of Land Management and contained in the application, the land will not be managed as a wilderness study area until further analyses have been completed.

Findings:

Information provided in the application is considered adequate to meet the requirements of this section of the regulations.

AIR POLLUTION CONTROL PLAN

Regulatory Reference: R645-301-420

Analysis:

Appendix 4-3 contains a copy of the Air Quality Approval Order from the Division of Air Quality. A letter in Appendix 4-3 from Jay Marshall to the Division of Air Quality says the applicant was requesting approval for a throughput of up to 2,000,000 tons per year, but the Approval Order says up to 1,500,000 tons of coal could be mined in a rolling twelve month period. Section 523 of the application indicates production should be between 1,000,000 and 1,500,000 tons per year for the first five years but that production could peak at 4,500,000 tons. Therefore, the application is consistent with the Air Quality Approval Order for the first five years. Any increase in production after five years would require amendments to both the Air Quality Approval Order and the mining and reclamation plan.

Findings:

Information provided in the application is adequate to meet the requirements of this section of the regulations.

INTERIM STABILIZATION

Regulatory Reference: R645-301-331

Analysis:

Section 331 says the permit area is approximately 40.77 acres of which only 39.86 acres will be disturbed drainage area. The permit area would be the entire area proposed to be mined, not just the disturbed area, so these acreage figures are not correct.

All incidental disturbances that will not be used as part of the operations will be revegetated with an interim seed mix. Table 3.4/3.5 is a seed mix that would be used for both interim and final revegetation. While this seed mix should provide adequate erosion protection for both interim and final reclamation, the Division recommends the applicant include a rhizomatous grass to increase

Section 331 refers to the revegetation plan in Section 340 for further information about revegetation methods. The details of this plan are discussed under "Revegetation" below.

Findings:

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

R645-301-331, In Section 331, the application says the permit area would be 40.77 acres. This appears to be a mistake, and it needs to be corrected.

While the species in the seed mix should be adequate for interim revegetation, the Division recommends adding one or two species of rhizomatous grasses, such as western wheatgrass and thickspike wheatgrass.

SUBSIDENCE

Regulatory Reference: R645-301-332

Analysis:

According to the application, the main potential effects of subsidence would be escarpment failure and disruption of surface and ground water. One eagle nest is in the subsidence area. Protection of this nest or mitigation for its loss is discussed in detail in the section of this analysis dealing with the fish and wildlife protection plan.

Section 525.100 says limited renewable resource lands exist within the area surveyed and that limited areas were found that contribute to the long-range productivity of water supply or fiber products.

The value of the lands within the proposed addition to the permit area as renewable resource lands is discussed elsewhere in the application; however, there is no indication any of the land is not within the definition of renewable resource lands.

According to the application, ground water will probably be intercepted in the course of mining, but it is not known whether it is perched or an active recharge aquifer. If the mine was to discharge water, it could benefit wildlife, at least through the life of the mine.

The mitigation for losses of wildlife habitat through subsidence could include habitat enhancement to increase production of selected forage species, and development of off-site water sources, such as guzzlers.

Subsidence cracks are occasionally large enough to be dangerous for wildlife, livestock, and people that might be in the area. The applicant has committed in Sections 525.160 and 525.231 to restore to the extent technologically and economically feasible material damage to the surface lands. This commitment is in accordance with regulatory requirements and is considered adequate.

A standard stipulation on federal leases is that the lessee monitor the effects of underground mining on vegetation. The application includes a plan to monitor vegetation with color infrared photography every five years. This commitment is consistent with commitments other mines have made and is acceptable.

Findings:

Information provided in the application is adequate to meet the requirements of this section of the regulations.

FISH AND WILDLIFE PROTECTION PLAN

Regulatory Reference: R645-301-333

Analysis:

Protection and Enhancement Plan

In Section 333, the application says the major impacts to wildlife in and around the mine will be the loss of habitat during construction and through the life of the mine. It also says most wildlife will either accept the mine or adjust behavior to coexist with the operation.

Operational impacts, such as collisions with mine-associated vehicles, loss of habitat during the life of the mine, wildlife disturbance, and fragmentation of nearby habitat, are difficult to quantify but would be the greatest impacts from the mine. The Fish and Wildlife Service commented that the mine's disturbance would kill most burrowing animals and others that are less mobile. It would also result in habitat fragmentation and dislocation of some animals to less desirable or already-occupied areas. Although wildlife can coexist with mining operations, animals may be forced to adjust their behaviors and may be otherwise stressed in ways that

reduce their chances for survival

The applicant has committed to train mine employees annually on environmental awareness. This will include wildlife protection measures, such as avoidance during stress periods, caution in driving, recognition of threatened or endangered species, and instructions to remove wildlife carcasses well off the road to avoid collisions with scavenging raptors. Wildlife Resources will be notified of any large game killed on the road, and the applicant will request that they be moved to safeguard raptors. The applicant will instruct personnel as to current regulations pertaining to off road vehicle and firearm use.

All suitable water encountered during mining will be discharged in a manner that it becomes available to wildlife. The applicant will need to ensure the water rights allow for this use and that the water quality is suitable. The water rights listed in Table 7-2 indicate the uses are for "mining" and "other." Ensuring that water quality is suitable should be possible through testing required for the discharge permit.

The application discusses the possible benefits of water in the sediment pond to wildlife. In the event water in the pond contains materials hazardous to wildlife, it would be removed and the pond monitored to ensure no negative effects on wildlife.

Wildlife Resources indicates there are bighorn sheep that spend all year in the Lila Canyon area, and use by sheep is expected to be curtailed following construction. Wildlife Resources also commented that Lila Canyon, and more particularly the water sources up the canyon, are heavily used by chukars, and they feel the mining operations will affect these birds. They suggested the applicant install some watering structures of a suitable design and said these water sources would greatly benefit chukars and other area wildlife. According to the application, the applicant has agreed to install two guzzlers.

The applicant has also agreed to participate in a habitat enhancement project on about 70 acres to convert this from pinyon-juniper woodland to shrubs, forbs, and grasses. Wildlife Resources feels the conversion from pinyon-juniper to a grass-shrub community would profit both big game and raptors. In their experience, jackrabbit and cottontail rabbit populations increase markedly with this change in vegetation, and they believe this would greatly benefit raptors.

As the mitigation projects are completed, some details should be included in the application or mining and reclamation plan. If this does not happen, it is easy to lose track of what was accomplished. If the applicant or anyone else visits the mitigation sites, general comments on use should be noted and reported to Wildlife Resources and the Division.

Endangered and Threatened Species and Bald and Golden Eagles

The Fish and Wildlife Service has determined that water depletions from the Upper Colorado River Basin may affect four listed threatened or endangered fish species. Mitigation is required when the annual depletion exceeds 100 acre-feet. According to information in the Probable Hydrologic Consequences statement, the total annual water use is expected to be 21.3 acre-feet. Since the mine is not expected to use more than 100 acre-feet, no mitigation should be required.

The Fish and Wildlife Service commented in a letter dated April 14, 1999, that there should be an evaluation of effects on the Colorado pikeminnow (formerly the Colorado squawfish) of a water discharge line to the Price River. This discharge line was apparently proposed early in the planning process for the mine, but it is no longer being planned.

The applicant commits to establish a one-half mile buffer zone of no disturbance during critical nesting periods. This is adequate to protect eggs and chicks from abandonment, and this commitment combined with the mitigation discussed above should be adequate for the loss of most nests near the mine.

Section 358.200 contains a commitment to safeguard any escarpment that has been identified as a raptor nest site; however, there is one nest within the subsidence area as shown on Plate 5-3. The Division assumes this nest could actually be lost, not just not used. The Fish and Wildlife Service feels the applicant should provide at least two alternative nest sites to replace the nest that could be lost. The application needs to show how this will be done.

In Section 358.200, the applicant commits to conduct a raptor survey to ensure that raptors or their nests or young will not be adversely affected though any mining or mine-related activity.

Since no threatened or endangered species are known to occur in the proposed addition to the permit area, no protection or mitigation measures are needed..

R645-301-358.510 requires that the operator ensure that power lines used for or incidental to coal mining and reclamation operations within the permit area be designed, constructed and maintained to minimize electrocution hazards to raptors. The application contains a commitment to this effect. The Fish and Wildlife Service recommends application of power line designs such as those in the Avian Power Line Interaction Committee's "Mitigating Bird Collisions with Power Lines: the State of the Art in 1994," or "Suggested Practices for Raptor Protection on Power Lines: the State of the Art in 1996," prepared for the Edison Electric Institute/Raptor Research Foundation, Washington, D. C.

Wetlands and Habitats of Unusually High Value for Fish and Wildlife

The application says the proposed disturbed area contains critical winter range for deer

and elk, and it discusses a mitigation plan for the habitat that would be lost during the life of the mine. The "Protection and Mitigation Plan" section of this review discusses this issue further.

According to the application, there are no wetlands or riparian areas within the proposed addition to the permit area. While there are a few springs in the area, there are no perennial drainages.

Findings:

Information provided in the application is not considered adequate to meet the requirements of this section of the regulations. Prior to final approval, the applicant must supply the following in accordance with:

R645-301-333, The applicant has committed to not subside escarpments that contain eagle nests, but it appears the area near one nest would be subsided. The applicant needs to show how nests in the subsidence areas would be protected or what mitigation will be done. The Fish and Wildlife Service has suggested building alternative nest sites in the area.

While the access road and power lines will probably not be regulated by the Division, the Division of Wildlife Resources and Fish and Wildlife Service commented on these facilities. It is very important that power lines be designed and constructed in accordance with the most current technology to avoid electrocutions. The poles will be used by golden eagles, ferruginous hawks, and other raptors.

Many big game animals are killed in collisions with vehicles used to haul coal, and it is vital that drivers be instructed on the importance of maintaining proper speeds and watching for wildlife. Any animals killed must be taken well off the road to avoid scavengers, including eagles, being hit. They should also be reported to Wildlife Resources.

RECLAMATION PLAN

LAND USE RECLAMATION PLAN

Regulatory Reference: R645-301-412

Analysis:

The postmining land uses will be the same as premining land uses. This will be accomplished through the reclamation plan presented in other sections of the application.

Support activities to achieve the postmining land use will include site monitoring; remedial actions, such as regrading, reseeding, and replanting; and fencing as necessary to restrict access and grazing.

The postmining land use is in accordance with the Bureau of Land Management's management plans. Appendix 4-2 contains a letter from the Bureau of Land Management stating the postmining land use for the area is wildlife habitat, grazing, and incidental recreation.

Findings:

Information provided in the proposal is considered adequate to meet the requirements of this section of the regulations.

REVEGETATION

Regulatory Reference: R645-301-341

Analysis:

Revegetation Plan

Table 3-3 in Chapter 3 is a general reclamation timetable. According to this timetable, seeding and mulching would begin about the first of October, depending on the weather, and seedlings would be planted about the first of November. Except as discussed below, these are the normal times for planting, and the schedule is acceptable.

Blue grama and galleta are two of the dominant grasses, and they are both warm season grasses. Other mines in Utah have had a great deal of difficulty establishing these species on reclaimed sites, and this may be because they are often seeded in the fall. Mines in New Mexico and Arizona usually seed these species in the summer to take advantage of late summer rains, but, to the Division's knowledge, no Utah mines have attempted to establish these species by planting them in the summer.

The Division is willing to accept the plan to seed in the fall, but the applicant needs to at least try seeding in the summer on an experimental basis. To do this, the applicant could establish traditional test plots or could simply show an area of the mine where summer seeding could be tried for blue grama and galleta. The interim and final revegetation seed mixes are essentially the same; therefore, it is possible for the applicant to try the different seeding times for blue grama and galleta in some areas of the mine that will receive interim revegetation treatments. These areas should be monitored, and if the different seeding time was successful,

the reclamation plan should be modified accordingly.

Following demolition, the area would be regraded to approximate original contour. These areas will then be ripped 18 inches deep and disced. Topsoil will then be distributed to depths from six to eighteen inches as discussed in Chapter 2.

It is vital that there be soil for plants to have adequate rooting depth. Studies of plant phenology have clearly shown plants in arid areas use soil water from increasing depths as the growing season continues, and if there is inadequate rooting depth, production and vegetative cover will decrease.

Any soils not salvaged and protected would be subject to contamination from mine operations, compaction, and mixing with unsuitable materials. Some of the deeper subsoils, below the roots, have very high (>65%) rock contents, and some are derived from marine shales that could severely limit vegetation establishment and growth. If these materials were in the rooting zone, it would be difficult or impossible to achieve revegetation success.

Following topsoil redistribution, the soil will be tilled until large clods on the surface are diminishing. Tilling the soil to reduce the number and size of clods has not been necessary at other Utah mines because clods are broken up as the soil is redistributed, but a limited amount of tilling would probably not be detrimental. Gouging or pocking (see below) would also serve to break up large clods.

According to Section 553.230, surface preparation will include pock marking to minimize the potential for erosion and to enhance vegetation establishment. Because of the limited precipitation, the Division considers surface roughening to be essential at this site. Figure 1 in Appendix 5-8 is diagrams of pock mark configurations.

Appendix 5-8 says that in conjunction with pock marking, the track hoe can cast any vegetation, dead trees, and large rocks back onto the reclaimed surface. This debris provides solar protection but also increases available moisture in small areas and increases topographic and vegetation diversity.

The seed mixture for final reclamation is shown in Table 3.4/3.5. It consists of 22 species, 19 of which are native to the area. The introduced species are yellow sweet clover, alfalfa, and prostrate kochia.

The application includes justification for including yellow sweet clover. There is controversy whether this species should be included for revegetation, but the applicant would apply it at a rate of only 0.5 pounds per acre for broadcast seeding and half this rate for drilling. At this rate, it should not dominate the site or spread to adjacent areas. The application says

yellow sweet clover has proven beneficial in rapid establishment on marginal sites and that, as a legume, it should be able to fix nitrogen. The application includes a commitment to use inoculated seed.

The application needs to include justification for the other two introduced species such as in the following discussion. R645-301-353.120 says reestablished vegetation will be comprised of species native to the area, or of introduced species where desirable and necessary to achieve the approved postmining land use and approved by the Division. Alfalfa was recommended by the Division of Wildlife Resources, and because this site is marginal for alfalfa, it should not be overly aggressive. There is evidence forage kochia competes well with downy brome, a weed that dominates much of the proposed disturbed area.

The seeding rate shown in Table 3.4/3.5 is about 125 seeds per square foot for areas that are broadcast seeded and half this rate for drill seeded areas. This is a little higher than the rate recommended by the *Interagency Forage and Conservation Planting Guide for Utah* but is acceptable.

Appendix 5-8 says seedlings will be planted at a rate of 200 per acre and gives planting specifications. It says the ratios and species will be determined by the Bureau of Land Management and the Division. The Division does not determine ratios and species for planting although it can make recommendations. The application gives adequate details of when and how seedlings would be planted, but if the applicant intends to plant seedlings, the plan needs to show what would be planted at what rates and where.

Section 241 says seed will be hand broadcast and raked or applied with a hydroseeder. Chapter 3 discusses using a rangeland drill but also includes the option of broadcasting the seed. The applicant needs to correct this discrepancy between the two chapters. Drill seeding is likely to decrease surface roughness and should be avoided.

According to Chapter 3, straw mulch will be applied by hand or with a straw blower at a rate of 2000 pounds per acre on all inaccessible areas. The mulch will be anchored by crimping using discs traversing the mulched area. Accessible areas will be hydromulched. Chapter 2 does not discuss using straw, so the two chapters are inconsistent. Also, the tackifier rates are different in the two chapters.

The Division prefers straw mulch on inaccessible areas not be crimped rather than crimping it and decreasing surface roughness. Some mulch would blow away, but some would be caught in gouges. The Division feels it is more important to have gouges than to anchor the mulch.

There will be no irrigation, and no pest or disease control measures are planned. The

Division does not anticipate irrigation will be necessary as long as water harvesting methods are used. Unless medusahead rye is present, there are no serious pest control problems in the area of which the Division is aware, so, hopefully, no control measures will be necessary.

Section 357.301 says the Lila Canyon Mine would like to reserve the right to apply for augmentation of reclaimed areas thus extending the bond liability period on a site specific case scenario. This statement is acceptable but unnecessary. The regulations in R645-301-357 are designed to allow a limited amount of reseeding and other work for specific purposes without lengthening the extended liability period.

Success Standards

The reference area for the mine site disturbance was established adjacent to the proposed facilities during the summer of 1999, and the application refers to Plate 3-1. Plate 3-1 shows wildlife habitats in the general area and does not show the reference area; however, Figure 1 in the report for the 1999 vegetation survey shows the reference area location. The reference in the application to Plate 3-1 should be corrected.

The grass/shrub reference area is similar in most respects to the proposed disturbed grass/shrub areas, and it is considered an acceptable success standard. At the time of final reclamation, the range condition of the reference area will need to be reevaluated to ensure it is still in fair or better range condition. In the meantime, the reference area needs to be marked and should not be disturbed without first designating another revegetation success standard. The Division recommends the reference area be checked every five years to help ensure it remains in fair or better condition.

The applicant is proposing to use the grass shrub reference area as a success standard for the pinyon/juniper community. Pinyon/juniper areas generally provide relatively little forage for wildlife or livestock compared to a grass/shrub community, and the Division considers the proposal acceptable. Although it is impossible to statistically compare vegetation cover values between the reference area and the proposed disturbed pinyon/juniper area, cover in the reference area was measured at over twice the value in the pinyon/juniper area. This may be a difficult standard to achieve, but it is not unrealistic since there will be a different vegetation community in the pinyon/juniper area.

The Division is required in R645-301-356.230 to consult with the Division of Wildlife Resources and gain approval for the tree and shrub density standard for success. The standard set in consultation with Wildlife Resources is 1500 per acre, and this standard has been included in the application. The standard was based more on the species expected to become established in the area than on the existing vegetation.

Section 341.250 discusses success standards for diversity, seasonality, and erosion control. As understood by the Division, the standard for diversity is acceptable, but it must be clarified and may not be what the applicant intends. (It is possible the Division does not understand the applicant's intended standard and that the standard is not acceptable.) The Division understands that each species with at least 20% frequency would be classified by life form, such as grass, broadleaf forb, and shrub. The reclaimed area would need to reflect a 70% similarity of composition by group. The Division understands this to mean that, for example, if fourwing saltbush, sagebrush, shadscale, and winterfat were all in the reference area with a frequency of at least 20%, the reclaimed area would need to have at least 70% of these species with 20% frequency, (3 species = 75% in the example).

The problem with a standard like this is that it requires the same species, i.e. composition, in both the reclaimed and reference areas. The reclaimed area may have more desirable species than the reference area but not meet the standard because the species are not the same.

If the applicant intends to keep this standard, it must be clarified so there is no confusion about it. Also, the applicant needs to define the life form categories. Assuming "undesirable species" is one of these categories, this category needs be clearly defined.

The Division suggests the standard be modified. Every species with more than 20% relative cover could be classified into a life form. The standard would be that the reclaimed area must have at least as many species in each life form, except introduced and undesirable species, as the reference area. The reclaimed and reference areas would not need to have exactly the same species. Possible life form categories would be shrubs, trees, broadleaf forbs, grasses, introduced species, and undesirable species. For seasonality, the life form categories would simply be warm and cool season.

The proposed erosion standard is that vegetation will have demonstrated its erosion control effectiveness when UPDES effluent standards are met. This standard is generally acceptable, but compliance and erosion control would need to be demonstrated with a trend rather than just a few samples. Samples would need to be taken at every drainage leading away from the reclaimed area. The application needs to contain these commitments.

Field Trials

The application says the methods outlined have a proven performance based on the successful reclamation of the Horse Canyon Mine.

The applicant intends to plant all species in the seed mixture in the fall, but the Office of Surface Mining has recommended that warm season species, such as blue grama and galleta, be planted in the summer to take advantage of late summer rains. The applicant needs to try seeding

these species in the summer on part of the area that will have interim revegetation. The rest of the species would be seeded in the fall, and this treatment could be compared to areas that are only seeded in the fall.

Wildlife Habitat

The application says the sediment pond will be maintained through the life of the operation and will be removed when effluent criteria are met after reclamation. Sections 761 and 763.100 indicate the sediment pond will remain in place until the stability and vegetation requirements for Phase II Bond Release are met and that this will be a minimum of 2 years after the last augmented seeding.

A water source in this area would serve as a wildlife habitat enhancement. However, it is not known whether the pond would actually contain water a significant part of the year and would thus serve as an enhancement. It is also not known whether the water quality would be suitable for wildlife use. Even if it does contain water, the enhancement would only be temporary.

The species in the seed mixture will potentially provide good forage and cover for wildlife. The pinyon/juniper area will be reclaimed to a grass/shrub community, and this should enhance the quality of habitat in the area. There are plenty of pinyon/juniper areas nearby to provide cover, but the greatest need is the increased forage that would be provided in a grass/shrub area.

Findings:

Information provided in the proposal is not considered adequate to meet the requirements of this section of the regulations. Prior to final approval, the applicant must provide the following in accordance with:

R645-301-341.300, R645-301-354, The revegetation plan shows two warm season species being planted in the fall where experience in other states indicates these species could be best established by planting them in the summer. To test whether summer or fall seeding is best, the applicant needs to designate at least one area of the mine where interim vegetation would be established and plant blue grama and galleta in the summer. This treatment could be compared to fall seeding. The application needs to show where this would be done and discuss how the site would be monitored.

R645-301-341.250, The application needs to demonstrate that the introduced

species proposed for use in the plan for final reclamation are desirable and necessary for achieving the postmining land use.

R645-301.341.210, Appendix 5-8 says the ratios and species of seedlings will be determined by the Bureau of Land Management and the Division, but the Division does not determine ratios and species for planting although it can make recommendations. If the applicant intends to plant seedlings, the plan needs to show what would be planted at what rates and where.

R645-301-341.220, Chapter 2 says seed will be broadcast, but Chapter 3 indicates it will be either broadcast or drilled. The applicant needs to correct this discrepancy. Drill seeding is likely to reduce surface roughening, and this method should not be used.

R645-301-341.230, Chapters 2only discusses hydromulching, but Chapter 3 says inaccessible areas will be mulched with straw. This inconsistency needs to be resolved. The straw mulching plan includes crimping the straw, and this would tend to decrease surface roughness. The Division would rather the straw not be anchored than to use a method that would decrease the amount of roughness.

R645-301-323, The application says the revegetation reference area is shown on Plate 3-1, but this statement needs to be corrected. The reference area is shown on Figure 1 of the report for the 1999 vegetation inventory.

R645-301-341.250, The applicant needs to clarify the success standards for seasonality and diversity.

R645-301-341.250, The proposed success standard for erosion control is generally acceptable, but the applicant needs to commit to demonstrate compliance with several samples showing a trend, and every drainage leading away from the disturbed area must be included in the sampling regimen.

RECOMMENDATIONS:

The application should not be approved until the applicant has adequately addressed the deficiencies discussed in this memorandum.

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