



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

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August 30, 1999

TO: File

THRU.: Daron Haddock, Permit Supervisor *DH*

FROM: Paul Baker, Reclamation Specialist
Priscilla Burton, Reclamation Specialist
Peter Hess, Reclamation Specialist
Sharon Falvey, Reclamation Specialist *SF*
Wayne Western, Reclamation Specialist *WHW*

RE: Barn Canyon Shaft, Plateau Mining Corporation, Willow Creek Mine, ACT/007/038-98B, File #2, Carbon County, Utah

SUMMARY:

The Permittee for the Willow Creek Mine submitted and amendment for the Barn Canyon shaft. The Division found several deficiencies in the amendment and they are noted in the following technical review.

ENVIRONMENTAL RESOURCE INFORMATION

GENERAL

Regulatory Reference: R645-301-411, -301-521, -301-721.

The Permittee supplied the Division with adequate environmental resource information. The specific information will be discussed in other sections of this TA.

Findings:

The Permittee met the minimum requirements of this section.

VEGETATION AND FISH AND WILDLIFE RESOURCES

Regulatory Reference: R645-301-320

Analysis:

Barn Canyon Shaft
ACT/007/038-98B
August 30, 1999
Page 2

The application includes a qualitative survey of the vegetation in the area of the proposed shaft. Because the shaft would be near the bottom of the canyon, there are two aspects and three vegetation communities. They are pinyon/juniper, grass/sage, and Gambel oak/maple. The application also includes a discussion of the predominant species in these communities.

Two of these three communities are described in detail in the current mining and reclamation plan. The plan does not contain a description of the Gambel oak/maple community, but it does have a description of a very similar community, mixed brush. However, considering the size of the proposed disturbance and the similarity of the vegetation to what is described in the plan, it is not necessary to acquire additional quantitative vegetation information.

The proposed shaft is near where a golden eagle nest was found in about 1995. The applicant monitored the area from the ground weekly during the spring of 1998, but no birds were seen. In a helicopter check in May of 1998, the nest could not be found.

The current mining and reclamation plan contains information about other wildlife species in the area. Barn Canyon in the vicinity of the proposed shaft contains critical elk and deer winter range.

Findings:

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

SOILS RESOURCE INFORMATION

Regulatory Reference: R645-301-411, -301-220.

Analysis:

Standard soil descriptions were completed in the field and a total of eleven soil samples were collected from the four pits. Page 3.1-32 of the MRP indicates that the field notes are located in Exhibit 5 (Volume 9).

Findings:

This amendment meets the minimum requirements of this section.

HYDROLOGIC RESOURCE INFORMATION

Regulatory Reference: R645-100-200, -301-724.

Analysis:

Surface-water information.

The Barn Canyon contains an ephemeral drainage. By regulatory definition this drainage is intermittent because it is greater than 1 square mile.

Probable hydrologic consequences determination.

The Barn Canyon ventilation shaft will be sealed with a five foot re-enforced upward an expanding concrete plug on top of the bulkhead, and will be buried by four feet of soil that is re-enforced with rock around it's base. It is expected that this seal will result in minimizing potential impacts to the HYDROLOGIC balance by preventing runoff from entering the underground entry. The applicant shows the ventilation portal location in relation to the postmining drainage along the road on Map 32A.

Construction at the Barn Canyon ventilation shaft is not expected to involve intercepting ground water that would need to be discharged from the underground workings. Currently ground water encountered in the mine has characteristics that do not meet UPDES discharge requirements. If intercepted groundwater needs to be discharged, the plan commits to convey the ground water to the raw water pond and retain it in a closed loop system. Encountered ground water will be analyzed according to the ground water baseline parameters outlined in the plan, and the Permittee will obtain Division approval prior to discharge or use (pg. 4.7-10). The amendment also provides commitments to wash down the cement trucks into the raw water pond to reduce potential for impacts to the Price River downstream from the construction site.

Findings:

This amendment does meet the minimum requirements of this section.

OPERATION PLAN

RELOCATION OR USE OF PUBLIC ROADS

Regulatory Reference: R645-301-521, -301-526.

Analysis:

There are no public roads associated with the Barn Canyon ventilation fan project.

Barn Canyon Shaft
ACT/007/038-98B
August 30, 1999
Page 4

Findings:

The Permittee met the minimum requirements of this section.

SUBSIDENCE CONTROL PLAN

Regulatory Reference: R645-301-521, -301-525, -301-724.

Analysis:

Subsidence control plan.

The potential subsidence areas are shown on Maps 19A through 19D and 20. The Barn Canyon ventilation fan and the access road are outside the planned subsidence zone.

Performance standards for subsidence control.

Findings:

The Permittee met the minimum requirements of this section.

TOPSOIL AND SUBSOIL

Regulatory Reference: R645-301-230.

Analysis:

Topsoil salvage projections are listed for each Barn Canyon soil Map Unit in two charts on page 3.1-32 of the submittal. The first chart reflects the topsoil to be salvaged within the anticipated area of disturbance. The second chart portrays the available topsoil within the perimeter of the disturbed area, rather than the anticipated area of disturbance.

Table 4-2.1 itemizes the volumes of soil recovered from each disturbance area. Table 4.2-1A reiterates the information in Table 4-2.1 *and* includes the projected depth of salvage for each site. **But**, the soil volumes reported in Table 4-2.1A do not correlate with the projected depth of removal and acreage provided in this same table. Table 4-2.1A must be edited for clarity; so that the reader can multiply the acreage by the depth of recovery to calculate the volume of soil recovered.

The disturbed area boundaries shown on Figure 3.1-1 Barn Canyon Shaft Facility Soils Study have been changed from the original map submitted in 1998. Boundaries of the soil map

Barn Canyon Shaft
ACT/007/038-98B
August 30, 1999
Page 5

units were extrapolated from the original map based upon information received from Jim Nyenhuis.

Findings:

The information provided by the Permittee does not meet the minimum requirements of this section. However there is enough information for the Division to approve the amendment with the following stipulation.

Table 4-2.1A must be edited for clarity as described above.

PROTECTION OF BIOLOGICAL RESOURCES

Regulatory Reference: R645-301-330

Analysis:

The current mining and reclamation plan contains a plan for interim re vegetation of disturbed areas, and this should be adequate for this site.

Although there were no signs of nesting activity and no nest was found in 1998, it is possible birds could return to the area at some time in the future. However, because the disturbance will be ongoing, returning birds would necessarily be able to tolerate the disturbance.

To not disturb wintering big game, the applicant has committed to not do shaft construction between December 1 and April 15. If the shaft is built, the applicant would need to inspect the site weekly, and this could cause some disruption of big game. Anyone using the road during the winter needs to be instructed to not harass big game, and they should not stop to observe the animals.

In a visit to the Willow Creek Mine on March 18, 1998, a Division representative saw thirteen deer in the Barn Canyon substation area. These deer seemed to have habituated to the nearby disturbance and were not particularly frightened.

Findings:

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

ROAD SYSTEMS AND OTHER TRANSPORTATION FACILITIES

Regulatory Reference: R645-301-521, -301-527, -301-534, -301-732.

Analysis:

Road Systems

Road classification system.

The Barn Canyon access road was classified as a primary road by the Permittee. The road was classified as primary because it will be used for more than six months and is proposed to be left as part of the postmining land use. The access road to the Barn Canyon ventilation shaft is a private road. The road was constructed no later than 1956 when a 138 KVA power line was constructed in the canyon.

Plans and drawings

Map 33 shows the general plans for the Barn Canyon access road. The Permittee proposed to construct parts of the road in an intermittent stream because:

1. The existing road is stable and shows no signs of instability or major erosion.
2. The channel is technically ephemeral
3. The road surface material is sandy, cobbly, boulder material
4. To construct a new road out of the flow path would create extensive and unnecessary environmental degradation.
5. Typical flows (10 year 6 hour events) can be diverted off the road in sections below the shaft site where the road is not the channel. Two culverts will also be constructed to keep these flows off of the road in locations. (See Map 33 and Exhibit 22).
6. Where swales are installed, these will be constructed using washed gravel (thereby removing particle sizes smaller than 8 mesh). Construction of the swale will begin downstream from the natural channel to minimize contributions of sediment to the stream.

The road will be approximately 15 feet wide, 2,000 feet long and has an average grade of 7%. Two 30 inch culverts will be used to route water away from the road. Swells and riprap will be used to protect the road surface. Passing area will be constructed at two locations.

The Division does not have guidelines for road construction. The Division usually relies upon information and expertise from the design engineer along with current road construction practices. The road designs appear to be adequate and are similar to other roads in the area. The designs were certified by a professional engineer.

The Division is allowing the Permittee to alter the natural drainage way in order to construct a road because:

1. The stream channel has already been altered by road construction.
2. The only alternative would be to have the Permittee construction a new road on slopes with slopes greater than 30°.
3. The road has been properly engineered.

Findings:

The Permittee has met the minimum requirements of this section.

SPOIL AND WASTE MATERIALS

Regulatory Reference: R645-100-200, -301-210, -301-211, -301-212, -301-412, -301-512, -301-513, -301-514, -301-521, -301-526, -301-528, -301-535, -301-536, -301-542, -301-553, -301-745, -301-746, -301-747.

Analysis:

Coal mine waste.

On Page 4.5-59 of the March 9, 1999 submittal the Permittee states:

Shaft rock from ventilation shaft construction, including that resulting from construction of the Barn Canyon shaft, will be placed in the School House Canyon Refuse Pile. In the refuse stockpile area, waste ventilation-shaft rock will be handled and placed in essentially the same way as coal refuse material as discussed in the subsequent subsection titled Coal Processing Waste Handling and Disposal.

The Permittee has responded to the issue of where the mine development waste generated during the construction of the air shaft will be placed. All waste will be placed on the School House Canyon refuse pile which is a permitted site meeting all requirements of the R645 regulations.

Findings:

The Permittee met the minimum requirements of this section.

HYDROLOGIC INFORMATION

Regulatory Reference: 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:

Discharges into an underground mine.

No discharge into an underground mine is applied for or granted with this amendment.

Diversions.

Diversions around the fan portal were designed to convey runoff from a 10-year, 6-hour precipitation event and are routed along the pad perimeter. Ditch UD-24 is not shown to drain to any existing drainage features but, will join road ditch DD-31. The last five feet of this ditch are to be flattened and expanded to convey runoff across the road.

Drainage associated with the ventilation shaft access road are presented on Maps 31A , 31B, and 33. The existing road lies in the canyon drainage at some locations. The existing road shows no signs of instability or excessive erosion. (This was verified on May 13, 1998: See the DOGM field visit form). The road is intended to be retained for site access with alterations to improve the existing road. Alterations include; two passing areas, two swales, two culverts and two adjacent road ditches DD-31 and DD-32. The plan shows an existing road configuration, in section DD-31b, where the road is not adequately sloped to promote runoff to flow along the roadside. The applicant should provide proof of the effort in cutting this section to the design presented in DD-31a as is recommended by the consultant. It is recognized the road substrate is composed of rock and cobbles and re-grading may not be feasible in this section without blasting. However, attempts should be made to re-grade this section.

Stream buffer zones.

The ventilation pad is within an ephemeral drainage and an existing road will be utilized for access and maintenance issues. Stream buffer zone regulations apply to this site because the site drains a watershed area greater than one square mile. The existing road is aligned in the drainage through the canyon. The minimum design requirements for the 10 year- 6 hour event on the road is considered adequate based on the following:

- The proposed road is to be used for maintenance access only after construction is completed.
- The proposed design will promote runoff to flow into existing stream channels rather than the current conditions which convey flow along portions of the road by-passing the natural channel.

The Division is granting an exemption to R645-742.412 because the applicant has committed to the following at the request of the Division and in accordance with R645-301-730:

- Clean gravel will be used, particles smaller than + 8 mesh (2.38 m.m.) will be removed.

- Truck wash down from cement mixing associated with the site construction will be drained into the thickener pond.
- Gravel use will be minimized and applied only in the areas designated. Swale construction will avoid placing gravel in the flow path from the existing natural channel (Development will begin downstream from the natural channel to minimize contributing sediment to the channel).

Sediment control measures.

The applicant has updated the plan for ASCM (Alternate Sediment Control Measures) that are not associated with the Barn Canyon Fan Amendment. The information relative to the West Portal Long Tunnel, AMR reclamation area, Methane Pump Station will be reviewed in association with the "As-Built" submittal. At this time, no specific approval is granted for the ASCM applied in the areas associated with the "As-Built" amendment.

The sediment control plan is presented for the Barn Canyon Fan Pad Site Plan (Map 31A) and, design calculations are provided in Exhibit 22. Alternate Sediment Control Measures are used to minimize the sediment contributions from the Barn Canyon ventilation site. The pad is treated by surfacing the disturbed area with two inches of washed gravel and placing a boulder re-enforced toe along the cut slope. Washed gravel, eliminating particle sizes less than 8 mesh, is used to minimize the potential for additional sediment contributions. Where swales are constructed, gravel will be placed downstream from the natural drainage to minimize sediment contributions and will be applied only in designated areas.

The proposed method for sediment control is considered acceptable based on the specific information supplied for the ASC measures, design and maintenance including; 1) estimated roughened pocket area and volume, 2) monitoring for visual movement of gravel and sediment from the site and clean up if movement is excessive, 3) replacing gravel on the pad if gravel is displaced from the site, 4) a commitment to provide additional measures should sediment from the site become excessive.

The submitted information includes an estimate for sediment yield and compares undisturbed, operational and post-reclamation site conditions. The estimate provided shows the reclamation configuration to be less erosive than the natural conditions. The division disagrees with some assumptions used to arrive at these numbers. The K factor, after manipulation for the reclaimed section, is not expected to be less erosive than the factor for undisturbed soils. The mulching practice, was accounted for as soil organic matter to adjust the K factor: this adjustment is inappropriate. According to Renard, K.G, et al, 1997 "short term effects such as from protective cover of mulch or from the mechanical constraints such as disturbance of surface and sub- surface residues are related to the C factor whereas long-term effects such as soil changes or soil structural alterations by organic compounds should be considered part of the K factor". The method incorporating straw into the soil should be determined under C factors. However, the RUSLE and USLE measures are primarily designed from data from farming techniques and little information is currently available for reclamation techniques. Some

applications for C factors may be applicable to reclaimed areas.

Measures to be employed include gouging ,and mulch application including incorporating 2 tons/acre mulch into the soil, and then adding 1.5 - 2 tons per acre that is either crimped or tackified to the soil surface. Still, the proposed method for sediment control is considered acceptable because the area is relatively small, and the determination for success in the practices conducted at the site will be determined from ongoing site inspection.

Topsoil will be transported to the Gravel Canyon topsoil stockpile. Sediment control measures for the topsoil storage area include surrounding the storage site with a berm, roughening the surface and establishing vegetation.

Exemptions for siltation structures.

No exemption from siltation structures was requested or granted associated with the Barn Canyon ventilation portal amendment.

Findings:

This amendment meets minimum requirements under this section.

SUPPORT FACILITIES AND UTILITY INSTALLATIONS

Regulatory Reference: R645-301-526.

Analysis:

A general description of how the ventilation shaft will be constructed is given in Exhibit 22 of the March 9, 1999 submittal. The Permittee states that the shaft will be approximately 16 to 20 feet in diameter and will be approximately 493 feet deep. The Permittee anticipates that very little ground water will be encountered. However, if significant quantities of groundwater are encountered, the groundwater will be collected and pumped to the surface during construction and handled as discussed in Section 4.7.2.2. After construction the groundwater will be discharged into the mine workings.

Two methods that may be used to remove groundwater are a water ring or perforated pipe behind the liner. The selection and sizing of the groundwater collection system will be determined at the time groundwater is encountered.

The emergency hoist equipment to be installed in the Barn Canyon shaft is an E.C.A. 5-30 stiff leg derrick. The hoist is diesel powered. Plans for the hoist are on Exhibit 22 Map 1.

Findings:

The Permittee has met the minimum requirements of this section.

USE OF EXPLOSIVES

Regulatory Reference: R645-301-524.

Analysis:

Blasting and Explosives

In the April 2, 1998 deficiency response to the Barn Canyon submittal, the applicant committed on page 4.5-28, paragraph one to address the initial round of the shaft excavation as a surface blast as mandated by R645-301-524.

Exhibit 22, page 1, paragraph 1 of VENTILATION SHAFT CONSTRUCTION indicates that, based on bore hole data from MC-018, up to forty-five feet of soil and loose rock will have to be excavated to expose the initial bedrock layers. At least two 10 foot rounds will need to be shot and mucked such that an in hole concrete foundation can be poured to initiate the shaft lining. At that point, it is not known if the top forty feet of the shaft will be poured up and backfilled to the original surface elevation, or if the remaining shaft lining will be excavated and poured down to the "D" seam. Then, the top forty feet of coping can be poured and the surface restored.

Based on the fact that 45 feet of earth will be excavated prior to the initial excavation rounds, the rounds are no longer under the jurisdiction of R645 surface blasting requirements. All rounds will be under the jurisdiction of 30 CFR 77, Subpart N.

Regulatory Reference: R645-301-524.200.
R645-301-524.210.

Analysis:

**Anticipated Blast Design in Permit Application
Anticipated Blast Design**

Based on Figure 2, page 4 of Exhibit 22, the depth of this air shaft will be approximately 493 feet from surface to top of the "D" coal seam. Based on the regulatory requirements of R645-301-524.212, Blasting Operations within 500 feet of an Active Underground Coal Mine, the applicant has submitted Figure 1, Typical Shot Pattern for Ventilation Shaft. Figure 1 addresses drill hole or shot pattern, delay periods, depth of round, and drill hole diameters.

Underground entries have, as of the date of this analysis, not been developed in the area of the "D" coal seam where the Barn Canyon air shaft will be constructed.

Using the indicated hole diameters of 1-3/8" to 1-1/2", and the ten foot hole depth, it can be calculated that approximately 108 pounds of dynamite (240, 1-1/4" x 8" sticks) will be used per explosive round. This calculation does not include the loading of the perimeter or trim holes which are always loaded at a lighter rate to prevent excessive over fracturing of the shaft walls.

Although Figure 1 is not to scale, and there is no indication of hole spacing, it must be realized that this is merely an anticipated blast design. It will be up to the discretion and experience of the certified blaster on site to change design parameters as necessary to meet the fragmentation requirements necessary to expedite the mucking process. Once the finalized blast design has been determined by the certified blaster and approved by MSHA, it should be forwarded to the Division. This will meet the requirements of R645-301-524.220.

Blast design requirements which require methods to protect the public from air blast, fly rock and ground vibration have not been discussed within the submitted anticipated design. The initial delays in the submitted design will send fractured material vertically; the secondary and tertiary delays will send fractured material toward the center of the excavation. There may be a few pieces of machinery within the immediate area of the shaft coping which will need protection from fly rock on the initial rounds. As shaft depth increases, almost all flyrock will be contained within the hole. As only a few hundred pounds of dynamite will be used per round, air blast and ground vibration will be negligent in the surrounding area. There are no residents within a half mile radius of the Barn Canyon shaft construction site.

Although Figure 1, page 3 of Exhibit 22 lacks detailed information with regard to the requirements of R645-301-524.230, sufficient information can be determined through utilization of a Blasters Handbook to meet the aforementioned.

The excavation rounds for this air shaft are considered to be under full jurisdiction of the U. S. Department of Labor, Mine Safety and Health Administration through 30 CFR 77, Subpart N.

In conclusion, the blasting design requirements of the R645 rules relative to underground coal mining and reclamation activities as they pertain to the initial blast rounds in shaft construction have been adequately addressed. The anticipated blast design which has been submitted should be approved.

Analysis:

Pre-blast Surveys

There are no residents or occupiable dwellings within one-half mile of the Barn Canyon shaft construction site. The closest structure is a storage building located across from the

preparation plant substation (permittee owned); horizontal distance from the building to the shaft construction site is .43 miles.

Findings:

The Permittee met the minimum requirements of this section.

MAPS, PLANS, AND CROSS SECTIONS OF MINING OPERATIONS

Regulatory Reference: R645-301-512, -301-521, -301-542, -301-632, -301-731, -302-323.

Analysis:

Maps 19A through 19D and 20 show the past mining activities and the proposed mine plan until the year 2002. Some of the proposed mine workings and subsidence zones are outside the permit boundaries. The Permittee states on those maps and in the text (Sections 4.5.1.5 and 4.5.2.2) that no mining or subsidence will occur outside the permit boundaries. Those maps show the life-of-mine affected areas as required by R645-301-521.141.

Maps 19A through 19D and 20 also show the areas where planned subsidence mining will be used. The Permittee states on the maps that panels and their associated subsidence which extend outside the indicated permit area will not be mined until the permit area are appropriately expanded.

Monitoring and sample location maps.

Findings:

The Permittee has met the minimum requirements of this section.

RECLAMATION PLAN

POSTMINING LAND USES

Regulatory Reference: R645-301-400

Analysis:

Land uses in the area are described in the existing mining and reclamation plan, and no additional information is needed. The area has been surveyed for cultural resources, and none

were found. The application contains a clearance letter from the Division of State History giving their determination of no effect.

No changes to the postmining land use are proposed. The applicant is proposing to permit the road and to leave it for the postmining land use. The application justifies retention of the road because it existed prior to mining. Reclaiming the road would unnecessarily disturb the channel and vegetation, and since the road is compatible with the postmining land use, the Division agrees with the arguments in the plan to retain the road.

Findings:

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

APPROXIMATE ORIGINAL CONTOUR RESTORATION

Regulatory Reference: R645-301-234, -301-270, -301-271, -301-412, -301-413, -301-512, -301-531, -301-533, -301-553, -301-536, -301-542, -301-731, -301-732, -301-733, -301-764.

Analysis:

The Permittee committed to reclaim the Barn Canyon Shaft area to the approximate original contours. The reclamation plan shown on Map 33 shows that the shaft area will have a topography that blends into the surrounding area and complements the surrounding drainage.

Findings:

The Permittee met the minimum requirements of this section.

BACKFILLING AND GRADING

Regulatory Reference: R645-301-234, -301-537, -301-552, -301-553, -302-230, -302-231, -302-232, -302-233.

Analysis:

The Permittee has shown that the reclaimed slopes will have a safety factor of 1.3 or greater. The slopes will be revegetated to minimize erosion. The area around the shaft will be reclaimed to the approximate original contours. The road will remain to support the post mining land use. The road culverts will be removed and replaced by low maintenance structures.

Findings:

The Permittee met the minimum requirements of this section.

MINE OPENINGS

Regulatory Reference: R645-301-513, -301-529, -301-551, -301-631, -301-748, -301-765, -301-748.

Analysis:

An expanding plug will be used to seal the shaft during final reclamation. An expanding plug is the best known shaft sealing method currently available.

Findings:

The Permittee met the minimum requirements of this section.

TOPSOIL AND SUBSOIL

Regulatory Reference: R645-301-240.

Analysis:

The excess fill material needed for reclamation of the Barn Canyon area will be hauled from the Gravel Canyon topsoil stockpile where it was stored during construction ventilation shaft facility area. Excess cut material was stored at the Gravel Canyon topsoil stockpile and included salvaged topsoil and excess cut substitute topsoil.

The stockpiled Mollisol soil that is stored at the Willow Creek topsoil stockpile will be hauled back to the Barn Canyon shaft facility area at reclamation.

No further information is provided for reclamation commitments of the Barn Canyon ventilation disturbance area other than those generally contained in existing Mine Reclamation Plan.

Findings:

The information provided meets the regulatory requirements of this section.

ROAD SYSTEMS AND OTHER TRANSPORTATION FACILITIES

Regulatory Reference: R645-100-200, -301-513, -301-521, -301-527, -301-534, -301-537, -301-732.

Barn Canyon Shaft
ACT/007/038-98B
August 30, 1999
Page 16

Retention.

A road to be retained for an approved postmining land use shall be classified as a primary road and designed constructed and maintained in accordance with the requirements for primary roads and in consideration of the approved postmining land use.

Analysis:

The road in Barn Canyon will be retained as part of the approved postmining land use. The road is classified as a primary road and meets the design specifications.

Findings:

The Permittee met the minimum requirements of this section.

HYDROLOGIC INFORMATION

Regulatory Reference: 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.

Analyses:

Diversions.

The CPMC has committed to establish a post mining configuration compatible with the natural drainage pattern of the surrounding terrain. The reclamation plan indicates the culverts will be removed and the road, road ditches, and swales will be retained. Presently, no statement from the land owner is provided to acknowledge retaining the road as a post mining land use.

Sediment control measures.

The reclamation sediment control measures to be applied at this site are roughening and mulching. Specific applications are discussed in the **Operational Hydrologic Information** presented previously.

Findings:

This amendment meets the requirements for diversions and sediment control measures under this section.

Barn Canyon Shaft
ACT/007/038-98B
August 30, 1999
Page 17

REVEGETATION

Regulatory Reference: R645-301-244, -301-353, -301-354, -301-355, -301-356, -302-280, -302-281, -302-282, -302-283, -302-284.

REVEGETATION

Regulatory Reference: R645-301-341

Analysis:

Except for riparian areas, the same seed mix would be used to revegetate the entire disturbed area of the Willow Creek Mine. This seed mix was designed primarily for big sage/grass and pinyon/juniper areas, and most of the species are adapted to the Barn Canyon site. However, the bottom of the canyon contains oak and maple trees that need to be reestablished. To this end, the applicant proposes to plant big tooth maple and Gambel's oak at the rate of 250 per acre.

Findings:

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

MAPS, PLANS, AND CROSS SECTIONS OF RECLAMATION OPERATIONS

Regulatory Reference: R645-301-323, -301-512, -301-521, -301-542, -301-632, -301-731.

Analysis:

Map 32 shows the reclamation contours and cross sections for the Barn Canyon area. The maps are certified by a professional engineer and show all the information required.

Findings:

The Permittee met the minimum requirements of this section.

BONDING AND INSURANCE REQUIREMENTS

Regulatory Reference: R645-301-800, et seq.

Barn Canyon Shaft
ACT/007/038-98B
August 30, 1999
Page 18

Analysis:

The reclamation cost estimate to reclaim the Barn Canyon shaft was estimated to be \$110,000. The current bond amount is over \$10,000,000. The increase in bond amount is less than 5%. The Division usually does not require a Permittee to post additional bond for increases of less than 5%.

Findings:

The Permittee met the minimum requirements of this section.

RECOMMENDATION:

It is recommended that this amendment be approved following incorporation of the amendment in a format that: 1) removes the redline strike-out, 2) can be directly inserted into the existing plan, 3) includes the missing text from page 3.7-96, 4) corrects any pages which do not coalesce with the existing plan and 5) the Permittee must edit Table 4-2.1A for clarity prior to construction.

References:

Renard, K.G., G.R. Foster, G.A. Weesies, D.K. McCool, and D.C. Yoder, coordinators. 1997. Predicting Soil Erosion by Water: A Guide to Conservation Planning With the Revised Universal Soil Loss Equation (RUSLE). U.S. Department of Agriculture, Agriculture Handbook No. 703, 404 pp.