



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

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TO: File

THRU: Daron Haddock, Permit Supervisor *DORH*

FROM: Paul Baker, Reclamation Biologist *PB*

RE: Technical Analysis, Cyprus Plateau Mining Corporation, Star Point Mine, ACT/007/006-98B, Folder #2, Carbon County, Utah

SUMMARY

Cyprus Plateau Mining Corporation submitted a new plan for the Star Point Mine in September 1996. The Division developed a draft technical analysis, and Cyprus submitted its revised plan in June 1997. The Division responded in September 1997. The third round submittal was received in November 1997 and February 1998, and the Division's response was sent May 27, 1998. The fourth round submittal was received in September and October 1998. This review is an analysis of the September and October submittals and is primarily a revision of the review by Susan White dated April 30, 1998. It also includes sections from earlier technical analyses.

TECHNICAL ANALYSIS

VEGETATION RESOURCE INFORMATION

Regulatory Reference: R645-301-320

Analysis:

Map 321.100a shows plant communities within and adjacent to the permit area. Maps 321.100b through 321.100f delineate the vegetation types in greater detail. Map 321.100e shows a proposed fam site in Little Park Canyon. Maps 321.100g thru 321.100i classify each disturbed area according to date of disturbance, such as pre-SMCRA (not used since), pre-SMCRA (use continuously since), and post-SMCRA.

The plan describes nine vegetation types within the permit area. They are Douglas fir, aspen, mountain grassland, mountain shrub, spruce/fir, sagebrush, pinyon-juniper, saltbush, and barren. Table 321.100a shows acreages of vegetation types within the permit area. The permit

area is 9060 acres and the disturbed area is 173.76 acres. The largest acreage of disturbed area is in the sagebrush community, and the mountain shrub and pinyon-juniper communities have also been extensively disturbed. These areas are known to be of great importance to deer and elk as winter range. The saltbush community has been disturbed to a lesser extent.

Section 321.200 contains information about the productivity and range condition of various communities in the permit area.

In 1981, reference areas for the mountain shrub, Douglas fir, mountain grassland and sagebrush areas were established. The saltbush, pinyon-juniper and aspen reference areas were sampled in 1982. Reference areas were selected and sampled using procedures that were approved at the time of sampling. Reference area sampling during the period of extended responsibility and at bond release will need to follow current Division procedures. Currently, the Division requires cover sampling to be based on total cover of 100 percent and to include all tree and shrub canopy cover. Including all vegetation cover within the 100 percent will likely result in a higher cover value for some community types; however, the saltbush community values will probably not change. Reference areas and disturbed areas were compared using the t-test and McArthur Index of Similarity (Table 321.100i). In 1998, the permittee simplified the reference areas and eliminated the Douglas fir, pinyon-juniper and aspen reference areas.

Findings:

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

FISH AND WILDLIFE RESOURCE INFORMATION

Regulatory Reference: R645-301-322

Analysis:

In 1982, various vegetative communities were sampled for occurrence and use by wildlife. Other methods, such as literature research and personal contacts, were used to evaluate the wildlife resources within the area. Tables 322.200a, b, and c provide lists of mammals, birds, and reptiles and amphibians that are likely to occur within the permit area. Deer and elk are major concerns to the management agencies.

Elk utilize the permit area on a seasonal basis. Areas near the fan sites in high elevation aspen and mountain brush communities are likely to be used as summer range and possibly calving areas for elk. The areas surrounding the main mine site are most likely used from early November until mid May.

Mule deer on the permit area are considered part of herd unit 33. Both deer and elk generally use the permit area on a seasonal basis. Other high value mammal species are discussed in this section of the plan.

Raptor inventories have been conducted in the permit area yearly since 1981 in conjunction with the Division of Wildlife Resources (DWR) and the Fish and Wildlife Service. Bald eagles and peregrine falcons, listed threatened and endangered species, have been observed near the permit area. The continued monitoring of these birds should document any impacts. Map 322.220a, shows the locations of raptor nests in the area. A total of 44 nests and 23 chicks have been observed since 1982

Aquatic and riparian habitats are important for wildlife. In Section 322.220 through 230, the plan says the permit area includes the headwaters of two small perennial streams, Miller Creek and Tie Fork. Nuck Woodward Creek is also an important aquatic resource. Numerous macroinvertebrate sampling studies have been and continue to be conducted to document mining impacts on the aquatic resources within and adjacent to the permit area. Sampling of Tie Fork Creek and Wild Cattle Hollow was initiated in 1981. Miller Creek has been studied since 1976. It appears that the studies have not all been from the same stations or samplers. Macroinvertebrate sampling in Wild Cattle Hollow, Gentry Hollow/Tie Fork, and Nuck Woodward Creek continues until 2001 as shown in Table 322.220b. Results of sampling from previous years are included in annual reports.

Findings:

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

HISTORIC AND ARCHEOLOGICAL RESOURCE INFORMATION

Regulatory Reference: R645-301-411

Coal mining started in the area in 1917. The Lion Coal Company operated the Wattis No. 1 and 2 Mines until the end of 1963. The plan contains limited cultural and historic resource information for the area of the Lion Deck facilities and the lower facilities. Most cultural resource reports in the plan are for areas to be disturbed after 1980.

On October 2, 1998, the permittee submitted a new cultural resources report for facilities used for mining operations. These were found not to be eligible for listing in the National Register of Historic Places, so there are no protection requirements. The permittee intends to demolish them when the site is reclaimed.

Limited historic reporting could be found for the town of Wattis. The plan says the town

of Wattis was allowed to deteriorate between the end of World War II and the mid 1950's. The town of Wattis was covered with the lower facilities area and the refuse pile.

If cultural resources are found during reclamation operations, the permit contains a standard stipulation that mining and reclamation operations cease until the area can be evaluated by a qualified archaeologist.

Findings:

Information provided in the application is considered adequate to meet the requirements of this section of the regulations. If cultural resources are uncovered during mining and reclamation operations, these operations will need to cease until the area can be evaluated by a qualified archaeologist.

LAND-USE RESOURCE INFORMATION

Regulatory Reference: R645-301-411

Analysis:

Premining land use is livestock, timber, and wildlife habitat. The permit says mining has continued in the area for several decades with only minor effects on vegetation, wildlife, hydrology, and vegetation. Oil and gas were produced in limited quantities from 1924 to 1976. In the mid 1990's gas development again became important on lands adjacent to the permit area. During this development period, River Gas Corporation intends to develop their oil and gas leases in the area adjacent to the mine facilities and contemplates using the existing area roads. Carbon County's communication and relay facilities are on the ridge above the mine facilities. Timbering in the Price area has increase in recent years; however, land owners in the permit area have not yet expressed interest in developing this resource.

Current land uses also include hunting, camping, picnicking, mountain biking and other recreational activities. The area near the train loadout is designated for used by livestock and wildlife; however, the productivity of this area is relatively low because of the Mancos shale-derived soils.

Findings:

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

OPERATION PLAN

FISH AND WILDLIFE PROTECTION PLAN

Regulatory Reference: R645-301-333

Analysis:

Protection and Enhancement Plan.

Many of the facilities were in existence before passage of the Surface Mining Control and Reclamation Act. Wildlife has adapted to some extent to the presence of the mine as evidenced by big game use of sediment ponds and wildlife sightings in the mine facilities area. The permittee has tried to minimize impacts on wildlife from existing facilities and to design new facilities to take wildlife into consideration, including raptor-proof power lines and conveyors constructed to allow deer crossing. The permittee has committed to notify the Division of the use of pesticides and fires and to fence, cover or buffer hazard areas.

Mitigation of impacts and enhancement of wildlife resources include employee education, deer winter range vegetation enhancement and a guzzler to compensate for the unit train loadout and refuse expansion areas, availability of sediment ponds for deer use and interim final revegetation planned to maximize benefit to wildlife.

Numerous inventories and studies have been conducted since the late 1970's and early 1980's. They have been designed to assess impacts of mining and reclamation activities on the raptor and macroinvertebrate populations, and the permittee is continuing to collect data.

Table 322.200e lists several wildlife species and includes an impact scale and perturbation scale. Both the impact and the perturbation are considered 0 for most of the species listed. The Division cannot concur with the listed values; habitat loss has almost certainly affected most species on the list. However, there is no reason to change the values since the disturbances have already occurred.

Endangered and Threatened Species.

The permittee has committed to promptly report to the Division any state or federally-listed threatened or endangered species within the permit area.

Bald and Golden Eagles.

The plan says subsidence could have affected two golden eagle nests on a cliff face in Section 18, T15S, R8E, during initial permitting. In 1987, a take permit was issued by the Fish and Wildlife Service for two golden eagle nests that had potential to be adversely affected by

mining. The two nests were fenced with chain link to prevent the golden eagle pair from nesting. The area was monitored from 1988 until 1991. Subsidence movement was detected during this time, but the nests were not lost. The eagle pair produced young in 1991. During the time of the survey, the eagle pair remained in the territory and used alternate nest sites (Exhibit 342.100a).

Wetlands and Habitats of Unusually High Value for Fish and Wildlife.

The plan says under the Mitigation and Management Plans (Section 330) that subsidence impacts to Miller Creek and Tie Fork Creek will be monitored and mitigated if required. Both of these areas have been surveyed for macroinvertebrates. A portion of Miller Creek has subsided, and mining has ceased in the area of Tie Fork Creek. Exhibit 322.220b describes macroinvertebrate monitoring in Tie Fork which shows that no effects have been seen from subsidence (1982).

Annual reports, the Probable Hydrologic Consequences document, and the Cumulative Hydrologic Impact Assessment discuss changes in the water quality and quantity in the North Fork of the Right Fork of Miller Creek. There have been mining-related adverse effects to the hydrologic balance in this area, and these are discussed in detail in these documents. No further information is required for this portion of the plan.

Findings:

Information provided in the proposal is considered adequate to meet the requirements of this section of the regulations. A copy of Exhibit 731.110a from the 1991 version of the mining and reclamation plan needs to be inserted in Exhibit 322.220c.

VEGETATION

Regulatory Reference: R645-301-331

Analysis:

Vegetation on Forest Service land will be monitored using color infrared photography and by visual observations.. Monitoring is conducted to document changes in vegetation communities as a result of subsidence affects. This monitoring has been done several times since 1980 (Section 525.100), and the permittee has committed to provide the information in the annual report.

The permittee's consultant compared photographs from 1980 and 1993 and found possible changes in vegetation in 11 areas. None of these was greater than 4 acres. The changes could be due to insect damage, disease, subsidence, groundwater alterations, and/or weather conditions. Two surveys are only adequate to suggest a change, but no conclusion can be made.

The monitoring will continue.

An interim seed mixture is specified in Table 341.220k. As wildlife mitigation during operations, disturbed areas not in use will be seeded with an interim seed mixture.

Findings:

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

RECLAMATION PLAN

POSTMINING LAND USES

Regulatory Reference: R645-301-412, -301-413

Analysis:

Certain facilities in the disturbed area will not be reclaimed but will be left for the postmining land use. These include the county road and roads adjacent to the railroad and power lines.

The county road is used for several purposes, including access to transmission towers above the mine. These towers are used as repeaters and translators for television and radio signals, including those for public safety. The road is also used to gain access for various recreation activities, such as bicycling, hunting, and backpacking, and for people who are caring for livestock. Therefore, the proposal to leave an access road to the area is acceptable.

There is also a maintenance road along the power lines leading to the transmission towers. The plan contains an agreement giving control of the property to Carbon County and requiring the permittee to make certain modifications so the power lines will be useable following reclamation.

The road that parallels the railroad is, according to a letter from Utah Railway in the October 2, 1998, submittal, the property of the railroad company. This letter quotes agreements from 1984, 1985, and 1990 indicating Utah Railway requires that the road be left following reclamation. The text of Chapter 4 has been updated to reference this letter and explain the situation.

The postmining land use for each area of the mine is described in Table 412.100a. The land use in relation to ownership and seeded area is described. The land uses will be wildlife habitat and grazing.

Copies of letters sent to surface owners concerning the post mining land use are found in Exhibit 412.200a. These letters say, "If you have any plans which would be in conflict with these proposed post-mine land uses, please let us know." It can be implied that, since this statement does not require a response if there are no concerns, none of the land owners had concerns or conflicts with the proposed land uses.

The plan contains no direct comments from the land owners; however, agreements and other documents included or quoted in the plan indicate the land owners' agreement with the postmining land uses. The plan quotes the Carbon County zoning code indicating the postmining land use is in compliance with the county zoning requirements. It also references the Forest Service management plan for the area, and it appears the postmining land uses are in accord with the management plan. Through easement and right of way agreements, holders of these rights have indicated their intentions to use the land for the railroad and for the maintenance and access roads.

The Division has concerns about potential selenium uptake in plants growing on the refuse pile and whether this could pose a hazard to wildlife or livestock. So far, it appears the levels of selenium in plants in refuse pile test plots have been low enough that this will not be a concern. However, some monitoring of plant tissue selenium concentration will be needed during the period of extended responsibility for revegetation success.

Findings:

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

PROTECTION OF FISH, WILDLIFE, AND RELATED ENVIRONMENTAL VALUES

Regulatory Reference: R645-301-333, -301-342, -301-358.

Analysis:

The post mining land uses are wildlife and grazing. The permittee proposes to meet the wildlife land use by planting species which are known to be of value to wildlife for food and cover. Transplants will be used in the reclamation of several community types which may result in accelerated community establishment.

Probably the best enhancement for all types of wildlife, not just big game, is providing as much diversity as possible in the reclamation. Diversity in topography, aspect, food, and cover is of great value for habitat development. Section 340 commits to achieving varied topographic features.

Findings:

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

REVEGETATION

Regulatory Reference: R645-301-341

Analysis:

General Requirements

Table 341.100a is a detailed schedule and time table for the completion of each major step in the revegetation plan. This schedule includes a time line for material procurement, including adequate lead times for growing transplants and collecting seed, expected time to seed, fertilize and mulch if necessary, and any follow-up activities.

Seed mixtures have been designed to correspond to the different plant communities found in the disturbed areas. If the areas are drill seeded, they will be seeded at a rate of one-half that given in the seed mixture tables. However, most areas will be broadcast seeded to maintain the surface roughness. Five seed mixtures (Tables 341.220a through 341.220i) will be used for final reclamation seeding. These are:

<u>Name of Mixture</u>	<u>Table No.</u>	<u>Areas of Use</u>
Forest Service Areas	341.220g and h 341.220i and j	Gentry Mtn Shaft Mudwater Canyon Breakout Corner Canyon Fan
Unit Train Loadout	341.220a and b	Unit train loadout area (saltbush type)
Mountain Grassland	341.220c and f	Star Point No. 1 Mine Area, Lion Deck Portal Area
Sagebrush Area	341.220c and d	Refuse Pile, Topsoil Stockpile, Lower Office, Wash Plant, Conveyor, Lion Deck Portal Access Road

These areas are also shown on Maps 341.100g thru 341.100i.

The seed mixtures contain a few introduced species. Some of these species were

included to compete with cheatgrass in the lower Wattis area. Squirreltail, a native species, was included in the seed mixture because it has also been reported to compete well with cheatgrass. The permittee should attempt to control cheatgrass now to reduce the amount of seed in the soil that will be used in reclamation. In addition, the permittee should be aware of the provisions in R645-301-357.320 that allow some weed control after initial seeding.

Yellow sweetclover and alfalfa have been added to the lower elevation seed mixtures. There is some controversy about whether these species should be included in reclamation seed mixtures, but there are indications they may increase soil microbial activity.

The saltbush community type associated with the Mancos Shale is probably the most difficult community to reclaim. Soil chemistry, texture, structure, and other properties inhibit seed germination and seedling establishment. The permittee intends to use organic soil amendments as treatment for this area. The organic amendments may help reduce the surface crusting for seed germination.

At a nearby mine, test plots in Mancos Shale-derived soils showed best results where coal refuse and sandstone were used as a surface treatment. There are several possible mechanisms for this effect, but the permittee could propose using a similar treatment. It would be best to try a test plot before using this type of method for a large area.

Drill seeding on nearly flat surfaces should be successful. The Division's experience with drill seeding is that the furrow openers reduce any surface roughness provided by the scarification or gouging. In fact, surface roughness has been shown to greatly enhance the rate of revegetation success and protection from erosion.

Timing

Seeding will occur in the fall after September 15, and it will be done as contemporaneously as practicable with topsoil distribution. Fall seeding is standard practice in this area with the timing varied depending on elevation and weather conditions. Spring seeding tends to be less successful because of unreliable precipitation and seed stratification requirements.

Mulching and Other Soil Stabilizing Practices

The permittee intends to incorporate into the soil two tons per acre of straw or hay. Incorporation would probably occur during roughening. An additional 1.5 to 2 tons per acre will be spread on the surface after seeding and held in place by crimping or with a tackifier.

Standards for Success.

Revegetation success determination will be based on the community type reference area,

stocking rates, the post mining land use, and other standards as described in R645-301-353, such as diversity, effectiveness, and permanence. Forest Service requirements for success are required as part of the post mining land use and not the vegetation success standard. The permittee will use the MacArthur Diversity Index to measure diversity for bond release.

Reference areas were originally sampled early in the history of the Utah Coal Regulatory Program. When making comparisons for final bond release, sampling of reference and revegetated areas will need to use current Division standards. The Division requires cover sampling to be based on total cover of 100 percent and to include all tree and shrub canopy cover in that 100 percent. Reference areas were consolidated for simplicity and practicality in 1998. The current reference areas are the sagebrush, mountain grass, and saltbush.

Revegetated areas will be compared to the reference area of the corresponding vegetation types based on Maps 341.100g thru 341.100i. Table 356.200a summarizes the success standards for the revegetation areas at the Star Point Mines.

Woody plant density requirements were previously approved at 900 plants per acre on all south- and west-facing slopes and 2,200 stems per acre on all north- and east-facing slopes. This standard has now been changed to 2000 stems (plants) per acre on all reclaimed areas.

Between 1917 and 1980, considerable areas were disturbed without topsoil salvage; however, the Division does not anticipate the permittee will have severe problems in meeting the success standards. If problems arise, the permittee will reexamine the success criteria for previously disturbed areas since the rules allow lower standards for these areas. Previously disturbed areas are shown on Maps 341.100g thru 341.100i.

The rules require that vegetation be capable of stabilizing the soil surface from erosion. To make this determination on the refuse pile, stabilization will be considered successful if no refuse is exposed or can expect to be exposed. The reference area that corresponds with the refuse pile has about 34% vegetative cover with relatively flat slopes. Assuming vegetation on the refuse pile achieves this standard will not necessarily mean that erosion has been controlled. In particular, the refuse pile will have 3h:1v slopes that would tend to increase the amount of erosion.

One of the requirements for revegetation success is that the plant cover be capable of stabilizing the soil surface from erosion. This is part of the determination for Phase II bond release. Stabilization usually takes into consideration background levels of erosion; however, for Phase II bond release on the refuse pile, soil stabilization will be determined successful if no refuse is exposed or can expect to be exposed.

Reference area vegetation cover in the sagebrush community was 34 percent and slopes were generally flat. The refuse pile will be contoured to approximately 3:1 slopes. With this type of slope and vegetative ground cover of 34 percent, long-term stabilization by vegetation

alone may occur if grazing is properly managed. The refuse pile test plots were established in 1982, and erosion has been reduced after fifteen years of vegetation establishment.

Map 542.200c shows contour furrows on the reclaimed refuse pile. Contour furrows are rarely installed properly, and they often lead to increased erosion problems. They can lead to maintenance problems and a lengthened responsibility period. However, they can be beneficial if done correctly and especially if used in combination with other erosion control methods, such as gouging. While the Division has concerns about the design and how it might be implemented, the method is acceptable.

Findings:

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

RECOMMENDATION:

The applicant has adequately addressed the requirements of the biology and land use regulations, including cultural resource information. A copy of Exhibit 731.110a from the 1991 version of the mining and reclamation plan needs to be inserted in Exhibit 322.220c.