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

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Act 1007/004
 #2

May 12, 1995

TO: Daron Haddock, Permit Supervisor

FROM: Paul Baker, Reclamation Biologist *PBB*

RE: Draft Review, Willow Creek Refuse Removal Project, Castle Gate Mine, Amax Coal Company, ACT/007/004, ~~Working File~~, Carbon County, Utah
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SYNOPSIS

On March 16, 1995, the Division received a proposal from Amax Coal Company to remove about 450,000 cubic yards of coal refuse from the area of the previous Willow Creek permit disturbed area and place it at the Schoolhouse Canyon refuse pile. Amax would disturb an additional 27.5 acres of land for this project.

The application includes ownership and control information in addition to that contained in Chapter 2. Some of the information in Chapter 12 is required by the regulations but is not in Chapter 2. Since Chapter 2 is the main part of the plan containing ownership and control information, it needs to either reference Chapter 12 or to be amended to include the incomplete information.

The application needs to contain baseline vegetation information both for the reference area and the area that would be disturbed. It also lacks some wildlife information. No effects on listed, proposed, or candidate threatened or endangered species are anticipated, but the application includes insufficient detail to make a positive determination.

Because the area contains critical deer wintering areas, the fish and wildlife protection plan needs to include certain commitments to protect and enhance this habitat. Amax needs to clarify and modify several portions of the revegetation plan.

The application must contain a description of cultural and historic resources listed in or eligible for listing in the National Register of Historic Places and known archaeological sites within the permit and adjacent areas. Without this information, the Division cannot make a recommendation to the State Historic Preservation Officer about the potential to affect these resources.

The application needs to show how Amax has coordinated with the Division of Air Quality in complying with the Clean Air Act. An amendment to the existing Air Quality Approval Order may not be necessary, but Amax needs to show their coordination efforts.



ANALYSIS

IDENTIFICATION OF INTERESTS, VIOLATION INFORMATION, AND RIGHT OF ENTRY INFORMATION

Regulatory Reference: UCA R645-301-112; R645-301-113; R645-301-114

Analysis:

Identification of Interests

The Willow Creek refuse removal site is presently controlled by Amax Coal Company, a subsidiary of Cyprus Amax Coal Company, a subsidiary of Amax Energy Inc., which is wholly owned by Cyprus Amax Minerals Company. Amax Coal Company (Amax) is the applicant and operator, and the resident agent is C. T. Corporation System. Amax will be responsible for payment of the abandoned mine reclamation fee.

The revision shows names of officers and directors of Amax Coal Company, their titles, Social Security Numbers, and the dates they assumed their offices. Chapter 2 of the existing Castle Gate plan contains an organizational chart outlining the sequence of ownership and control for parent companies. Chapter 2 also has a list of other permits issued to Amax Coal Company.

The information in the amendment application is the same as what Amax submitted to the Division in February. The February submittal has yet to be approved and inserted into the mining and reclamation plan.

The owner of the surface to be affected by operations is Blackhawk Coal Company. Blackhawk also owns coal rights in the area, but Amax does not intend to mine coal as part of this proposal. The application includes the names and addresses of four entities that own surface land contiguous to the property and one that owns mineral rights contiguous to the proposed disturbance. No area within the lands to be affected by surface operations is under a real estate contract.

Violation Information

The application says violation notices received by the applicant during the preceding three years are in Appendix 12-1-2. At least five violations issued for the Castle Gate Mine within the last three years were not included in this list. These are N92-41-4-2 parts 1 and 2, N92-39-7-1, N94-41-93-2-1, and N94-41-1-1. All of these violations except N94-41-1-1 are listed in Chapter 2 of the current plan.

Chapter 2 of the mining and reclamation plan only includes violation information for Castle Gate, but the current application (Chapter 12) includes violation information for other Amax Coal Company operations. Chapter 2 should either contain this complete violation information or should reference Chapter 12 for it.

In neither Chapter 2 nor the proposed Chapter 12 does the plan indicate whether there are unabated cessation orders or unabated air and water quality violation notices received by any coal mining and reclamation operation owned or controlled by either the applicant or by any person who owns or controls the applicant. In the list of violations in Chapter 12, there are several violations where the status is shown as "pending." It is assumed the operators are working to abate these violations within required abatement periods, but this cannot be determined with the information given. The plan should contain a statement indicating whether there are unabated cessation orders or air and water quality violation notices received by Amax or any operation under joint ownership and control with Amax.

The plan says in Chapter 2 that neither the applicant nor any of its subsidiaries, affiliates, or persons controlled by or under common control with the applicant has had a federal or state mining permit suspended or revoked in the last five years, nor forfeited a mining bond or similar security deposited in lieu of bond.

Right of Entry Information

The application says the right of entry is conveyed by Cyprus Amax Minerals Company, then to Amax Coal Company in behalf of Cyprus Western Coal Company its subsidiary. Amax Coal Company, also a subsidiary of Cyprus Amax Minerals Company, has the right to enter and conduct operations at the Willow Creek site. The application also contains a general legal description of the area.

R645-301-114.100 requires that an application contain a description of the documents upon which the applicant bases their legal right to enter and begin coal mining and reclamation operations in the permit area. An application is also required to state whether the right to enter and begin operations is the subject of pending litigation. The description must identify the documents by type and date of execution, identify the specific lands to which the documents pertain, and explain the legal rights claimed by the applicant. The application does not comply with these requirements. It does not show the type of document involved, the date it was executed, or the specific legal rights claimed by Amax.

Findings:

This portion of the application is complete and accurate with the following exceptions:

1. The plan needs to include violation information in compliance with R645-301-

113. It does not include all violations issued for the Castle Gate Mine. It also does not indicate whether there are unabated cessation orders or air and water quality violation notices received by operations owned or controlled by Amax or by persons that own or control Amax. Because Chapter 2 is the primary source for information relative to R645-301-100, it should either include complete violation information or reference other portions of the plan where it is located.

2. Right of entry information needs to include a description of the documents on which Amax bases its right to enter and begin operations, the date these documents were executed, and the specific legal rights claimed by Amax.

UNSUITABILITY CLAIMS

Regulatory Reference: UCA R645-301-115

Analysis:

The application says, to the best of the applicant's knowledge, no portion of the area to be permitted is designated or under study for being designated unsuitable for mining. It says Amax does not intend to conduct coal mining or reclamation operations within 300 feet of any occupied dwelling or within 100 feet of a public road.

According to the Facilities Area Map, Exhibit 12-5-1, the office trailer, maintenance pad, and sediment trap 3A would all be within 100 feet of U. S. Highway 191. Therefore, the Division and Amax need to comply with appropriate provisions of R645-103-234.

Findings:

The application is complete and accurate with the following exception:

1. Because portions of this operation would be within 100 feet of a public road, the Division and Amax need to comply with appropriate provisions of R645-103-234.

PERMIT TERM, INSURANCE, PROOF OF PUBLICATION, FILING FEE, NOTARIZED SIGNATURE

Regulatory Reference: UCA R645-301-116; R645-301-117; R645-301-118; R645-301-123

Analysis:

The permit term would not change as a result of this revision.

The Division has on file a certificate of insurance for the Castle Gate Mine. The issuing company is the National Union Fire Insurance Company of Pittsburgh, Pennsylvania, and the policy number is GL 3197125. It includes coverage for \$6,000,000 aggregate and \$2,000,000 each occurrence, and the policy expires July 1, 1995.

The Division needs to receive proof of publication when the advertisement for this revision has run for four consecutive weeks. Advertising should have been complete on April 27, 1995.

The application says a permit filing fee of \$5.00 was submitted with the application. The Division does not have record of receiving this payment. Thirty CFR 714 (b) (1) says each application for a permit revision shall be accompanied by a fee made payable to the regulatory authority.

On March 13, 1995, the Division received a permit change form including a statement with the notarized signature of Lonnie Mills saying he is a responsible official of the applicant and that the information in the application is true and correct to the best of his information and belief.

Findings:

This portion of the application is complete and accurate with the following exceptions:

1. Amax needs to submit proof of publication for the newspaper advertisement when advertising is complete.
2. Amax needs to pay the \$5.00 application fee.

VEGETATION RESOURCE INFORMATION

Regulatory Reference: R645-301-321

Analysis:

The application says the only major vegetation type identified in the proposed permit area is grassland/sagebrush. This occurs on steep, dry slopes and near some of the lower drainages. The only quantitative vegetation information is in Chapter 9 and is part of a 1981

summary report. This report summarizes data for the Willow Creek grass-sage reference area.

According to the summary in Appendix 9-1, vegetative cover in the Willow Creek reference area was 40%, litter and rock were 34% and bare ground was 27%. Fifty-eight percent of the vegetative cover was big sage, 35% was grasses, mostly western wheatgrass and downy brome. Seventeen species were found in the reference area. Shrub density was 7199 per acre of which sagebrush comprised 92%. Productivity was estimated at 850 to 900 pounds per acre.

The reference area vegetation information summary presented in the plan is not adequate. It only lists three dominant species out of seventeen occurring in the area. The Division has an incomplete (data from two of fifteen transects is missing) copy of Mariah's raw data, but it is not in the amendment or current mining and reclamation plan. The complete data set would have only about nine pages and would satisfy regulatory requirements.

The application includes no baseline vegetation information for the area proposed to be disturbed. R645-301-321.100 says the application needs to include information about plant communities to be disturbed if required by the Division. This information is routinely required by the Division. In addition, R645-301-321.200 requires information about the productivity of the land before disturbance, and R645-301-411.120 requires the application to contain an analysis of vegetation characteristics of the area proposed to be affected by coal mining and reclamation operations. Since much of the area has been reclaimed, baseline information would show which species have become established and should be useful for establishing final reclamation techniques. It would also indicate whether reclamation to the performance standards proposed in this application is feasible.

Findings:

This section of the application is considered complete and accurate with the following exceptions:

1. The application needs to include complete baseline vegetation information for the Willow Creek grass-sage reference area. It contains a data summary, and the Division has a copy of most of the complete set of data, but the complete set is not in the mining and reclamation plan.
2. The application needs to contain baseline cover, productivity, and shrub density information for the area proposed to be disturbed.

FISH AND WILDLIFE INFORMATION

Regulatory Reference: R645-301-322

Analysis:

Wildlife Information

The application includes mostly general information about area wildlife. Included as Appendix 12-3-1 is a copy of the Wildlife Resources publication "Fauna of Southeastern Utah and Life Requisites Regarding their Ecosystems."

Willow Creek is not within the proposed permit area boundary, but there are 67 fish species that could be in the drainage. Willow Creek is classified as a Class IV fishery.

Six amphibians are suspected to inhabit the general area. The primary one is the tiger salamander. Seventeen reptile species could inhabit the area.

Thirty-one bird species could occupy or migrate through the project area. The application says disturbance to nesting habitat should be minimal because of the small land area associated with the project and the project's limited duration.

Small mammals represent a significant part of the ecosystem on the site. They are mostly herbivores that provide a food source for animals in higher trophic levels. Populations could be temporarily altered due to caving of burrows from movement of machinery and materials, but recovery should be imminent and rapid. The application also discusses several small carnivores that could inhabit the area.

According to the application, the proposed disturbed area contains critical elk winter range. Nearby rangelands also contain critical elk winter range in addition to high priority deer winter range.

The low levels of wildlife inventory are adequate for most species. However, certain uncommon species and those sensitive to human disturbance require more attention than given in the application. In particular, a few raptor species could potentially nest in the vicinity of the proposed disturbed area and could be affected by the operation. A few candidate threatened or endangered bat species could also be in the area.

The application says a wildlife and raptor survey was done in 1994, but it does not include results of this survey. If the survey results contain pertinent information, they should be included in the application. Otherwise, Amax needs to include additional information as discussed above. The Division of Wildlife Resources was consulted about what baseline

information needs to be in the application and concurred with these informational requirements.

Threatened or Endangered Species

Water depletions in the Upper Colorado River drainage have the potential of adversely affecting threatened and endangered fish of this drainage basin, including the Green River. The Fish and Wildlife Service receives one-time mitigation payments for annual depletions in excess of 100 acre feet. The application needs to give information showing how much water could be used for this project. It says about 2.4 acre feet will be retained on the site as part of sediment control, but it does not give information about how much water will be used for other parts of the operation, such as dust control.

The application says the Utah mountain kingsnake and the Utah milk snake are sensitive species that could occur in the permit area. This classification is based on concerns from Division of Wildlife Resources biologists, and it is not the same as federal agencies' definitions of sensitive species. These species have apparently not been found in the proposed disturbed area although the support for this information, as discussed below, is not known.

In Section 12.3.2.2.2, the application says no sensitive, rare, endemic, threatened, or endangered plant, fish or wildlife species listed in Tables 12-3-1 and 12-3-2 are known to inhabit the project area. It also says a literature survey indicated no endangered or threatened plant species in adjacent areas.

Amax needs to provide more detail about the basis of this information. Appropriate sources would include the Fish and Wildlife Service or the Utah Natural Heritage Program. Questions about the literature survey include the source and age of the literature and whether it includes information specific to this site. At least one sensitive plant species, canyon sweetvetch, has a potential of being in the proposed disturbed area although it is unlikely.

The Division is awaiting comments on the revision from the Fish and Wildlife Service. They were asked to provide a list of all proposed, candidate, and listed threatened or endangered species that could occur in the area. When their comments are received, the potential of adverse effects will need to be evaluated and a determination made whether mitigation or other action is required.

The application says in Section 12.3.2.2.2 the area of potential disturbance contains no known area of "high interest" to management agencies. This statement needs to be modified. Critical habitat is defined in R645-100 as "habitat of unusually high value." Although the map indicates the area has critical elk winter range, Ben Morris of the Division of Wildlife Resources said the critical elk range is on the plateau rather than in the canyon.

However, the proposed disturbed area has the components of critical deer winter range. He said the site is critical for local deer that frequent the area.

Riparian areas are also considered critical habitat. Although Amax does not plan to disturb areas near the stream and although the vegetation map does not show riparian vegetation in the area, the streambank probably had a riparian community before being disturbed by coal mining. The application says that, because of perennial flow in Willow Creek, the area is used year-round by deer, elk, and other wildlife. It therefore provides an important habitat component.

Maps

The Willow Creek grass-sage vegetation reference area is shown on Exhibit 12-3-2. Amax does not propose fish or wildlife monitoring stations or facilities for protecting and enhancing fish and wildlife and related environmental values.

Exhibit 9-6 shows abandoned mine vegetation reference areas. The existing mining and reclamation plan does not include this map although the Division has a copy. It needs to be included in the plan.

Findings:

This section of the application is complete and accurate with the following exceptions:

1. Amax needs to provide additional wildlife information. The application says a wildlife and raptor survey was done in 1994, but it does not include results of this survey. If the survey results contain pertinent information, they should be included in the application. Otherwise, Amax needs to include additional information about raptor nests in the area and whether bats use the area for foraging, roosting, or hibernating.
2. Amax needs to include information about how much water will be used for this operation. The application currently only shows that 2.4 acre feet could be lost by evaporation from sediment ponds and traps.
3. The application needs to include more detail about the basis of statements that no sensitive, rare, endemic, threatened, or endangered plant, fish or wildlife species listed in Tables 12-3-1 and 12-3-2 are known to inhabit the project area. It says the source of the information was a literature review but does not say what the literature is.
4. The Division has requested from the Fish and Wildlife Service a list of

proposed, candidate, and listed threatened and endangered species that could occur in the project area. If the Fish and Wildlife Service identifies species that could occur in the area, Amax will need to identify these species in the application. They will also need to discuss how impacts will be avoided or mitigated.

5. The statement in Section 12.3.2.2.2 that the area of potential disturbance contains no known area of "high interest" to management agencies needs to be modified. The area is designated as critical elk winter range although the critical range is on top of the plateau according to Wildlife Resources. The area proposed to be disturbed does contain critical deer winter range important for local deer populations.
6. Exhibit 9-6 is referenced but not included in the plan. This map shows abandoned mine reference area sites.

INTERIM STABILIZATION

Regulatory Reference: R645-301-331

Analysis:

No vegetative disturbance is anticipated beyond the permit and disturbed area boundaries. The applicant will attempt to minimize any disturbance within the permit area during project operation. Mitigation will include dust control. Water quality will be protected by various sediment control measures.

This portion of the plan does not specifically state how disturbances will be minimized and how temporary vegetation cover will be established within disturbed areas to minimize erosion. However, species list 4 in Chapter 9, the same as the seed mix in Table 12-3-3, is designated for temporary stabilization of disturbed areas. In addition, Amax only plans to use the area for coal refuse removal for about five months.

In Section 12.3.5.2, the applications says that, when necessary, small areas will be temporarily vegetated in order to protect soil and hydrologic resources. In areas requiring interim stabilization during operation, the interim seed mix shown in Table 12-3-3 will be used.

The interim seed mixture was designed for long-term temporary stabilization rather than for just a few months, but it also includes the annual grains oats, wheat and barley. These grains grow very quickly and would provide erosion and sediment control for the

winter and spring. It would probably not be beneficial to plant the perennial grasses included in the mixture. It is suggested that the seed mix in Table 12-3-3 be modified to include about 100 pounds of grain seed per acre but none of the other grasses.

Findings:

This section of the application is complete and accurate. It is suggested that the seed mix in Table 12-3-3 be modified to include about 100 pounds of grain seed per acre but none of the other grasses.

SUBSIDENCE CONTROL PLAN

Regulatory Reference: R645-301-332

Analysis:

There will be no subsurface disturbance associated with this project; therefore, this regulation does not apply.

Findings:

This regulation does not apply to the proposed operation, so this portion of the application is complete and accurate.

FISH AND WILDLIFE PROTECTION

Regulatory Reference: R645-301-333

Analysis:

Potentially adverse impacts to wildlife and associated environmental values will be avoided or minimized through implementing mitigation measures. Personnel will be restricted to site facilities and strongly discouraged from venturing outside the permit boundary. Access roads will be blocked or locked during non-operational periods. Operations are scheduled to prevent any major disturbances during birthing and early development of wildlife species.

Drivers will be instructed on the danger of animals on the road during dusk and night hours and the need to reduce speed to avoid collisions with animals. Employees will be educated about the value of wildlife resources associated with the permit area.

Existing power lines were surveyed by the Fish and Wildlife Service in 1981 and were found to be either properly constructed or located in a way that they do not pose a threat to perching raptors.

A schedule of refuse removal activities could not be found in the application; however, the letter accompanying the application says the applicant is hoping to complete the review process within 90 days of submittal. By this schedule, construction could begin June 11, 1995. If raptors are nesting in the area, this is within their crucial nesting period. There should be no construction activities within line of sight or one-half mile of active nests during crucial periods.

Although Wildlife Resources personnel say the precise project area does not contain critical elk winter range, it is critical winter range for local deer. Therefore, activities should be curtailed or ended by December 1. It is understood from conversations with the applicant's personnel that they intend to have this project completed by that time, but there appears to be no commitment in the application that this will occur.

Section 12.3.5.8 contains commitments concerning protection of fish, wildlife, and related environmental values. These are mainly commitments to the performance standards. Wildlife in the area will likely have to acclimatize to planned activities. However, the applicant will take measures to ensure safety and ease of movement through the permit area. If fences are built, they will be constructed according to Wildlife Resources' specifications. No hazardous concentrations of toxic materials are expected in the ponds, but ponds will be fenced if they do contain these materials. No new power lines are planned for this project.

Habitat enhancement opportunities are available. Because the area contains critical deer winter range, Wildlife Resources requests mitigation in the form of habitat enhancement at the rate of about one or two acres enhanced for every acre disturbed. Amax could consider other enhancement opportunities. This mitigation would serve for enhancement under the proposed Willow Creek Mine as well as the current project. Whatever enhancement is used, the mining and reclamation plan needs to outline what is planned and what occurs. It should be coordinated with Wildlife Resources and the Division.

If the Fish and Wildlife Service identifies any species of particular concern that have not yet been addressed, and if it is determined that this operation could adversely affect them, Amax will need to propose protection plans for these species.

Findings:

This section of the application is complete and accurate with the following exceptions:

1. No construction activities should be started during crucial periods if there are

raptor nests within line of sight or one-half mile of the project.

2. Activities should be curtailed or ended by December 1 to not interfere with wintering wildlife.
3. As required in R645-301-333, Amax needs to use the best technology currently available to enhance wildlife habitat. The area contains critical deer wintering areas, and Wildlife Resources requests mitigation in the form of habitat enhancement at the rate of about one or two acres enhanced for every acre disturbed. This mitigation would serve for enhancement under the proposed Willow Creek Mine as well as the current project. Amax could consider other enhancement opportunities, but they would need to be coordinated with Wildlife Resources and the Division. Whatever enhancement is used, the mining and reclamation plan needs to outline what is planned and what occurs.

REVEGETATION

Regulatory Reference: R645-301-340

Analysis:

Revegetation Methods

Seeds and seedlings will be planted at the optimum time following disturbance activities. Ideally, all seeding will be done in the fall. Later, the application says seeding will occur in the fall after October 1 and before December 1. Reclamation will take place the following year in areas that cannot be seeded by December 1. Chapter 9 says planting will typically occur after October 15 and before the ground freezes. When necessary, spring planting may occur between March 15 and May 15. Drainages will be planted in April when possible. The plan to plant drainages in April refers to seedlings and cuttings to be planted near drainages. The proposed Chapter 12 says seeding with the interim seed mixture could occur during other seasons to control erosion or soil degradation. The timing of planting operations discussed in the plan and application is consistent with traditional recommendations for this area.

The application says the reclamation timetable and schedule is outlined in Table 12-5-3. This table could not be found within the application. This may be a reference to Table 12-3-5 which contains a reclamation monitoring schedule. The schedule in Table 12-3-5 is discussed below.

All revegetated areas will be planted with either the interim or final reclamation seed

mixture as shown in Tables 12-3-3 and 12-3-4. These seed mixtures are the same as those found in Chapter 9. In response to comments from the Division of Wildlife Resource and after seeing the performance of the species in list 1, the same as the mixture in Table 12-3-4, Amax has proposed a few changes to the seed mix as shown in Chapter 9. These changes are in amendment ACT/007/004-95C, part of the response to Division Order 94-A. The mixture in Table 12-3-4 should also be changed. Salina wild rye should be deleted from the mixture. Sand dropseed could also be dropped. Thickspike wheatgrass at the rate of two pounds pure live seed (PLS) per acre should be added, and the seeding rate for fourwing saltbush should be increased to three pounds PLS per acre.

The application says revegetation of the site will also include the planting of shrub seedlings if available and economically feasible. Otherwise, shrub seed will be used and hand broadcast (see discussion below about seeding methods). It should not be necessary to plant seedlings, but Amax could probably achieve greater diversity by doing so. The application would need to show which species would be planted and at what rate. Amax might want to include this as an option in case shrub establishment from seed is not as great as desired.

The application includes a list of six criteria the seed must meet. Many of the requirements are included in the Utah Seed Act. The commitments in this part of the application should help ensure revegetation success.

Seed suppliers could have difficulty meeting requirement No.2, that the seed contain 90% pure live seed. Seed of most wildland species has a lot of inert matter, and germination rates are commonly lower than in agricultural species. PLS values for seed mixtures of this sort are commonly 70% or lower.

After the area is graded and prepared, fertilizer will be applied. The disturbed area will then be seeded by drilling or hand broadcasting where drilling is not practical. In areas where the seed is hand broadcast, it will be covered by backdragging or raking. The application says the seed drill will be set at 1/4 inch to 1/2 inch depths, but the presence of numerous rocks in the topsoil materials may vary the planting depth and facilitate establishment of all species in the mix.

Some of the seeds in the mixture are very small or chaffy. Separate seeding of these seeds is necessary where drilling is the primary seeding method. Chapter 9 says where a drill is to be used, a broadcast seeder will be attached to the drill or broadcast methods will be used to ensure separate shallow seeding of small seed and fluffy or trashy seeds. The proposed Chapter 12 says shrub seed will be hand broadcast. Not all shrub seeds should be broadcast. Also, there are non-shrub species in the mix where the seed should be broadcast rather than drilled. Louisiana sage, mountain big sage, blueleaf aster, winterfat, rubber rabbitbrush, and bluegrass should all be planted at or near the surface.

Native hay mulch or alfalfa will be applied at the rate of two tons per acre. This will be chopped and blown onto the topsoiled areas. With the subsequent action of the seed drill, the mulch and fertilizer will be mixed into the soil surface. This is consistent with mulching commitments in Chapter 9.

One of the most successful reclamation treatments used at Utah coal mines is extensive and irregular surface roughening. Roughening helps to increase water availability for germinating and establishing plants. Precipitation is marginal for successful seedling establishment in this area, and proper roughening procedures increases the likelihood that revegetation efforts will be successful. If precipitation is normal or better and if it comes at critical times in the spring, surface roughening may not be necessary. At other times, however, revegetation is unlikely without it. The Division highly recommends surface roughening techniques, such as gouging.

If weeds become a problem, mowing may be utilized where terrain permits. Herbicides may be used in extreme cases. Any necessary insect or rodent control will be guided by the Fish and Wildlife Service, the Utah State Cooperative Extension Service, or the Animal and Plant Health Inspection Service.

Under current regulations, any weed control following seeding will result in restarting the extended responsibility period for revegetation success. Weed control with herbicides is allowable but needs to be done in compliance with label requirements.

Success Standards

Revegetation success and permit area stabilization will be evaluated during the middle of each growing season when cover and composition studies are most feasible. The application says in Section 12.3.4.1.2 that the same statistical methods and sample adequacy levels used in establishing the reference area will be used for measurements to determine revegetation success. These are contained in Appendix 9-1. However, Section 12.3.5.6.1 says the applicant will comply with the standards for success, statistical sampling techniques for measuring success, and the approved methods outlined in the "Vegetation Information Guidelines, Appendix A."

The sample adequacy formula used in the original vegetation studies differs from the one listed in the "Vegetation Information Guidelines, Appendix A." This document is referenced in the regulations and must be used for sample adequacy determinations when sampling for revegetation success. The portion of Section 12.3.4.1.2 where the application says the sample adequacy methods used in the original sampling will be used to determine revegetation success should be modified or deleted to be consistent with the guidelines and Section 12.3.5.6.1.

Sections 12.3.5.3 and 12.3.5.6 contain many of the revegetation standards for success. The success determination methods and standards discussed in these sections are substantially different from the standards discussed in Chapter 9.

Diversity will be determined by ranking all species within the community by relative cover. The ranking determines the relative importance of each species. The number of species contributing greater than five percent of the relative cover in the reference area designates the number of species, the life forms, and seasonality of the species to be established in the reclaimed area. No one species will make up greater than 50% of the importance value.

This method has been used in various forms at other mines. It should ensure there are at least as many major species in the reclaimed area as there are in the reference area.

There are two items in this standard that should be clarified for someone in the future who might be applying the standard and who is not familiar with this method. First, the species are normally grouped into life forms. This makes it unnecessary to compare the areas for the same species. For example, if the reference area has a large amount of sagebrush but the main shrub component in the reclaimed area is fourwing saltbush, these species could still be compared because they would be grouped into the same life form.

The second clarification is where the application says no one species will make up greater than 50% of the importance value. This only applies to the reclaimed area, not the reference area. In the reference area, sagebrush has an importance value greater than 50%.

The proposed postmining land use is wildlife habitat. The application says the success of revegetation for wildlife habitat will be determined on the basis of shrub and vegetative ground cover growth. Minimum stocking and planting arrangements will be specified by the Division on the basis of local and regional conditions.

Consistent with the application and R645-301-356.231, the Division has examined the shrub density in the reference area and has consulted with the Division of Wildlife Resources about a shrub density standard for success. The standard obtained in consultation with Wildlife Resources is 4000 shrubs per acre. This standard needs to be included in the application. It is lower than the number in baseline data to allow for greater diversity in the reclaimed areas.

Although this is a previously disturbed area where the success standards of R645-301-356.250 could apply, the applicant has chosen to use a traditional undisturbed reference area. Section 12.3.5.6.1 says the reference area boundary was permanently marked in the field and sampled for cover and shrub density. Amax commits to restore the vegetative ground cover to that of the reference area.

The revegetation sampling regime shown in Table 12-3-5 includes quantitative sampling for cover, frequency, woody plant density, transplant survival, and productivity. These parameters are to be measured early enough in the extended responsibility period that remedial action will be possible if it is needed. The table needs to show monitoring of woody plant density in the fourth and eighth years of the extended responsibility period. This is because of R645-301-356.232 which says at least 80 percent of trees and shrubs counted toward the success standard will have been in place for at least 60 percent of the applicable minimum period of responsibility. To make this determination, there needs to be woody plant monitoring after 40% (four years) of the responsibility period. This rule also says no shrubs in place for less than two years may be counted toward the success standard. For this reason, woody plant density needs to be checked in the eighth year of extended responsibility.

The application does not include standards for erosion control. This is an undefined performance standard in the regulation. Chapter 9 of the current mining and reclamation plan says, "Suitable measures of erosion will be established in consultation with the Division of Oil, Gas and Mining, and such measures will be employed upon approval by that agency." Amax needs to propose a specific method for monitoring erosion and a success standard. A wide variety of methods is available, such as using the Universal Soil Loss Equation, sampling runoff, and the Bureau of Land Management's "Erosion Condition Classification System."

In Section 12.3.5.7.1, the application says the period of extended responsibility will begin the year after reseeding and fertilization have been completed. According to R645-301-357.100, the period of extended responsibility begins after the last year of augmented seeding, fertilization, irrigation, or other work, excluding approved husbandry practices. Although the Division has proposed husbandry practices, they are not yet approved. Therefore, the extended responsibility period does not begin until all seeding *and other work* discussed in this regulation have been completed. This is not just seeding and fertilizing as the application says. Although this is a performance standard and would be applied no matter what the application says, the application should be consistent with the regulations.

Field Trials

Amax commits to comply with any requirements to conduct field tests or greenhouse trials. These would be for the purpose of demonstrating that revegetation can be accomplished as required by the State program.

A need for field trials or greenhouse tests is not anticipated. There is a reasonable amount of vegetation on the site although the exact amount is unknown. When the Division receives this data, it will be possible to make a definitive determination whether vegetation can be established on this site.

Wildlife

Wildlife enhancement will be created by the development of micro-topographic features, such as swales and rises, during regrading. Also, Amax will establish rock piles and use natural materials, where available, to create snags and roosts.

Amax should consult with Wildlife Resources about the specific placement and use of materials for snags and roosts. The site may not be suitable for these features, but locating them in particular areas may make them more usable.

The application says the plant species in the reclamation seed mix are consistent with those presently growing in the permit and adjacent area. This statement is correct, but, as discussed above, Amax needs to make a few changes to the seed mix to keep it in line with Wildlife Resources' recommendations.

Amax's commitments for reclamation habitat enhancement appear to be adequate. If additional enhancement opportunities within the regulatory definition of "best technology currently available" become available, they should be incorporated into the plan.

Findings:

This portion of the application is complete and accurate with the following exceptions:

1. The application says the reclamation timetable and schedule is outlined in Table 12-5-3, but neither a table with this number nor one containing a reclamation timetable and schedule could be found in the application.
2. The seed mixture in Table 12-3-4 should be changed to be consistent with the mixture proposed in species list 1 of amendment ACT/007/004-95C. This amendment was submitted in response to Division Order 94-A.
3. The application says revegetation of the site will include shrub plantings if seedlings are available and if it is economically feasible. The application would need to show which species would be planted and at what rate. Amax might want to include this as an option in case shrub establishment from seed is not as great as desired.
4. Very small or chaffy seed in the seed mixture needs to be broadcast seeded rather than drilled. The application says shrub seed will be broadcast, but some shrub seed should be drilled.
5. In Section 12.3.4.1.2, the application says the same statistical methods and

sample adequacy levels used in establishing the reference area will be used for measurements to determine revegetation success. The sample adequacy formula used in the original vegetation studies differs from the one listed in the "Vegetation Information Guidelines, Appendix A." However, in Section 12.3.5.6.1, the application says the applicant will comply with the standards for success and approved methods outlined in the "Vegetation Information Guidelines, Appendix A." These conflicting statements need to be reconciled. Amax will need to use the methods in Appendix A.

6. The plan includes a method and success standards for judging diversity and seasonality of the reestablished vegetation cover. The method needs to be clarified. It should make it clear that species are grouped into life forms for comparisons. Also, the application says no one species will make up greater than 50% of the importance value. the application should make it clear that this applies to the reclaimed area.
7. In consultation with the Division of Wildlife Resources, the Division established a woody plant density success standard of 4000 per acre. This standard needs to be included in the application.
8. Table 12-3-5 needs to be modified to include monitoring woody plant density in the fourth and eighth years of the extended responsibility period.
9. The application needs to include an erosion control standard for success.
10. In Section 12.3.5.7.1, the application says the period of extended responsibility will begin the year after reseeding and fertilization have been completed. This statement needs to be modified to be consistent with R645-301-357.100. Both the application and regulation say the period of extended responsibility begins after the last year of augmented seeding and fertilization, but the regulation also says the extended responsibility period begins after the last year of augmented irrigation or other work, excluding approved husbandry practices.

LAND USE RESOURCE INFORMATION

Regulatory Reference: R645-301-411.110 through R645-301-411.130; R645-301-411.200

Analysis:

The surface and subsurface lands in the permit area have historically been used for

mining facilities and operations. The first mine in the Willow Creek drainage was opened in 1890. The application discusses several other mining operations and companies in the area.

The application is normally required to contain some details about previous mining activity, such as the coal seams mined, mining methods used, and the extent of coal removed. Although the area was used for previous mining activities, there was little or no coal mined from the actual area to be disturbed. Rather, it was used for surface activities. Also, including this information in the application serves no useful purpose since there will be no actual mining associated with this project.

The application says there is no record indicating what the land may have been used for prior to mining, but the applicant assumes it was wildlife habitat. Adjacent areas are used for grazing, wildlife habitat, recreation, watersheds, and small surface developments to support the mining industry.

The application references Exhibits 3-22, 9-1, 10-1, 12-4-1, 12-4-2, and 12-5-1 for land use information in adjacent areas. These maps show surface and coal ownership, utility corridors, the cemetery, and regional vegetation communities and wildlife habitat.

R645-301-411.120 requires the application to contain a narrative of land capability which analyzes the land-use description in conjunction with other environmental resources information. The narrative will provide analyses of the capability of the land before any coal mining and reclamation operations to support a variety of uses, giving consideration to soil and foundation characteristics, topography, vegetative cover, and the hydrology of the area proposed to be affected by coal mining and reclamation operations. The application only contains general statements about historic mining operations, wildlife habitat, and regional land uses. There are no descriptions of the land use capability, particularly vegetative production, of the area that would be disturbed. This is required under both this regulation and R645-301-321, and it is included as a deficiency in the "Vegetation Resource Information" section of this review.

Findings:

This portion of the application is complete and accurate with the following exception:

1. The application needs to contain information about the capability of the land to support a variety of uses, giving consideration to soil and foundation characteristics, topography, vegetative cover and the hydrology of the area proposed to be affected by coal mining and reclamation operations. Vegetative production information is required in this review under R645-301-321.

HISTORIC AND ARCHÆOLOGICAL RESOURCE INFORMATION

Regulatory Reference: R645-301-411.140

Analysis:

The application says cultural resource information and maps identifying cultural and historical study areas are located in Chapter 5. There are no cemeteries, public parks, historic places, or units of the National System of Trails or the Wild and Scenic Rivers System located within the permit boundary. Amax agrees to notify the Division and the Utah State Historical Society if previously unidentified cultural resources are discovered in the course of operations and to have these evaluated in terms of National Register of Historic Places eligibility criteria.

Chapter 5 of the existing mining and reclamation plan contains no cultural resource information about the proposed disturbed area. The application is required to contain a description of cultural and historic resources listed or eligible for listing in the National Register of Historic Places and known archæological sites within the permit and adjacent areas. The description will be based on all available information, including, but not limited to, information from the State Historic Preservation Officer and from local archæological, historic, and cultural preservation agencies.

Considering the amount of coal mining and the abandoned mine reclamation activity that have occurred in the area, cultural resource information is probably available without doing field studies. Amax at least needs to document that they have checked literature sources and files of the Division of State History to see if significant sites have been found in the past.

Findings:

This section of the application is complete and accurate with the following exception:

1. The application must contain a description of cultural and historic resources listed in or eligible for listing in the National Register of Historic Places and known archæological sites within the permit and adjacent areas. The description will be based on all available information, including, but not limited to, information from the State Historic Preservation Officer and from local archæological, historic, and cultural preservation agencies.

POSTMINING LAND USES

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Regulatory Reference: R645-301-112, R645-301-113

Analysis:

The area will be returned to wildlife habitat following mining. This is the use the area is presumed to have had prior to any mining. It is not a change in land use and should be approved by the Division.

Findings

Amax has complied with the requirements of this regulation.

AIR POLLUTION CONTROL PLAN

Regulatory Reference: R645-301-420

Project operations will be conducted in compliance with the requirements of the Clean Air Act and Utah Air Quality regulations. During operations, fugitive dust emissions will be caused by loading, transportation, and redistribution of topsoil and by wind erosion of exposed areas. There will be fugitive dust emissions during reclamation associated with moving topsoil and spoil and during grading and mulching. Emission controls will be limited to watering roads as required for safe and efficient work conditions.

The application briefly discusses how Amax plans to reduce fugitive dust, but it does not describe coordination efforts with the Division of Air Quality. The current Air Quality Approval Order is only for the Castle Gate Preparation Plant.

According to the Division of Air Quality, Amax may not need to amend its Air Quality Approval Order since the refuse removal activity would be short-lived. However, Amax does need to have a determination from Air Quality whether the current approval order needs to be amended or if they need to take other actions. The application needs to document these coordination efforts.

Findings:

This section of the application is complete and accurate with the following exception:

1. The application needs to describe coordination efforts with the Division of Air Quality including a determination whether it is necessary to amend the Preparation Plant Approval Order.

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RECOMMENDATIONS

This application should not be approved in its current form. It needs to include baseline information and several commitments and clarifications before it complies with the regulations.