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DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS AND MINING

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TO: **Internal File**

FROM: Paul B. Baker, Reclamation Biologist and Project Team Lead *PBB*

RE: Revised Reclamation Plan, PacifiCorp, Deer Creek Mine, C/015/0018-AM99C-3

SUMMARY:

On March 22, 2001, the Division received a response to its November 6, 2000, technical analysis of the revised reclamation plan for the Deer Creek Mine. The chronology of this amendment is:

Initial Submittal	May 25, 1999
Division Response	July 7, 1999
PacifiCorp Response	December 6, 1999
Division Response	March 13, 2000
PacifiCorp Response	September 21, 2000
Division Response	November 6, 2000
PacifiCorp Response (This submittal)	March 22, 2001

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TECHNICAL ANALYSIS:

OPERATION PLAN

TOPSOIL AND SUBSOIL

Regulatory Reference: 30 CFR Sec. 817.22; R645-301-230.

Analysis:

Topsoil Substitutes and Supplements

Exploration/Sampling Program - Substitute Topsoil

The Deer Creek Mine was developed prior to the Surface Mining Reclamation Control Act (SMRCA) and topsoil was not salvaged or stockpiled during construction and mine development activities. The applicant intends to use construction fills within the disturbance area as substitute topsoil. Much of this material is from the terraced area on the south side of Deer Creek Canyon.

The application contains limited information about the substitute soils that would be used for reclamation. Eighteen samples were taken from the terraces from which much of the fill originated, and these were analyzed for the parameters in the Division's soils guidelines. Results are in Appendix R645-301-200B. Although these samples were not taken from the fill itself, they should give a general idea of the chemical and physical characteristics of the fill. No samples showed any limiting chemical characteristics, but textures of most samples were fairly high in clay.

In the fill itself, core samples were taken from seven locations and from various depths at each location. These locations are shown on Drawing DS-1810-D. The samples were taken for the purpose of doing stability analyses, so the locations were not necessarily the same as those from which the applicant proposes to gather substitute topsoil. Two samples were taken in the refuse piles, three near some of the highwalls, and two from the fan portal area at the upper end of the disturbed area.

The results of these analyses are in Appendix R645-301-200-C. Samples 1, 2, 3, 4, and 5 had either high sodium adsorption ratio (SAR) or high electrical conductivity (EC) values. Generally, the highest SAR and EC values were in the upper few feet, and, according to verbal information from the applicant's representative, this may be because of salt applications to keep the roads free of ice. High pH readings were found in samples 3 and 6. The upper layers of material near one of the portals had high selenium values. The only site where all samples in the

profile met all the Division's criteria for acceptable soils was 2A near the fan.

In addition to these samples taken in 2000, several other samples were taken in 1980 and 1983. These samples were of fill, coal refuse, and slag. Results of analyses on these samples are in the existing mining and reclamation plan, Chapter 4, Tables I and II. With a few exceptions, these samples do not show problems with the physical or chemical characteristics of the fill, but the samples were not analyzed for all the parameters in the Division's *Guidelines for Management of Topsoil and Overburden for Underground and Surface Coal Mines*. The Division recognizes that the 1980 thru 1983 operational sampling took place prior to implementation of the 1988 guidelines for topsoil and overburden. However, reclamation standards for soil and overburden are now rated using the 1988 guidelines. Therefore, since sampling did not follow the current 1988 Division guidelines for topsoil and overburden, information in the plan is incomplete and does not show that the fill or refuse materials in Deer Creek and Elk canyons are suitable for achieving the revegetation standards. Further sampling using current guidelines needs to be performed before a determination can be made concerning substitute soil and refuse suitability.

Most of the samples from 1980 and 1983 show few or no problem with EC or SAR values; however, two samples from the parking lot fill slope had EC values of 9.0 (assumed to be $\text{mmhos} \cdot \text{cm}^{-1}$). This could be a result of using salt as discussed above, and the problem may have grown progressively worse to where some of these soils may now be unusable.

In the current mining and reclamation plan and in the application, there are no results of testing soils that would be used in reclamation according to current guidelines. For this reason, the applicant commits in this application to conduct a soils sampling program during in June through October of 2001 and 2002. The areas to be sampled will be at accessible sites between 3+00 and 31+00 as shown on map DS-1810-D. Testing will be done according to the Division's soils guidelines. The timetable commitment is acceptable, and it is important that the applicant and the Division ensure soil samples are actually taken and analyzed and that the mining and reclamation plan is amended accordingly.

In the reclamation section of the existing mining and reclamation plan are the headings "Interim Vegetation Establishment" and "Fill Slopes." This section discusses interim revegetation efforts on fill slopes at the equipment yard and run of mine conveyor. The plan says the interim vegetation plan will provide the basis for developing final revegetation plan by testing revegetation techniques and plant species. Another purpose for this interim revegetation plan is to develop the fill material as a substitute for topsoil by establishing a root system in the top layers along with organic material buildup and an environment suitable for microorganism colonization.

Commitment 7 in the maintenance and monitoring section of the interim revegetation section of the plan says the soil materials on the fill slopes will be sampled at five year intervals. Because development of these soils is part of the reclamation plan, results of these analyses need

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to be included in the application. The sampling program to which the applicant commits in the application needs to specifically include the interim revegetation areas where soil was being developed for final reclamation. This commitment is already in the plan, but the applicant needs to fulfill its commitment.

Exploration/Sampling Program - Refuse Piles

Appendix R645-301-200-C contains analyses of two core samples from the refuse piles, one from Deer Creek Canyon and one from Elk Canyon. The analyses of the Deer Creek Canyon refuse, site 1 on Drawing DS-1810-D, show high salt levels in the upper part of the profile similar to the soil samples gathered elsewhere. This could be because the sample site was near two storage docks where salt may have been used. Since only two samples were taken, they may not be representative of the entire refuse pile. Further sampling of the refuse in Deer Creek Canyon might show other portions of the refuse pile do not have the high salt levels found at site 1. The refuse in Elk Canyon, site 6, does not have the high salt concentrations, but it does have high pH values (9.0) in the upper layers. No acid forming potential was identified in these samples.

Within Chapter 3 of the current mining and reclamation plan, page 3-65, Table 7, Deer Creek Mine - Waste Rock Analysis, several problems are identified associated with materials taken from roof and floor materials. Data is incomplete since no determinations were made for selenium or for acid base potential. One of the samples had a paste pH value of 5.87 which indicates there could be acid forming potential. One Blind Canyon floor sample apparently had a very high SAR value which indicates that although some areas may meet the Division's criteria, there are probably isolated problem areas.

The Division lacks confidence in the data in Table 7 because some of the SAR values do not correlate with the reported calcium, magnesium, and sodium values. Either some of the SAR values were calculated incorrectly or the sodium, calcium, and magnesium values were not reported correctly.

Tables I and II in Chapter 4 also show some chemical analyses of coal waste with one sample of slag. The slag sample had a very high pH (10.9), but otherwise, no problems were found in the refuse or slag samples. However, the applicant did not test these samples for several parameters listed in the Division's soils guidelines.

The Division cannot make a determination of waste acceptability because of errors in the data, incomplete data, and because several samples show unacceptable salt, SAR, and pH levels. Errors exist within some of the data in the current plan, and some analyses are incomplete and do not follow the Division's soils guidelines. Furthermore, unacceptable criteria are identified for Blind Canyon floor samples for SAR and pH, and poor criteria are met on Blind Canyon split samples for SAR and on Hiawatha floor samples for pH. Therefore, since data errors exist, data is incomplete, and roof and floor analyses identify toxicity, the Division cannot make a

determination of waste acceptability.

There is some evidence not all of the refuse is toxic to plants. This is discussed further in the reclamation plan section of this analysis.

The applicant commits in the application to sample refuse on the same schedule as substitute topsoil and includes some details of this sampling plan. Sampling will be done in 2001 and/or 2002. Sample points will be placed randomly in the refuse areas, and samples will be taken at three-foot depth intervals to a point four feet below the grade of the proposed final surface configuration. This general commitment is acceptable, but until the Division has this information, it must be assumed that the refuse must be covered with at least four feet of the best available non-toxic and non-acid forming material.

All soil and refuse sampling should be coordinated with the Division. Although this is not a regulatory requirement, the applicant should be able to avoid having to resample if a Division soil scientist is present when the samples are being taken. In addition, the application does not specify how many samples would be taken, and this can be coordinated in the field at the time of sampling.

Findings:

Information provided in the application is adequate to meet the requirements of this section of the regulations. The applicant should coordinate its soil and refuse sampling program so Division representatives can be present when these samples are being taken. This is not a regulatory requirement, but it is a good way to avoid questions about the data or having to resample.

RECLAMATION PLAN

POSTMINING LAND USES

Regulatory Reference: 30 CFR Sec. 784.15, 784.200, 785.16, 817.133; R645-301-412, -301-413, -301-414, -302-270, -302-271, -302-272, -302-273, -302-274, -302-275.

Analysis:

According to Section 412 of the application, the postmining land uses will be grazing and wildlife habitat, and these are the same as the premining land uses. Both the Forest Service and Bureau of Land Management have indicated no foreseeable changes to this use, and the area is zoned by the county for grazing, mining, and recreation.

Findings:

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

TOPSOIL AND SUBSOIL

Regulatory Reference: 30 CFR Sec. 817.22; R645-301-240.

Analysis:

Soil Redistribution

Reclamation will involve three disturbed areas: Deer Creek Canyon, Deer Canyon, and Elk Canyon. According to the backfilling and grading plan in Section R645-301-553 of the application, reclamation will begin at the uppermost parts of the disturbed areas and will proceed down the canyons. Various stages of the process will be occurring simultaneously. Substitute topsoil will be excavated from the existing undisturbed drainage corridor. The material will be taken from between stations 9+00 and 15+00 and between 24+00 and 30+00 as shown on map DS-1782-D. It is estimated 58,891.08 cubic yards of material is available which gives an average cover depth of 27 inches over the area this map shows receiving soil.

Map DS-1782-D does not show soil being placed over all of the disturbed area, and the application does not discuss why this is the case. According to verbal information from the applicant's representative, this is because in-place substitute topsoil will be used in some areas. The application needs to make this clear.

The estimates of the amount of soil available must be considered strictly estimates at this point and cannot be finalized until results are received from the sampling program. Having 27 inches of substitute topsoil over nontoxic spoil and refuse would be acceptable, but the Division is unsure how widespread the problems are that have been identified in the spoil and refuse. Therefore, the Division accepts the plan as presented, but the applicant must understand there is a chance modifications will be needed.

Soil Nutrients and Amendments

The biology chapter of the application says fertilizer will be applied at the rate of 40 pounds per acre of ammonium nitrate and 35 pounds per acre of triple superphosphate. The Division encourages operators to use minimal amounts of fertilizer, and these quantities are relatively low.

In addition to the fertilizer, the applicant commits to apply one ton per acre of certified noxious weed free hay, and the hay and fertilizer will be incorporated into the soil in the gouging

process. This should help to increase the amount of organic matter and the fertility and structure of the substitute topsoil.

Soil Stabilization

Once soil has been distributed, the soiled surface will be roughened by deep gouging (pocking) using a trackhoe to create depressions approximately 3 feet diameter x 1.5 feet deep. The application says these depressions will be developed throughout the reclaimed area and will influence moisture retention and greatly reduce sediment loss. Deep gouging creates depressions across the surface, which increases water harvesting and helps reduce surface erosion. In addition, rock litter consisting of various sized rocks and boulders will be randomly placed on the slopes and/or nested into the soil to help control slope slippage.

After seeding, the application says certified noxious weed free straw mulch will be applied at a rate of 2000 pounds per acre followed by application of 500 lbs/ac of tackifier on slopes greater than 20% to anchor the straw mulch and stabilize the soil. This mulching technique has worked very well at similar nearby mine sites.

Rills and gullies which develop to a depth of nine inches or greater in areas that have been re-graded and topsoiled and which either; (1) disrupt the approved post-mining land use or the reestablishment of the vegetative cover, or (2) cause or contribute to the violation of water quality standards for receiving streams will be filled, regraded, or otherwise stabilized. The topsoil will be replaced and the areas will be reseeded.

Refuse Pile Reclamation

Refuse that is cut during grading will be used as fill along cut banks and highwalls. Any acid-forming or toxic materials will be covered with four feet of non-acid and/or nontoxic material. The sampling program included in the application will determine whether some of the refuse is suitable as subsoil.

If the applicant can adequately identify and isolate those areas of the refuse where toxicity problems are located, it may be possible to use part of the refuse as a subsoil substitute. Refuse with unacceptable chemical or physical characteristics would need to be segregated and buried under at least four feet of non-toxic, non-acid forming, and noncombustible material as the applicant has committed to do.

The Division anticipates that not all of the refuse will be toxic or acid-forming. Sampling of vegetation established on portions of the refuse pile for interim erosion control indicates the refuse can, at least in some areas, support vegetation. In 1998, vegetation cover on the refuse pile was measured by the applicant's consultant as 40.5%, and in 1999, vegetation cover on the pinyon-juniper reference area was roughly estimated as about 40%. While this seems to indicate the refuse can, by itself, support adequate vegetation, there is no vegetation established on the

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area of the refuse pile where the high salt concentrations were found near the surface.

Findings:

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

R645-301-240, Map DS-1782-D does not show soil being placed over all of the disturbed area, and the application needs to explain why this is the case or else provide for substitute topsoil cover over the entire disturbed area.

REVEGETATION

Regulatory Reference: 30 CFR Sec. 785.18, 817.111, 817.113, 817.114, 817.116; R645-301-244, -301-353, -301-354, -301-355, -301-356, -302-280, -302-281, -302-282, -302-283, -302-284.

Analysis:

Timing

Table 3-1 shows the timing of various steps in reclamation, and Table 3-2 is a schedule of monitoring activities. Except for soil sampling, the reclamation timetable does not show months in which the activities would occur, but a note below the table discusses the timing of seeding and planting more specifically. Soil salvage and replacement activities would be done during backfilling and grading operations. Advantageously, seeding will occur in the fall, but if recontouring is completed in the spring on the upper portions of the disturbed area, seeding will follow. Seeding will occur as contemporaneously as practical with grading operations, and tree and shrub plantings will occur in early spring.

The seeding and planting schedule is acceptable, but the applicant should attempt to seed as much of the area as possible in the fall. Grading cannot usually begin in the spring until the ground has dried to some degree, and by this time, seeding would be very risky.

Although spring is recognized as a good time to plant seedlings, other operators have had good success planting containerized stock in the fall, particularly at mid- or higher elevation sites that are likely to have some snow cover for much of the winter. Snow cover reduces frost heaving.

The application is not required to have a revegetation monitoring schedule, but the schedule in the application should be adequate for showing revegetation success for bond release.

Mulching and other soil stabilizing practices.

The section of this review addressing the reclamation plan for soils and subsoils discusses soil preparation techniques.

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Seed and planting mixes

The applicant has revised the three seed mixes in the mining and reclamation plan and has followed Division recommendations. Many of the species have been tried at interim revegetation sites at the mine, and the recommendations were partly based on the successes at those sites. Every species in the mixtures is native to the area, and the mixtures are diverse and should lead to vegetation stands that comply with the revegetation performance standards. Drawing DS-1797-D shows which seed/planting mixes will be planted in which areas of the mine. The riparian seed mixture will be applied to the area within 20 feet either side of the channels. The conifer seed mixture will be applied to north-facing slopes, and the pinyon-juniper seed mixture will be applied on south-facing slopes.

The applicant is required by R645-301-358.400 to enhance where practicable, restore, or replace, wetlands and riparian vegetation along rivers and streams and bordering ponds and lakes. Since these areas are considered habitat of unusually high value, the applicant needs to use the best technology currently available to achieve these goals. Deer Creek above and below the mine supports a riparian community that needs to be restored as far as possible. The seed and planting mix contains many of the species assumed to have been in the riparian area before disturbance as shown in Table 6, page 2-156, of the current mining and reclamation plan. Many of the species in the seed and planting mix are upland species, but there are other species in the mix that would grow strictly in areas with enhanced moisture availability.

In Section R645-301-342, the application says channel design will incorporate soft bioengineering in slope areas of less than 5% along the Deer and Elk Creek drainages. Instead of riprap, alternative instream controls, such as wing deflectors, boulder clusters, and U- or V-shaped weirs, will be used. Locations where these techniques will be used are shown on Drawing DS-1780-D, and specific designs are in Figures 7-1A and 7-2A.

In the November 6, 2000, technical analysis, the Division made recommendations and requirements for changing the stream restoration designs. These included planting sedge and grass plugs and additional willows behind logs and root wads to prevent erosion and scouring, changing the locations of the willow wattles, and doing a sieve analysis on the channel base material. In its response letter, the applicant explained the reasons for the stream channel design, and a commitment to do a sieve analysis on the base material was included in the application. The Division has some concerns about the designs in the application, but the applicant's reasoning is logical. The Division is willing to accept the design, but it is important that the reclaimed channel be monitored closely following reclamation, particularly until vegetation becomes established.

Seeding and mulching methods

Seed will be applied with a hurricane spreader or using a hydroseeder. If a hydroseeder is used, a small amount of wood fiber mulch will be added to mark the coverage area during

application. These are standard seeding methods and are acceptable.

After seeding, certified noxious weed free straw mulch will be applied at a rate of 2000 pounds per acre followed by application of 500 pounds per acre of tackifier to anchor the straw mulch and stabilize the soil. This mulching technique has worked very well at similar nearby mine sites. The applicant should not use an asphalt-based tackifier.

Two of the seed mixes include some combination of containerized plants, cuttings, rooted cuttings, bare root plants, and poles. In the riparian areas, 25% of each of these would be planted during each of the first four years. This allows some sedimentation and development of suitable planting sites to occur before all the seedlings are planted. In the Division's experience, there are not always enough places to plant along a restored stream during the first year after reclamation.

The Division has recently become aware of difficulties that can accompany planting rooted cuttings. The roots tend to break off easily, and for this reason, they need to be handled very carefully. If proper care is taken, however, they can work very well.

The concept of planting the transplants in stages was suggested by the Division, but the applicant needs to be aware it would lead to a longer extended responsibility period. Regulation R645-301-357.311 allows planting trees or shrubs at a rate of up to a cumulative total of 20% of the required stocking rate through 40% of the extended responsibility period without restarting the extended responsibility period. The success standard for woody plants in the riparian area is 3412 per acre; therefore, up to a total of 682 trees or shrubs per acre could be planted during the first four years after the initial planting without affecting the extended responsibility period. According to the application, however, about 1014 per acre would be planted each of the first four years for a total of about 3042. This, of course, is much greater than 682.

Maintenance and monitoring

The application does not discuss irrigation, so it is assumed the reclaimed area will not be irrigated. Rodent control measures will be implemented as necessary. Weed control will not be done unless it is necessary, but all noxious weeds will be eradicated if they become established on the site. The Division does not anticipate that irrigation or pest control will be needed except for noxious weeds. The husbandry practices in R645-301-357 allow control of noxious weeds through the entire extended liability period without affecting the length of this period.

The application says the annual monitoring will include inspection for rills and gullies. If present, they will be filled and the soil reseeded. Rill and gully repair will follow the requirements of rules R645-301-357.360 through R645-301-357.365.

Standards for success

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The plan contains information about three reference areas that will be used as revegetation success standards. It appears from the data and comparisons in the plan that these reference areas are acceptable.

The application discusses ways of measuring vegetation cover, productivity, and the density of woody plants. It also mentions the statistical tests that will be used, and these methods are acceptable.

The application says revegetation for tree and shrub species will be considered successful when the tree and shrub counts in the reclaimed areas are similar at the time of bond release to the counts in the reference areas. Standards attained at the time of bond release will be approved by the Division and the Division of Wildlife Resources.

The Revised Universal Soil Loss Equation (RUSLE) will be used to model sediment loss from disturbed and reclaimed areas, and sedimentation will be monitored above and below the mine. While there are problems with every method developed for measuring erosion, those discussed in the application are acceptable.

At the time of bond release or when the extended period for successful revegetation has passed, one or a combination of the similarity indexes in Appendix B of the Division's "Vegetation Information Guidelines" will be used to compare life forms and/or species present in the reclaimed and reference areas. Similarity will be considered successful when the index value is at least 70% of the reference area.

The methods and standard proposed are acceptable. The application leaves open the possibility of doing similarity tests on life forms and/or species. Since reclaimed and reference areas do not always have exactly the same species, it is best to leave the option open to do the test either way. The applicant and the Division should also do a qualitative analysis of the vegetation data. The Division has found in comparing diversity between reclaimed and reference areas that diversity and similarity indexes are useful but that they do not always take enough factors into account. It is impossible with many of these indexes to use a statistical test, so if the standard is not met, there is no alternative but to say the site does not meet bond release criteria.

Seasonality of established plant species is an important issue at some mines, but most or all of the species encountered in the vegetation sampling at Deer Creek were cool season species. These are generally much easier to establish than warm season species, so seasonality should not be a concern. To achieve revegetation success, essentially all of the species in the reclaimed area should be cool season.

The other requirements in R645-301-353 would be very difficult to measure quantitatively, so a qualitative analysis at the time the applicant is seeking bond release is most appropriate.

Field Trials

The application includes no specific proposal for field trials, but field trials could be needed depending on the results of sampling refuse and substitute soils.

The mining and reclamation plan and the application lack adequate soils and refuse data for the Division to determine conclusively that revegetation is feasible using the proposed reclamation plan. The application includes a plan for sampling soils and refuse, but without that information, it is not known how well vegetation will grow.

It is vital that there be adequate suitable soils for revegetation. The applicant anticipates having 27 inches of soil over subsoil and refuse with at least four feet of material over any toxic or acid-forming spoil or refuse. This should be adequate if this much material is actually available. Most perennial species in Utah have relatively deep roots so they can extract water from increasing depths as the summer progresses. If root growth is inhibited by poor chemical or physical characteristics or if the soil has low water holding capacity, vegetative cover, production, diversity, and erosion control will all suffer.

Fish and Wildlife Habitat

The seed mixtures in the application are acceptable for providing proper habitat conditions for wildlife.

Re-establishment of the riparian areas is an important aspect of reclamation because all riparian areas are considered critical wildlife habitat. The reclamation plan presented in the application is designed to restore as many wildlife values as possible to the riparian area.

No other enhancement measures are discussed in this section of the application, but the application says rocks and boulders would be placed on the surface. This enhancement method has been used successfully at other mines to create habitat for birds and small mammals.

The application discusses possible water discharge from the portal after reclamation. In the July 7, 1999, technical analysis, the Division required a program to study the effects of the discharge on macroinvertebrate populations in Deer Creek and Huntington Creek. The cover letter for the response to this technical analysis says the applicant believes there is no justification to perform a macroinvertebrate study before or after reclamation.

Volume 9A of the current mining and reclamation plan contains a report from the Ecosystem Research Institute about the water quality and macroinvertebrate studies done in Deer and Huntington Creeks in 1990, 1991, 1992, and 1994. The report concludes the water discharge from the Deer Creek mine had no measurable effects on the macroinvertebrate populations of Huntington Creek. However, it did affect Deer Creek.

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Water from the mine had a pH of near 7, but as CO₂ was lost from the water, the pH increased to about 8.5 and calcium carbonate precipitated. The report estimates that 250,000 kg of calcium carbonate was deposited as limestone in Deer Creek over a three year period. It concludes that this rate of precipitation would "seal the stream bottom and thus prevent accrual of stream water into the adjacent riparian community." It also says this precipitation would decrease the amount of macroinvertebrate colonization in Deer Creek. This could be through alteration of the substrate or direct effects on the macroinvertebrates as observed in the stonefly study.

The Division contacted the Division of Wildlife Resources about this issue, and they are primarily concerned about any effects on Huntington Creek rather than Deer Creek. They do not feel the effects on Deer Creek are of enough significance to warrant further monitoring of the macroinvertebrate populations. Therefore, while there have been and probably will continue to be effects on the macroinvertebrate populations of Deer Creek, these are not significant enough to require further monitoring.

After the mine is reclaimed, there will, presumably, continue to be some discharge from the mine and calcium carbonate precipitation; however, most should occur near the disturbed area with less happening farther down the canyon. The report in the plan discusses the sealing effect the calcium carbonate had on the streambed and that it decreased infiltration into the soil. This could continue to occur after reclamation, but the area most likely to be affected would be the reclaimed area. As the report in the plan says, there were, unexpectedly, no effects of the water discharge on the riparian vegetation. The increased water should have had some effects on the vegetation composition and cover, but limestone precipitation apparently sealed the stream bottom to the point there were no measurable effects. When the mine water discharge is eliminated or greatly reduced, the effects of sealing the creek bottom will remain, so the amount of water available to riparian vegetation could be decreased compared to premining levels.

Findings:

Information provided in the revegetation section of the application is adequate to meet the requirements of this section of the regulations. However, before the Division can make a finding that reclamation is feasible, it needs complete soils and refuse information. The applicant has committed to gather this information, but the data is not yet in the application or the approved mining and reclamation plan.

RECOMMENDATION:

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