



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

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March 31, 1997

Johnny Pappas, Senior Environmental Engineer
 AMAX Coal Company
 P.O. Drawer PMC
 Price, Utah 84501

RE: Reclamation Bond Adjustments for the Willow Creek and Castle Gate Mines, AMAX Coal Co, Castle Gate Mine, ACT/007/004-95E, File #2, Carbon County, Utah

Dear Mr. *J. Pappas* Pappas:

The attached technical memo by Wayne Western, outlines two deficiencies in the above referenced amendment. They basically consist of separation of permit areas and earthwork cost estimates. Please provide a response to these deficiencies by April 15, 1997.

Any questions regarding this amendment may be directed to Wayne Western, Senior Reclamation Specialist, of the division.

Sincerely,

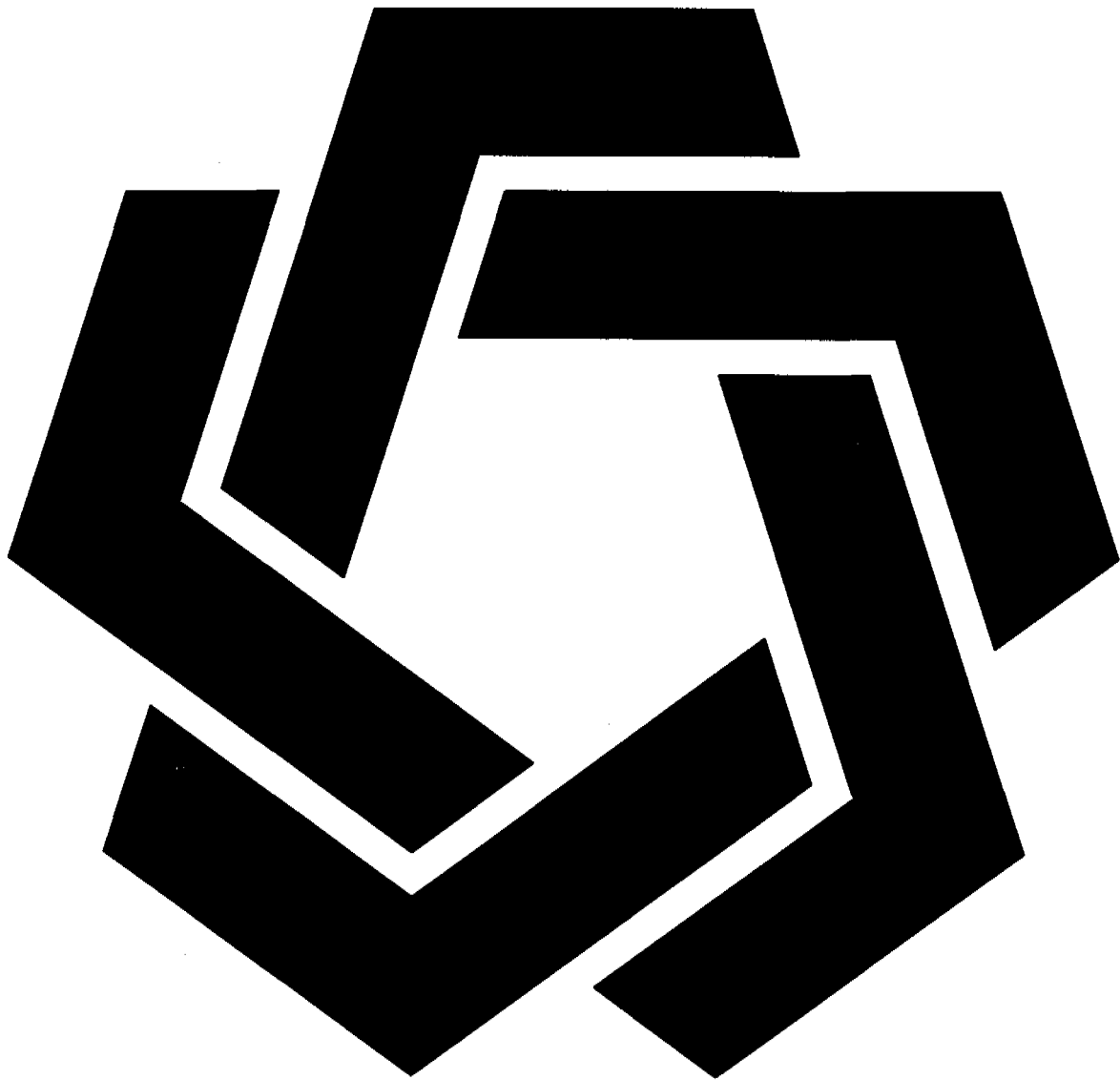
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tt

cc: Ranvir Singh, OSM
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State of Utah
Division of Oil, Gas and Mining
Utah Coal Regulatory Program



Castle Gate Mine
Hardscrabble Canyon Reclamation Plan
ACT/007/004 - 96F
April 14, 1997

TABLE OF CONTENTS

ACT/007/004-96F

Introduction	1
Summary of Outstanding Deficiencies	2
Operation Plan	
Spoil and Waste Materials	
Disposal of Noncoal Waste	3
Coal Mine Waste	3
Refuse Piles	4
Reclamation Plan	
Topsoil and Subsoil	4
Revegetation	8
Postmining Land Uses	9
Approximate Original Contour Restoration	11
Backfilling and Grading	12
Mine Openings	14
Road Systems and Other Transportation Facilities	15
Bonding and Insurance Requirements	17
Reclamation Hydrologic Information	
Diversions	18
Stream Buffer Zones	18
Sediment Control Measures	18
Siltation Structures	19
Sedimentation Ponds	19
Exemptions for Siltation Structures	19
Discharge Structures	19
Structure Removal	19

TECHNICAL ANALYSIS

Last revised - April 14, 1997

INTRODUCTION

On May 1, 1996, the Division received a proposal from Amax Coal Company to revise the reclamation plan for Hardscrabble Canyon, and a revised plan was received December 2, 1996. Portions of Hardscrabble Canyon were reclaimed in 1984, 1993, and 1995. The Division previously approved a reclamation plan for the remainder of the canyon, but the applicant has acquired new soils and coal refuse information that made it necessary to alter the backfilling and grading plan. Also, a person who owns grazing rights above the property requested that the road not be fully reclaimed but left so he can trail his livestock through the area.

Information included in the permit changes include as-built drawings and information related to the No. 4 mine area, a revised backfilling and grading plan for the reclamation of Hardscrabble Canyon and the incorporation of a permanent road as part of the postmining land use. Other changes include different surface preparation and mulching techniques which are included as part of the sediment and erosion control plan.

TECHNICAL ANALYSIS

Last revised - April 14, 1997

SUMMARY OF OUTSTANDING DEFICIENCIES

As determined in the following analysis and findings, information found in the plan was considered adequate to meet all of the regulatory requirements. However, prior to approval by the Division for any adjustment to the current bond amount, the applicant must provide the following:

R645-301-800: Prior to approval for any bond release or application for adjustment to the bond amount, the applicant must provide complete and updated information regarding the reclamation cost estimate provided in the plan for all areas within the permit area. No determination as to the amount of bond available for release or transfer can be made by the Division until such time as current cost information is provided to and approved by the Division.

TECHNICAL ANALYSIS

Last revised - April 14, 1997

OPERATION PLAN

SPOIL AND WASTE MATERIALS

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

Analysis:

Disposal of noncoal waste

Page 3.3-24 of the proposal indicates that nonhazardous and nonflammable materials, such as concrete, asphalt, and steel, will be used as backfill in areas such as sediment pond 007, highwalls, and cut slopes.

Coal mine waste

Page 3.3-26 states that coal debris and acid- and/or toxic-forming material exposed or excavated during reclamation will be removed, if possible, and used as backfill against highwalls, cut slopes, or as backfill in existing sedimentation ponds. These materials will then be covered by a minimum of four feet of acceptable overburden material. Where coal debris and acid- and/or toxic-forming material is found and cannot be effectively completely removed, the area will be over-excavated to allow for reclamation of the area with a cover of at least four feet of appropriate overburden material. The over-excavated material will be used as backfill against highwalls, cut slopes, etc., and then covered by a minimum of four feet of acceptable overburden material.

Exact quantities and locations of such materials is not and cannot be determined until such time as reclamation activities occur. The majority of the disturbance is pre-SMCRA with little known information as to the location and disposition of refuse materials, spoil, coal mine waste, and mine development waste. The applicant has committed to handle these materials in accordance with the parameters set forth in the performance standards and as described in the plan.

TECHNICAL ANALYSIS

Last revised - April 14, 1997

Refuse piles

Refuse material, when encountered, will be handled similarly to that indicated in coal mine waste.

Findings:

Information provided in the proposal is considered adequate to meet the requirements of this section of the regulations. Refer to comments in the soils section of the plan regarding testing and analysis of acid- and/or toxic-forming materials.

RECLAMATION PLAN

TOPSOIL AND SUBSOIL

Regulatory Reference: R645-301-240

Analysis:

The remaining 20 acres scheduled for reclamation in Hardscrabble Canyon were disturbed by mining prior to the enactment of SMCRA. As a result, no topsoil was salvaged from the site. The existing soil and overburden material at the site will be used as substitute topsoil. Several studies have been performed to assess the usefulness of these materials for reclamation purposes. Both the 1990 and 1995 soil investigations were conducted to evaluate the physical and chemical characteristics of the soil materials according to the Division's guidelines for topsoil and overburden¹. In addition, the 1995 soil investigation was conducted to locate areas of buried coal debris that would likely be encountered during reclamation. Descriptions of the soils and coal debris were made using trenches, soil pits and soil borings at varying depths.

Generally, overburden samples have a loam to sandy loam texture, possess a weak, sub-angular to granular structure, and have a pH in the range of 7.4 to 8.6. Coal samples range from loamy sand to sandy loam in texture, and are generally loose to single grained with a pH rang

¹Leatherwood, J., and Duce, D., 1988. Guidelines for Management of Topsoil and Overburden for Underground and Surface Coal Mining. State of Utah Department of Natural Resources, Division of Oil, Gas and Mining.

TECHNICAL ANALYSIS

Last revised - April 14, 1997

from 7.5 to 8.0. Overburden and coal samples meet the requirements of the DOGM for toxicity and acid-forming potential. Boron concentration does not exceed 5 mg/kg in any sample with only 2 samples in excess of 3 mg/kg. Selenium is rarely above the method of detection (0.02 mg/kg) limit for the hot water extraction procedure with only three samples HC-COMP-3 (0.02 mg/kg), HC-COMP-6 (0.04 mg/kg) and HC-COMP-12 (0.02 mg/kg) exceeding the detection limit. In terms of surface acidity potential, all samples meet DOGM's limit of -5 tons CaCO₃ per 1000 tons material. Coal samples have a higher acid potential with their neutralization capacity 4 times greater than their total sulfur acidity. The composite loam sample HC-COMP-8 has elevated sodicity with a sodium adsorption ratio (SAR) of 15.7 exceeding DOGM's SAR limit of 12 for fine textured soils. DOGM's guidelines require that in soils with unacceptable SAR values, exchangeable sodium percentage (ESP) is needed to verify a true sodicity problem. By traditional classification, soils with an ESP greater than 15% having an electrical conductivity less than 4 are classified as sodic soils².

With the exception of overburden between 30 and 72" in HC-3, and 18 and 48" in HC-5 (Sample HC-COMP-8 has high SAR values), soil material encountered in the 1995 sampling has the potential for use as alternate topsoil within Hardscrabble Canyon. However, the use of identified overburden suitable as substitute topsoil may produce water limiting conditions for regenerating vegetation since the overburden has a weak soil structure and is essentially void of organic matter. To mitigate against the drought nature of the overburden, AMAX proposes that hay and/or straw mulch, or suitable substitute with high organic matter content, be incorporated into the upper layers of soil thus improving aeration and water holding capacity of the overburden material. The plan further notes that care should be taken during the mulching process to avoid compaction of the upper regions of the soil. Loam soils, with elevated sodium levels, even concentrations well below the Division's minimum requirements, are prone to aggregate slaking. Aggregate slaking increases bulk density of the soil and may cause reductions in hydraulic conductivity. Compaction would exacerbate this condition by further reducing the micro-pore space of the soil.

Based on the results of the 1995 soil sampling and the types of material found within the excavations and borings, approximately 20,270 yd³ of substitute topsoil may be available for use as appropriate growth media. The total area to be reclaimed in Hardscrabble Canyon is approximately 869,122 ft². The volume of salvaged soil will allow approximately 9 inches of soil cover over the reclaimed areas with the exception of road R-1 and the reclamation channels. The postmining land use for Hardscrabble Canyon is grazing and wildlife.

²Terminology Committee, *Glossary of Soil Science Terms*, Soil Science Society of America, Madison, Wisconsin, 1973.

TECHNICAL ANALYSIS

Last revised - April 14, 1997

Alternate sediment control measures (ASCMs) will be implemented during reclamation to reduce erosion of the soil growth media. These ASCMs will include the following and are discussed below:

1. Ripping of the regraded surface prior to placement of growth media,
2. Contour furrowing,
3. Incorporation of hay and/or straw mulch into the growth media,
4. Deep gouging of the growth media,
5. Seeding and fertilizing the prepared soil,
6. Addition of more mulch following seeding, and
7. Physically or chemically anchoring the final mulch layer.

Ripping the fill surface prior to soil placement will help promote a smooth fill: soil boundary interface that will encourage both root penetration and water infiltration. This smooth interface is especially critical on reclaimed compacted fill slopes to help retain soil and prevent sloughing of the soil surface.

Following placement of the soil growth media, an organic mulch will be incorporated into the soil at a rate of 2 tons/acre by either plowing along the contour, deep gouging, or a combination of these two methods. The soil surface will be gouged to an approximate 12 to 18 inch depth using the bucket of a trackhoe. Deep gouging will thus extend below the 9 inch thickness of the growth media. However, the 1995 soil investigation shows that the soil materials which will be used for backfilling in the canyon are neither acid nor toxic-forming. Therefore, if these materials are exposed, they will not create revegetation concerns. With time, wind and water transport of adjacent soil material will cover exposed fill.

Approximately 25 pounds of nitrogen and 50 pounds of phosphorus will be applied per acre of reclaimed area. The nitrogen will be a slow-release form (i.e., urea), while the phosphorus will be in the form of phosphate (P_2O_5).

Following seeding, an additional 2 tons/acre of straw mulch will be spread over the seeded area by mechanical blowers or hand spreading. This final mulch will either be crimped with the trackhoe bucket or sprayed with a tackifier.

Stability analyses in the No. 4 Mine canyon indicate that fill slopes as steep as 39° (1.2H:1V) will be stable with a static safety factor exceeding 1.3H:1V, provided that the fill is properly placed and compacted during construction. These stability analyses are considered representative of all slopes to be reclaimed within Hardscrabble Canyon. It is noted that reclamation slopes have been designed to be concave in cross section and not exceed a slope of

TECHNICAL ANALYSIS

Last revised - April 14, 1997

2H:1V. Slopes shown to be steeper than 2H:1V are natural rock outcrops that will be retained following reclamation. To the extent possible, using the reasonably-available material, existing cut slopes will be backfilled during reclamation operations, however, given the extent of pre-SMCRA disturbances in the canyon, some cut slopes will likely remain following reclamation. Pertaining to reclaimed cut slopes and other steep reclaimed slopes, deep gouging and/or straw mulch are not sufficient alone to protect the soil surface from erosion on steep slopes (\geq 2H:1V) before and after seeding. In addition to deep gouging and mulching, erosion control materials are needed on surface slopes at 25° (2 H: 1 V) and steeper to protect the soil material from erosion. These materials may include erosion control matting, blankets, tackifiers, etc.

Coal debris and acid- and/or toxic-forming material exposed or excavated during reclamation grading will be removed, if possible, and used as backfill against highwall, cut slopes, or as backfill in existing sedimentation ponds. The plan states that all coal debris and acid- and/or toxic-forming material will then be covered by a minimum of four feet of overburden material. The analytical section (Appendix 3.3M, Overburden and Coal Evaluation, April 1, 1996, Section 5-1 Coal Disposal) states that "based upon the nontoxic/non-acidic nature of the coal, the depth of cover placed on coal and mixed coal waste will be determined by the amount of overburden and alternative growth media available on site." The application contains the clarifying statement, "Despite the nonacid- and/or toxic-forming nature of the coal debris, the applicant will make every effort to cover this material with a minimum of 4 feet of the best available, nonacid- and/or toxic-forming and noncombustible material. The applicant's ability to place a minimum of 4 feet over the coal debris will be limited to the available fill material existing at the site; therefore, some variability in overall cover thickness may exist." Through discussions with the applicant's personnel, it is understood this variability would result from some unevenness in placing material over the waste and should not be more than several inches. As further discussed in the analytical appendix 3.3M, section 4.0 Analytical results, coal samples range from loamy sand to sandy loam in texture, and are generally loose to single grained. Because of the water limiting conditions of coal and coal-waste material, vegetation regeneration is severely restricted. In the event that inadequate overburden exists and the operator wants to use less than four feet of cover, the operator must specifically request a variance to the four feet cover requirement.

Findings:

Information provided in the proposal is considered adequate to meet the requirements of this section of the regulations. In the event that inadequate overburden exists and the operator wants to use less than four feet of cover, the operator must specifically request a variance to the four feet cover requirement.

TECHNICAL ANALYSIS

Last revised - April 14, 1997

REVEGETATION

Regulatory Reference: R645-301-340

Analysis:

Following placement of the growth medium, hay, straw, or another organic amendment will be incorporated into the medium at a rate of two tons per acre. It will be incorporated by either plowing on the contour, deep gouging, or a combination of these methods. Either after or during mulch incorporation, depending on which method is used, the surface soil will be gouged to a depth of about twelve to eighteen inches using a trackhoe bucket.

This depth of gouging would extend into materials below the growth medium. This could be a concern, but the application demonstrates that these materials are not acid-forming or toxic. Also, the gouges will gradually fill in mostly with material originally placed on the surface. Additionally, the applicant has located additional growth medium making the total depth of substitute topsoil about two feet. With this additional material, the gouges should not extend into spoil or waste material.

After gouging, the area will be seeded with species mix 1 except within 20 feet of the edge of channels where species list 5 will be used. Seed will be broadcast seeded. Next, the area will be fertilized and mulched. Mulch will be spread with mechanical blowers or by hand and will be anchored either by crimping it with a trackhoe bucket or shovel or by spraying it with a tackifier. Two tons per acre of straw will be used for mulch.

Species list one complies with regulatory requirements but could be modified according to experience with using it in Sowbelly Gulch and Hardscrabble Canyon. Some species from this list have not been observed in either canyon while others have done very well. Specific recommendations were made in a previous review but were not incorporated in the plan. No changes are recommended for species list five.

The revegetation methods proposed are expected to produce good revegetation results. Gouging is a very effective water harvesting treatment, and the organic matter additions and mulching should improve the chances for revegetation success.

Other parts of the revegetation plan are not changed. Chapter 9 includes methods for judging revegetation success and to enhance wildlife habitat.

TECHNICAL ANALYSIS

Last revised - April 14, 1997

In 1993, the applicant sampled the Goose Island area for revegetation success. Vegetation cover data were compared with cover data from reference areas in Gilson Gulch and Sowbelly Gulch. The amount of cover in Goose Island was similar to what was in the reference areas, but there were not as many shrubs, so the reclaimed area did not meet the diversity success standard established in the mining and reclamation plan. More recently, however, it appears numerous sagebrush seedlings have become established.

Hopefully, the rest of Hardscrabble Canyon will have greater shrub density than Goose Island. If vegetation in Goose Island is sampled with vegetation in the remainder of Hardscrabble Canyon for judging revegetation success, the amount of shrub cover for the entire site could be compared with the reference areas. The average should be enough to meet success standards. Alternatively, the applicant could wait to see if the sagebrush seedlings mature or could try to establish shrubs from seed or seedlings. This last option is not recommended.

Findings:

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

POSTMINING LAND USES

Regulatory Reference: R645-301-412, -301-413, -301-414, -302-270, -302-271, -302-272, -302-273, -302-274, -302-275.

Analysis:

The proposed permit changes for Hardscrabble Canyon include the construction of a road to be permanently retained as part of reclamation. This road has been designated as reclamation road R-1, and can be seen on the postmining reclamation map for Hardscrabble Canyon as Exhibit 3.3-4A.

Appendix 3.3L provides a letter requesting post-reclamation access in Hardscrabble Canyon by Nick Sampinos, Attorney for Boyd Marsing. The letter explains that private and BLM land grazing allotments are in close proximity to Hardscrabble Canyon and that the existing road through the mine property has historically been used for grazing access. Mr. Marsing has been using the land for grazing since the mid-1960's. This letter requests

TECHNICAL ANALYSIS

Last revised - April 14, 1997

retention of a road following reclamation based on historic use of the road for ingress and egress to the higher mountain grazing areas.

Letters were submitted by Cyprus Plateau Mining Corporation to American Electric Power (AEP), the BLM, and the Carbon County Commissioner seeking approval for retention of road R-1 as a primary, permanent road through Hardscrabble Canyon. The letters describe the intended use for the road and the general design of the road as it is to be reconstructed during reclamation activities. No adverse comments were received regarding the retention of the construction of the road. The Bureau of Land Management response said the continued use of the road would be in conformance with its land use plan. Carbon County Road Commissioner, William D. Krompel did indicate that the county road is a class B road and actually extend 0.2 miles into the site beyond the existing gate.

Text describing the road is found on page 3.3-27 of the plan. The proposed reclamation road is stated to be used for accessing the substation in the Goose Island area, for reclamation repair as needed, and to provide access to grazing lands in the canyon. The reclamation road will, in effect, replace the existing road designated as P-1, which is part of the current mining operations. Re-alignment and relocation of the existing road is necessary in order to achieve drainage control and backfilling and grading necessary during reclamation operations.

Of the proposed uses for road R-1, access for grazing, hunting, mountain biking, and other recreational uses, and access for BLM land management are indicated. Access onto the road from the county road will be restricted by a locked gate. Use of the road for reclamation treatments and for access to the substation are only uses which would occur during ongoing mining and reclamation activities and would not occur following final reclamation of the site. The road connects to the county road at the lower end of the mine site and to an existing jeep trail at the upper end of the site above the disturbed area boundaries.

The letter provided on behalf of Mr. Marsing in Appendix 3.3L only expresses the interest of an individual holding grazing allotments and is in support of the proposed retention of the road.

Findings:

Information found in the proposal successfully demonstrates the regulatory requirements necessary to approve the retention of road R-1 as part of the post-reclamation

TECHNICAL ANALYSIS

Last revised - April 14, 1997

land use. This road may be constructed and utilized during phase I and phase II reclamation activities and will remain as a permanent road following reclamation.

APPROXIMATE ORIGINAL CONTOUR RESTORATION

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

Analysis:

Proposed changes to the Hardscrabble Canyon reclamation plan include redisturbance of the Dog Flat area which was initially reclaimed in 1987 (see page 3.3-23 of the plan). This area is to be regraded to accommodate improved drainage and runoff control through HCRD-2 to the main channel. Refuse material placed in the Dog Flat area will be removed and used as backfill materials in areas adjacent to the Dog Flat area.

Another change in the backfilling and grading plan involves the retention of a road up the main canyon as a permanent road following reclamation. Cross section provided in the plan to show the location of the permanent road are provided as Exhibits 3.3-8A and B.

Allowing retention of the road does not appear to significantly affect reclamation efforts within the Hardscrabble Canyon area. Cut slope areas will be retained in conjunction with the final backfilling and grading plan and are shown in plan and on the cross sections. Retention of a road through the site only has a minimal effect on areas to be backfilled within the canyon and does not significantly increase the areas where cutslopes are to be retained. The elevation of the road was increased in most areas to accommodate fill materials necessary for backfilling and grading.

In conjunction with relocation and realignment of the existing road to the proposed post-mining road, R-1, the profile of the road was reduced from a two-lane to a single-lane configuration. The majority of ditches and culverts associated with the existing road are to be eliminated. The proposed road plans on utilizing swales where drainage is necessary across the road and the installation of two minor cross culverts to maintain drainage across the road..

Proposed changes to the backfilling and grading plan do not alter requested highwall variances from approximate original contour. These highwall variances include the No. 3

TECHNICAL ANALYSIS

Last revised - April 14, 1997

portal highwall, the No. 4 portal highwall and the No. 5 mine return air shaft. These variances were requested and approved by the Division in previously approved permit changes.

The proposed backfilling and grading changes for the Hardscrabble Canyon area increases the amount of backfilling from the previously approved plan by about 3 times. The additional earthwork further reduces the areas in which cutslopes are planned to be retained and more closely approximates pre-mining contours. The proposed permit changes are a significant improvement over the previously approved reclamation plan for the Hardscrabble Canyon area.

Findings:

Information included in the application regarding the Hardscrabble Canyon area was found to meet the requirements of this section of the regulations.

BACKFILLING AND GRADING

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

Analysis:

The proposed permit changes regarding backfilling and grading can be found on Exhibit 3.3-4A which show the proposed contours for final reclamation. Cross sections of the area showing the existing surface and the final surface configuration are provided as exhibits 3.3-8A and B.

Proposed changes to the plan were a result primarily from the applicant's desire to establish a permanent road through the Hardscrabble Canyon area and to more effectively utilize available materials as backfill. Map information for the Hardscrabble Canyon area required that additional survey information be collected to evaluate the reclamation plan. Contour information provided on the proposed maps varies somewhat from previous plans based on the new survey data.

Regrading plans increased the amount of backfilling and grading from just over 22,000 cubic yards to over 61,000 cubic yards for the Hardscrabble Canyon earthwork (excluding the No. 4. Canyon). Comparison of the contours provided in the re-engineered

TECHNICAL ANALYSIS

Last revised - April 14, 1997

plans indicate that a significantly greater amount of earthwork will result in a surface configuration which will more closely resemble pre-mining contours.

One of the major changes in the plan is to regrade the Dog Flat area which was initially regraded in 1987. The refuse material will be taken from the Dog Flat area and will be utilized as fill material in the areas adjacent to it. The primary benefit of relocating this material is that reconfiguration of drainage channel HCRD-2. The proposed plan calls for utilizing underlying bedrock as gradient control rather than construction of a steep channel, over fill, which would require extensive use of large riprap.

Another change in the plan calls for the removal of mine development waste material which was sidecast over a steep slope during the development of the No. 3 mine portals. The existing materials below the portal area have unsuccessfully been revegetated in an attempt to stabilize and prevent erosion in that area. The proposed plan calls for the removal of the mine development waste down to the underlying bedrock and talus slope found at the base of the natural cliff which existed below the coal seam at the No. 3 portal area. The removal of the mine development waste will re-expose the natural cliff formed below the portals and the elimination of the fill materials in that area will increase the overall stability of that area.

Factors which limit the degree and amount of backfilling and grading possible are the establishment and alignment of the permanent drainage through Hardscrabble Canyon and the narrow and constricting geometry of the canyon itself. Re-evaluation of the backfilling and grading plan appears to be based primarily on re-establishing the natural drainage through the canyon. The proposed channel alignment is superior in comparison to the alignment of the channel as currently approved. The additional survey data used during evaluation of site also indicated that the alignment of the channel would have to be revised from the currently approved design.

Two areas are noted on Exhibit 3.3-4A as conceptual topography, actual final topography may vary. These areas are the Dog Flat and the No. 3 portal areas where the applicant intends on removing materials down to bedrock and natural cliffs which were covered with refuse and mine development waste materials. Because the actual location of the bedrock beneath these areas is not known, these areas have been noted as such on the drawing.

Incorporation of a road, R-1, into the backfilling and grading plan included changes in the profile and the alignment of the existing road to accommodate backfilling and grading.

TECHNICAL ANALYSIS

Last revised - April 14, 1997

The cross sections indicate that the inslopes and the outlopes of the road were made to blend into the adjacent slopes and conform to AOC requirements.

In comparison to the currently approved backfilling and grading plan for Hardscrabble Canyon, the proposed plan is superior.

In addition to the proposed changes for Hardscrabble Canyon, as-built drawings were provided of the No. 4 mine canyon area. These drawings are provided as Exhibits 3.3-16 through 18. The as-built drawings reflect the changes to the plan to further reduce the highwall at the No. 4 portals and eliminate the vertical drop and plunge pool at the head end of the drainage of the disturbed area. This additional fill also covered the mined coal seam exposed near the No. 4 portals. While some exposed coal areas remain, especially on the south side of the canyon, these are stringer and rider seams which are not part of the mined coal seam. These changes also eliminated the ramp which existed as access above the portal area to the MSHA bench of the highwall. This area was cut down and reduced in slope and the material was used as fill to cover the exposed coal seam and further backfill the portal areas. Portions of the highwall remain and are considered as part of the highwall variance provided by the Division for the No. 4 portal highwall.

Findings:

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

MINE OPENINGS

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

Analysis:

As-built drawings were provided for the completion of the No. 4 mine canyon area. These as-builts included the changes to the No. 4 portal area. The vertical extent of the highwall was eliminated by cutting down portions of the highwall above the portals and by providing additional backfill at the base of the highwall.

TECHNICAL ANALYSIS

Last revised - April 14, 1997

Maps and information provided of the No. 4 portal area appear adequate for evaluation during phase I bond release.

Findings:

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

ROAD SYSTEMS AND OTHER TRANSPORTATION FACILITIES

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

Analysis:

The proposed permit changes for Hardscrabble Canyon include the construction of a road to be permanently retained as part of reclamation. This road has been designated as reclamation road R-1, and can be seen on the postmining reclamation map for Hardscrabble Canyon as Exhibit 3.3-4A.

Text in the plan describing the road is found on page 3.3-27 of the plan. The reclamation road will, in effect, replace the existing road designated as P-1, which is part of the current mining operations. Re-alignment and relocation of the existing road is necessary in order to achieve drainage control and backfilling and grading necessary during reclamation operations.

The applicant has provided a detailed description of the proposed road in section 3.3-4 of the plan. Design information is found in section 3.3-4(1). Reclamation hydrology for the road is discussed in section 3.3-4(2). Two culverts are proposed to be installed in conjunction with the road (HCRC-1 and -2), both being a minimum of 12 inches in diameter. Culvert design information can be found in Tables 3.3-10A and -10B of the plan. Three swales for drainage control are also used in conjunction with the road construction. One swale crossing of the main channel is also incorporated into the plan. The road design call for the surface of the road to be covered with a compacted roadbase a minimum of 6 inches thick and a top slope of 2% towards the inslope of the road to the drainage ditch. The drainage ditch associated with the road will be on the inslope side of the road and will nominally be one foot deep, triangular in shape and have side slopes of 1.5:1. Alignment of

TECHNICAL ANALYSIS

Last revised - April 14, 1997

the road and drainage can be seen on Exhibit 3.3-4A, Main Canyon of Hardscrabble Canyon, Postmining Reclamation Map.

The plan describes the road as being reduced to a single lane width of approximately 10-12 feet. Where possible, the outslope of the existing road will be maintained. The road will be relocated in those areas where the road would limit or impinge upon the reclaimed channel. The surface of the reclamation road will not receive an application of substitute topsoil. However, the road will be compacted with a minimum of 6 inches of road base material. This material will be gravel or crushed aggregate(pavement) from the existing road. Maintenance of the road will be minimal and performed on an as-needed basis.

Existing culverts associated with the previously existing roads are to be removed. Broad swales will be utilized in three areas to accommodate small tributary drainages and an additional swale crossing the main drainage will occur near the #4 Mine canyon.

Cross sections of the postmining reclamation backfilling and grading can be found in the plan as Exhibits 3.3-8A and B. Centerlines for the cross sections coincide with the centerline of the proposed road. Road elevations at most of the cross sections are at the existing road elevation or at a higher elevation (on fill) than the existing road. These changes in the road elevations were made to allow backfilling of the cut slopes associated with the existing road construction. These cross sections also indicate that the road will be sloped outwards toward the drainage channel rather than center crowned or retro graded back toward the hillside. Grading the road in this manner will eliminate ditches along the cut slope side of the road. Road ditches are not planned for construction along either side of the roadway.

The plan states that during the reclamation monitoring period, the areas where water from the road surface toward the reclamation stream channels will be observed for evidence of erosion. If excessive erosion is noted, appropriate repairs will be made to prevent long-term re-occurrence of this erosion.

The post-reclamation road, R-1, is designated in Table 3.3-15 as a permanent primary road, and is in accordance with the requirements of R645-301-527.120.

Design information related to the construction of road R-1 adequately addresses the requirements of R645-301-527.210. Specifications for each road width, road gradient, road surface, road cut, fill embankment, culvert, bridge, drainage ditch, and drainage structure have been incorporated into the plan. A typical cross section of the road indicating the width and slope (crowning) of the road is provided on Exhibit 3.3-4A. Surfacing of the road is

TECHNICAL ANALYSIS

Last revised - April 14, 1997

non erodible by design. A gravel roadbase (6" minimum depth) for the width of the road has been indicated in the design. Erosion protection is further supported by the use of swales, culverts ditches used for drainage control. Most runoff from the road and runoff from areas adjacent to the road will be collected through this series of ditches and passed through the swales and culverts into the main permanent channel. Providing gravel surfacing will help eliminate or prevent erosion of the road surface and minimize maintenance of the road throughout the reclamation liability period and following bond release.

Findings:

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

BONDING AND INSURANCE REQUIREMENTS

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

Analysis:

No additional reclamation cost information was provided as part of the applicant's proposal. Significant changes to the reclamation treatments should also be reflected in the reclamation costs. However, since the applicant is considered to currently be over-bonded due to shared permit areas with the Willow Creek permit area and other changes to the plan since the determination of the current bond amount, no adjustment to the current bond amount is considered necessary at this time. However, prior to any phased bond release or transfer of permit areas to other operations, such reconciliation of the bond amount must be presented in the plan and a new bond amount be determined by the Division.

Findings:

Information presented in the application is considered adequate for approval at this time. However, the following condition is applicable regarding the bond amount.

Prior to approval by the Division for any adjustment to the current bond amount, the applicant must provide the following:

R645-301-800, prior to approval for any bond release or application for adjustment to the bond amount, the applicant must provide complete

TECHNICAL ANALYSIS

Last revised - April 14, 1997

and updated information regarding the reclamation cost estimate provided in the plan for all areas within the permit area. No determination as to the amount of bond available for release or transfer can be made by the Division until such time as current cost information is provided to and approved by the Division.

RECLAMATION HYDROLOGIC INFORMATION

Regulatory Reference: R645-301-512, -301-513, -301-514, -301-515, -301-532, -301-533, -301-542, -301-723, -301-724, -301-725, -301-726, -301-728, -301-729, -301-731, -301-733, -301-742, -301-743, -301-750, -301-751, -301-760, -301-761.

Analysis:

Diversions

Reclamation diversion designs are found in Appendix 3.3C, Reclamation Hydrologic Structures. Discussion is found on page 3.3-29, Section 3.3-4(2). Table 3.3-9, 9A, and 10 are summaries of diversion designs. Exhibit 3.3-4A and 3.3-16 show the location of the drainages and Exhibit 3.3-8C shows the profile of the main diversion (HCRD-7 and 8).

The intermittent drainages HCRD-7 and 8 are designed to convey the 100-year, 24-hour storm event. The smaller diversions are designed for the 10-year, 24-hour storm event. Riprap has been designed for all diversions for protection from erosion and stabilization. Granular filters are proposed where riprap size is much larger than base material.

Stream Buffer Zones

The stream buffer zones information is given in Section 3.3-7, page 3.3-37. No stream buffer zone is included in the permit application because all channels were altered prior to the enactment of the law.

Sediment Control Measures

Sediment control measures are covered in Section 3.3-4(3) beginning on page 3.3-32 and in Appendix 3.3E. All areas are intended to be alternate sediment control areas. Treatment will be consistent throughout the reclaimed area, consisting of practicing contour plowing, deep gouging, mulching, applying a tackifier for the mulch, and revegetation.

TECHNICAL ANALYSIS

Last revised - April 14, 1997

The sequence of effectiveness from these measures insures that sediment will be consistently controlled from the point of reclamation to the establishment of vegetation. These are considered sediment control areas rather than exemption from sediment control because the measures used will be subject to maintenance. If any of these measures fail to a point that the Division does not think sediment control is adequately met, the applicant will be required to either re-implement the designed practices (i.e.-reseed and re-mulch), or they must design new sediment control measures that will treat areas where failure is discovered and the Division does not think the existing designs will work.

The operational sediment ponds are not sized properly for reclamation, therefore, the alternate sediment control measures are best technology currently available (BTCA) for treating sediment in runoff.

Siltation Structures

There are no plans for siltation structures in reclamation. All sediment control will be fulfilled by alternate sediment control measures.

Sedimentation Ponds

There are no plans for siltation structures in reclamation. All sediment control will be fulfilled by alternate sediment control measures. The operational sediment ponds are not sized properly for reclamation, therefore, the alternate sediment control measures are BTCA for treating sediment in runoff.

Exemptions for Siltation Structures

All reclaimed areas will be treated by alternate sediment control measures. While no sediment ponds will be used, these areas will not be exempt from sediment control.

Discharge Structures

There are no plans for siltation structures in reclamation. Without siltation structures there is no need for discharge structures.

Structure Removal

The removal of structures is listed in Section 3.3-4(1), under the grading subheading. Section 3.3-5 has a timetable for the removal of structures. The timetable on page 3.3-27 is

TECHNICAL ANALYSIS

Last revised - April 15, 1997

specific to the timing of sediment pond removal and alternate sediment control measures construction.

Findings:

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

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