



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

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October 22, 2001

Mike Glasson, Environmental Coordinator  
West Ridge Resources, Inc.  
P. O. Box 902  
Price, Utah 84501

Re: Findings for Response Dated July 2 and 14, 2001, Division Order DO00A-4, West Ridge Resources, Inc., West Ridge Mine, C/007/041-DO00A-4, Outgoing File

Dear Mr. Glasson:

The above referenced Division Order response has been reviewed and there are deficiencies that must be adequately addressed prior to approval. A copy of our Technical Analysis is enclosed for your information. Please respond to these deficiencies within 60 days from receipt of this information, i.e by December 26, 2001.

A major concern that still exists within the Division is the reclaimability of the portal highwall area. Although the slope stability analysis which was performed by Agapito and Associates, Inc. is felt to be nearly adequate, the prospect of leaving the reclaimed slope unvegetated in order to meet the requirements of the 1.3 long term static safety factor causes a major concern which cannot be approved without additional information from the permittee. It may be necessary to reconfigure the entire reclamation plan for the portal highwall area and any adjacent areas affected by this revised plan in order to meet both the engineering requirements for slope stability and the soils/revegetation requirements of the R645 coal rules. The in-situ topsoil storage experimental practice plan and the effect that this revised plan may have upon it must also be evaluated.

In order to assist you, the coal technical review staff would like to meet with the West Ridge permitting staff at the Salt Lake Office to discuss options for the revegetation of the portal highwall area. Please call me to set up the meeting time.

If you have any questions, please call Peter Hess at (435) 613-5622, or me at (801) 538-5268.

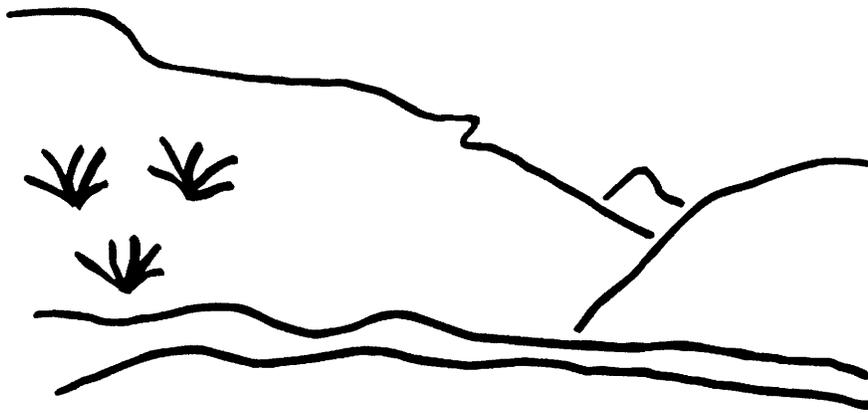
Sincerely,

A handwritten signature in black ink, appearing to read "Pamela Grubaugh-Littig". The signature is fluid and cursive, with a large initial "P" and "G".

Pamela Grubaugh-Littig  
Permit Supervisor

phh/sd  
Enclosure  
cc: Price Field Office  
O:\007041.WR\FINAL\DEFDO00A-4.DOC

# State of Utah



## Utah Oil Gas and Mining

### Coal Regulatory Program

West Ridge Mine  
Division Order DO00A  
C/007/041-DO00A-4  
Technical Analysis  
October 9, 2001

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INTRODUCTION

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## TECHNICAL ANALYSIS

### INTRODUCTION

West Ridge Resources, Inc. submitted a permit application package to the Division to permit an underground coal mine utilizing longwall and continuous mining methods in the "C" Canyon area of the Book Cliffs located NNW of Sunnyside, Utah on January 26, 1998. As part of that permitting process, the Division approved a reclamation plan for a highwall located in the portal area of the to-be-constructed mine. The approved permit also included an experimental practice, which had been reviewed and approved by both the Division and OSM. This practice was to allow the permittee to bury existing topsoil in place, protecting it via a geotextile material.

During the construction process of the Mine, the permittee discovered that a coal burn existed which was much more extensive than originally anticipated. The burned area created fragile ground conditions that required the permittee to construct a more extensive highwall in order to provide effective stability. The constructed highwall was taller and wider than originally permitted. Also, in order to provide a safety zone for the men and machinery working in the highwall area, the permittee constructed a safety bench, which would hopefully catch any material, which might fall from the exposed overburden over the portals.

In order to approve a permit application package, the Division must make written findings relative to the fact that the applicant has "demonstrated that reclamation as required by the State Program can be accomplished according to information given in the permit application." With the construction of the more extensive highwall, the Division had internal concerns and felt that it did not have adequate information in order to re-evaluate the approved reclamation plan for the 'as-built' portals highwall. The potential for effect on the experimental practice was also a concern.

On April 6, 2000, the Division issued a Division Order to West Ridge Resources, Inc to submit additional information, including as-built drawings and a detailed backfilling and grading plan to determine, among other things, if an adequate reclamation bond had been determined for the site. DO00A also requested updated hydrologic and sediment control information.

The permittee submitted an initial response on July 14, 2000, which was followed by a complete rewrite of the MRP's hydrology section, submitted on September 18, 2000.

On November 30, 2000, the Division returned a deficiency response indicating that more

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information was needed relative to the backfilling and grading plan (i.e., type of material to be used for fill, material characteristics, material size gradation, compaction requirements, etc.).

The permittee responded on March 16, 2001; the Division responded by returning the entire submittal before completing its review based on the fact that the permittee had failed to submit the information that had been requested within the previous deficiency document.

The permittee submitted a fourth response on July 14, 2001, which included a slope stability analysis performed by Agapito and Associates, Inc. for the portal highwall area, as well as other information.

The following technical analysis is a review of the permittee's information, as received in July 2001.

SUMMARY OF OUTSTANDING DEFICIENCIES

## SUMMARY OF DEFICIENCIES

*The Technical Analysis of the proposed permit changes cannot be completed at this time. Additional information is requested of the permittee to address deficiencies in the proposal. A summary of deficiencies is provided below. Additional comments and concerns may also be found within the analysis and findings made in this Draft Technical Analysis. Upon finalization of this review, any deficiencies will be evaluated for compliance with the regulatory requirements. Such deficiencies may be conditioned to the requirements of the permit issued by the Division, result in denial of the proposed permit changes, or may result in other executive or enforcement action as deemed necessary by the Division at that time to achieve compliance with the Utah Coal Regulatory Program.*

*Accordingly, the permittee must address those deficiencies as found within this Draft Technical Analysis and provide the following, prior to approval, in accordance with the requirements of:*

### **Regulations**

- R645-301-222**, Include in Appendix 2-2, Soil Resource Assessment West Ridge Mine Area. Carbon County, Utah, and on Map 2-2, Minesite Order 1 Soil Survey, an aerial assessment of rubbleland or talus slopes..... 7
- R645-301-230**, Include in the legend and on the Map 2-2, Minesite Order 1 Soil Survey, the three sample sites for acid/toxic information and on Map 2-4, Topsoil Storage Area, indicate the actual volumes of soil recovered and stored in the topsoil storage area, not the projected or "proposed" volume. .... 10
- R645-301-321.100**, the plan must describe the existing talus slopes within the permit area. The description will include information adequate to predict the potential for reestablishing vegetation and productivity..... 5
- R645-301-341**, the plan must contain a revegetation plan for the talus slope. The revegetation plan must be adequate to establish vegetation at least equal in extent of cover to the natural vegetation in the area. .... 33
- R645-301-542.200**, The permittee must give the Division a detailed backfilling and grading plan for the highwall area that includes the following: 1) The permittee must state from where the rock material that will be used to backfill the highwalls will come. 2) The permittee must show that the material used to backfill the highwall will meet the requirements of the AAI slope stability report including the gradation specification listed on Table 1. The permittee must also state how those material specifications, as described in the AAI slope stability analysis, will be ensured. 3) The permittee must state what compaction specifications are felt to be necessary and how they will be obtained and verified in the field. 4) The permittee must show that the reclaimed highwall slopes will have a convex shape as recommended by AAI.

**SUMMARY OF OUTSTANDING DEFICIENCIES**

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- 5) The permittee must state what safety programs will be used during reclamation of the highwall area. The safety program should include the recommendations in the AAI report. 6) The permittee needs to commit to have a geotechnical engineer who is experienced with slope stability be responsible for all construction activities at the site during the reclamation of the highwall. 7) The permittee must give the Division a detailed plan for monitoring the highwall for groundwater. 8) The permittee must state how they will monitor the reclaimed highwalls for stability..... 29
- R645-301-553.120**, The Permittee must commit to eliminate the entire highwall. If rock fill cannot be placed at the top of the slope due to instability, then the permittee will have to modify the reclamation plan so that the highwall will be eliminated..... 29
- R645-301-553.130**, The permittee must show that the slope at Station 24+00 as depicted on Map 5-6B will have a safety factor of 1.3 or greater. The Division is concerned about the slope on Station 24+00 because it is higher than the slope used in the stability analysis. The slope used in the stability analysis has a height of 74 feet. The slope stability analysis must critique the highest slope or worst-case scenario..... 29
- R645-301-830.140**, The permittee must provide the Division with detailed earthwork calculations for the reclamation of the highwalls. The earthwork calculations must include enough detail to show that conventional equipment can be used to place the backfill material against the highwall so that all engineering specifications, including those relative to compaction, will be met..... 29

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**ENVIRONMENTAL RESOURCE INFORMATION**

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**ENVIRONMENTAL RESOURCE INFORMATION**

Regulatory Reference: Pub. L 95-87 Sections 507(b), 508(a), and 516(b); 30 CFR 783., et. al.

**VEGETATION RESOURCE INFORMATION**

Regulatory Reference: 30 CFR 783.19; R645-301-320.

**Minimum Regulatory Requirements:**

Provide a map that delineates existing vegetative types and a description of the plant communities within the area affected by surface operations and facilities and within any proposed reference area. The description shall include information adequate to predict the potential for reestablishing vegetation. The map or aerial photograph is required, sufficient adjacent areas shall be included to allow evaluation of vegetation as important habitat for fish and wildlife for those species of fish and wildlife as identified under the fish and wildlife resource information.

**Analysis:**

The MRP describes four vegetative communities that existed within the disturbed area prior to disturbance. These are:

- Douglas fir/maple
- Rocky Mountain juniper/Douglas fir
- Sage/grass
- Pinyon/juniper

No description of a talus slope vegetative community was found within the disturbed area or permit area. Maps of the vegetative communities, Map 3-1 and Map 3-2, do not designate a talus slope community or area. The plan provides for no revegetation on the talus slope. Many talus slopes do have vegetation. Reclaiming the highwall to a talus slope can only be considered when resource information is provided.

**Findings:**

Information provided in the proposed amendment is not considered adequate to meet the requirement of this section. Prior to approval, the permittee must provide the following in accordance with:

**R645-301-321.100**, the plan must describe the existing talus slopes within the permit area. The description will include information adequate to predict the potential for reestablishing vegetation and productivity.

## SOILS RESOURCE INFORMATION

Regulatory Reference: 30 CFR 783.21; 30 CFR 817.22; 30 CFR 817.200(c); 30 CFR 823; R645-301-220; R645-301-411.

### Minimum Regulatory Requirements:

Provide adequate soil survey information on those portions of the permit area to be affected by surface operations or facilities consisting of a map delineating different soils, soil identification, soil description, and present and potential productivity of existing soils.

Where selected overburden materials are proposed as a supplement or substitute for topsoil, provide results of the analysis, trials and tests required. Results of physical and chemical analyses of overburden and topsoil must be provided to demonstrate that the resulting soil medium is equal to or more suitable for sustaining revegetation than the available topsoil, provided that trials and tests are certified by an approved laboratory. These data may be obtained from any one or a combination of the following sources: U.S. Department of Agriculture Soil Conservation Service published data based on established soil series; U.S. Department of Agriculture Soil Conservation Service Technical Guides; State agricultural agency, university, Tennessee Valley Authority, Bureau of Land Management or U.S. Department of Agriculture Forest Service published data based on soil series properties and behavior; or, results of physical and chemical analyses, field site trials, or greenhouse tests of the topsoil and overburden materials (soil series) from the permit area. If the permittee demonstrates through soil survey or other data that the topsoil and unconsolidated material are insufficient and substitute materials will be used, only the substitute materials must be analyzed.

### Analysis:

Map 2-2, Minesite Order 1 Soil Survey identifies areas of Rock Outcrop – Rubble Land. As described in Appendix 2-2, the components of the unit are 45% rock outcrop (exposed sandstone and limestone); 35% rubbleland (areas of stones and boulders that are virtually free of vegetation); and 20% Travessilla gravelly loam. The vegetation growing on Rock Outcrop-Rubble Land is described in Appendix 2-1 as Utah juniper, pinyon, Salina wildrye, and galleta vegetation. In the Order I Survey of the Mine site (Appendix 2-2 and Map 2-2), rubble lands or talus slopes were not separately mapped. Sample site AC-13 located on Map 2-2 in Rock was described as having five inches of soil over sandstone bedrock.

The highwall shown by cross-sections 23+00 to 26+00 on Maps 5-6 A & B and described in Appendix 5-9, West Ridge Mine Proposed Highwall Reclamation Plan, prepared by Agapito Associates, Inc, does not include any soil cover over the reclaimed slope. Statements number 4 and 5 in the (Agapito) Proposed Reclamation plan read as follows:

*In order to help ensure the minimum 1.3 static safety factor over this height and angle, the surface of the highwall backfill will not be covered with soil, and will not be revegetated. Soil covering for overall vegetation and even "pocket" vegetation may result in eventual filling of the voids in the backfill and affect the free-draining nature of the fill, thus reducing the safety factor.*

*The reclaimed highwall will have the appearance of a "talus slope", which is compatible with other slopes in the area.*

ENVIRONMENTAL RESOURCE INFORMATION

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In Attachment A of Appendix 5-9, the slope stability report the consultant recommended that the reclaimed slope should be free of vegetation or soil, but if vegetation is needed then small pockets should be created and filled with bentonite and then soil (refer to item #4 on page 8 of the Attachment).

In fact, the soil in the location of the highwall was specified on Map 2-2 as Midfork very stony fine sandy loam 10 – 50% slopes. This soil is described as existing in “the densely vegetated south slope (north-facing slope) of the right fork drainage.” Present vegetation is Douglas fir and snowberry. Components of the Midfork unit are 75% Midfork, 10% rubbleland, 10% Commodore, and 5% Rock Outcrop. Midfork is deep to very deep, well drained with an effective rooting depth of 60 inches or more. Sample site AC-14 (located in the vicinity of the highwall) is described as having a seven-inch topsoil layer (with 17 – 35% rock fragments) overlying a very cobbly sandy loam subsoil (with up to 40% rock fragments). Eighteen inches of soil were recommended for salvage from the Midfork soil on this slope (page 18, Appendix 2-2) below this depth, rock fragments exceeded 40%. It was also noted on page 15 of Appendix 2-2 that only the Midfork soils could be salvaged and that small areas of rubbleland were unsuitable for salvage.

Since, the Permittee’s proposal is to reclaim the highwall area to a “talus slope,” *which is compatible with other slopes in the area*, the identification of talus slopes or rubblelands in the Order I soil survey is required. This will enable the Division to determine whether a talus configuration devoid of vegetation will blend in with the existing landscape. Otherwise, the permittee must address the necessary requirements to revegetate the reclaimed slope.

**Findings:**

The information provided is not adequate to support the proposed reclamation plan. Prior to approval, the Permittee must submit the following in accordance with:

**R645-301-222**, Include in Appendix 2-2, Soil Resource Assessment West Ridge Mine Area Carbon County, Utah, and on Map 2-2, Minesite Order 1 Soil Survey, an aerial assessment of rubbleland or talus slopes.

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**ENVIRONMENTAL RESOURCE INFORMATION**

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**OPERATION PLAN**

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# **OPERATION PLAN**

## **TOPSOIL AND SUBSOIL**

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

### **Minimum Regulatory Requirements:**

#### **Topsoil removal and storage**

All topsoil shall be removed as a separate layer from the area to be disturbed, and segregated. Where the topsoil is of insufficient quantity or of poor quality for sustaining vegetation, the selected overburden materials approved by the Division for use as a substitute or supplement to topsoil shall be removed as a separate layer from the area to be disturbed, and segregated. If topsoil is less than 6 inches thick, the operator may remove the topsoil and the unconsolidated materials immediately below the topsoil and treat the mixture as topsoil.

The Division may choose not to require the removal of topsoil for minor disturbances which occur at the site of small structures, such as power poles, signs, or fence lines; or, will not destroy the existing vegetation and will not cause erosion.

All materials shall be removed after the vegetative cover that would interfere with its salvage is cleared from the area to be disturbed, but before any drilling, blasting, mining, or other surface disturbance takes place.

Selected overburden materials may be substituted for, or used as a supplement to, topsoil if the operator demonstrates to the Division that the resulting soil medium is equal to, or more suitable for sustaining vegetation than, the existing topsoil, and the resulting soil medium is the best available in the permit area to support revegetation.

Materials removed shall be segregated and stockpiled when it is impractical to redistribute such materials promptly on regraded areas. Stockpiled materials shall: be selectively placed on a stable site within the permit area; be protected from contaminants and unnecessary compaction that would interfere with revegetation; be protected from wind and water erosion through prompt establishment and maintenance of an effective, quick growing vegetative cover or through other measures approved by the Division; and, not be moved until required for redistribution unless approved by the Division.

Where long-term surface disturbances will result from facilities such as support facilities and preparation plants and where stockpiling of materials would be detrimental to the quality or quantity of those materials, the Division may approve the temporary distribution of the soil materials so removed to an approved site within the permit area to enhance the current use of that site until needed for later reclamation, provided that: such action will not permanently diminish the capability of the topsoil of the host site; and, the material will be retained in a condition more suitable for redistribution than if stockpiled.

The Division may require that the B horizon, C horizon, or other underlying strata, or portions thereof, be removed and segregated, stockpiled, and redistributed as subsoil in accordance with the above requirements if it finds that such subsoil layers are necessary to comply with the revegetation.

### **Analysis:**

#### **Removal and Storage**

This submittal revises page 30 of Appendix 5-5 to state, "In the left fork, the secondary topsoil storage area (ASCA-Y) has been eliminated. This area is an optional topsoil storage site and is to be used only on an as-needed basis." The approved MRP must be modified in the following locations if this statement is approved:

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- The revision of Map 2-2, Minesite Order 1 Soil Survey to reflect the elimination of the secondary topsoil storage area (ASCA Y) has also eliminated the sample site locations for acid/toxic information to be gathered over the next five years. These sample site locations and the commitment to sample the soil of the operations pad over the next five years is described in the Annual Report year 2000.
- The revision of Map 2-4, Topsoil Storage Area should indicate actual volumes of soil recovered and stored in the topsoil storage area, not the projected or "proposed" volume.

### Topsoil Substitutes and Supplements

Borrow area soils have been identified on page 2-14 of the MRP and in Appendix 2-4. Map 2-4 locates the borrow soils and provides reclamation contours for the borrow site.

### Findings:

The As-Built maps submitted are not adequate and do not satisfy the operations plan topsoil and subsoil requirements of the Regulations. Prior to approval the Permittee must submit the following in accordance with:

**R645-301-230**, Include in the legend and on the Map 2-2, Minesite Order 1 Soil Survey, the three sample sites for acid/toxic information and on Map 2-4, Topsoil Storage Area, indicate the actual volumes of soil recovered and stored in the topsoil storage area, not the projected or "proposed" volume.

## HYDROLOGIC INFORMATION

Regulatory Reference: 30 CFR 773.17, 774.13, 784.14, 784.16, 784.29, 817.41, 817.42, 817.43, 817.45, 817.49, 817.56, 817.57; R645-300-140, -300-141, -300-142, -300-143, -300-144, -300-145, -300-146, -300-147, -300-147, -300-148, -301-512, -301-514, -301-521, -301-531, -301-532, -301-533, -301-536, -301-542, -301-720, -301-731, -301-732, -301-733, -301-742, -301-743, -301-750, -301-761, -301-764.

### Minimum Regulatory Requirements:

#### General

All underground mining and reclamation activities shall be conducted to minimize disturbance of the hydrologic balance within the permit and adjacent areas, to prevent material damage to the hydrologic balance outside the permit area, and to support approved postmining land uses in accordance with the terms and conditions of the approved permit and the performance standards of this part. The Division may require additional preventative, remedial, or monitoring measures to assure that material damage to the hydrologic balance outside the permit area is prevented. Mining and reclamation practices that minimize water pollution and changes in flow shall be used in preference to water treatment.

#### Groundwater Monitoring

In order to protect the hydrologic balance underground mining activities shall be conducted according to the hydrologic reclamation plan. Ground-water quality shall be protected by handling earth materials and runoff in a manner that minimizes acidic,

## OPERATION PLAN

toxic, or other harmful infiltration to ground-water systems and by managing excavations and other disturbances to prevent or control the discharge of pollutants into the ground water.

Ground-water monitoring shall be conducted according to the ground-water monitoring plan. The Division may require additional monitoring when necessary. Ground-water monitoring data shall be submitted every 3 months to the Division or more frequently as prescribed by the Division. Monitoring reports shall include analytical results from each sample taken during the reporting period. When the analysis of any ground-water sample indicates noncompliance with the permit conditions, the operator shall promptly notify the Division and immediately provide for any accelerated or additional monitoring necessary to determine the nature and extent of noncompliance and the results of the noncompliance. Plans and hydrologic information to evaluate and mitigate the noncompliance situation and information relevant to the PHC shall be submitted to the Division as required.

Ground-water monitoring shall proceed through mining and continue during reclamation until bond release. The Division may modify the monitoring requirements including the parameters covered and the sampling frequency if the operator demonstrates, using the monitoring data obtained, that: the operation has minimized disturbance to the prevailing hydrologic balance in the permit and adjacent areas and prevented material damage to the hydrologic balance outside the permit area; water quantity and quality are suitable to support approved postmining land uses; or, monitoring is no longer necessary to achieve the purposes set forth in the monitoring plan.

Equipment, structures, and other devices used in conjunction with monitoring the quality and quantity of ground water onsite and offsite shall be properly installed, maintained, and operated and shall be removed by the operator when no longer needed.

### Surface Water Monitoring

In order to protect the hydrologic balance, underground mining activities shall be conducted according to the approved plan, and the following: surface-water quality shall be protected by handling earth materials, ground-water discharges, and runoff in a manner that minimizes the formation of acidic or toxic drainage; prevents, to the extent possible using the best technology currently available, additional contribution of suspended solids to streamflow outside the permit area; and otherwise prevent water pollution. If drainage control, restabilization and revegetation of disturbed areas, diversion of runoff, mulching, or other reclamation and remedial practices are not adequate to meet water-quality standards and effluent limitations, the operator shall use and maintain the necessary water-treatment facilities or water-quality controls. Surface-water quantity and flow rates shall be protected by handling earth materials and runoff in accordance with the steps outlined in the approved plan.

Surface-water monitoring shall be conducted according to the approved surface-water monitoring plan. The Division may require additional monitoring when necessary. Surface-water monitoring data shall be submitted every 3 months to the Division or more frequently as prescribed by the Division. Monitoring reports shall include analytical results from each sample taken during the reporting period. When the analysis of any surface-water sample indicates noncompliance with the permit conditions, the operator shall promptly notify the Division and immediately provide for any accelerated or additional monitoring necessary to determine the nature and extent of noncompliance and the results of the noncompliance. Plans and hydrologic information to evaluate and mitigate the noncompliance situation and information relevant to the PHC shall be submitted to the Division as required. The reporting requirements of the water monitoring plan do not exempt the operator from meeting any National Pollutant Discharge Elimination System (NPDES) reporting requirements.

Surface-water monitoring shall proceed through mining and continue during reclamation until bond release. The Division may modify the monitoring requirements, except those required by the NPDES permitting authority, including the parameters covered and sampling frequency if the operator demonstrates, using the monitoring data obtained, that: the operation has minimized disturbance to the hydrologic balance in the permit and adjacent areas and prevented material damage to the hydrologic balance outside the permit area; water quantity and quality are suitable to support approved postmining land uses; and, monitoring is no longer necessary to achieve the purposes set forth in the approved monitoring plan.

Equipment, structures, and other devices used in conjunction with monitoring the quality and quantity of surface water onsite and offsite shall be properly installed, maintained, and operated and shall be removed by the operator when no longer needed.

### Acid- and toxic-forming materials and underground development waste

Drainage from acid- and toxic-forming materials and underground development waste into surface water and ground water shall be avoided by: identifying and burying and/or treating, when necessary, materials which may adversely affect water quality, or be detrimental to vegetation or to public health and safety if not buried and/or treated; and, storing materials in a manner that will protect surface water and ground water by preventing erosion, the formation of polluted runoff, and the infiltration of polluted water.

### Discharges into an underground mine

Discharges into an underground mine are prohibited, unless specifically approved by the Division after a demonstration

## OPERATION PLAN

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that the discharge will: minimize disturbance to the hydrologic balance on the permit area, prevent material damage outside the permit area and otherwise eliminate public hazards resulting from underground mining activities; not result in a violation of applicable water quality standards or effluent limitations; be at a known rate and quality which shall meet the effluent limitations for pH and total suspended solids, except that the pH and total suspended solids limitations may be exceeded, if approved by the Division; and, meet with the approval of the Mine Safety and Health Administration.

Discharges shall be limited to the following: water; coal-processing waste; fly ash from a coal-fired facility; sludge from an acid-mine-drainage treatment facility; flue-gas desulfurization sludge; inert materials used for stabilizing underground mines; and, underground mine development wastes.

Water from one underground mine may be diverted into other underground workings according to the requirements of this section.

### Gravity discharges from underground mines

Surface entries and accesses to underground workings shall be located and managed to prevent or control gravity discharge of water from the mine. The surface entries and accesses of drift mines first used after the implementation of a State, Federal, or Federal Lands Program and located in acid-producing or iron-producing coal seams shall be located in such a manner as to prevent any gravity discharge from the mine. Gravity discharges of water from an underground mine first used before the implementation of a State, Federal, or Federal Lands Program, may be allowed by the Division if it is demonstrated that the untreated or treated discharge complies with the performance standards and any additional NPDES permit requirements.

### Water-quality standards and effluent limitations

Compliance with all applicable State and Federal water quality laws and regulations and with the effluent limitations for coal mining promulgated by the U.S. Environmental Protection Agency set forth in 40 CFR Part 434.

### Diversions: General

With the approval of the Division, any flow from mined areas abandoned before May 3, 1978, and any flow from undisturbed areas or reclaimed areas, after meeting the criteria for siltation structure removal, may be diverted from disturbed areas by means of temporary or permanent diversions. All diversions shall be designed to minimize adverse impacts to the hydrologic balance within the permit and adjacent areas, to prevent material damage outside the permit area and to assure the safety of the public. Diversions shall not be used to divert water into underground mines without approval of the Division.

The diversion and its appurtenant structures shall be designed, located, constructed, and maintained to: be stable; provide protection against flooding and resultant damage to life and property; prevent, to the extent possible using the best technology currently available, additional contributions of suspended solids to streamflow outside the permit area; and, comply with all applicable local, State, and Federal laws and regulations.

Temporary diversions shall be removed when no longer needed to achieve the purpose for which they were authorized. The land disturbed by the removal process shall be restored. Before diversions are removed, downstream water-treatment facilities previously protected by the diversion shall be modified or removed, as necessary, to prevent overtopping or failure of the facilities. This requirement shall not relieve the operator from maintaining water-treatment facilities as otherwise required.

A permanent diversion or a stream channel reclaimed after the removal of a temporary diversion shall be designed and constructed so as to restore or approximate the premining characteristics of the original stream channel including the natural riparian vegetation to promote the recovery and the enhancement of the aquatic habitat. The Division may specify additional design criteria for diversions.

### Diversions: Perennial and intermittent streams

Diversion of perennial and intermittent streams within the permit area may be approved by the Division after making the finding relating to stream buffer zones that the diversions will not adversely affect the water quantity and quality and related environmental resources of the stream. The design capacity of channels for temporary and permanent stream channel diversions shall be at least equal to the capacity of the unmodified stream channel immediately upstream and downstream from the diversion. Protection against flooding and resultant damage to life and property shall be met when the temporary and permanent diversions for perennial and intermittent streams are designed so that the combination of channel, bank and flood-plain configuration is adequate to pass safely the peak runoff of a 10-year, 6-hour precipitation event for a temporary diversion and a 100-year, 6-hour precipitation event for a permanent diversion. The design and construction of all stream channel diversions of perennial and intermittent streams shall be certified by a qualified registered professional engineer as meeting the performance standards and any design criteria set by the Division.

### Diversions: Miscellaneous flows

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Diversion of miscellaneous flows, which consist of all flows except for perennial and intermittent streams, may be diverted away from disturbed areas if required or approved by the Division. Miscellaneous flows shall include ground-water discharges and ephemeral streams. The design, location, construction, maintenance, and removal of diversions of miscellaneous flows shall meet all of the general performance standards of this section. Protection against flooding and resultant damage to life and property shall be met when the temporary and permanent diversions for miscellaneous flows are designed so that the combination of channel, bank and flood-plain configuration is adequate to pass safely the peak runoff of a 2-year, 6-hour precipitation event for a temporary diversion and a 10-year, 6-hour precipitation event for a permanent diversion.

### Stream buffer zones

No land within 100 feet of a perennial stream or an intermittent stream shall be disturbed by underground mining activities, unless the Division specifically authorizes underground mining activities closer to, or through, such a stream. The Division may authorize such activities only upon finding that: underground mining activities will not cause or contribute to the violation of applicable State or Federal water quality standards and will not adversely affect the water quantity and quality or other environmental resources of the stream; and, if there will be a temporary or permanent stream-channel diversion, it will comply with the regulatory requirements for diversions.

The area not to be disturbed shall be designated as a buffer zone, and the operator shall mark it accordingly with buffer zone markers.

### Sediment control measures

Appropriate sediment control measures shall be designed, constructed, and maintained using the best technology currently available to: prevent, to the extent possible, additional contributions of sediment to stream flow or to runoff outside the permit area; meet the more stringent of applicable State or Federal effluent limitations; and, minimize erosion to the extent possible.

Sediment control measures include practices carried out within and adjacent to the disturbed area. The sedimentation storage capacity of practices in and downstream from the disturbed areas shall reflect the degree to which successful mining and reclamation techniques are applied to reduce erosion and control sediment. Sediment control measures consist of the utilization of proper mining and reclamation methods and sediment control practices, singly or in combination. Sediment control methods include but are not limited to: disturbing the smallest practicable area at any one time during the mining operation through progressive backfilling, grading, and prompt revegetation; stabilizing the backfilled material to promote a reduction of the rate and volume of runoff; retaining sediment within disturbed areas; diverting runoff away from disturbed areas; diverting runoff using protected channels or pipes through disturbed areas so as not to cause additional erosion; using straw dikes, riprap, check dams, mulches, vegetative sediment filters, dugout ponds, and other measures that reduce overland flow velocity, reduce runoff volume, or trap sediment; treating with chemicals; and, treating mine drainage in underground sumps.

### Siltation Structures: General

All surface drainage from disturbed areas shall be passed through a siltation structure before leaving the permit area. Siltation structures shall mean a sedimentation pond, a series of sedimentation ponds, or other treatment facility. Other treatment facilities means any chemical treatments, such as flocculation, or mechanical structures, such as clarifiers, that have a point-source discharge and that are utilized to prevent additional contribution of suspended solids to streamflow or runoff outside the permit area.

Disturbed area requiring treatment through a siltation structure shall not include those areas in which the only underground mining activities include: diversion ditches, siltation structures, or roads that are designed, constructed and maintained in accordance with the regulatory requirements; and, for which the upstream area is not otherwise disturbed by the operator.

Additional contributions of suspended solids and sediment to streamflow or runoff outside the permit area shall be prevented to the extent possible using the best technology currently available. Siltation structures for an area shall be constructed before beginning any underground mining activities in that area, and upon construction shall be certified by a qualified registered professional engineer, or when authorized under the regulations, by a qualified registered professional land surveyor, to be constructed as designed and as approved in the reclamation plan.

Any siltation structure which impounds water shall be designed, constructed and maintained in accordance with the requirements for impoundments.

Siltation structures shall be maintained until removal is authorized by the Division and the disturbed area has been stabilized and revegetated. In no case shall the structure be removed sooner than 2 years after the last augmented seeding. When the siltation structure is removed, the land on which the siltation structure was located shall be regraded and revegetated in accordance with the reclamation plan. Sedimentation ponds approved by the Division for retention as permanent impoundments may be exempted from this requirement.

Any point-source discharge of water from underground workings to surface waters which does not meet effluent limitations shall be passed through a siltation structure before leaving the permit area.

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### Siltation Structures: Sedimentation ponds

Sedimentation ponds, when used, shall: be used individually or in series; be located as near as possible to the disturbed area and out of perennial streams unless approved by the Division; and, be designed, constructed, and maintained to:

- 1.) Provide adequate sediment storage volume;
- 2.) Provide adequate detention time to allow the effluent from the ponds to meet State and Federal effluent limitations;
- 3.) Contain or treat the 10-year, 24-hour precipitation event ("design event") unless a lesser design event is approved by the Division based on terrain, climate, other site-specific conditions and on a demonstration by the operator that the effluent limitations will be met;
- 4.) Provide a nonclogging dewatering device adequate to maintain the required time;
- 5.) Minimize, to the extent possible, short circuiting;
- 6.) Provide periodic sediment removal sufficient to maintain adequate volume for the design event;
- 7.) Ensure against excessive settlement;
- 8.) Be free of sod, large roots, frozen soil, and acid- or toxic-forming coal-processing waste; and
- 1.) Be compacted properly.

A sedimentation pond shall include either a combination of principal and emergency spillways or a single open-channel spillway configured as specified in this section, designed and constructed to safely pass the applicable design precipitation event. The Division may approve a single open-channel spillway that is: of nonerodible construction and designed to carry sustained flows; or earth- or grass-lined and designed to carry short-term infrequent flows at non-erosive velocities where sustained flows are not expected.

The required design precipitation event for a sedimentation pond meeting the spillway requirements of this section is: for a sedimentation pond meeting the size or other criteria of 30 CFR Sec. 77.216(a), a 100-year 6-hour event, or greater event as specified by the Division; or, for a sedimentation pond not meeting the size or other criteria of 30 CFR Sec. 77.216(a), a 25-year 6-hour event, or greater event as specified by the Division.

In lieu of meeting the above spillway requirements, the Division may approve a sedimentation pond that relies primarily on storage to control the runoff from the design precipitation event when it is demonstrated by the operator and certified by a qualified registered professional engineer or, as applicable, a qualified registered professional land surveyor that; the sedimentation pond will safely control the design precipitation event; the water from which shall be safely removed in accordance with current, prudent, engineering practices; and, such a sedimentation pond shall be located where failure would not be expected to cause loss of life or serious property damage. If the sediment pond is located where failure would be expected to cause loss of life or serious property damage, a sedimentation pond that relies primarily on storage to control the runoff from the design precipitation event may be allowed if, in addition to the design event, is: in the case of a sedimentation pond meeting the size or other criteria of 30 CFR Sec. 77.216(a), designed to control the precipitation of the probable maximum precipitation of a 6-hour event, or greater event as specified by the Division; or, in the case of a sedimentation pond not meeting the size or other criteria of 30 CFR Sec. 77.216(a), designed to control the precipitation of a 100-year 6-hour event, or greater event as specified by the Division.

### Siltation Structures: Other treatment facilities

Other treatment facilities shall be designed to treat the 10-year, 24-hour precipitation even unless a lesser design event is approved by the Division based on terrain, climate, other site-specific conditions and a demonstration by the operator that the effluent limitations will be met. Other treatment facilities shall be designed, constructed and maintained accordance with the applicable requirements as described under sediment ponds.

### Siltation Structures: Exemptions

Exemptions to the requirements of this section may be granted if: the disturbed drainage area within the total disturbed area is small; and, the operator demonstrates that siltation structures and alternate sediment control measures are not necessary for drainage from the disturbed drainage areas to meet effluent limitations and applicable State and Federal water-quality standards for the receiving waters.

### Discharge structures

Discharge from sedimentation ponds, permanent and temporary impoundments, coal processing waste dams and embankments, and diversions shall be controlled, by energy dissipators, riprap channels, and other devices, where necessary, to reduce erosion, to prevent deepening or enlargement of stream channels, and to minimize disturbance of the hydrologic balance. Discharge structures shall be designed according to standard engineering design procedures.

### Impoundments

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The following requirements apply to both temporary and permanent impoundments:

- 1.) An impoundment meeting the size or other criteria of 30 CFR Sec. 77.216(a) shall comply with the requirements of 30 CFR Sec. 77.216 and this section.
- 2.) The design of impoundments shall be certified as designed to meet the requirements of the regulations using current, prudent, engineering practices and any design criteria established by the Division. The qualified, registered, professional engineer or qualified, registered, professional, land surveyor shall be experienced in the design and construction of impoundments.
- 3.) An impoundment meeting the size or other criteria of 30 CFR Sec. 77.216(a) or located where failure would be expected to cause loss of life or serious property damage shall have a minimum static safety factor of 1.5 for a normal pool with steady state seepage saturation conditions, and a seismic safety factor of at least 1.2. Impoundments not meeting the size or other criteria of 30 CFR Sec. 77.216(a), except for a coal mine waste impounding structure, and located where failure would not be expected to cause loss of life or serious property damage shall have a minimum static safety factor of 1.3 for a normal pool with steady state seepage saturation conditions. For an impoundment not meeting the size or other criteria of 30 CFR Sec. 77.216(a), where failure would not be expected to cause loss of life or serious property damage, the Division may establish engineering design standards that ensure stability comparable to a 1.3 minimum static safety factor in lieu of engineering tests to establish compliance with the minimum static safety factor of 1.3.
- 4.) Impoundments shall have adequate freeboard to resist overtopping by waves and by sudden increases in storage volume.
- 5.) Foundations and abutments for an impounding structure shall be stable during all phases of construction and operation and shall be designed based on adequate and accurate information on the foundation conditions. For an impoundment meeting the size or other criteria of 30 CFR Sec. 77.216(a), foundation investigation, as well as any necessary laboratory testing of foundation material, shall be performed to determine the design requirements for foundation stability. All vegetative and organic materials shall be removed and foundations excavated and prepared to resist failure. Cutoff trenches shall be installed if necessary to ensure stability.
- 6.) Slope protection shall be provided to protect against surface erosion at the site and protect against sudden drawdown.
- 7.) Faces of embankments and surrounding areas shall be vegetated, except that faces where water is impounded may be rippedraped or otherwise stabilized in accordance with accepted design practices.
- 8.) Spillways: An impoundment shall include either a combination of principal and emergency spillways, a single open-channel spillway, or, be configured as an impoundment that relies primarily on storage to control the runoff from the applicable design precipitation event. The Division may approve a single open-channel spillway that is of nonerodible construction and designed to carry sustained flows; or, earth- or grass-lined and designed to carry short-term, infrequent flows at non-erosive velocities where sustained flows are not expected. Except impoundments that rely primarily on storage to control the runoff, the required design precipitation events for an impoundment having spillways are: for an impoundment meeting the size or other criteria of 30 CFR Sec. 77.216(a) a 100-year 6-hour event, or greater event as specified by the Division; and, for an impoundment not meeting the size or other criteria of 30 CFR Sec. 77.216(a), a 25-year 6-hour event, or greater event as specified by the Division. In lieu of meeting the single open-channel spillway requirements, the Division may approve an impoundment that relies primarily on storage to control the runoff from the design precipitation event when it is demonstrated by the operator and certified by a qualified registered professional engineer or qualified registered professional land surveyor that the impoundment will safely control the design precipitation event, the water from which shall be safely removed in accordance with current, prudent, engineering practices. Such an impoundment shall be located where failure would not be expected to cause loss of life or serious property damage, except where: in the case of an impoundment meeting the size or other criteria of 30 CFR Sec. 77.216(a), it is designed to control the precipitation of the probable maximum precipitation of a 6-hour event, or greater event as specified by the Division; or, in the case of an impoundment not meeting the size or other criteria of 30 CFR Sec. 77.216(a), it is designed to control the precipitation of a 100-year 6-hour event, or greater event as specified by the Division.
- 9.) The vertical portion of any remaining highwall shall be located far enough below the low-water line along the full extent of highwall to provide adequate safety and access for the proposed water users.
- 10.) Inspections: Except as provided in paragraph (a)(10)(iv) of this section, a qualified registered professional engineer or other qualified professional specialist under the direction of a professional engineer, shall inspect each impoundment as provided in paragraph (a)(10)(i) of this section. The professional engineer or specialist shall be experienced in the construction of impoundments.

Inspections shall be made regularly during construction, upon completion of construction, and at least yearly until removal of the structure or release of the performance bond. The qualified registered professional engineer, or qualified registered professional land surveyor as applicable, shall promptly after each inspection provide to the Division a certified report that the impoundment has been constructed and/or maintained as designed and in accordance with the approved plan and this section. The report shall include discussion of any appearance of instability, structural weakness or other hazardous condition, depth and elevation of any impounded waters, existing storage capacity, any existing or required monitoring procedures and instrumentation, and any other aspects of the structure affecting stability. A copy of the report shall be retained at or near the minesite.

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A qualified registered professional land surveyor may inspect any temporary or permanent impoundment that does not meet the size or other criteria of 30 CFR Sec. 77.216(a) and certify and submit the report required above, except that all coal mine waste impounding structures shall be certified by a qualified registered professional engineer. The professional land surveyor shall be experienced in the construction of impoundments. Impoundments subject to 30 CFR Sec. 77.216 must be examined in accordance with 30 CFR Sec. 77.216-3. Other impoundments shall be examined at least quarterly by a qualified person designated by the operator for appearance of structural weakness and other hazardous conditions.

If any examination or inspection discloses that a potential hazard exists, the person who examined the impoundment shall promptly inform the Division of the finding and of the emergency procedures formulated for public protection and remedial action. If adequate procedures cannot be formulated or implemented, the Division shall be notified immediately. The Division shall then notify the appropriate agencies that other emergency procedures are required to protect the public.

A permanent impoundment of water may be created, if authorized by the Division in the approved permit based upon the following demonstration:

- 1.) The size and configuration of such impoundment will be adequate for its intended purposes.
- 2.) The quality of impounded water will be suitable on a permanent basis for its intended use and, after reclamation, will meet applicable State and Federal water quality standards, and discharges from the impoundment will meet applicable effluent limitations and will not degrade the quality of receiving water below applicable State and Federal water quality standards.
- 3.) The water level will be sufficiently stable and be capable of supporting the intended use.
- 4.) Final grading will provide for adequate safety and access for proposed water users.
- 5.) The impoundment will not result in the diminution of the quality and quantity of water utilized by adjacent or surrounding landowners for agricultural, industrial, recreational, or domestic uses.
- 6.) The impoundment will be suitable for the approved postmining land use.

The Division may authorize the construction of temporary impoundments as part of underground mining activities.

Ponds, impoundments, banks, dams, and embankments

Each application shall include a general plan for each proposed sedimentation pond, water impoundment, and coal processing waste bank, dam, or embankment within the proposed permit area. Each general plan shall:

- 1.) Be prepared by, or under the direction of, and certified by a qualified, registered, professional engineer, a professional geologist, or in any State which authorizes land surveyors to prepare and certify such plans, a qualified, registered, professional land surveyor with assistance from experts in related fields such as landscape architecture;
- 2.) Contain a description, map, and cross section of the structure and its location;
- 3.) Contain preliminary hydrologic and geologic information required to assess the hydrologic impact of the structure;
- 4.) Contain a survey describing the potential effect on the structure from subsidence of the subsurface strata resulting from past underground mining operations if underground mining has occurred; and
- 5.) Contain a certification statement which includes a schedule setting forth the dates when any detailed design plans for structures that are not submitted with the general plan will be submitted to the Division. The Division shall have approved, in writing, the detailed design plan for a structure before construction of the structure begins.

Each detailed design plan for a structure that meets or exceeds the size or other criteria of the Mine Safety and Health Administration, 30 CFR Section 77.216(a) shall:

- 1.) Be prepared by, or under the direction of, and certified by a qualified registered professional engineer with assistance from experts in related fields such as geology, land surveying, and landscape architecture;
- 2.) Include any geotechnical investigation, design, and construction requirements for the structure;
- 3.) Describe the operation and maintenance requirements for each structure; and
- 4.) Describe the timetable and plans to remove each structure, if appropriate.

Each detailed design plan for a structure that does not meet the size or other criteria of 30 CFR Section 77.216(a) shall:

- 1.) Be prepared by, or under the direction of, and certified by a qualified, registered, professional engineer, or in any State which authorizes land surveyors to prepare and certify such plans, a qualified, registered, professional land surveyor, except that all coal processing waste dams and embankments covered by Sections 817.81-817.84 of this Chapter shall be certified by a qualified, registered, professional engineer;
- 2.) Include any design and construction requirements for the structure, including any required geotechnical information;
- 3.) Describe the operation and maintenance requirements for each structure; and

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- 4.) Describe the timetable and plans to remove each structure, if appropriate.

Sedimentation ponds, whether temporary or permanent, shall be designed in compliance with the requirements of Siltation Structures. Any sedimentation pond or earthen structure which will remain on the proposed permit area as a permanent water impoundment shall also be designed to comply with the requirements for Impoundments. Each plan shall, at a minimum, comply with the requirements of the Mine Safety and Health Administration, 30 CFR Sections 77.216-1 and 77.216-2.

Permanent and temporary impoundments shall be designed to comply with the requirements for Impoundments. Each plan for an impoundment meeting the size of other criteria of the Mine Safety and Health Administration shall comply with the requirements of 30 CFR Sec. 77.216-1 and 77.216-2. The plan required to be submitted to the District Manager of MSHA under Sec. 77.216 of this title shall be submitted to the Division as part of the permit application. For an impoundment not meeting the size of other criteria of 30 CFR Sec. 77.216(a) and located where failure would not be expected to cause loss of life or serious property damage, the Division may establish through the State program approval process engineering design standards that ensure stability comparable to a 1.3 minimum static safety factor in lieu of engineering tests to establish compliance with the minimum static safety factor of 1.3.

Coal processing waste banks, dams and embankments shall be designed to comply with the requirements for Coal Mine Waste. Each plan shall comply with the requirements of the Mine Safety and Health Administration, 30 CFR Sections 77.216-1 and 77.216-2, and shall contain the results of a geotechnical investigation of the proposed dam or embankment foundation area, to determine the structural competence of the foundation which will support the proposed dam or embankment structure and the impounded material. The geotechnical investigation shall be planned and supervised by an engineer or engineering geologist, according to the following:

- 1.) The number, location, and depth of the borings and test pits shall be determined using current prudent engineering practice for the size of the dam or embankment, quantity of material to be impounded, and subsurface conditions.
- 2.) The character of the overburden and bedrock, the proposed abutment sites, and any adverse geotechnical conditions which may affect the particular dam, embankment, or reservoir site shall be considered.
- 3.) All springs, seepage, and ground-water flow observed or anticipated during wet periods in the area of the proposed dam or embankment shall be identified on each plan.
- 4.) Consideration shall be given to the possibility of mudflows, rock-debris falls, or other landslides into the dam, embankment, or impounded material.

If the structure is 20 feet or higher or impounds more than 20 acre-feet, each plan of this section shall include a stability analysis of each structure. The stability analysis shall include, but not be limited to, strength parameters, pore pressures, and long-term seepage conditions. The plan shall also contain a description of each engineering design assumption and calculation with a discussion of each alternative considered in selecting the specific design parameters and construction methods.

**Analysis:**

**General**

Based on the first Technical Analysis (TA), the Division expected to receive two maps relating to the as-built hydrology of the Mine site. Instead, an entirely new Appendix 7-4, West Ridge Mine Sedimentation and Drainage Control Plan was submitted. The permittee indicated there were so many changes that the whole appendix had to be redone. This technical analysis review compared the original, approved, Appendix 7-4 to the new, as-built version. The new appendix was also reviewed. All maps, design calculations, and as-built construction in the new submittal are certified by a Professional Engineer.

## Diversions

Comparing the old and new Map 7-2, Mine Site Drainage Map, several changes were noted that appear necessary due to the revised configuration of the site. These configuration changes included changing the right fork of the site from five levels to four levels. The road configuration was changed accordingly. These changes appear to have little hydrologic impact.

- DC-8 was moved under the road to the coal storage pile.
- DD-4A and DC-4A were added.
- DC-5 designation was changed to DC-6 and DC-5 is now at a new location across the canyon.
- DD-8 goes around the base of the "nose" instead of above the lower road.
- UC-DD and UC-FF have different alignments. These culverts direct undisturbed drainage flows from the channel outside the site to the main culvert under the site. The three main culverts under the site follow the originally approved alignment. This is important to reclamation and was essential to retain.
- DD-11 goes directly to upper Cell A of the Sediment Pond instead of to DC-12 and into the lower Cell B.
- DD-8A was added between two roads.
- Snow storage sites were reduced from 18 to 15.
- UD-15, which drains the County Road, remains the same. The County Road segment also remained the same near the site.
- The roads to the "nose" and to the portals are less steep, but are longer. There is a large added safety berm at the base of the highwall.

All disturbed area diversions, ditches and culverts, have been designed to a 10-year, 24-hour design. This exceeds the 10-year, 6-hour regulatory design, but is consistent with the 10-year, 24-hour design of the sediment pond and the ASCA areas. The design storm is an SCS Type II. The runoff curve numbers were decided upon with Division input. Nearly all runoff numbers remained the same.

Ditches, disturbed and undisturbed, have a minimum freeboard of 0.5 feet, which is at least 20% of the flow depth. This is good engineering design. All ditches having flows greater than 5 feet per second are concrete lined. The number of undisturbed drainage ditches was reduced from seven to two.

With one exception, the bypass culvert sizes remained the same. Culvert UC-HH was reduced from 3 feet to 2 feet. The design calculations appear appropriate and there is 10 feet of headwater available at the inlet, should that be needed.

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<b>Bypass Culvert</b>	<b>Old Design Flow (CFS)</b>	<b>New Design Flow (CFS)</b>
UC-AA	45.5	45.5
UC-HH	28	25
UC-JJ	2.14	2.16
UC-DD	0.91	0.91
UC-MM	0.50	0.52
UC-FF	0.95	0.95

The three main bypass culvert lengths were reduced. These are the three legs of the "Y" formed by the left, right, and main channels. The reduction was from 5007.2 feet to 4329.2 feet, a reduction of 677.7 feet.

All undisturbed area culverts are equipped with ramped trash-racks to reduce culvert plugging. The trash-racks are ¾-inch bars, 6 inches on center. Riprap extends to 6 inches above the elevation head required for the design flow. Culverts carrying undisturbed flows have been designed using a 100-year, 6-hour storm.

**Sedimentation Ponds**

Comparing the old and new Map 7-4, Sediment Pond Plan and Profile, some changes were noted that appear necessary due to the revised configuration of the site. These changes appear to have little hydrologic impact. Other elements remained the same.

- DD-11 flows to DC-13 and into upper Cell A, instead of into DC-12 and lower Cell B.
- The roads are in basically the same location.
- Both cells of the sediment pond are very close to the original design. The cells do not cut into the hillside and are positioned right next to one another as originally approved.

The disturbed area drainages flowing to the pond were all designed with the appropriate 10-year, 24-hour storm. The volume of flows reporting to the pond remained the same from the approved plan to the as-built plan. The sum of the runoff from the Disturbed Area, Undisturbed Area, Direct Precipitation, and 3-years of sediment is 7.051 acre-feet. The combined capacity of the two cells of the pond is 8.170 acre-feet, or about 16% greater than design calculations.

The Open-Channel Spillway between cells was designed to meet the appropriate 25-year, 6-hour storm. There is only about one foot of freeboard at that flow, but that would probably be adequate. The Principal and Emergency Spillways are designed to independently pass the required 25-year, 6-hour design event. This conservative design means either spillway could be plugged and the design flow would still flow out of the lower cell. Similar to the upper cell, the freeboard at that flow would be a little over one foot.

All culverts leading to both cells of the sediment pond were checked for capacity and appear to be adequate. In addition, the flows into and through the pond cells showed the following:

- 1) Total inflow into the upper cell, Cell A, is 27.52 cfs. Total flow into the lower cell, Cell B, is 13.51 cfs. This means slightly more than two times the flow enters the upper cell and can flow out the Open-Channel Spillway. The upper cell has a 4.667 acre-feet volume while the lower cell has a 3.482 acre-feet volume. It's preferable that the greater volume flows to the larger (upper) cell.
- 2) The Open-Channel Spillway can pass the flows from the upper cell to the lower cell. That spillway can accommodate the 27.52 cfs with about 1 foot of freeboard.
- 3) The total inflow to the lower cell is 41.03 cfs (27.52 + 13.51) and the outflow from the lower cell is at least 48 cfs. The Principal and Emergency Spillways can function without the other to provide this capacity. This means there appears to be no restriction to flow through the multi-cell sediment pond and its associated inlet culverts, open spillway, and two outlet spillways.

One intent of the submittal was to compare the constructed highwalls to the one approved in the MRP. Hydrologically there are really no changes at the highwalls. The approved highwall was about 40 feet high while the constructed one is about 90 feet tall. Additionally, there is a safety bench at the base of the highwalls that was not in the original submittal. The drainage area remains the same and no added runoff would result.

### **Other Treatment Facilities**

ASCA-Z is the alternate sediment control area that exists in the parking lot area immediately SW of the lower cell (Cell B) of the mine site sediment pond. After the initial construction of the Mine site, the permittee felt that the total containment basin that had been permitted as the treatment method utilized too much space. This space was needed, such that more parking would be available when the Mine office was constructed. The permittee permitted a new design for ASCA-Z through C/007/041-AM00E. Although approved by the Division, the new design was never field implemented. Thus the in-place treatment for ASCA-Z is total containment and evaporation, and not the silt fence dam with discharge to the undisturbed bypass culvert as was proposed by AM00E.

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**Discharge Structures**

The riprap at the outlet of the main mine site culvert is appropriately designed. It remains the same as originally approved with a correctly designed filter bed below the riprap. The water exit velocity is 5 feet per second while the natural stream velocity is 10 feet per second. This should prevent any stream channel scouring.

**Findings:**

The submittal meets minimum regulatory requirements.

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RECLAMATION PLAN

# RECLAMATION PLAN

## BACKFILLING AND GRADING

Regulatory Reference: 30 CFR 785.15, 817.102, 817.107; R645-301-234, -301-537, -301-552, -301-553, -302-230, -302-231, -302-232, -302-233.

### Minimum Regulatory Requirements:

#### General

Disturbed areas shall be backfilled and graded to: achieve the approximate original contour; eliminate all highwalls, spoil piles, and depressions; achieve a postmining slope that does not exceed either the angle of repose or such lesser slope as is necessary to achieve a minimum long term static safety factor of 1.3 and to prevent slides; minimize erosion and water pollution both on and off the site; and, support the approved postmining land use.

The postmining slope may vary from the approximate original contour when approval is obtained from the Division for a variance from approximate original contour requirements, or when incomplete elimination of highwalls in previously mined areas is allowed under the regulatory requirements. Small depressions may be constructed if they are needed to retain moisture, minimize erosion, create and enhance wildlife habitat, or assist revegetation.

If it is determined by the Division that disturbance of the existing spoil or underground development waste would increase environmental harm or adversely affect the health and safety of the public, the Division may allow the existing spoil or underground development waste pile to remain in place. Accordingly, regrading of settled and revegetated fills to achieve approximate original contour at the conclusion of underground mining activities shall not be required if: the settled and revegetated fills are composed of spoil or nonacid- or nontoxic-forming underground development waste; the spoil or underground development waste is not located so as to be detrimental to the environment, to the health and safety of the public, or to the approved postmining land use; stability of the spoil or underground development waste must be demonstrated through standard geotechnical analysis to be consistent with backfilling and grading requirements for material on the solid bench (1.3 static safety factor) or excess spoil requirements for material not placed on a solid bench (1.5 static safety factor); and, the surface of the spoil or underground development waste shall be vegetated in accordance with the revegetation standards for success, and surface runoff shall be controlled in accordance with the regulatory requirements for diversions.

Spoil shall be returned to the mined-out surface area. Spoil and waste materials shall be compacted where advisable to ensure stability or to prevent leaching of toxic materials. Spoil may be placed on the area outside the mined-out surface area in nonsteep slope areas to restore the approximate original contour by blending the spoil into the surrounding terrain if the following requirements are met: all vegetative and organic materials shall be removed from the area; the topsoil on the area shall be removed, segregated, stored, and redistributed in accordance with regulatory requirements; the spoil shall be backfilled and graded on the area in accordance with the general requirements for backfilling and grading.

Disposal of coal processing waste and underground development waste in the mined-out surface area shall be in accordance with the requirements for the disposal of spoil and waste materials except that a long-term static safety factor of 1.3 shall be achieved.

Exposed coal seams, acid- and toxic-forming materials, and combustible materials exposed, used, or produced during mining shall be adequately covered with nontoxic and noncombustible materials, or treated, to control the impact on surface and ground water, to prevent sustained combustion, and to minimize adverse effects on plant growth and the approved postmining land use.

Cut-and-fill terraces may be allowed by the Division where: needed to conserve soil moisture, ensure stability, and control erosion on final-graded slopes, if the terraces are compatible with the approved postmining land use; or, specialized grading, foundation conditions, or roads are required for the approved postmining land use, in which case the final grading may include a terrace of adequate width to ensure the safety, stability, and erosion control necessary to implement the postmining land-use plan.

Preparation of final-graded surfaces shall be conducted in a manner that minimizes erosion and provides a surface for replacement of topsoil that will minimize slippage.

Previously mined areas

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Remining operations on previously mined areas that contain a preexisting highwall shall comply with all other reclamation requirements except as provided herein. The requirement that elimination of highwalls shall not apply to remining operations where the volume of all reasonably available spoil is demonstrated in writing to the Division to be insufficient to completely backfill the reaffected or enlarged highwall. The highwall shall be eliminated to the maximum extent technically practical in accordance with the following criteria:

- 1.) All spoil generated by the remining operation and any other reasonably available spoil shall be used to backfill the area. Reasonably available spoil in the immediate vicinity of the remining operation shall be included within the permit area.
- 2.) The backfill shall be graded to a slope which is compatible with the approved postmining land use and which provides adequate drainage and long-term stability.
- 3.) Any highwall remnant shall be stable and not pose a hazard to the public health and safety or to the environment. The operator shall demonstrate, to the satisfaction of the Division, that the highwall remnant is stable.
- 4.) Spoil placed on the outslope during previous mining operations shall not be disturbed if such disturbances will cause instability of the remaining spoil or otherwise increase the hazard to the public health and safety or to the environment.

### Backfilling and grading on steep slopes

Underground mining activities on steep slopes shall be conducted so as to meet other applicable regulatory requirements and the requirements of this section. The following materials shall not be placed on the downslope: spoil; waste materials of any type; debris, including that from clearing and grubbing; abandoned or disabled equipment; land above the highwall shall not be disturbed unless the Division finds that this disturbance will facilitate compliance with the environmental protection standards and the disturbance is limited to that necessary to facilitate compliance; and, woody materials shall not be buried in the backfilled area unless the Division determines that the proposed method for placing woody material within the backfill will not deteriorate the stable condition of the backfilled area.

### Special provisions for steep slope mining

No permit shall be issued for any operations covered by steep slope mining, unless the Division finds, in writing, that in addition to meeting all other regulatory requirements, the operation will be conducted in accordance with the requirements for backfilling and grading on steep slopes. Any application for a permit for surface coal mining and reclamation operations covered by steep slope mining shall contain sufficient information to establish that the operations will be conducted in accordance with the requirements for backfilling and grading on steep slopes.

This section applies to any person who conducts or intends to conduct steep slope surface coal mining and reclamation operations, except: where an operator proposes to conduct surface coal mining and reclamation operations on flat or gently rolling terrain, leaving a plain or predominantly flat area, but on which an occasional steep slope is encountered as the mining operation proceeds; where a person obtains a permit under the provisions for mountaintop removal mining; or, to the extent that a person obtains a permit incorporating a variance from approximate original contour restoration requirements.

## Analysis:

### General

The permit application package for the West Ridge Mine, which was reviewed and eventually approved by the Division. Same permitted a reclamation plan for the portal highwall area that was smaller in height and width than the highwall which was constructed. During the construction of the portal faceup, the permittee discovered that the coal near the outcrop had been burned more extensively than was originally anticipated. The permittee could not follow the approved mine plan because it did not anticipate the extent of coal burn discovered. Thus, it was necessary to construct a larger highwall. The permittee also constructed a safety bench to protect employees and machinery in this area from falling debris. A major concern developed within the ranks of the Division as to whether or not the highwall could be properly reclaimed to R645 standards. Therefore, the Division issued a Division Order (DO00A) which required the

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permittee to submit "as-built" drawings of the entire Mine site, including the portal highwall area, along with a detailed slope stability study of the highwall area. These were necessary to determine the reclaimability of the portal highwall area, as required under R645-300-133.710.

In the July 2, 2001 submittal, the permittee included Appendix 5-9, West Ridge Mine Proposed Highwall Reclamation Plan. The plan was prepared by Agapito Associates, Inc. (AAI), who had done the original slope stability work. The highwall reclamation plan includes the following:

*Existing Conditions:*

*The portal excavation consists of a rock highwall approximately 58' in height at an angle of 68° from horizontal. The highwall is comprised primarily of sandstone with the face roughly parallel to the dip of the bedding. An MSHA safety bench approximately 25' in width has been constructed above the portals at the base of the slope to protect miners from potential rockfall.*

*Although minor rockfall is evident on the bench, the highwall shows no signs of instability such as tension cracks or raveling. The existing slope is dry, and no water flow or seepage has been noted on the slope to date.*

*Proposed Reclamation Plan:*

*The following is the proposed plan of reclamation for this highwall. The plan is based on recommendations and technical information provided in the attached Agapito report.*

- 1. The highwall will be backfilled using clean, angular rockfill as recommended in the report. This backfill will be per the specifications and gradation as prescribed by the report.*
- 2. The angular rock backfill will be placed in lifts of 1' to 3' thick, and will be compacted by wheeled loader where width allows. Placement and compaction of the upper, narrower portion of the fill will be accomplished with a trackhoe.*
- 3. The backfill will extend from the prescribed toe of the slope to the top of the excavation. The reclaimed section will reach a height of approximately 58' at an angle of approximately 40° from horizontal, as shown on Figure 1.*
- 4. In order to help ensure the minimum 1.3 static safety factor over this height and angle, the surface of the highwall backfill will not be covered with soil, and will not be revegetated. Soil covering for overall vegetation and even "pocket" vegetation may result in eventual filling of the voids in the backfill and affect the free-draining nature of the fill, thus reducing the safety factor.*
- 5. The reclaimed highwall will have the appearance of a "talus slope", which is compatible with other slopes in the area.*
- 6. The reclamation of the highwall in accordance with this plan will meet the*

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*requirements of R645-301-553 by achieving the Approximate Original Contour, eliminating all highwalls, achieving a long-term static safety factor of 1.3, minimizing erosion and water pollution (angular, durable rock fill), and supporting the approved postmining land use (wildlife habitat.)*

7. *It should be noted that under this plan, no special provisions are made to divert or otherwise prevent water infiltration from the backfill. Since it is nearly impossible to guarantee success of such controls even after bond release, the use of a stable, free-draining angular rock backfill is a much more desirable and permanent reclamation technique in this instance.*
8. *The highwall will be visually monitored through the life of the mine for signs of instability or seepage. More intensive monitoring and reporting will only be implemented if the highwall shows signs of instability, which could affect the safety of the personnel or the success of the reclamation.*

AAI report states that the height of the highwall shown on Figure 1 is 58 feet. While the highwall height is 58 feet, the slope associated with the reclaimed highwall is 75 vertical feet.

Attached to the proposed highwall reclamation plan is Revision No. 1 Stability Evaluation for the Proposed Reclaimed Slope at the Portal Excavation. In the report, the consultant shows the result of a slope stability analysis for the reclaimed highwalls. The results of the analysis are as follows:

1. The reclaimed highwall will have a static safety factor of 1.31. The Division requires that the slope have a minimum static safety factor of 1.3.
2. The reclaimed slope will have a pseudostatic (earthquake load) of 1.1. The Division does not have requirements for earthquake load for reclaimed slopes. However, that information is useful for evaluating the general backfilling and grading requirements as well as evaluating AOC.

In the slope stability report the consultant has made the following recommendations:

1. The backfill material should be a clean angular rockfill that is free of fines. The specific gradation (partial size distribution) is listed on Table 1 of the slope stability study.
2. The backfill material should be placed in thin lifts between 1 and 3 feet thick. Where the width of the backfill permits, the backfill should be placed by a front-end-loader. As the fill narrows, placement by a skilled trackhoe operator is recommended.
3. The backfill should be compacted by wheel-rolling rubber tire equipment when possible, and compacted by tamping by a trackhoe bucket elsewhere.
4. The reclaimed slope should be concave instead of straight and be free of vegetation or soil. If vegetation is needed then small pockets should be created and filled with soil.
5. Laborers should not be allowed on the slope for several months after the work is completed.

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6. If achieving the full slope height becomes difficult due to instability during construction, it should be acceptable to limit the backfill height to some distance below the crest of the current wall.
7. All construction equipment should be OSHA compliant. A full-time rock spotter should be used during construction.
8. A geotechnical engineer with a strong background in slope stability should manage the reclamation of the highwall area.
9. The existing slope should be visually monitored for indications of groundwater above the base of the slope.
10. The backfill should be monitored visually and by surveying techniques during the post-reclamation monitoring period.

The Division has reviewed the highwall reclamation plan and made the following findings:

1. The Division agrees with the proposal to use clean angular rocks for backfill because 1) the material has a high internal angle of friction that is needed for stability, 2) angular rock tends to pack better (few void spaces) than rounded rock, and 3) rock will provide a free draining material that will prevent the buildup of positive pore water pressure.
2. The permittee did not state where the backfill material for the highwalls would come from, nor did they state how they would ensure that all material would meet the specifications outlined in Table 1 of the Agapito Associates, Inc.(AAI) report. The Division needs that information to determine reclamation costs and if additional areas must be permitted in order to obtain that material.
3. The permittee needs to establish a measurable compaction standard. The Division has concerns that a wheeled vehicle (a front end loader) could not achieve the desired compaction rate because they do not transmit enough weight per unit area to achieve adequate compaction. Rock material is compacted best when using vibrating equipment rather than rolling equipment.
4. The AAI report recommends that the reclaimed slopes be stable but the cross sections show that the reclaimed highwall area (Station 23+00 to 27+00) will have straight to slightly convex slopes. The permittee needs to redesign the reclaimed slopes in order to comply with the AAI recommendation of concave slopes.
5. R645-301-553.120 requires that all post-SMCRA highwalls be eliminated.
6. The permittee needs to incorporate the recommended safety procedures into the reclamation plan.
7. The permittee needs to commit to have a geotechnical engineer, who is experienced in slope stability, be responsible for all construction activities during the reclamation of the highwall area.
8. The permittee must commit to monitoring for groundwater in the existing highwall until any noted water sources are covered during the backfilling of the area.
9. The permittee must describe the slope stability-monitoring program that will be used

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- during the monitoring and maintenance period.
10. The Division agrees with the claims in the AAI report that the angle-of-repose of the rock backfill will be 43° to 45°. The slope angles for the reclaimed highwall area will not exceed 40°.
  11. The Division agrees with the finding in the AAI report that the slope in Figure 1 will have a minimum static safety factor of 1.3.
  12. The height of the reclaimed slope shown in Figure 1 is 75 feet. The height of the reclaimed slope as depicted at Station 24+00 on Map 5-6B, is 105 feet. The 105 foot high reclaimed slope is the worst-case scenario. Since the safety factor for the slope in Figure 1 is just 1.31, the permittee must show that the reclaimed slope which reaches the height of 105 feet can also achieve the minimum long term static safety factor of 1.3. Therefore, the permittee must provide the Division with additional information.
  13. The permittee's proposal is to reclaim the highwall area to a "talus slope", *which is compatible with other slopes in the area*. The permittee needs to identify these other talus slopes in the area that are being referenced. This would aid the Division in making a determination that adequate justification exists in order to approve the reclamation of the slope to a talus configuration. Otherwise, the permittee must address the necessary requirements to revegetate the reclaimed slope. In order to meet the requirements of the R645 coal rules relative to revegetation and the long-term static safety factor, it may be necessary to reconfigure the reclamation plan for the highwall area.

**Findings:**

The information in the proposed amendment is not considered adequate to meet the requirements of this section. The permittee must provide the following in accordance with:

- R645-301-542.200**, The permittee must give the Division a detailed backfilling and grading plan for the highwall area that includes the following: 1) The permittee must state from where the rock material that will be used to backfill the highwalls will come. 2) The permittee must show that the material used to backfill the highwall will meet the requirements of the AAI slope stability report including the gradation specification listed on Table 1. The permittee must also state how those material specifications, as described in the AAI slope stability analysis, will be ensured. 3) The permittee must state what compaction specifications are felt to be necessary and how they will be obtained and verified in the field. 4) The permittee must show that the reclaimed highwall slopes will have a convex shape as recommended by AAI. 5) The permittee must state what safety programs will be used during reclamation of the highwall area. The safety program should include the recommendations in the AAI report. 6) The permittee needs to commit to have a geotechnical engineer who is experienced with slope stability be responsible for all construction activities at the site during the reclamation of the

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highwall. 7) The permittee must give the Division a detailed plan for monitoring the highwall for groundwater. 8) The permittee must state how they will monitor the reclaimed highwalls for stability.

**R645-301-553.120**, The Permittee must commit to eliminate the entire highwall. If rock fill cannot be placed at the top of the slope due to instability, then the permittee will have to modify the reclamation plan so that the highwall will be eliminated.

**R645-301-553.130**, The permittee must show that the slope at Station 24+00 as depicted on Map 5-6B will have a safety factor of 1.3 or greater. The Division is concerned about the slope on Station 24+00 because it is higher than the slope used in the stability analysis. The slope used in the stability analysis has a height of 74 feet. The slope stability analysis must critique the highest slope or worst-case scenario.

**R645-301-830.140**, The permittee must provide the Division with detailed earthwork calculations for the reclamation of the highwalls. The earthwork calculations must include enough detail to show that conventional equipment can be used to place the backfill material against the highwall so that all engineering specifications, including those relative to compaction, will be met.

## HYDROLOGIC INFORMATION

Regulatory Reference: 30 CFR 784.14, 784.29, 817.41, 817.42, 817.43, 817.45, 817.49, 817.56, 817.57; 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.

Minimum Regulatory Requirements:

Hydrologic reclamation plan

The application shall include a plan, with maps and descriptions, indicating how the relevant regulatory requirements will be met. The plan shall be specific to the local hydrologic conditions. It shall contain the steps to be taken during mining and reclamation through bond release to minimize disturbance to the hydrologic balance within the permit and adjacent areas; to prevent material damage outside the permit area; and to meet applicable Federal and State water quality laws and regulations. The plan shall include the measures to be taken to: avoid acid or toxic drainage; prevent, to the extent possible using the best technology currently available, additional contributions of suspended solids to streamflow; provide water treatment facilities when needed; and control drainage. The plan shall specifically address any potential adverse hydrologic consequences identified in the PHC determination and shall include preventive and remedial measures.

Each application shall contain descriptions, including maps and cross sections, of stream channel diversions and other diversions to be constructed within the proposed permit area to achieve compliance with the performance standards for those structures.

Postmining rehabilitation of sedimentation ponds, diversions, impoundments, and treatment facilities

Before abandoning a permit area or seeking bond release, the operator shall ensure that all temporary structures are removed and reclaimed, and that all permanent sedimentation ponds, diversions, impoundments, and treatment facilities meet the requirements of this Chapter for permanent structures, have been maintained properly and meet the requirements of the approved

reclamation plan for permanent structures and impoundments. The operator shall renovate such structures if necessary to meet the requirements of this Chapter and to conform to the approved reclamation plan.

## **Analysis:**

### **General**

In the originally approved MRP there was an Optional Reduction of Mineyard Extent. This option was exercised during construction and the As-Built yard is slightly less than originally approved. The reduced area quantified as a reduction of 0.06 acres on the C2 Form.

### **Diversions**

Comparison of original Fig. 10 and new Fig. 12, Restored Channel Typical Sections, shows that the reclaimed main channel and the side channels remained essentially the same. Flow depth, freeboard, and velocity were checked. Reclaimed channels RC-GG and RC-KK have slightly reduced velocities of flow. All designs were and are based on the required 100-year, 6-hour storm.

Other Hydrologic aspects of the Reclamation Plan remained essentially the same. The sediment calculations are the same. The roughening and mulching reclamation method will still be used and result in less sediment than natural conditions. The series of silt fences used to minimize sediment contribution to the stream will still be used. That includes those at the lowest point in the stream at the southernmost end of the site.

## **Findings:**

The submittal meets minimum regulatory requirements.

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**REVEGETATION**

Regulatory Reference: 30 CFR 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.

**Minimum Regulatory Requirements:**

**Revegetation: General requirements**

The permittee shall establish on regraded areas and on all other disturbed areas except water areas and surface areas of roads that are approved as part of the postmining land use, a vegetative cover that is in accordance with the approved permit and reclamation plan and that is: diverse, effective, and permanent; comprised of species native to the area, or of introduced species where desirable and necessary to achieve the approved postmining land use and approved by the Division; at least equal in extent of cover to the natural vegetation of the area; and, capable of stabilizing the soil surface from erosion.

The reestablished plant species shall: be compatible with the approved postmining land use; have the same seasonal characteristics of growth as the original vegetation; be capable of self-regeneration and plant succession; be compatible with the plant and animal species of the area; and, meet the requirements of applicable State and Federal seed, poisonous and noxious plant, and introduced species laws or regulations.

The Division may grant exception to these requirements when the species are necessary to achieve a quick-growing, temporary, stabilizing cover, and measures to establish permanent vegetation are included in the approved permit and reclamation plan.

When the Division approves a cropland postmining land use, the Division may grant exceptions to the requirements related to the original and native species of the area. Areas identified as prime farmlands must also meet those specific requirements as specified under that section.

**Revegetation: Timing**

Disturbed areas shall be planted during the first normal period for favorable planting conditions after replacement of the plant-growth medium. The normal period for favorable planting is that planting time generally accepted locally for the type of plant materials selected.

**Revegetation: Mulching and other soil stabilizing practices**

Suitable mulch and other soil stabilizing practices shall be used on all areas that have been regraded and covered by topsoil or topsoil substitutes. The Division may waive this requirement if seasonal, soil, or slope factors result in a condition where mulch and other soil stabilizing practices are not necessary to control erosion and to promptly establish an effective vegetative cover.

**Revegetation: Standards for success**

Success of revegetation shall be judged on the effectiveness of the vegetation for the approved postmining land use, the extent of cover compared to the cover occurring in natural vegetation of the area, and the general requirements for Revegetation. Standards for success and statistically valid sampling techniques for measuring success shall be selected by the Division and included in an approved regulatory program.

Standards for success shall include criteria representative of unmined lands in the area being reclaimed to evaluate the appropriate vegetation parameters of ground cover, production, or stocking. Ground cover, production, or stocking shall be considered equal to the approved success standard when it is not less than 90 percent of the success standard. The sampling techniques for measuring success shall use a 90-percent statistical confidence interval (i.e., a one-sided test with a 0.10 alpha error).

Standards for success shall be applied in accordance with the approved postmining land use and, at a minimum, the following conditions:

- 1.) For areas developed for use as grazing land or pasture land, the ground cover and production of living plants on the revegetated area shall be at least equal to that of a reference area or such other success standards approved by the Division.
- 2.) For areas developed for use as cropland, crop production on the revegetated area shall be at least equal to that

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- 3.) of a reference area or such other success standards approved by the Division. For areas to be developed for fish and wildlife habitat, recreation, shelter belts, or forest products, success of vegetation shall be determined on the basis of tree and shrub stocking and vegetative ground cover. Such parameters are described as follows: minimum stocking and planting arrangements shall be specified by the Division on the basis of local and regional conditions and after consultation with and approval by the State agencies responsible for the administration of forestry and wildlife programs. Consultation and approval may occur on either a programwide or a permit-specific basis; trees and shrubs that will be used in determining the success of stocking and the adequacy of the plant arrangement shall have utility for the approved postmining land use. Trees and shrubs counted in determining such success shall be healthy and have been in place for not less than two growing seasons. At the time of bond release, at least 80 percent of the trees and shrubs used to determine such success shall have been in place for 60 percent of the applicable minimum period of responsibility; and, vegetative ground cover shall not be less than that required to achieve the approved postmining land use.

For areas to be developed for industrial, commercial, or residential use less than 2 years after regrading is completed, the vegetative ground cover shall not be less than that required to control erosion.

For areas previously disturbed by mining that were not reclaimed to the requirements of the performance standards and that are remined or otherwise redisturbed by surface coal mining operations, as a minimum, the vegetative ground cover shall be not less than the ground cover existing before redisturbance and shall be adequate to control erosion.

The period of extended responsibility for successful revegetation shall begin after the last year of augmented seeding, fertilizing, irrigation, or other work, excluding husbandry practices that are approved by the Division.

In areas of more than 26.0 inches of annual average precipitation, the period of responsibility shall continue for a period of not less than five full years. Vegetation parameters identified for grazing land or pasture land and cropland shall equal or exceed the approved success standard during the growing seasons of any two years of the responsibility period, except the first year. Areas approved for the other uses shall equal or exceed the applicable success standard during the growing season of the last year of the responsibility period.

In areas of 26.0 inches or less average annual precipitation, the period of responsibility shall continue for a period of not less than 10 full years. Vegetation parameters shall equal or exceed the approved success standard for at least the last 2 consecutive years of the responsibility period.

The Division may approve selective husbandry practices, excluding augmented seeding, fertilization, or irrigation, provided it obtains prior approval from the Director as a State Program Amendment that the practices are normal husbandry practices, without extending the period of responsibility for revegetation success and bond liability, if such practices can be expected to continue as part of the postmining land use or if discontinuance of the practices after the liability period expires will not reduce the probability of permanent revegetation success. Approved practices shall be normal husbandry practices within the region for unmined lands having land uses similar to the approved postmining land use of the disturbed area, including such practices as disease, pest, and vermin control; and any pruning, reseeding, and transplanting specifically necessitated by such actions.

### Analysis:

#### General Requirements

The permittee proposes to reclaim the highwall area to a talus slope. Revegetation standards cannot be determined until the information required in the Vegetation Resource Information section of this TA are provided.

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**Standards for Success**

The permittee will establish on all disturbed areas, except water areas and surface areas of roads, a vegetative cover that is at least equal in extent of cover to the natural vegetation of the area. No plan has been provided that will reestablish the premining 66% vegetative cover on the highwall talus slope as required.

If the reclaimed highwall slope was reduced, topsoil could be applied and the approved vegetative cover standard could be used. Reducing the slope gradient may affect the experimental practice. If the experimental practice is affected then those parts of the MRP will need modification.

**Findings:**

Information provided in the proposed amendment is not considered adequate to meet the requirement of this section. Prior to approval, the permittee must provide the following in accordance with:

**R645-301-341**, the plan must contain a revegetation plan for the talus slope. The revegetation plan must be adequate to establish vegetation at least equal in extent of cover to the natural vegetation in the area.

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# REQUIREMENTS FOR PERMITS FOR SPECIAL CATEGORIES OF MINING

## EXPERIMENTAL PRACTICES MINING

Regulatory Reference: 30 CFR 785.13; R645-302-210, -302-211, -302-212, -302-213, -302-214, -302-215, -302-216, -302-217, -302-218.

### Minimum Regulatory Requirements

No application for an experimental practice under this section shall be approved until the Division first finds in writing and the Director then concurs that:

- 1.) The experimental practice encourages advances in mining and reclamation technology or allows a postmining land use for industrial, commercial, residential, or public use (including recreational facilities) on an experimental basis;
- 2.) The experimental practice is potentially more, or at least as, environmentally protective, during and after mining operations, as would otherwise be required by the regulatory standards;
- 3.) The mining operations approved for a particular land use or other purpose are not larger or more numerous than necessary to determine the effectiveness and economic feasibility of the experimental practice; and
- 4.) The experimental practice does not reduce the protection afforded public health and safety below that provided by the regulatory standards.

Experimental practices granting variances from the special environmental protection performance standards applicable to prime farmland shall be approved only after consultation with the U.S. Department of Agriculture, Soil Conservation Service.

Each person undertaking an experimental practice shall conduct the periodic monitoring, recording, and reporting program set forth in the application, and shall satisfy such additional requirements as the Division or the Director may impose to ensure protection of the public health and safety and the environment.

Each experimental practice shall be reviewed by the Division at a frequency set forth in the approved permit, but no less frequently than every 2 1/2 years. After review, the Division may require such reasonable modifications of the experimental practice as are necessary to ensure that the activities fully protect the environment and the public health and safety. Copies of the decision of the Division shall be sent to the permittee and shall be subject to the provisions for administrative and judicial review.

Revisions or modifications to an experimental practice shall be processed in accordance with the regulatory requirements for revisions or modifications and approved by the Division. Any revisions which propose significant alterations in the experimental practice shall, at a minimum, be subject to notice, hearing, and public participation and concurrence by the Director. Revisions that do not propose significant alterations in the experimental practice shall not require concurrence by the Director.

### Analysis:

The permit for the West Ridge Mine includes provisions for an experimental practice (described in Appendix 2-6) where topsoil was preserved in place rather than being salvaged. The Office of Surface Mining, Reclamation and Enforcement and the Division approved this practice believing it would offer at least as much environmental protection as traditional soil salvage. The mining and reclamation plan included very specific steps needed for this practice to succeed.

In the bottom of C Canyon, soil was left in place rather than being salvaged prior to mining (see Map 2-2 for an outline of the experimental practice area). This soil was covered either with geotextile or with strips of flagging to mark it. As shown on Map 2-5, twenty to thirty feet of fill was placed on top of the soil, and the mine facilities were built on top of the fill. Reclamation plans were to remove the fill and re-expose the topsoil.

In the approved mining and reclamation plan, the Permittee demonstrated these cuts could be reclaimed to the same contour existing prior to mining. This was necessary because if the slopes had to be less steep, they would cover the soil in the experimental practice area.

This submittal shows on Map 5-9 that the geotextiled soil will be re-exposed and reclamation contours will match pre-existing contours in the highwall area as described by cross-sections 23+00 to 26+00 on Maps 5-6 A & B.

In order to meet the requirements of the R645 coal rules relative to revegetation and the long-term static safety factor, it may be necessary to reconfigure the reclamation plan for the highwall area. If the slope has to be less steep, it would cover part of the experimental practice area where topsoil is buried. This could be allowed if the buried topsoil is first recovered from beneath C Canyon. Alternatively, the borrow area soils (described in Appendix 2-4) could be utilized to reclaim the slope and the experimental practice area would be reduced.

**Findings:**

Information provided in the proposal is adequate to meet the experimental practice requirements of the Regulations.

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