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

Michael O. Leavitt
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July 20, 1993

Mr. Richard H. Allison, Jr. P.E.
AMAX Coal West, Inc.
165 South Union Blvd., Suite 1000
P.O. Box 280219
Lakewood, Colorado 80228-0219

Dear Mr. Allison:

Re: Approval of Castle Gate Area, Adit #1 and Gravel Canyon Plans, AMAX Coal Company, Castle Gate Mine, ACT/007/004, Folder #3, Carbon County, Utah

The Division has completed a review of your submittals intended to satisfy the requirements of the Settlement Agreement under Docket 91-001 for the Castle Gate area, the Adit #1 area, and the Gravel Canyon Area. The submittals are considered adequate to satisfy the requirements of the Division Order and subsequent NOV N91-28-2-1 for the above mentioned areas and are hereby approved as part of your mining and reclamation plan.

There are, however, a few remaining technical problems with your plans dealing with lack of information, that have been identified in the enclosed technical memo. The single most important issue that must be resolved deals with number 46 and how AMAX will demonstrate that water quality parameters for bond release are being met.

It is the Division's understanding that you now plan to provide copies of the revised text and maps for updating your MRP. You should also supply the lacking technical information identified above at the same time. Please work closely with Sharon Falvey of the Division's technical staff to insure that you provide the appropriate information.

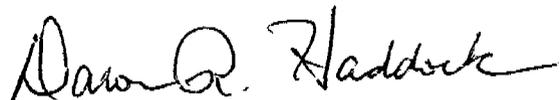
At this point, most of your plan has been revised with the exception of the Crandall Canyon area. The Division has provided you with a review of this area and is currently waiting for a response. We are anxious to complete this portion of your plan and ask that you meet with us to establish a schedule for its submittal.



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Thank you for your cooperation in resolving this situation. If you have further questions, please call me or an appropriate member of the technical staff.

Sincerely,

A handwritten signature in cursive script that reads "Daron R. Haddock". The signature is written in dark ink and is positioned above the typed name.

Daron R. Haddock
Permit Supervisor

Enclosure
cc/enc: P. Baker
S. Falvey
R. Harden
CASTGATE.AMA



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July 8, 1993

TO: File

THRU: Daron Haddock, Permit Supervisor

FROM: Sharon Falvey, Reclamation Hydrologist *SFF*

RE: Castle Gate Preparation Plant and Adit #1, and Gravel Canyon Response, Price River Complex, AMAX Coal Company, ACT/007/004, Folder #2, Carbon County, Utah.

Summary

Castle Gate's amendments for the Preparation Plant, were received at the Division May 1, 1992, September 30, 1992, and December 16, 1992. Amendments for Adit 1 and Gravel Canyon were received at the Division June 18, 1992 and September 29, 1992. The Operator's most recent response submittal and addendum, were received at the Division on April 14, 1993, and April 28, 1993 respectively. The latest submittal responds to the March 23, 1993, and the February 22, 1993, deficiency memo from the Division. However, this analysis pertains to the Divisions deficiencies outlined in the March 23, 1993 memo only. See the Divisions approval memo dated June 3, 1993 regarding the February 22, 1993, deficiency response.

This review is divided according to the following segments: Castle Gate School House Canyon Refuse Diversion Designs, General Operational Preparation Plant Review for Castle Gate Preparation Plant, Gravel Canyon, and Adit 1.

Remaining deficiencies numbers 1, 9, 28a, 38 and 46, under General Operational Deficiencies from the June 12, 1992 memo.

The Operator's plan for general reclamation contains wording through out sections which does not comply with the performance standards. The following wording is contained in the document pg 3.5-16, "Although every reasonable effort will be made to have at least one sediment control measure in place, there may be a period of time when that is not feasible. The probability that a 10-year event will occur during the construction period of approximately three months is only 2.6 %. This Probability is relatively small, and thus no special measures will be taken to address this possibility".

This proposal is not acceptable for 2 reasons: *First*, the event that



should be discussed for this case is a single event that produces runoff, since no controls would be in place for a smaller event. *Second*, the Operator is not providing BTCA if measures are not in place prior to and during construction activities. Current BTCA's include providing at least one sediment control measure downstream of construction activities to minimize erosion and contributions of sediment to streamflow. The Operator should make every effort during construction to provide some sediment control measure downstream of all disturbed areas including the beltline area. At a minimum the Operator can place straw bales at the most downstream limit of the construction area.

Castle Gate School House Canyon Refuse Diversion Designs

1. *Provide drainage designs for runoff from the face of the pile within CGWS-D2F, or demonstrate that no erosive flow occurs on the area.*

Response:

Precipitation falling on or above the Refuse Haul Road on the face of the Refuse Pile flows to diversion CGD-19. Precipitation runoff from the west side of the face of the Refuse Pile below the Refuse Haul Road travels primarily as sheet flow to Pond 013. Precipitation runoff from the west face of the Refuse Pile below the haul road during a 100-year 6-hour storm does not result in runoff that is sufficient to cause appreciable erosion on the face of the refuse pile. Additional lateral diversions from the face of the pile are not necessary. Calculations are in Appendix 3.4J of the permit documents.

Analysis:

The Operator's calculations show the flows to be non-erosive.

2. *Provide a 100-year 6-hour event design for ditch CGD-19 and culvert CGC-4.*

Response:

Diversion CGD-19 and culvert CGC-4 have been redesigned to accommodate the runoff flow from a 100-year 6-hour event. Calculations are contained in supplement to Appendix 3.4 J. Section 3.4-3(3) in the permit text is also revised. An amendment to the proposed stilling well design extension of Culvert CGC-4 was received at the Division on April 28, 1993.

Analysis:

The Operator's calculations show Diversion CGD-19 to have a discharge of 30.4 cfs. for the 100-year 6-hour event. The proposed change (April 28, 1993)

for CGC-4 is to extend a 30" half round culvert to the pond bottom to transport flow. The proposed change should replace the text presented earlier.

3. ***The Operator must clarify the information in text stating how the remainder of the drainages will be brought in compliance with the proposed design.***

Response:

Except for diversions CGD-6 (lower) and the upper section of CGD-7(lower) all diversions will be up-graded as necessary to meet the designs presently contained in the permit documents. The grouted sections of these two diversions are currently functioning satisfactorily. And, there is no need to reconstruct them until the mine begins operating again. Calculations included with this submittal verify that these two diversions are adequate under current conditions. A discussion is included in Section 3.4-3(3), School House Canyon, Refuse Site Drainage Control.

Section 3.4(3), School House Canyon, Refuse Site Drainage Control has been amended to state that the Refuse Pile diversions will be extended in conformance with the designs presented in the permit documents, at each ten foot vertical increase in pile elevation.

Analysis:

The Operator states that as the refuse pile grows the drainage diversions on the face of the refuse will be extended after each ten foot vertical increase in pile elevation (pg. 3.4-8). The Division is accepting this wording with the understanding that the extended design is that shown for the worst case scenario, and is not the existing grouted design.

The Operator also indicates that it is not reasonable to replace these diversions until the Preparation Plant starts processing coal again. This is not the only condition under which the Operator would be required to extend the ditch to meet the proposed configuration. If the Operator accumulates a significant volume of material during other activities, the Operator may change the drainage such that flow from the area may exceed an acceptable design velocity, at which time, the Operator would need to implement the proposed drainage configuration.

The Operator should also be aware that if the maximum extent of the pile is not reached prior to reclamation phases the Operator will be required to submit an amendment for the final reclamation configuration and hydrology designs.

- 4. Include information on design terraces proposed over the face of the refuse pile. Provide cross sections and longitudinal profiles of the drainage down the refuse pile.**

Proposal:

Fig 3.4-10 has been amended and Figure 3.4-11 has been added to the permit to more definitively portray the configuration of the face of the Refuse Pile as it expands to its final reclamation size. In general, the terraces on the face of the pile serve to slow the velocity of the precipitation runoff, thereby decreasing the sediment load-carrying capacity of that runoff. The terraces are approximately 40 feet wide, and slope at 10%. Calculations presented herein indicate that diversions and/or berms need not be built into the terraces to divert the runoff to the primary diversions along the edge of the face of the refuse pile; i.e. CGRD-3A and CGRD-9.

Analysis:

The calculations determining the potential for erosion on the face of the pile across terraces are located in supplement to Appendix 3.4 J. The Operator's calculations show the design flows to be non-erosive.

General Operational and Reclamation Designs, All Canyons

- 1. Remove conflicting information on Page 3.4-6 for the addition of culvert CGC-10.**

Response:

Section 3.4-3(3) has been revised to eliminate the discussion of the culvert that was once proposed to replace the lower reach of diversion CGD-7 (lower). A previous submittal included a revised design for the diversion labeled CGD-7(lower)/CGRD-3A. The diversion design precludes the need for a culvert design.

Analysis:

The Operator has removed the conflicting text.

- 2. Use a Manning's "n" in ditch design that is representative for the site.**

Response:

The Manning's "n" value selected for use in peak flow velocity calculations

associated with unlined operational phase drainage ditches is merely an engineering estimation of a true channel roughness. The actual surface roughness value is not worth determining to design operational phase drainage ditches. In Table 3.1 of Applied Hydrology and Sedimentology for Disturbed Areas (Barfield et. al, 1981) Manning's "n" values for earthen channels range from 0.017 the extreme minimum for straight uniform ditches, to 0.040 for small drainage ditches. In most cases the design flows for the Preparation Plant area translate to shallow flow depths, and some vegetation is common in these ditches. A Manning's "n" of 0.030 is certainly a reasonable estimation for these conditions.

Analysis:

The Operator feels the Manning's "n" of 0.030 for earthen ditches is justified. Determination of design adequacy may be determined through the function of the ditches and their ability to meet regulatory requirements.

3. ***The Operator should include a commitment to rip the soil parallel to contours on slopes from 10 to 20 % and all other places where practical.***

Proposal:

Section 3.4-4(1), Phase I reclamation, re-soiling has been edited to include a commitment by Castle Gate Coal to rip the reclaimed surfaces whose slopes are shallower than 20% where this is practical.

Analysis:

Pg 3.4-26 states ripping will occur parallel to the contours with a mechanical ripper on slopes < 20%.

4. ***Provide stream gauging stations to determine peak flow in reclaimed channels and demonstrate stable channel designs for reclamation bond release.***

Proposal:

The State of Utah Coal Mining Rules currently require that the design precipitation events have a duration of six hours (R645-301-742-323 and R645-301-742-333, 1992). According to the National Engineering Handbook (Soil Conservation Service, 1956, Chapter 4), the SCS Type "b" storm distribution was established to model six hour storms. The SCS Type II storm distribution models 24 hour precipitation events, as discussed by Barfield, et al. (1981, p. 66). Thus, the SCS type "b" storm distribution is the appropriate model to use when

designing diversions in compliance with the Coal Mining Rules. All permit revisions associated with hydrology completed within the last two years have utilized the SCS Type "b" storm distribution. Staff gauges and/or flow measuring devices will not be installed in the drainage diversions to measure peak flows as this is not necessary nor is it a requirement of the Coal Mining Rules.

Analysis:

The main intent of providing flow measuring devices is to demonstrate the stability criteria is met. Essentially a true demonstration of stability can not be determined until the design event is passed through the channel. Therefore, it would be desirable for the Operator to provide the information to demonstrate stability for bond release criteria. The information would also be available for the Operator if ditch failure would occur from exceeding the design event. The Operator is correct that the demonstration is not necessary at this time. However, the Operator should note that according to R645-301-742.314, the Division may specify any additional design criteria to meet the requirements of R645-301-742.300. Should ditch failure(s) occur the Operator may be requested to provide gauging stations.

Remaining Deficiencies from June 12, 1992 memo

1. ***No water supply intakes were supplied on Exhibit 1.1. Piezometer and other monitoring wells to be monitored during the reclamation period could not be located as well as, slurry/recovery wells, exploration holes, operational water lines and monitoring wells.***

Proposal:

Exhibit 1-1 has been edited to include the locations of the water supply intake piping. The water supply lines inside the disturbed area boundary and outside the utility corridor will be removed during Phase I of reclamation, as mentioned in Section 3.4-4(1) Phase I Reclamation Demolition.

The existing piezometer wells that will be monitored during reclamation of the Preparation Plant area are shown on Exhibit 3.4-3A, as mentioned in the response submittal summary included in front of the September 1992 permit revisions. No other monitoring wells exist.

The slurry injection wells are referenced on Exhibit 3.4-2A, dated September 8, 1992, as being shown on Exhibit 3.10-1. There are two slurry wells one injection and one return well.

There are no unsealed exploration holes in the Preparation Plant area.

The utilities not associated with the mine that pass through the Preparation Plant area are routed within the utility corridor adjacent to the railroad tracks, as shown on Exhibit 3.4-3 a, dated September, 8, 1992.

Analysis:

Exhibit 1-1 the Price River Water Improvement District Water Treatment Plant intake. No other intakes are shown. The intent of supplying water supply intakes is to determine the intake points for users that have the potential of being affected by the mining activities. The Operator is referred to the 30 CFR Section 779.24 (g). The Operator should include any current water user intakes from the permit area to the extent of potential impact areas.

Deficiency:

The Operator should state, in the text of the plan, that no water user intakes exist between potential downstream impact areas and the permit area, or provide those intakes on an applicable map.

9. ***Fate of drainage for reclamation channels terminate at the Price River. Although, the placement of the culvert outlets at the river already exist, the reclamation design requires addition of riprap. The area of channel alteration will be small however, the Operator is required to submit a plan to the Division of Water Rights for stream channel alteration. The Operator needs to submit details of the extent of riprap placement and toe protection. This information may be in diagram form.***

Response:

A summary of the required riprap for the reclamation culvert outlets are presented in Table 3.4-15. If required by the Division of Water Rights, a stream alteration permit will be submitted prior to site reclamation to address the placement of riprap at the outlet of the two culverts that terminate at the river's edge. Details of riprap placement will be submitted with the stream alteration permit.

As mentioned in the Response Submittal Summary included in front of the September 1992 permit revision submittal, the operational drainage plan includes the discharge of undisturbed area storm runoff along the railroad right-of-way toward the Willow Creek drainage. Reclamation storm runoff can continue along this same path with no detrimental effect.

Analysis:

The Operator should include their response regarding discharge to the railroad right-of-way in the text of the plan. The Operator indicates that the

operational drainage has followed a similar route during the recent history of the Preparation Plant without adverse impact. However, the changes incorporated for reclamation include removal of a sediment detention pond which detains and decreases peak flow. Other drainage changes could potentially affect the characteristics of the drainage at this point. Discharge dissipation for drainages discharging at the railroad right of way remains unclear and can be clarified by using directional arrows.

Deficiency:

Include a discussion in the text of the plan including proposed fate of drainage and characteristics of expected flow changes that may differ during reclamation drainage from the previous operational flow characteristics. Mapping direction of flow at the edge of the operations may also be added for additional information.

- 19. *The Operator has not included a reclamation plan for the areas disturbed by removal of structures and foundation for the no.3 belt area.***

Response:

Section 3.4-4(1) notes that the structures associated with the beltline will be demolished and removed as explained in the Adit #1 Canyon Demolition Section 3.5-4(1). Upon removal of the structure foundations, the foundation holes will be filled with borrow material from the Preparation Plant site, Adit #1 Canyon or, Gravel Canyon up the level of the surrounding grade. All debris will be removed from the site, the site graded to drain, and the disturbed ground will be seeded and mulched.

Analysis:

The Operator refers to the Adit #1 sections in the text as response. See No. 3 in the following Adit 1 review section.

- 28. *Riprap filter gradation is only found for the refuse pile drainages. Note: At completion of this review the riprap amendment received January 7, 1993 was found. A review is forthcoming.***

Proposal:

Riprap and filter gradation designs will be submitted prior to the construction of each reclamation diversion channel once the rough grading is complete and samples of the sub-grade material can be collected. See Section 3.4-4(2), Reclamation Hydrology, Reclamation Channel Design.

Analysis:

The Operator's commitment is presented in Section 3.4-4(2) on page 3.4-30.

28a. Correct the design slope and calculations for ditch CGRD-2.

Proposal:

The discrepancy concerning the slope of CGRD-2 was identified when evaluating the reclamation riprap designs associated with the January 1993 submittal. The maximum channel slope is 0.30 ft/ft not 0.09 ft/ft as originally reported. The proposed riprap size has been adjusted accordingly from a D_{50} of 2 inches to a D_{50} of 5 inches (Table 3.4-12).

Analysis:

The Operator stated on pg.3.4-29 that reclamation channel riprap sizing greater than 10 % are based on the Simons, Li and Associates (1982). The Operator did not follow the steep slope method for this channel design as is indicated in text on Pg. 3.4-29.

Deficiency:

The Operator should provide the steep slope design methodology for channel riprap sizing as indicated in the plan.

32. No drainage for CGWS-9 reclamation channel is presented.

Response:

As shown on Exhibit 3.4-3A, CGRWS-U9 is the undisturbed area above the existing Raw Water Pond. Once the Raw Water Pond is removed during Phase I of reclamation, the precipitation runoff from CRWS-U9 will travel by sheet flow to the berm/swale along the Price River to Pond 011. The calculations for the berm/swale are included in Appendix 3.4M, pages 60B-60D. A discussion of the typical berm geometry is presented in Section 3.4-4(3). Table 3.4-12 has been revised to include the berm/swale geometry.

Analysis:

Apparently the Operator feels drainage down the slope of this site is not necessary. However, the volume of water flowing over the site is in question. It is felt that the Operator may need to provide drainage to a ditch from the face of the previously undisturbed drainage across the reclaimed slope. Should the

Operator have erosion problems in this area the Division will reassess the need for a channel and may, at that time, require the Operator to provide drainage designs.

- 34. *The Operator indicates the ponds will be removed 2 years after seeding. However, Regulations R645-301-763.100 specifically state the Operator must first obtain an authorization from the Division. The Operator also leaves out the condition that water quality criteria must be met.***

Response:

Sections 3.4-4(3) and the reclamation timetable (Section 3.4-5) have been expanded to detail the requirements necessary to gain pond removal authorization.

Analysis:

On Pg. 3.4-32 the Operator addresses this deficiency. However, the Operator retains the two-year removal statement on page 3.4-24. Although minor, this affects the clarity of the document.

- 38. *The Operator has provided a sediment removal plan. However, the plan does not state that survey stakes are used for determination of sediment level and it does not contain a de-watering plan. Additionally the Acid Toxic testing should be reported to the Division, prior to sediment removal.***

Response:

Section 3.4-4(3) identifies the 60% sediment clean-out elevations for each of the three ponds. Sediment markers will be installed in each of the ponds so that sediment levels can be readily determined by Division personnel during their site inspections.

A dewatering plan for each reclamation pond was presented in Section 3.4-4(3) of the September 1992 submittal.

Prior to sediment removal the sediment will be tested for acid and/or toxic forming compounds, and the results forwarded to the Division. Section 3.4-4(3) has been revised to incorporate this statement.

Analysis:

The Operator has incorporated commitments to submit results of Pond Sediment waste to the Division on page 3.4-32. The Operator indicates the 60 % cleanout level will be determined by a sediment marker in each pond on page 3.4-32. However, the Operator does not indicate the location of each marker. In most ponds the sediment falls out first at the inlets. Therefore uneven settlement may

provide an incorrect assessment of sediment accumulation. Additional sediment markers should be installed. The Operator is responsible for providing accurate measures of remaining pond capacity in each annual report.

The dewatering plan referred to in the deficiency is in regard to dewatering the pond not for dewatering the pond sediment.

Deficiency:

The Operator should identify where the pond sediment will be placed for dewatering prior to disposal of waste.

- 41. Post-mining land use requirements R645-301-400 and R645-302.270 must be addressed for those features to remain as permanent features.**

Response:

Section 3.4-4(1) Phase I Reclamation-Demolition of the September 1992 submittal identifies which structures are to remain as permanent features. These include the buried utilities within the utility corridor and two culverts (GCTRC-2 and CGRC-3). Section 3.4-4(1) also includes a brief description of why the culverts must remain in place indefinitely, and how they fit into the postmining land use plan (R645-301-412). Reference is made to Exhibit 3.4-3 which identifies the location of the culverts and the utility corridor.

Regulation R645-301.270 applies to a request to obtain a variance to the Approximate Original Contour. Castle Gate Coal is not requesting a variance for retaining permanent features at the Preparation Plant site.

Analysis:

Section 3.4-4(1) 3.4-23 states " Water Supply intakes serving the Preparation Plant outside the disturbed area boundary (Exhibit 1) will remain, while the piping within the disturbed area boundary and outside the utility corridor will be removed." Utilities within the utility corridor along with a buried telephone cable will remain.

Pg 3.4-30 states that three culverts will remain for the Castle Gate reclamation plan. CGRC-1, will be removed following Phase I reclamation while CGRC-2 will remain in a shortened configuration and CCGRC-3 will remain in the current configuration. The culverts remain to protect the utility corridor.

- 42. Page 3.4-39 states that sediment will be removed when either side will be built up to half it's height. If the downstream side is built up with sediment it may indicate a failure in design and may require**

immediate action. Therefore, reference to the height of sediment on the downstream section is not prudent. The Operator has indicated silt fences and soil in the vicinity of the fence will be removed during Phase II reclamation. This was requested in the June 12, memo. However, it is felt that the Operator could remove the fence by cutting the material at the soil surface and then removing the stakes in areas where soil has stabilized with minor volumes of soil. When it is recognized that the silt fence retains large amounts of sediment (near clean out point), that would be the time to remove sediment and reseed the area prior to removal of the fence.

Response:

Silt fences will be maintained such that the trapped soil will be removed when it reaches half the height of the silt fence. Once the Division approves the removal of the silt fences, the fence fabric and posts will be removed where possible. If it appears that cutting the fabric at ground level will be more advantageous than removing all of the fabric, then some fabric may be left in place below ground level. This procedure will only be followed where removal the fabric will substantially disrupt the established vegetation near the silt fence. Section 3.4-4(4)-Reclamation Work Phase I and 3.4-4(1)Phase II Reclamation have been amended accordingly.

Analysis:

The Operator states "However, where removal of the silt fence fabric will substantially disrupt the established vegetation adjacent to the fence, the fabric may be cut at ground level and the buried fabric abandoned in place", page 3.4-27. This practice is considered acceptable by the Division in areas where soil has stabilized with minor volumes of accumulated soil.

- 46. The Operator has not provided a clear Water Monitoring program to demonstrate that the Performance standards required by R645-751 will be met. The monitoring plan should also describe how the data will be used to demonstrate the requirements of R645-880 are met for bond release. Monitoring of the pond water does not demonstrate the water coming off the site meets water quality criteria for removal of the sediment ponds. The monitoring should include, at a minimum, water quality sample points at the inlet of ponds and at the perimeter of the disturbed area drainages.***

Response:

The water monitoring program is addressed in Chapter 7. Chapter 7 was revised and submitted in its entirety on January 7, 1993. As noted in Chapter 7, Exhibit 7-3 identifies the locations of the surface water monitoring points.

Analysis:

The Operator's response does not adequately discuss how the data will be used to determine whether the criteria for bond release have been met. The areas where alternate sediment control measures are used during reclamation also require a method to determine how water quality criteria are met.

The Operator indicates that a 6 month period will be used to demonstrate compliance. This time period may not be adequate for demonstration if little or no rainfall events occur. The Operator would be required to sample until the demonstration is determined adequate by the Division. Therefore, it would be in the Operator's interest to begin sampling prior to that time. The Division will not accept pond water sampling analysis for determination of contributions pertaining to sediment transport from the area. However, the Operator may also provide a demonstration using Sed Cad+ to determine sediment contributions. The Operator also needs to provide a method for comparison of on site and off site contributions. The Operator indicates that two years after seeding the Operator will evaluate the water quality for post-mining land use suitability and to determine if continued water monitoring is necessary. The Operator and the Division need to determine which criteria is acceptable to arrive at this determination.

Additional deficiencies include failure to locate monitoring stations for bond release on a map. Also, the Operator's proposal has conflicting and inaccurate information on pages 7-48, 7-59, regarding; Dissolved Oxygen, Sampling for bond release, and the frequency and parameters to be measured for bond release monitoring, respectively.

The Operator's Abbreviated Laboratory Analysis Table does not indicate whether the metal constituents will be analyzed for dissolved or total concentrations. Phenol and Fluoride were identified as constituents sampled with values above the standards for Class "C" waters but, are not included in the Water Quality analysis.

The Operator states that after 2 years the ground water monitoring will be discontinued. The Operator must provide a demonstration to show additional water monitoring is not necessary and receive Division approval prior to discontinuing the monitoring.

Deficiency:

The Operator has not provided a clear Water Monitoring program to demonstrate that the Performance standards required by R645-751 will be met. The monitoring plan should also describe how the data will be used to demonstrate the requirements of R645-880 are met for bond release. Monitoring of the pond water does not demonstrate the water coming off the site meets water quality criteria for removal of the sediment ponds. The monitoring should include, at a minimum, water quality sample points at the inlet of ponds and at the perimeter of

the disturbed area drainages.

- 47. The narrative addressing Rules R645-301-731.111-121, could not be located. The Operator indicates the Acid or Toxic forming materials which may adversely affect water quality or vegetation, will be treated or buried. The location of burial is important to meeting the requirements of R645-301-731.111-112. The Operator needs to expand the discussion on this issue. The Operator should include in the discussion a commitment to provide the analysis to the Division and receive approval for burial prior to such action or, provide a descriptive location and method for burial for advanced approval. The Operator does not discuss what materials will be used to fill the ponds and retain the approximate pre-mining recharge for areas on alluvial material. This is particularly important for ponds in the Preparation Plant adjacent to the Price River.**

Response:

Disposal of acid/toxic forming compounds Section 3.4-4(1)- Phase I Reclamation-Re-soiling has been expanded to include a more detailed plan for the burial of toxic/acid forming materials.

The reclamation ponds will be filled with locally available native soil. This will insure that the pond fill will have a permeability approximating the pre-mining permeability.

Analysis:

On page 3.4-26 the plan states "Any acid forming or toxic materials exposed during the grading operation, which may adversely affect water quality or vegetation, will be excavated and transported to the Refuse Pile where this is feasible. Where acid and/or toxic soil cannot be readily removed, the toxic soil will be buried under four feet of topsoil. Any other methods of disposal are subject to DOGM approval prior to implementation.

Although in some cases the acid and/toxic soil may be buried under topsoil. The quantity and type of constituent may require additional protection, such as a clay liner or removal to an approved waste site. Cases where it is most critical that the materials be moved or handled differently include areas where impact may occur to the hydrologic regime.

Gravel Canyon and Adit #1

See original deficiency from the July 21, 1993 memo by Rick Summers.

3. ***The belt line area, buttresses removal, is not discussed in the reclamation plan. Include a reclamation plan for the areas disturbed by removal of structures and foundation for the no. 3 belt area.***

Response:

Section 3.4-4(1) states all foundations associated with the beltline structures will be removed. Section 3.5-4(1) has been revised to include a discussion of the reclamation grading plan for the beltline area.

The Operator proposes to fill the foundations with soil from regrading Adit No.1 the Preparation Plant or Gravel canyon. The fill will be graded to drain and, the surface prepared for seeding (pg. 3.5-9).

Analysis:

The Operator does not provide for sediment control other than roughening of the surface. Although these areas are small, the Operator should provide at a minimum, straw bales to prevent additional contributions of sediment to streamflow and to retain sediment within the disturbed areas. Such control measures must be placed prior to commencement of reclamation activities. Straw bales or mulching should also be in place following earth moving processes.

8. ***The Operator states that the channel does not have to meet the requirements of R645-301-742-323 which applies to perennial and intermittent streams having no less capacity of the upstream and downstream channel. However, the designs do have to meet the requirements of stable channel design as well as R645-742.313 which indicate that a permanent diversion or a stream channel be designed to approximate the pre-mining characteristics of the original channel. It is well documented that the channel geometry is related to the dominant flows received by stream. Therefore prudent engineering designs incorporates these characteristics. Provide cross-sections for the upstream and downstream channels. Base stream channel designs on those channel characteristics.***

Response:

The reclamation channels for Adit #1 and Gravel Canyons have been designed in compliance with the requirements of R645-301-742 using prudent engineering judgement. Specifically, the channels are designed to contain the peak flow and be stable while conveying the runoff from a 10-year 6-hour storm. The amount of riprap necessary to insure that stability under design methodologies. In addition, the permanent reclamation channels have trapezoidal cross sections to approximate the pre-mining characteristic shape of the stream channel. Unfortunately, the requirement to provide a stable channel in an ecosystem where

stream beds are constantly eroding conflicts with the pre-mining characteristics of the natural channel. The current reclamation channel designs emphasize stability over natural stream configurations.

Analysis:

The Operator has not demonstrated by the use of cross sections that the presented design meets approximate pre-mining characteristics but, instead states that providing a stable channel in an erosional system conflicts with the pre-mining characteristics. The Operator suggests the pre-mining configuration and postmining configuration for these channels varies through the erosional process. One would assume that the pre-mining characteristic of the stream would be to change in response to the erosional factors that create the upstream and downstream channel instead of remaining static. Therefore a "stable channel" and a channel that "meets pre-mining characteristics" could be interpreted to be partially defined by the upstream and downstream channel configuration. Currently, the Operator meets the described regulatory design criteria according to "accepted" practices even though, those practices may not provide a stable channel. Should the proposed measures result in failure or multiple failures, for the design event, a different approach to channel design may be requested by the Division.

9. ***The reclamation time tables commit to retaining the sediment control measures until the disturbed area is stabilized and revegetated. However, the Operator must indicate that it will receive approval from the Division prior to removal of sediment control structures.***

Response:

The Division will be solicited for approval to remove the siltation structures. See permit section 3.5-4(3) and 3.5-5.

Analysis:

The Operator has adequately addressed this deficiency.

RECOMMENDATION:

The remainder of the discrepancies in the plan may be clarified during field inspection on site by site basis. Many of the remaining deficiencies result from a lack of providing the information in the response letter rather than incorporation into the plan. However, it is critical the water monitoring criteria for Bond release be clarified. Although the Operator's water quality proposal has provided some information related to reclamation monitoring, adequate detail for determining whether the water quality conditions for bond release can be met, is not included. This is especially true for areas that do not report to a sediment pond. This

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deficiency should be clarified prior to approval as it is in the best interest of the Operator to do so. The Operator is encouraged to meet with the Division to arrive at an adequate reclamation monitoring plan.

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