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DEPARTMENT OF NATURAL RESOURCES
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February 24, 1989

Mr. Mike Glasson
Andalex Resources, Inc.
P. O. Box 902
Price, Utah 84501

Dear Mr. Glasson:

Re: Mid-Permit Term Review, Andalex Resources, Inc., Centennial Project, ACT/007/019, Folder #2, Carbon County, Utah

The Centennial Project was granted a renewed permanent program mining permit from the State of Utah on March 3, 1987, which will expire January 5, 1992. In accord with Rule UMC 788.11, a Mid-Permit Term Review (MPTR) is now due. Attached is a flow chart outlining the steps and time frames of the MPTR process.

The Division has reviewed the permit, with conditions, and the current Mining and Reclamation Plan (MRP) on file, and determined that the MPTR will include the following: a technical update of the reorganized MRP which was submitted as a condition to permit renewal, and a re-evaluation of the bond requirement, due to proposed construction of the Aberdeen facilities.

Attached is a review document which outlines deficiencies that exist in the current MRP. This document also identifies information which has been recently submitted by Andalex and found to be adequate, and includes deficiencies related to the Aberdeen Facilities Amendment, which have already been separately forwarded to you.

Please submit a complete response to this review by April 10, 1989. Once reclamation details have been finalized the bonding liability will be recalculated. The MPTR process should be completed, with the updated MRP and bond in place, by July 4, 1989.

Please feel free to contact me if I can provide any further assistance.

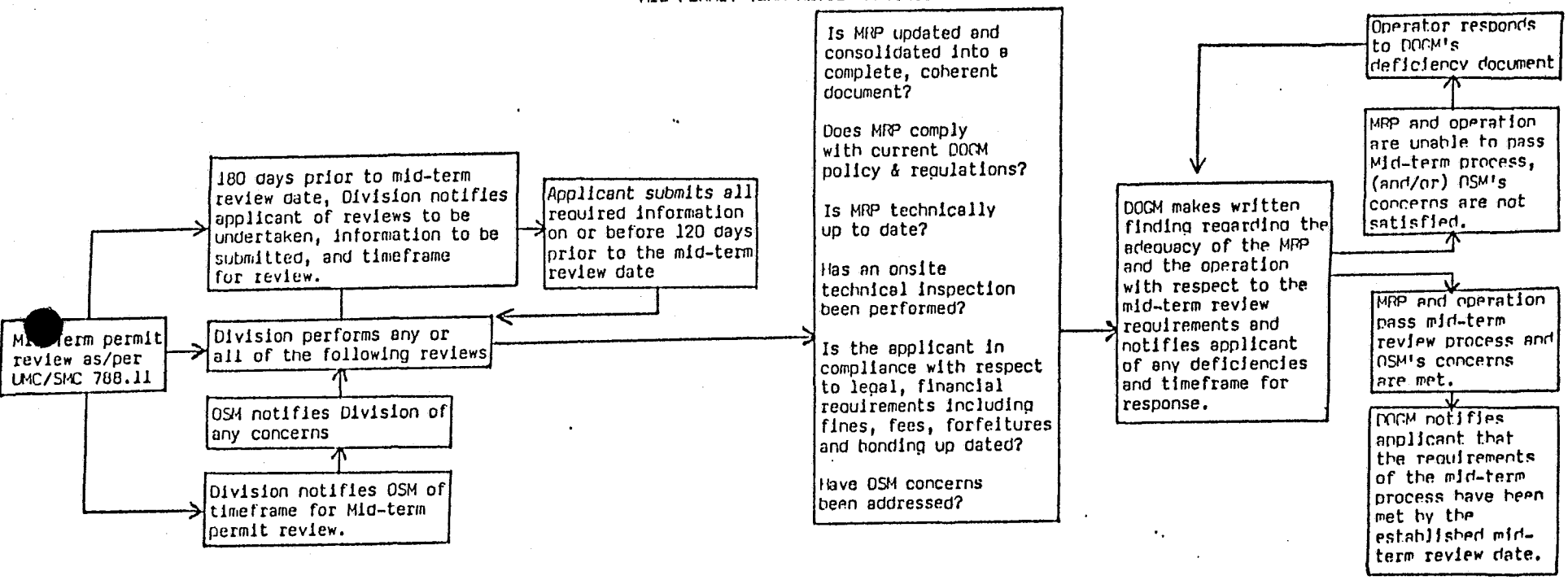
Sincerely,

Susan Linner

Susan C. Linner
Reclamation Biologist/
Permit Supervisor

cl
cc: P. Rutledge
R. Hagen
D. Darby
R. Harden
R. Summers
BT45/175-176

MID PERMIT TERM REVIEW PROCESS



(revised July 1986)
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MID-PERMIT TERM REVIEW

Andalex Resources, Inc.
Centennial Project
ACT/007/019
Carbon County, Utah

February 23, 1988

UMC 783.16 Surface Water Information - RPS

The applicant states in the introductory letter that the summaries of the water monitoring program will be submitted. This regulation cannot be reviewed until this information is received.

UMC 783.17 Alternate Water Supply Information - RPS

Section 783.17 discusses the option of dedicating water rights owned by Andalex in the event of disruption of an existing right.

UMC 783.24 Maps: General Requirements - RPS

(g) Plate 6 identifies the only water intake in the area which is owned by Andalex and is the water right for discharge into the Old Chidester Mine works.

UMC 783.25 Cross Sections, Maps and Plans - RPS

(b) Figure IV-11 depicts a topographic map of the water monitoring locations. This section is adequate.

(g) Figure IV-11 depicts the ephemeral channels in the area on a U.S.G.S. topographical map. This section is adequate.

(i) Plate 8 depicts the location of impoundments at the site. This section is adequate.

UMC 783.24 Maps: General Requirements - JRH

UMC 783.25 Cross Sections, Maps, and Plans - JRH

The operator has located non-coal waste facilities on Plate 6 of the Mining and Reclamation Plan (MRP). However, the operator has not located the temporary and permanent locations for the storage and disposal of excess spoil and mine development waste materials and other materials such as sediment pond waste which must be disposed of within the permit area. This section of the regulations is not considered to be complete. The operator must provide plans for the temporary and permanent location for storage and disposal of these materials.

It is believed that the operator has only mismarked these locations and that the areas designated for non-coal waste are for excess spoils and mine development waste including such materials as sediment pond waste. The operator shall correct this in the plan and on the drawings.

Although this section of the regulations is considered to be complete, the following minor deficiencies or technical problems were found on these drawings:

1. Plate 14 does not include certification by a registered engineer.

2. Plate 17, Final Reclamation, should include the location and the extent of the reclamation to be accomplished during Phase II reclamation on the site.

3. Plate 5 shows the surface disturbed area boundary but does not include the permit area boundary for reference to the location of the disturbed area. Since the permit boundaries are found on other drawings, this drawing is considered to be satisfactory.

UMC 784.13 Reclamation Plan: General Requirements - RPS

(b)(1) The applicant commits to removal of the sediment pond E-PM during Phase II and pond C during Phase I of the reclamation effort, section 1.1, Chapter 4, only when the requirements of UMC 817.46 (u) are met. The applicant is in compliance.

UMC 784.13 Reclamation Plan: General Requirements - JRH

The operator has indicated in the MRP that the site will be returned as close as possible to the approximate original contour of the area prior to mining. In those areas where solid rock was excavated in face up of the portals, as well as road cuts and pad development, the swell factor associated with these excavations will not allow for total replacement of these materials to their original volume. Additionally, fill areas may not be considered stable if placed back to their original surface contour.

In areas where steep slopes occur (greater the 2h:1v) or in other locations on the site where the operator does not intend to completely backfill the site to the original conditions, the operator must provide detailed sections showing the final configuration of the surface, and if necessary, stability analysis to ensure long-term stability of the slopes.

Cut and fill calculations do not include the amount of swell or the compaction of the materials as they are relocated on the site. No adjustments in the mass balance are seen within the mining and reclamation plan.

The bond estimate as provided by the operator does not include productivity calculations for the equipment selected. In order to determine the calculations complete, equipment sizing and productivity calculations should be included in the mining and reclamation plan.

The operator has partially addressed the above comments. There is, however, no specific details regarding highwall reduction in the plan. Cross-sections provided by the operator are not sufficiently detailed to show highwall reduction for individual face-up areas. Mass balance calculations have not been adjusted.

The operator has not provided productivity calculations for the estimate of the costs for reclamation.

UMC 784.23 Operation Plan: Maps and Plans - RPS

(b)(6), (b)(10), (b)(12), (c) Plate 8 (certified by a registered professional engineer) depicts the diversions, culverts, and sediment ponds located at the site. This section is adequate.

UMC 817.42 Hydrologic Balance: Water Quality Standards & Effluent Limitations - RPS

The application discusses one small area exemption at the site. Section 2.19-2 presents calculations for a catch basin for the powder magazine area. The area is small (0.02 acres) and the application is approvable.

UMC 817.43 Hydrologic Balance: Diversions & Conveyance of Overland Flows - RPS

ABERDEEN FACILITIES

Diversions UD-2, UD-4, UD-5, DD-4:

Peak flow values calculated by the Division for these areas demonstrate that the values presented in the application are correct and are generally conservative. The application does not contain sufficient slope information to verify the slopes used in the designs. However, using values presented by the applicant, the expected velocities were generally correctly calculated for the maximum slope sections. The minimum slope sections utilize a Manning's n-value of 0.04 which is the same as the heavily riprapped sections. This is an error. The application refers to p. 179 to justify the use of 6 fps as the erodable velocity. That same table presents the expected Manning's n-value for that soil group (gravel-loam) as 0.024 - 0.026. Using that value, the Division calculated minimum slope velocities larger than the applicant's values for UD-2, UD-5, and DD-4. The expected minimum slope velocities for these diversions are 9.42 fps, 6.65 fps, and 9.48 fps, which are considered to be erosive. It should be noted that the peak flow values used in these designs by the applicant are generally twice as large as those found by the Division (exception DD-4).

In consideration of the facts that: 1) slope information cannot be verified at this time, 2) the applicant's design peaks are usually excessive, and 3) the designs are proposed at this time, the Division recommends a conditional approval for these structures. This will allow the anlysis to proceed using accurate channel information (size, slope, and manning's n-value). The applicant is advised to consider departures from the proposed design as changes occur in the field at an early stage to prevent the need for reconstruction (i.e. addition of riprap) at a later date. The applicant is considered to be

responsible for meeting the performance standards of subchapter K of the rules upon completion of the structures. At a minimum, the proposed designs in the existing application must be installed. Based upon the Division review, the applicant should be advised that some of the designs appear to be excessive.

UMC 817.44 Hydrologic Balance: Stream Channel Diversions - RPS

The applicant proposes to extend the existing bypass culvert beneath the mine facilities to a location below the anticipated disturbance associated with the Aberdeen mine facilities. Peak flow values were checked to validate the applicant's values. The Division values for 10 yr. - 24 hr. peak flow events for all watersheds were slightly less than those presented by the applicant. The Division calculations were performed using a CN of 70 and a precipitation value of 1.82 inches. The applicant's flows were calculated using a CN of 65 and a precipitation value of 2.25 inches. To obtain the design flow value for culvert C15, peak flow values were routed for all upstream watersheds. The Division calculated a value of 46.1 cfs (SEDCAD software) and the applicant presented a value of 55.0 cfs for the design flow. This design is acceptable.

The calculations for the reclaimed channels presented in Table IV-6 are in error with regards to peak flow values. For example, Division calculations show that the expected peak flow event for the 100 yr. - 24 hr. event for watershed C1 alone is 190.4 cfs. The application presents a value of 193 cfs for RC-1. RC-1 encompasses the entire drainage to the lowermost point of mine disturbance and would therefore include other watersheds (C3, C5, etc.). It appears as though this flow value is therefore underestimated. Additionally, the slope value presented in the application for C1 appears to be in error. The Division calculated a value of 55.1 percent (versus 19.8% in Table IV-6). Similar problems exist with the other reclaimed channel designs. Please recheck the values presented in Table IV-6. The peak flow values for the side channels have been calculated by the Division and the applicant's values have been found to be adequate.

The application presents a channel slope of 5.56 percent. Using Plate 17, the length of RC-1 was found to be approximately 4840 feet. At 5.56 percent slope, the elevation difference will be 269 feet. Plate 17 shows this elevation difference to be approximately 315 feet or 6.6 percent slope.

Even so, using the incorrect peak flow value, the Division determined that the expected velocities in RC-1 will be 11.2 fps rather than the 8.78 fps presented in the MRP. The calculations should be checked.

Details of the riprap designs for the reclaimed channels should be submitted. This information should include: riprap depth (1.25 times median diameter), filter blanket depth (equal to maximum riprap diameter), a riprap gradation specification, a filter blanket design and gradation specification. Details should be based upon the peak flow values presented in Table IV-6. Flow velocities should be based upon a design slope that is depicted and justified on the appropriate reclamation contour maps.

UMC 817.46 Hydrologic Balance: Sedimentation Ponds - RPS

Pond E - Aberdeen Facilities

Plate 8 depicts the disturbed area acerage reporting to pond E as 10.87 acres. Section 2.6, p. 142 states the area is 11.82 acres. The Division approves the use of 11.82 acres, but the discrepancy should be corrected.

The analysis performed by the Division of the runoff volume, sediment storage volume, 60 percent cleanout elevation, and proposed pond volume (stage-volume curve) demonstrates that sediment pond E is adequately designed relative to these criteria (calculations available in Division files).

The primary spillway at an elevation of 6960 ft. has been demonstrated to have a capacity of 23.6 cfs. The design flow for the 10 yr. - 24 hr. event was verified to be 12.9 cfs. The primary spillway is adequate. It should be noted that the spillway has the capacity to pass the 25 yr. - 24 hr. flow event (18.97 cfs).

The ponds will be inspected quarterly (section 2.2-5) and reports will be maintained onsite and submitted to the Division on an annual basis.

The orifice rating tables in Appendix O are still in error. The L in the orifice equation should be replaced with circumference of the pipe and not the pipe diameter and the ratings recalculated.

Section 2.7-2 should be revised to state that the emergency spillway will be of grouted riprap as depicted on Figure IV-6. Figure IV-6 should be revised with the dimensions of the spillway removed from the figure and placed in the design tables for the proposed pond E and pond E-PM design.

Pond E-PM

The application presents the disturbed and undisturbed areas reporting to the reclamation pond as 34.2 and 805.5 acres respectively. The Division digitized these areas to be 35.72 and 878.1 from Plates 8 and 9. The values are within 10 percent error and are considered to be acceptable.

Section 2.6-1, lines 6 and 7 presents the expected flow and velocity of flow for a 10 yr. - 24 hr. event. Line 6 should be labeled as such and line 7 should be clarified. What struture was used to determine this expected velocity? Reference to Section 2.8 could not clarify this issue.

Section 2.6-3 discusses the pond design. That section states that a primary and emergency spillway will be installed to handle the 10 yr. - 24 hr. and 25 yr. - 24 hr. precipitation events repsectively. Plate 10 does not depict a primary spillway. The language should be changed to read combined primary and emergency spillways. The spillway must be designed to pass the 25 yr. - 24 hr. event.

The configuration of the spillway should be specified (i.e. bottom width for operation and reclamation phases).

Pond C (includes Catch Basin B)

The application presents the disturbed and undisturbed areas reporting to the pond as 13.79 and 37.99 acres. The Division found these values to be 15.07 and 30.8 acres respectively (Plate 8). The applicant's values are within 10 percent of the Division's calculations or are conservative, therefore, they are acceptable.

The design for pond C uses a value of 0.05 AF sediment for each acre of disturbed area. The application requests a variance from the 0.1 AF/acre rule due to the use of catch basin B and the large extent of paved roads in the area. The Division feels this variance is acceptable based upon the

pond/catch basin performance to date. The pond has been in existence since the initial construction and has not needed cleaning in that period. Catch basin B is trapping the majority of the sediments and is in need of cleanout. However, when the cleaning is final, it can be expected that similar performance from the basin will occur in the future.

Plate 12 presents a contour map of the pond. A stage-volume curve for the pond was not submitted. The Division attempted to verify the available pond volume, but was unable to complete the analysis due to possible map errors on Plate 12. The drawing is based upon 2 foot contour intervals, yet no contour exists for elevation 7052. A discrepancy exists between the elevation of the top of dam (7056 ft.) and the contour lines (i.e. contour 7056 does not tie to the embankment top).

The plan does not present elevations for the maximum sediment storage elevation, or the 60 percent cleanout elevation. These values should be justified with stage-volume data or a stage-capacity curve for the pond.

Division caclulations show that the presented design peak flows for pond C in section 2.8 are acceptable. Division calculations show that the 36 inch spillway has the capacity to pass a 25 yr. - 24 hr. event (38.04 cfs) at 1.25 ft. of head (orifice flow condition). The application does not give the elevations of the 18 inch primary spillway and the 36 inch emergency spillway. The elevations should be included in the MRP. However, section 2.7-2 states that the elevation of the 36 inch riser will be 1.5 ft. below the elevation of the top of the dam. With a head of 1.25 ft. required to pass the event, the freeboard requirements of this regulation are not met. The application should demonstrate that the top of the embankment will be a minimum of 1.0 ft. above the required head level for the 25 yr. - 24 hr. flow event.

<u>UMC 817.46 Hydrologic Balance: Sedimentation Ponds - JRH</u>

Upon completion of the construction of sediment pond E, the operator shall be required to provide certified as-built drawings of the pond, and, certification by a registered professional engineer that the pond meets the design requirements proposed in the mining and reclamation plan.

UMC 817.47 Hydrologic Balance: Discharge Structures - RPS

This section will be reviewed upon receipt of the information relative to channel designs and peak flow values requested in this review.

UMC 817.49 Hydrologic Balance: Permanent and Temporary Impoundments - RPS

The application does not propose any permanent impoundments for the site. The application does not contain the certification statement for pond C required by subsection (h) of this regulation. This certification and a commitment to submit the statement for pond E upon completion of construction should be submitted.

UMC 817.52 Hydrologic Balance: Surface and Ground Water Monitoring - RPS

The application presents a monitoring plan in section 3.1-1.2 for surface waters that includes six monitoring stations. The monitoring locations are depicted on Figure IV-11. Additionally, two NPDES points will be monitored.

UMC 817.53 Hydrologic Balance: Transfer of Wells - RPS

The application does not propose to transfer wells at this time. The applicant is in compliance with this regulation.

UMC 817.55 Hydrologic Balance: Discharge of Water Into an Underground Mine - RPS

Section 2.18 discusses the areas for which surface runoff reports to an underground mine. The areas presented on Plate 8 (digitized by the Division) were found to be different than those presented in this section. The following table presents those values:

Mine	Undisturbed Area	Disturbed Area
Chidester Mine	17.68	5.06
Apex	2.06	1.47
Pinnacle	negligible	1.04

The applicant should recheck the values presented in the MRP.

UMC 817.71 Disposal of Excess Spoil and Underground Development Waste: General Requirements - JRH

The following comments remain unchanged from previous reviews:

In accordance with part (a) of this section, "Underground development waste and excess spoil not required to achieve approximate original contour within the area where overburden has been removed and which is not used as backfill shall be hauled or conveyed to and placed in designated disposal areas within a permit area."

While the operator has included methodology for handling the immediate waste situation for the site by disposal of the excess waste in the construction of the Aberdeen Mine, long-term reclamation is not apparent for the entire facilities.

The Mining and Reclamation Plan is not clear on some of the terminology that is used in discussion of the waste materials. The operator has included excess spoil and mine development waste with the treatment of non-coal waste material.

If the non-coal waste storage area described in the plan and shown on the facilities drawing were clarified to indicate that this location is for the temporary storage of excess spoil and mine development waste material, the temporary storage requirements of this section could be considered to be complete.

With regard to a permanent location for disposal of excess spoil and mine development waste, the operator must re-evaluate the location and disposition of the material. The operator has indicated that this excess material will be disposed of off-site in a landfill. Under this section of the regulations, excess spoil and mine development waste cannot be removed or placed outside the permit area.

In summary of the deficiencies associated with this section of the regulations, the operator needs to incorporate the following into the plan:

1. Language referring to the description of non-coal waste, excess spoil and mine development waste, and sediment pond waste must be corrected in the plan. Excess fill from earthwork and grading, sediment pond materials, underground waste rock, contaminated coal, coal waste and other such earthen materials shall be considered to be excess spoil and mine development waste and shall be treated in accordance with the requirements of this section (UMC 817.71).

2. The operator shall be required to show on the drawings, the location(s) for both the temporary and permanent storage and disposal for these materials. The capacities for these areas should be included in the narrative description of the plan and included on the drawings. For those waste materials which are found to be non-toxic or non-acid forming, the operator may incorporate these materials into backfill areas during reclamation activities. However, a reasonable estimate of the waste materials to be accumulated on the site must be taken into consideration, and, these quantities must be factored into the mass balance for the reclamation earthwork for the site.

3. The operator needs to provide a commitment or methodology to ensure that the materials to be disposed of are non-acid or non-toxic forming and that if acid- or toxic-forming materials are encountered, they will be treated accordingly.

4. It appears that the operator will most likely be able to incorporate the permanent disposal of these waste materials into the backfilling of the site in achieving approximate original contour and that a permanent waste fill facility will not have to be constructed. The material should be placed within the cuts for the highwalls from pads and portal face-ups at the time of reclamation. The major problem that the operator will encounter is the location of temporary storage areas for these materials during mining operations.

Confusion and conflicting information is still found within the plan and on the drawings as outlined above. The operator will have to further clarify the terminology and the description of waste materials.

UMC 817.89 Disposal of Non-Coal Wastes - JRH

The operator has misinterpreted the requirements for non-coal waste materials by including excess spoils and mine development waste materials into the discussion of non-coal waste. Non-coal waste materials as defined in the regulations include but are not limited to grease, lubricants, paints, flammable liquids, garbage, abandoned mine machinery, timber and other combustibles generated during underground coal mining activities.

Earthen materials including excess spoil, mine development waste, coal waste, waste rock, excess fill materials, sediment pond waste and soil are not considered to be non-coal waste materials.

Information found under Section 3.1 Combustible Materials, is more appropriate for the requirements of this section and the plan should be revised to indicate that non-coal waste materials as defined by the regulations will be collected in trash containers and hauled to an approved landfill for the type of materials to be disposed.

The operator also needs to indicate that specific materials such as oil and grease or other waste which is subject to other specific local, state and federal requirements will be disposed in accordance with those regulations.

Refer to section UMC 817.71 of this review for a discussion of excess spoil and mine development waste materials as described by the operator under non-coal waste.

The operator has addressed most of the comments regarding non-coal waste materials. However, similar to those comments made under section UMC 817.71, the operator shall need to further clarify the plan and the drawings regarding non-coal waste materials.

UMC 817.101 Backfilling and Grading: General Requirements - JRH

Information regarding backfilling and grading is found on pages 101-103 of the Mining and Reclamation Plan. A mass balance survey is included in the plan on pages 97 through 99, with sections of the facilities taken from Plates 14 and 15.

In order to achieve approximate original contour, the operator will need to indicate where excess fill materials will be located. In response to those comments made in section UMC 817.71, the operator should also incorporate the volumes of materials which will be developed from the cleaning of sediment ponds, surface cleanup of coal spills, and such waste materials which may not be returned to underground workings.

In conjunction with the construction of the exiting facilities, a pad was developed which exceeded the 2h:1v slope criteria as outlined in the regulations and the operator has conducted a stability analysis for that which is included in the Mining and Reclamation Plan.

Although the operator has indicated that the cut and fill volumes presented in the plan account for swell and recompaction, no information could be found in the text of the MRP regarding this. Cut and fill calculations do not account for swell or recompaction factors. Pads and portal areas which were cut in rock may not prove to be stable if reclaimed to the pre-existing slopes for those areas. These areas should be identified in the plan and proven stable by analysis.

Final configuration of the site upon reclamation may be subject to geotechnical slope stability analysis. For those slopes which are greater than 2h:1v, the following information shall be provided:

1. A detailed cross section indicating the location of bedrock, soils, and fill materials.

2. Characteristics of the materials to the extent that slope stability analysis can be performed including but not limited to shear strength, pore pressure, bulk density, saturated density, cohesion, and soil classification.

3. Geotechnical analysis and calculations for slope stability.

UMC 817.153 Roads: Class I: Drainage - RPS

Largely, all Class I roads in the permit area report to sediment ponds C or E. One section of the entrance haul road is unable to report to pond E. The road drainage is treated with straw bales or silt fence prior to discharging from the permit area. The applicant is in compliance with regards to Class I road sediment control.

UMC 817.163 Roads: Class II: Drainage - RPS

All Class II Roads are within the disturbed area boundaries and report to sediment ponds or underground works. This meets the requirements of this section.

UMC 817.173 Roads: Class III: Drainage - RPS

All Class III Roads are within the disturbed area boundaries and report to sediment ponds or underground works. This meets the requirements of this section.

cc: B Team
BT15/58-71