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August 4, 1998

TO: File

THRU: Joe Helfrich, Permit Supervisor

THRU: Daron Haddock, Permit Supervisor

FROM: Robert Davidson, Soils Reclamation Specialist

RE: Soils Technical Analysis of the West Ridge Permit Application Package, West Ridge Resources, Inc., West Ridge Mine, PRO/007/041, Folder #2, Carbon County, Utah

SUMMARY:

TECHNICAL ANALYSIS:

ENVIRONMENTAL RESOURCE INFORMATION

SOILS RESOURCE INFORMATION

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

Analysis:

Chapter 2, Soils, Sections R645-301-220 through -224, discuss the soil resources within the proposed West Ridge Mine area. Relevant soils information includes prime farmland investigation, current and published soil surveys, soil characterizations, and substitute topsoil identification. The Analysis section discusses resource information as follows:

- Prime Farmland Investigation
- Soil Survey Information
- Soil Characterization
- Substitute Topsoil Borrow Area

Prime Farmland Investigation

Prime Farmland site investigations were performed by the Natural Resources Conservation Service (NRCS). No prime farmland or farmland of statewide importance were found within the proposed permit area, mine site and topsoil borrow site because of slope and soil erodibility. The determination letter from the NRCS dated August 7, 1998, was sent to Andalex Resources, Inc., and is included in Appendix 2-3.

Soil Survey Information

(1) *General, Third Order Soil Survey*:
- Reproduced from the Carbon County Soil Survey, published by the United States Department of Agriculture, Soil Conservation Service, National Cooperative Soil Survey, issued in June 1988.
- Appendix 2-1 - relevant portions of soil survey for the proposed permit area
- Soils Map 2-1 - regional soils map for the proposed permit area

(2) *A site specific, First Order Soil Survey*
- Performed during June and October 1997 and prepared by Mr. James Nyenhuis, Certified Professional Soil Scientist (ARCPACS #2753):
- Appendix 2-2 - proposed disturbed area mine site
- Appendix 2-4 - proposed topsoil borrow area
- Appendix 2-5 - proposed gravel borrow area
- Soils Map 2-2 - proposed disturbed area mine site
- Soils Map 2-3 - topsoil borrow area soils maps

Soil identification and soil descriptions are contained in each of the respective Appendices (2-1, 2-2 & 2-4) for each of the soil surveys. All mapping and soil survey work were performed according to the standards of the National Cooperative Soil Survey. The First Order Soil Surveys for the proposed disturbed area mine site area, topsoil borrow area, and gravel borrow area were correlated with the published National Cooperative Soil Survey. Based on the site-specific soil descriptions, and laboratory data, each of the soils were classified according to current NRCS soil taxonomy, and correlated to specific soil series names. Correlation of site-specific soils with NRCS soil series criteria allows for subsequent reference to and use of established NRCS soil interpretation values for these soils.

For the disturbed area mine site, four mapping units were delineated (Map 2-2) and include Rock Outcrop-Rubbleland-Travessilla complex, Midfork very stony fine sandy loam, Brycan loam and Strych stony fine sandy loam. In the proposed topsoil borrow area, three soil units were mapped (Map 2-3) as Strych stony fine sandy loam, Atrac fine sandy loam and Gerst-Badland-Rubbleland complex. For the gravel borrow area, one soil series, Strych gravelly loam, was present across the entire sampled area.

Soil productivity of existing soils was determined by Mr. George Cook from the Natural Resources Conservation Services and results are shown in Appendix 3-1.

Soil Characterization

Soil pedons were characterized by the soil horizons at each sampling location. All profile descriptions were recorded on standard NRCS "232" forms and are provided in each of the appendices.

The soil horizons at each sampling location were sampled and characterized according to the State of Utah Division of Oil, Gas and Mining (DOGM) guidelines for topsoil and overburden[1]. Sampled parameters included: soil texture; pH; organic matter percent; saturation percent; electrical conductivity; $CaCO_3$; soluble potassium, magnesium, calcium and sodium; sodium absorption ratio, and extractable selenium and boron. Available water capacity, alkalinity, total nitrogen and available phosphorus were not analyzed at this time; these parameters can be tested at reclamation time. Organic matter percent was substituted for organic carbon. Soil texture by hand-texture method, rock fragment content (% by volume), Munsell color, and qualitative calcium carbonate content were determined in the field by Mr Nyenhuis.

No unacceptable criteria were found for salvageable soils and substitute soils except for percent rock content. Although DOGM suitability criteria considers >30% (by volume) rock fragments (for both gravels <3" in size and cobbles 3 to 10" in size) to be unacceptable, and >10% stones and boulders >10" in size to also be unacceptable, the recent trend by DOGM is to salvage "**native soils**" with "**intrinsic rock content**". Jim Nyenhuis somehow thought that the Division's general idea was to salvage otherwise suitable soil with higher amounts of rock content in the soil than typical. However, the general idea is that native soils could be salvaged containing a higher rock content than the DOGM guidelines deems acceptable. Ultimate site reclaimability using these rocky soils could enhance reclamation success by providing an environment similar to native conditions. Higher rock content soils provide for a more stable reclaimed surface, aid in water harvesting and ultimate water holding capacity of interstitial soils, and create wildlife habitat and niches on the surface were surface boulders and larger cobble sized rocks are placed.

Substitute Topsoil Borrow Area

A supplemental soil resource areas has been identified in the event that reclamation efforts are not successful utilizing the topsoil resources at the mine site. The borrow topsoil site has been investigated to document the physical and chemical characteristics of this material and

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

to determine the soil's suitability (see Appendix 2-4).

Appendix 2-5 gives the soil resource assessment of the gravel borrow material that will be used for fill during culvert installation and pad construction. Based on DOGM's soil and overburden guidelines, these gravel fills in their current natural state are suitable as substitute topsoil based on physical and chemical characterization.

Findings:

The information provided meets the regulatory requirements of this section.

OPERATION PLAN

TOPSOIL AND SUBSOIL

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

Analysis:

Chapter 2, Soils, Sections R645-301-230 through -234, and R645-302-200 through -218, discusses the soil's operation plan for the proposed West Ridge Mine. Topsoil protection incorporates traditional methods of salvaging/stockpiling and an experimental practice method for protecting in-place soils with a layer of geotextile fabric. The **Experimental Practice** is unique by taking a **Reclamation Approach** for topsoil protection. Relevant analysis information includes soil salvage, stockpiling, topsoil substitutes and supplements, and experimental practice. The Analysis section discusses operation information as follows:

- Topsoil and Subsoil Removal - Traditional Methods
- Topsoil and Subsoil Protection - Experimental Practices
- RO/RL Travessilla Complex Soils
- Topsoil Substitutes and Supplements
- Topsoil Storage

Topsoil and Subsoil Removal - Traditional Methods

For the purpose of maximizing topsoil recovery during construction, topsoil salvage will occur under the on-site supervision of a competent soil scientist. Traditional methods for protecting topsoil resources will occur in the following areas:

(1) Excavated areas - Topsoil will be salvaged from those areas of the mine yard where material will be excavated in order to achieve final yard configuration. Topsoil salvage

areas are identified on the First Order soil survey as Brycan, Midfork and Strych soil units. A total of 6500 CY of topsoil is projected for salvage.

(2) RO/RL Travessilla Complex - The plan commits to salvaging isolated pockets of Travessilla soil during construction.

Several questions remain concerning topsoil removal and protection with respect to construction sequence of the pad as follows:

- *How are soils protected during vegetation removal and grubbing? If soils are heavily impacted with haul roads and/or heavy equipment on hillsides, then they need be salvaged from these areas.*

- *Rather than bury all slash material, could the slash be chipped and used as mulch during interim reclamation?*

- *When are cutslopes constructed; after pad placement or before?*

- *If cutslopes are constructed before pad placement, how are soils below cutslopes and beneath the pad surface protected during cutslope operations?*

- *Delineate on a map all areas within the disturbed area where cuts will actually occur during pad construction.*

Topsoil and Subsoil Protection - Experimental Practices

Most of the West Ridge Mine site will have topsoil salvage and protection using traditional methodology. However, Andelex is proposing a topsoil protection plan which incorporates Experimental Practices (R645-302-200) for protecting the in-place soil with a layer of geotextile fabric. The geotextile fabric provides a protective barrier between the existing soil and the imported fill materials used to construct the mine pads. By utilizing this procedure, soils are not only preserved in-place, but the existing stream channel morphology and original ground surface configuration are preserved likewise. Approximately 4.75 acres of the proposed 29 acres disturbed area will be affected using the experimental practice.

In order to test this practice, Andalex has proposed a test plot study in the right fork topsoil stockpile. After the fill material has been in place for five years, the test plot study will monitor reclamation success of the Experimental Practice by removing the geotextile and then treating the surface with several treatments utilizing the same methodology being proposed for final reclamation. For comparison to assess reclamation success, an adjacent plot will also be constructed utilizing traditional reclamation methodology. If additional testing needs to be conducted, then fifteen years will remain to conduct additional testing. As a last, Andelex will

utilize the soil borrow area for obtaining soils to reclaim the site if the experimental practice is determined to be unworkable.

The following Operational concerns and questions are listed for the Experimental Practice that need to be addressed and/or changed in the PAP:

- *Andalex proposes to protect the soil resources in-place by covering the soil surface with a geotextile fabric, then placing fill material over the fabric. A marker layer, or marker flagging, needs to be utilized above the geotextile to mark the proximity of the geotextile surface to help prevent surface damage during reclamation excavation.*

- *The PAP contains conflicting construction and reclamation goals concerning preservation of the existing stream channel, stream bank geomorphology and original ground surface configuration. The conflict arises with construction procedures using a trackhoe to remove boulders and grade the stream channel prior to culvert installation versus channel preservation. In addition, Maps 2-4 shows culvert installation below original soil surface. If channel soils are not going to be preserved in-place and undisturbed, then they need to be salvaged and stockpiled.*

- *Information and specifications are needed on the geotextile fabric to assess it's suitability and durability for use as explained in the Experimental Practices.*

RO/RL Travessilla Complex Soils

The Permit Application Package (PAP) concludes that soil salvage of the RO/RL, Rock Outcrop-Rubbleland-Travessilla complex soils is generally not recommended because these areas have little or no topsoil material. The plan does commit to salvaging isolated pockets of Travessilla soil during construction and protecting buried Travessilla soils under geotextile. However, the general nature of RO/RL soils need to be addressed or resolved as follows:

- The Soil Resource Assessment report concludes that the RO/RL mapping unit is dominantly unsuitable for soil salvage. Since the RO/RL complex occupies the majority of the surface disturbance area, then the "unsuitable" nature of this mapping unit for soil salvage renders the site generally "unsuitable" for reclamation success. *Therefore, the Division must conclude that based on information set forth in the application concerning the RO/RL area and lack of soil, the site is not reclaimable.*

- The fact is that the RO/RL mapping unit does contain significant soils (35% soils by volume - 25% Travessilla plus 10% other) that support a significant vegetation community - 750 lbs/acre of Pinyon/Juniper versus 1500 lbs/acre of Douglas Fir/Rocky Mountain Juniper in the Midfork soils. These "rocky" soils have intrinsic

value for restoring RO/RL slopes and surfaces during reclamation to match current soil and vegetation conditions. The current vegetation community evolved to fit environmental conditions as they currently exist. *Therefore, successful reclamation requires the same soil and rock parameters as currently exist to establish revegetation success standards. The indigenous RO/RL soils and rock material need to be salvaged and protected in like manner to the Midfork, Brycan and Strych soils.*

- The Soil Resource Assessment report further concedes that attempting to salvage the RO/RL soils might destablize immediate upslope areas endangering equipment operators with possible boulder slides. However, the PAP operation plan clearly shows (as shown on Map 5-5, Surface Facility Map) that nearly every slope located along the entire length of "C" canyon, including the left and right hand forks, will be cut to widen the pad surfaces. The majority of these cutslopes are contained exclusively within the RO/RL mapping unit. *Therefore, either the RO/RL surface slopes are safe for constructing cutslopes and likewise soil salvage, or they're not safe for either activity.*

- Finally, if the RO/RL soils and surface materials render themselves suitable for constructing purposes using conventional construction equipment, (e.g., sediment pond basins, and pad fill), then these same indigenous soil and rock material from the unconsolidated RO/RL surfaces can likewise be salvaged and stockpiled for later reclamation use. *Therefore, in the RO/RL area wherever cutslopes and cut areas are constructed, all indigenous soil and rock material must be salvaged and stockpiled for later reclamation use. These rocky, thin soils need be segregated and stockpiled separately from the Midfork, Brycan and Strych soils.*

Topsoil Substitutes and Supplements

Appendix 2-5 gives the soil resource assessment of the gravel borrow material that will be used for fill during culvert installation and pad construction. Based on DOGM's soil and overburden guidelines, these gravel fills in their current natural state are suitable as substitute topsoil based physical and chemical characterization. *However, when these gravel subsoils and unconsolidated sub-materials are processed for standard 0 to 8" construction fills, their physical state will have been altered from native conditions and their suitability for substitute topsoil is no longer guaranteed.*

Topsoil Storage

The PAP states that soil salvaged from the cutslopes above the pads and from the M1, M2, B1, and S1 areas will be stockpiled and preserved for final reclamation. Two separate sites located in either the left fork or the right fork have been identified for topsoil storage. The sites are located up and away from the active mine yard area. The stockpiled soils will be seeded and

mulched to minimize erosion. Both stockpile areas combined can hold about 11,000 CY of soil with outslopes of 2:1 and depths ranging up to 15 feet. The outslope surfaces will be surface roughened and pitted to help retain moisture and minimize runoff. Map 2-4 shows details for each stockpile.

The primary topsoil storage area will be located in the right fork. This area is large enough to accommodate the total projected volume of salvaged topsoil. If extra capacity is needed, then the left fork area will be utilized for soil storage.

Construction of the topsoil stockpiles will begin by vegetation removal and installing the bypass culvert in the drainage channel. The stockpile will be built up over the bypass culvert with diversion ditches installed along the both flanks of the stockpiles.

Findings:

The permittee must provide the following, prior to approval, in accordance with the requirements of:

R645-301-232: Several questions remain concerning topsoil removal and protection with respect to construction sequence of the pad as follows:

- How are soils protected during vegetation removal and grubbing? If soils are heavily impacted with haul roads and/or heavy equipment on hillsides, then they need be salvaged from these areas.

- Rather than bury all slash material, could the slash be chipped and used as mulch during interim reclamation?

- When are cutslopes constructed; after pad placement or before?

- If cutslopes are constructed before pad placement, how will soils below cutslopes and beneath the pad surface be protected during cutslope operations?

- Delineate on a map all areas within the disturbed area where cuts will actually occur during pad construction for the purpose of assessing soil salvage areas.

R645-302-200: Several Operational concerns and questions are listed for the Experimental Practice that need to be addressed and/or changed in the PAP:

- Andalex proposes to protect the soil resources in-place by covering the soil surface with a geotextiles fabric, then placing fill material over the fabric. A marker layer, or marker flagging, needs to be utilized above the geotextile to mark the proximity of the

geotextile surface to help prevent surface damage during reclamation excavation.

- The PAP contains conflicting construction and reclamation goals concerning preservation of the existing stream channel, stream bank geomorphology and original ground surface configuration. The conflict arises with construction procedures using a trackhoe to remove boulders and grade the stream channel prior to culvert installation versus channel preservation. In addition, Maps 2-4 shows culvert installation below original soil surface. If channel soils are not going to be preserved in-place and undisturbed, then they need to be salvaged and stockpiled.

- Information and specifications are needed on the geotextile fabric to assess it's suitability and durability for use as explained in the Experimental Practices.

R645-301-232.200, R645-301-232.300 and R645-300-133.710: Concerning the RO/RL area, the following concerns need to be addressed as explained in the analysis section:

- The Division must conclude that based on information set forth in the application concerning the RO/RL area and lack of soil, the site is not reclaimable.

- Successful reclamation requires the same soil and rock parameters as currently exist to establish revegetation success standards. The indigenous RO/RL soils and rock material need to be salvaged and protected in like manner to the Midfork, Brycan and Strych soils (i.e., provide a marker layer and preserve undisturbed in-place).

- Either the RO/RL surface slopes are safe for constructing cutslopes and likewise soil salvage, or they're not safe for either activity.

- For the RO/RL area wherever cutslopes and cut areas are constructed, all indigenous soil and rock material must be salvaged and stockpiled for later reclamation use. These rocky, thin soils need be segregated and stockpiled separately from the Midfork, Brycan and Strych soils.

R645-301-233: Based on DOGM's soil and overburden guidelines, imported gravel fills in their current natural state are suitable as substitute topsoil based physical and chemical characterization. The PAP plan currently commits to leaving an average of 12 to 18 inches of pad fills as substitute soils. However, when these gravel subsoils and unconsolidated sub-materials are processed for standard 0 to 8" construction fills, their physical state will have been altered from native conditions and their suitability for substitute topsoil is no longer guaranteed.

RECLAMATION PLAN

TOPSOIL AND SUBSOIL

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

Analysis:

Chapter 2, Soils, Sections R645-301-240 through -244, discusses the soil's reclamation plan for the proposed Dugout Canyon Mine. The Analysis section discusses reclamation information as follows:

- Soil Redistribution
- Experimental Practices
- Soil Nutrients and Amendments
- Soil Stabilization

Soil Redistribution

Reclamation of the disturbed area will begin once all surface facilities and structures have been demolished and removed. Cut areas will be restored to AOC as the yard fill is removed. Cutslopes will be backfilled and regraded using fill material taken from the adjacent pad area. After the cutslopes are backfilled, topsoil will be redistributed and the slopes revegetated. Much of the regrading, re-topsoiling, and revegetation of the cutslopes can be accomplished using the adjacent pad fill areas as a work platform for equipment and materials. It is unclear at what point the highwall will be backfilled and reclaimed as fills are being removed from the pad and hauled into the old mine workings. The plan needs to provide information concerning topsoil replacement depths, with soil depths correlated with each corresponding soil and replacement area (e.g., Midfork soils or RO/RL soils).

Pad fill will be removed in 5-10 foot lifts starting from the upper end of the yard and proceeding down the canyon. As the yard area is being removed to establish AOC, the yard pad fill will be excavated and hauled underground for permanent storage. By removing the fill in 5-10 foot lifts and simultaneously reclaiming the slopes in corresponding lifts, the pad area can then serve as a convenient operating platform for machinery and supplies used during the reclamation effort.

The following items need to be addressed and clarified in the PAP:

- *The PAP contains conflicting reclamation commitments between normal reclamation AOC grading **versus** fill removal to expose original soil surfaces. Delineate in writing, and on a reclamation map, which reclamation technique applies to which*

area. This needs to be coordinated with the Operations deficiency for delineating on a map all areas within the disturbed area where cuts will actually occur during pad construction.

- *It is unclear at what point the highwall will be backfilled and reclaimed as fills are being removed from the pad and hauled into the old mine workings.*

- *Redistribute segregated stockpiled soils to their respective areas (e.g., RO/RL soils to RO/RL areas). Provide average replacement depths by area and by soil type based on stockpiled volumes.*

Experimental Practices

Fill removal from the slopes will be done carefully without disturbing the in-place soils located under the geotextile. Fill removal will be done by small earth moving equipment and/or by hand labor if necessary to minimize disturbance of the topsoil. A marker layer, or marker flagging, needs to be utilized above the geotextile to mark the proximity of the geotextile surface to help prevent surface damage during reclamation excavation.

Once the geotextile fabric has been exposed, the fabric will be carefully peeled away from the soil and the condition of the underlying soil materials observed at this time. The soil will be reclaimed in 5-10 foot horizontal zones that can be easily accessed and worked by hand from the adjacent pad fill level. All reclamation work performed directly on the slopes will be done with hand labor and tools. Slope restoration will be supported by heavy equipment staged on the adjacent pad level. Work will be done in continued successive lifts, involving fill removal, peeling away the geotextile, revitalizing the in-place topsoil, and revegetating the newly exposed increments. After the fill removal process reaches the bottom of the canyon, the bypass culvert will be exposed. After culvert removal, the underlying geotextile fabric will be peeled away from the soil surface.

The plan states that Polyacrylamide (PAM) relieves soil compaction. PAM is used to preserve soil structure and reduce soil erosion; PAM does not relieve soil compaction. In order to relieve soil compaction, the R-V-M (roughen, vegetate, mulch) method needs to be employed. To enhance the soil's ability to absorb moisture and reduce soil erosion, the best technology currently available at the time of reclamation (e.g., PAM, SOIL LOC®, Tackifier, etc.) needs to be applied to the soil surface. The plan also states that different techniques, including soil inoculum and soil stimulator, will be applied to the soil to stimulate soil microbiological activity.

The following reclamation items need to be addressed and clarified in the PAP for experimental practices:

- *PAM does not relieve soil compaction. In order to relieve soil compaction, the R-V-*

M (roughen, vegetate, mulch) method needs to be employed. To enhance the soil's ability to absorb moisture and reduce soil erosion, the best technology currently available at the time of reclamation (e.g., PAM, SOIL LOC®, Tackifier, etc.) needs to be applied to the soil surface.

- *A marker layer, or marker flagging, needs to be utilized above the geotextile to mark the proximity of the geotextile surface to help prevent surface damage during reclamation excavation.*

- *In order to properly assess reclamation sequence for restoration of in-place soils, please explain coordination and timing of conveyor belt removal, highwall reclamation, fill transport into old mine workings and pad removal.*

Soil Nutrients and Amendments

Topsoil and substitute topsoils will be sampled as they are redistributed. Fertilizer needs will be assessed based on analyses for soil nutrients. Nutrients and other amendments can be added by hydroseeding, by broadcasting or by other conventional methods.

Soil Stabilization

After AOC is met for each cut area, the surface will be prepared according to the roughen, vegetate and mulch method (R-V-M). Pocking will be the primary method used to roughen the surface and consists of imprinting the surface with a pattern of depressions measuring approximately 18" x 24" x 8" deep. The purpose of the pocks, or gouges, is to capture and retain water, reduce erosion and provide a cradle for seedling germination and development. Soils on steep slopes need to be protected from erosion prior to vegetation establishment. Soil erosion methods in addition to pocking should include best technology currently available at the time of reclamation (e.g., PAM, SOIL LOC®, Tackifier, etc.).

Vegetation will be the primary source for erosion control and surface stabilization. Revegetation efforts will include regrading, topsoiling, fertilizing, mulching and seeding.

The following items need to be addressed and clarified in the PAP:

- *A map showing cut areas to receive fill for achieving AOC.*

- *Buried RO/RL boulders need to go back on RO/RL slopes.*

- *Soils on steep slopes need to be protected from erosion prior to vegetation establishment. Soil erosion methods in addition to pocking should include best technology currently available at the time of reclamation (e.g., PAM, SOIL LOC®,*

Tackifier, etc.).

Findings:

The permittee must provide the following, prior to approval, in accordance with the requirements of:

R645-301-120: The following items need to be addressed and clarified in the PAP:

- The PAP contains conflicting reclamation commitments between normal reclamation AOC grading versus fill removal to expose original soil surfaces. Delineate in writing and on a reclamation map which reclamation technique applies to which area. This needs to be coordinated with the Operations deficiency for delineating on a map all areas within the disturbed area where cuts will actually occur during pad construction.

- It is unclear at what point the highwall will be reclaimed as fills are being removed from the pad and hauled into the old mine workings.

R645-301-242: Redistribute segregated stockpiled soils to their respective areas (e.g., RO/RL soils to RO/RL areas). Provide average replacement depths by area and by soil type based on stockpiled volumes.

R645-302-200: The following items need to be addressed and clarified in the Experimental Practices:

- PAM does not relieve soil compaction. In order to relieve soil compaction, the R-V-M (roughen, vegetate, mulch) method needs to be employed. To enhance the soil's ability to absorb moisture and reduce soil erosion, the best technology currently available at the time of reclamation (e.g., PAM, SOIL LOC®, Tackifier, etc.) needs to be applied to the soil surface.

- A marker layer, or marker flagging, needs to be utilized above the geotextile to mark the proximity of the geotextile surface to help prevent surface damage during reclamation excavation.

- In order to properly assess reclamation sequence for restoration of in-place soils, please explain coordination and timing of conveyor belt removal, highwall reclamation, fill transport into old mine workings and pad removal.

R645-301-120: The following items need to be addressed and clarified in the PAP:

- A map showing cut areas to receive fill for achieving AOC.

- Buried RO/RL boulders need to go back on RO/RL slopes.

- Soils on steep slopes need to be protected from erosion prior to vegetation establishment. Soil erosion methods in addition to pocking should include best technology currently available at the time of reclamation (e.g., PAM, SOIL LOC®, Tackifier, etc.).

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