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FAX TRANSMISSION

GENWAL RESOURCES, INC.

PRO/007/041 #2

801/637-5385
FAX: 801/637-8860

To:	Paul Baker	Date:	March 2, 1998
Fax #:	801-359-3940	Pages:	7 , including this cover sheet.
From:	Jean Semborski		
Subject:	text change		

COMMENTS:

Paul,

Attached are several pages with text changes based on your conversation with Dave. Also, I faxed a sheet with the projected water usage for the West Ridge Mine last Friday and just wanted to make sure you received it. I am interested in your comments on these changes. Thanks Paul.

R645-301-230 OPERATION PLAN

231.100 A detailed and in-depth discussion of the construction plan for the West Ridge Mine site is presented in detail in Appendix 5-5. Appendix 5-5 should be reviewed and thoroughly understood prior to continuing with the review of this 231.100 section. The information presented below is a brief outline of the detailed discussion and should only be used as a quick reference for Appendix 5-5. It is also important to remember that although the construction tasks are listed in a consecutive sequence, it is likely that various stages of these events may be occurring simultaneously in different parts of the mine yard.

A topsoil protection plan has been formulated for the C Canyon minesite which incorporates protection of soil resources both by the traditional method of salvaging/stockpiling and by the experimental practice of protecting the in-place soil with a layer of geotextile fabric. In areas where topsoil is to be protected in-place, geotextile fabric will be used to provide a protective barrier between the existing soil and the imported fill material which will be used to construct the mine pads. Geotextile placement will be utilized on approximately ** acres of the mine yard. In this manner, the existing stream channel morphology and original ground surface configuration will be preserved with the layer of geotextile fabric. The fill material which will be placed on top of the geotextile will be hauled in by trucks from an off-site source. The fill will be built up in compacted lifts until the required yard elevation has been reached.

In areas which contain topsoil and are proposed to be excavated during construction of the mine yard, the existing topsoil will first be salvaged and stockpiled. This topsoil material will be excavated with a backhoe, then trucked to the topsoil storage pile where it will be stockpiled and protected for the life of the mine. Brycan, Midfork and Strych soil units exist in these areas. Salvaging of topsoil in these areas would be accomplished under the on-site direction of a competent soil scientist.

A third type of construction area exists which is composed entirely of rock outcrop/rubbleland (RO/RL). In this area, bare rock or very minimal surficial cover exists over the bedrock materials. Isolated pockets of Travesilla soil exist within the RO/RL area. These pockets of soil will be removed during construction and stockpiled. The total volume obtained from salvage of this material, however, is not expected to be great in comparison with the other soil unit areas. This RO/RL area will not be covered with geotextile, but instead, fill will be placed directly over the existing ground surface.

The fill material to be used in the mine yard has been tested and found to be suitable as substitute topsoil material. It has no adverse properties that would prohibit it from being used as such. At the time of final reclamation, the soil material would be removed leaving a veneer of suitable material over the RO/RL areas as a growth medium for revegetation purposes. The existing surface is quite rough and irregular. Numerous large boulders lay on the surface, and steep, bedrock ledges form much of the remainder of the existing

and steep, bedrock ledges form much of the remainder of the existing surface. Although reclamation will closely re-establish the overall approximate contour of the area, the exact original roughness and irregularity of the original pre-mining surface will not be totally replicated. Upon final reclamation, the depth of the remaining fill material (i.e., growth medium) will vary depending on the roughness and irregularity of the original surface at any given location. For example, in some areas, such as bare rock ledges/outcrops, the remnant skiff of material may be only several inches thick. In other areas, such as in the bottom of pre-existing nooks and crannies and other similar deep depressions, the depth of the remnant material could be up to several feet thick. Overall, the average remnant depth is not expected to exceed 12-18 inches. This remnant material (growth medium) would provide a good base of material for re-establishment of vegetation on slopes that were previously devoid of topsoil and on which vegetation would have been more difficult to reestablish.

In area where topsoil is to be salvaged, the soils will be removed with one or more of the following types of equipment: bulldozer, grader, front-end loader, and/or trackhoe. A soil scientist will provide on-site consultation during the topsoil removal process to maximize harvest of quality topsoil.

Topsoil material will be stockpiled at designated storage areas located above the mine yard in both the right and left forks of C Canyon. These locations will allow the soil materials to be located away from mining activities to minimize the potential impacts from mine-related activities. The storage areas will be located over the bypass culvert so that the main canyon drainage will be culverted beneath the stockpiles and will not impinge on the stockpiled topsoil. Drainage ditches will also be located along the sides of the stockpiles to divert drainage away from the stockpile surface. Drainage will be diverted by ditches to the upstream end of the stockpile and will be treated by silt fences prior to entering the undisturbed drainage. The stockpile areas will be Best Technology Currently Available (BTCA) areas such treated by the alternate method of sediment control, such as silt fences and revegetation. Refer to Map 2-4 for details of the proposed topsoil storage areas. Refer to Appendix 7-4 for details of the drainage control designs proposed for these alternate sediment control areas (ASCAs).

It should be noted that the topsoil storage areas depicted on Map 2-4 show the potential area available for topsoil stockpile placement and not necessarily the final configuration of the stockpiled topsoil. This map portrays stockpiles totaling 11,350 cubic yards of topsoil storage which is more than sufficient to handle the projected topsoil storage requirements from the minesite (6,506 cubic yards). However, if additional topsoil is salvaged during construction (under the supervision of qualified soil scientist) the designated topsoil storage areas can easily accommodate the additional volume. The designated topsoil storage areas, ASCA X and ASCA Y, occupy approximately 1.12 acres and 0.64 acres respectively. The actual area occupied by the stockpiled topsoil is expected to be much less, however. For example, the topsoil storage piles depicted on Map 2-4 occupy only half of the dedicated topsoil storage area.

acidity or sodicity problems. If sampling identifies a potential concern, additional samples will be collected to better define the nature and extent of the potential problems.

Andalex is proposing to utilize an experimental practice with respect to topsoil salvage during construction, operation and reclamation of the mine yard. Topsoil will be protected in-place in a portion of the surface facility area. The soil will be left intact and a layer of geotextile fabric will be placed over the soil surface. Next, fill material will be hauled in and placed over the geotextile material. This method will be used on approximately ** acres of the surface facility area. In order to evaluate the effects of the geotextile and fill over the existing in-place topsoil material a test plot will be established at the upper end of the mine yard in the right fork near the topsoil stockpile. During initial construction, the fill will be placed over the geotextile and left in place for approximately ten years. The test plot will created by removing the fill material and geotextile from this portion of the yard, thereby exposing the original soil surface. The surface will then be treated with PAM (Polyacrylamide) and seeded with the final reclamation seed mix. PAM is designed to relieve compaction of the soil and open up channels for air and water penetration. Because of the small area to be treated, the seed will be broadcast on the surface and raked in. A wood fiber mulch will be applied over the seed bed, then the surface will be sprayed with a bonded fiber matrix tackifier. This type of tackifier has appeared to have a much greater ability than regular tackifier to hold and stabilize the soil surface. The bonded fiber matrix tackifier will be applied at a rate of 3,500 pounds per acre (or manufacturer's recommended application if greater).

Vegetation monitoring will compare the results of plant growth on the test plot site with the growth on a similar size area on the nearby topsoil stockpile. Both test plots will be monitored for five years. Andalex will consult with the Division regarding the results of the test plot study. Should the results show a need to revise the reclamation plan, Andalex will work with the Division to amend the plan and incorporate the changes needed to ensure reclamation of the mine yard area will be successful.

231.400 Construction of the topsoil storage sites will begin by removing any large, existing vegetation and installing a bypass culvert in the drainage channel. The stockpile will be built up over the bypass culvert. Diversion ditches will be installed after the stockpiles are in place to channel natural undisturbed drainage away from the stockpiles toward the undisturbed drainage. Once the topsoil stockpiles have been created with the material removed during construction of the proposed mine site, they will be reseeded and will remain in place until final reclamation occurs.

The surface of the stockpiles will be left rough and irregular to increase retention of rainfall and snowmelt. Seeding will be done following placement of the topsoil, and after September 15, to take advantage of winter moisture.

Tests have shown that this fill material is, in and Topsoil will not be applied to the re-exposed rock outcrop/rubbleland slopes which, by definition, are naturally devoid of topsoil, However, as the pad fill is being removed in lifts, a remnant layer of this fill material will be left in place on the rock outcrop/rubbleland slopes to help re-establish vegetation. of itself, a suitable growth medium (i.e., topsoil material). Refer to Appendix 2-5, "Soil Resource Assessment Gravel Borrow Area, Carbon County, Utah". This material is chemically and physically similar to the native material existing naturally in the minesite area. In fact, in its natural condition the fill material supports the exact vegetation types and species that are found at the minesite area. The fill material is composed of weathered remnants of the Black Hawk Formation from the adjacent Book Cliffs. By leaving a layer of this fill material in place on the rock outcrop/rubbleland areas, these slopes will have a growth medium which is as good as or better than the original outcrop/rubbleland in supporting reclamation revegetation. This residual fill material (growth medium) will then be processed as any other topsoil material in terms of revegetation. Prior to revegetation the area will be roughened and pitted with a backhoe bucket.

2) In areas where topsoil exists but was protected in place with geotextile the following method will apply.

   a) Once the yard fill has been removed, the geotextile fabric covering the original ground surface will be removed.

   b) On steep areas, a polyacrylamide will be applied to the ground surface to breakup soil compaction and facilitate water infiltration. On areas with a lesser slope (areas with a 2:1 slope or less) the surface will be ripped with the teeth of a backhoe to a depth of 6-8 inches to loosen up any soil compaction and to facilitate seed germination.

   c) The area will then be either broadcast or hydroseeded with the appropriate seed mix (as listed in Chapter 3, Tables 3a, 3-2B, 3c, and 3-2D). The seed will be applied at a rate specified on the table. The seed will then be raked in.

   d) Straw mulch will be applied to the surface at a rate of 1500 pounds per acre and tacked to the surface with a tackifier. The tackifier will be applied at a rate of 500 pounds per acre.

   e) If root stock is listed in the seed mix, the containerized plants will be planted at the rate specified in the seed list table.

3) For areas devoid of topsoil resources, such as the rock outcrop/rubbleland areas, a third methodology will be applied.

   a) Fill will be removed ~~until about 18 inches of material is remaining~~ over the original slope. Approximate original contour will be achieved by closely following the previously existing slopes. A remnant layer of fill material will be left in place to serve as a growth medium. The thickness of this layer may vary from a skiff (i.e. 2-3") up to 18-24" in areas where natural depressions and irregularities occur in the original existing surface.

   b) The surface will be gouged or pocked with irregularly shaped depressions approximately 18" x 24" x 6" deep to loosen any compaction that may have occurred, to provide depressions for water retention and to create microclimates for seed germination and growth.

   c) The surface will then be either broadcast or hydroseeded with the appropriate seed mix (as listed in Chapter 3, Tables 3a, 3-2B, 3c, and 3-2D). The seed will be applied at a rate specified on the table and then be raked in.

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By removing the fill in 5-10 foot lifts and simultaneously reclaiming the slopes in corresponding lifts, the pad area can then serve as convenient operating platform for the machinery and supplies used during the reclamation effort. In this manner heavy machinery will not be required to maneuver on the slopes. All reclamation work performed directly on the slopes will be done with hand labor and tools. The reclamation process will be supported by heavy equipment staged on the adjacent pad level.

After approximate original contour (AOC) is achieved, the surface will be prepared according to the R-M-V (roughen, mulch, revegetate) method. Pocking will be the primary method used to roughen the surface. Pocking consists of imprinting the surface with a pattern of depressions measuring approximately 18" x 24" x 8" deep. The purpose of these pocks is to capture and retain water (moisture), and provide a cradle for seedlings and other plant materials.

6) Re-expose the original rock outcrop/rubbleland surface and revegetate; Topsoil will not be applied to the re-exposed rock outcrop/rubbleland slopes which, by definition, are naturally devoid of topsoil, However, as the pad fill is being removed in lifts a remnant layer of this fill material will be left in place on the rock outcrop/rubbleland slopes to help re-establish vegetation. Tests have shown that this fill material is, in and of itself, a suitable growth medium (i.e., topsoil material). This material is chemically and physically the same as the native material existing naturally in the minesite area. In fact, in its natural condition the fill material supports the exact vegetation types and species that are found at the minesite area. The fill material is composed of weathered remnants of the Black Hawk Formation from the adjacent Book Cliffs. By leaving a layer of this fill material in place on the rock outcrop/rubbleland areas these slopes will have a growth medium which is as good as or better than the original rock outcrop/rubbleland in supporting reclamation revegetation. This residual fill material will then be processed as any other topsoil material in terms of revegetation. Prior to revegetation the area will be roughened and pitted with a backhoe bucket.

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Revegetation procedures for the rock/rubbleland slopes involves a four step program: 1) application of fertilizer (if laboratory testing indicates a need), 2) hydroseed, 3) hydro mulch the entire area with a wood fiber mulch to stabilize soil during vegetative growth and control runoff, 4) plant containerized stock to further stabilize the soil and provide vegetative diversity. Hydro seeding will combine the tackifier and small amount of mulch with the seed mix (to mark the area of coverage)