



State of Utah

DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS AND MINING

Norman H. Bangertter
Governor

Dee C. Hansen
Executive Director

Dianne R. Nielson, Ph.D.
Division Director

355 West North Temple
3 Triad Center, Suite 350
Salt Lake City, Utah 84180-1203
801-538-5340

June 1, 1988

TO: Susan C. Linner, Permit Supervisor/Reclamation Biologist
FROM: James S. Leatherwood, Reclamation Soils Specialist
Re: Technical Analysis, Waste Rock Disposal Site, Southern Utah
Fuel Company, Convulsion Canyon Mine, ACT/041/002, Sevier
County, Utah

UMC 817.21 - .25 Topsoil - JSL

Existing Environment and Applicants Proposal

The SUFCO Waste Rock Disposal site soil resources are discussed in Appendix five (5). The soil survey was conducted in December of 1987, and March of 1988, by Dr. Sheldon Nelson, Soil Scientist.

The soil in the proposed 7.5 acre waste disposal area consist primarily of one soil type. This soil is classified as a Typic Torrifluent. Surrounding soils are classified as Typic Argixerolls.

The soils at the proposed site are primarily alluvium derived from sandstone and limestone. A torric moisture with a frigid temperature regime prevail. Average annual soil temperature lower than eight degrees centigrade at a 50 cm depth.

The topography of the area is moderately sloping ranging from 5 to 9 percent. The site occurs in a small flood plain, primarily concave with a west aspect. The capability class is V nonirrigated with limitations due to climate and slope.

The soil profile depth is generally 140+ centimeters (cm). The present A horizon is 0-10 cm underlain by a C horizon extending to the 40-45 cm depth. A buried A horizon is located below the C horizon to a 45-140 cm with a IIIC horizon extending from 140+ cm.

Page 2
Susan C. Linner
ACT/041/002
June 1, 1988

Under native vegetation and non-vegetation the erosion hazard is slight and moderate, respectively. The texture ranges from a sandy loam to loam in the A horizon while the lower horizons range from a sandy loam to clay loam. Permeability is moderate. The water holding capacity ranges from 1.29 to 5.13 in the A horizon, 0.4 to 1.37 in the C horizon, and 2.4 to 9.4 in the Ab horizon. Vegetative root growth is found down to the IIIC horizon. Root growth may be restricted due to a water table at 80 to 140 cm depth.

The soil pH is neutral ranging from 7.0 to 7.5. The soil is considered non-saline and non-sodic with an electrical conductivity averaging 0.82 mmho/cm and the average sodium adsorption ratio of 0.61. The soil structure is granular in the top horizon and ranges from blocky to massive in the subsoil.

Removal

Approximately 0.5 of the 7.5 acres proposed for the disposal area will be used at a time. The soil removal plan is discussed in the operation plan, section 3.1.2, 3.2.1 and 3.2.3. Topsoil will be salvaged after vegetation has been removed from the site. The soil survey indicates a topsoil horizon depth of 0-10 cm, underlain by a C horizon and buried A horizon at 45-140 cm. Topsoil will be removed primarily by a frontend loader. Removal operations will be monitored by the grid stake method.

Compliance

The applicants proposal does not adequately address the requirements of this section. The waste material is presently considered as a potentially acid- or toxic-forming material (ATFM) based on a high boron level of 6.13 ppm. The potential ATFM analysis is based on one spoil sample. The operator states that further samples are currently being analyzed. In the "Addition to the Soil Survey" in Appendix V, Mr. S. L. Welsh states that the "waste rock buried at 2.5 feet of the existing soil profile should be sufficient to insulate the vegetation from slightly high concentrations of boron in the waste rock." The Division concurs with the 2.5 foot soil redistribution depth recommendation given by Dr. Welsh.

Page 3
Susan C. Linner
ACT/041/002
June 1, 1988

However, the PAP frequently states that only 24 inches of soil will be removed and 12 inches will be replaced. The PAP does not include any justification of reclaimability with the 12 inch redistribution depth. Therefore the plan must be updated to reflect that a sufficient volume of soil will be removed such that the total depth of redistributed soil will be a minimum of 2.5 feet.

Stipulation

UMC 817.22 Topsoil: Removal - (1) - JSL

Within 90 days of permit approval the operator shall submit to the Division, plans to remove sufficient volume of soil materials such that a 2.5 feet soil redistribution depth over the waste materials will be achieved.

Storage

Topsoil was salvaged during the previous disturbance. This stockpile will be placed over the first area to be reclaimed. The soil removed from the second area will be placed into long term storage on site. The topsoil from each preceding area will be directly hauled to the site to be reclaimed. Topsoil from the construction of the sediment pond will be placed into long term storage.

All long term storage topsoil stockpiles will be revegetated with the seed mix described in table 4.6.1-1, page 40. All short term stockpiles will be located away from the operations activities and will be protected as necessary with silt fence.

Compliance

The applicants proposal adequately addresses the requirements of this section.

Stipulation

None.

Redistribution

The PAP soil redistribution plan is discussed in sections 3.2.3, 4.5 and 4.6. The first reclamation section will be covered by the existing soil stockpile located on site. Topsoil redistribution in subsequent sections will be a direct haul from the next section. The soil material will be left in a rough state to enhance micro-water harvesting and to reduce the erosion potential. The soil will be scarified to a minimum six inch depth. Redistribution will not be carried out when the soil is excessively moist to avoid excessive compaction.

Compliance

The applicants proposal does not adequately address the requirements of this section. Pursuant to the discussion under topsoil removal, the depth of topsoil redistribution must be increased from twelve inches to 2.5 feet over the potential ATFM. This section will be in compliance with a commitment to stipulation UMC 817.22 - (1) -JSL.

Stipulations

None.

Nutrients and Amendments

The fertilizer rate will be determined by soil analysis at the time of final reclamation. The soil will be sampled prior to the reclamation effort. The fertilizer will be drilled one inch below the seed.

Compliance

The applicants proposal adequately addresses the requirements of this section.

Stipulation

None.

Page 5
Susan C. Linner
ACT/041/002
June 1, 1988

UMC 817.48 Hydrologic Balance: Acid- Forming and Toxic- Forming
Materials - JSL

Existing Environment and Applicants Proposal

Based on the presented limited data in the January 19, 1988 submittal, the waste material may to be a potential ATFM. This determination is based on the water soluble boron content of 6.13 ppm. In accordance with the Divisions Management of Topsoil and Overburden Material Guidelines, any material with available boron concentrations equal to or greater than 5 ppm is considered a potential toxic-forming material. This determination is based on only one sample.

The operator has committed (January 19, 1988 submittal) to composite sample and analyze the waste material on a quarterly basis with the provision that more frequent sampling will take place if a serious problem arises.

Compliance

The applicant's proposal does not meet the requirements of this section. As previously discussed under UMC 817.22 and required by stipulation UMC 817.22 - (1) - JSL the reclamation plan is not conducive to preventing environmental degradation from the potential ATFM. A commitment to stipulation UMC 817.22 - (1) - JSL should adequately mitigate any potential environmental degradation caused by high boron availability but may not mitigate any other acid- or toxic-forming problems should they arise.

A commitment to stipulation UMC 817.48 - (1) - JSL will bring this section of the plan into compliance.

Stipulation

UMC 817.48 - (1) - JSL

Within 90 days of permit approval, the operator shall submit to the Division, a commitment to submit an acid- or toxic-forming mitigation plan if the collected quarterly waste analysis indicates that an acid- or toxic-forming potential exist other than high boron levels. Said acid- or toxic-forming material mitigation report shall be submitted to the Division in not more than 30 days from notification of analysis. All identified potential acid- or toxic-forming materials must be buried or treated within 30 days after the material is first exposed on the mine site. The proposed mitigation plan must meet the requirements of UMC 817.48 and UMC 817.103.

Page 6
Susan C. Linner
ACT/041/002
June 1, 1988

UMC 817.99 Slides and Other Damages - JSL

Existing Environment and Applicants Proposal

No indication or reference to the requirements of this section could be found in the Reclamation Plan.

Compliance

The operator needs to provide in the Reclamation Plan, a commitment to notify the Division at any time a slide occurs which may have potential adverse effect on the public, property, health, safety, or the environment.

Stipulations

UMC 817.99 - (1) - JSL

Within 90 days from the date of approval of the Reclamation Plan, the operator shall provide and incorporate into the text of the Reclamation Plan a commitment to notify the Division in the event of a slide or other damage as required by this section.

UMC 817.103 Backfilling and Grading: Covering Coal and Acid- and Toxic- Forming Materials - JSL

Existing Environment and Applicants Proposal

Pursuant to UMC 817.22 and UMC 817.48 the materials is considered to be a potential acid- or toxic- forming material. The operators current plan calls for redistributing soils over the waste rock.

Compliance

The applicants proposal does not adequately meet the requirements of this section. The operator currently proposes to redistribute 12 inches of soil over the waste. As discussed under UMC 817.22 and UMC 817.48 a cover depth of 2.5 feet is considered to be adequate mitigation for the potential high available boron problem. A commitment to Stipulations UMC 817.22 - (1) - JSL and UMC 817.48 - (1) - JSL will satisfy the requirements of this section.

Page 7
Susan C. Linner
ACT/041/002
June 1, 1988

Stipulation

None.

UMC 817.106 Regrading or Stabilization of Rills and Gullies - JSL

Existing Environment and Applicants Proposal

The applicant commits to fill, stabilize and revegetate rills and gullies greater than nine inches deep in section 4.5 of the plan.

Compliance

The applicants proposal adequately meets the requirements of this section.

Stipulations

None.

UMC 822 Alluvial Valley Floors - JSL

Existing Environment and Applicants Proposal

The proposed waste rock disposal area does not contain an alluvial valley floor. The soil land use capability is determined to be a Class V with limitations due to climate and slope. The site does not contain sufficient water to support agricultural activities. There is no indication of current or historic irrigation or agricultural activities.

Compliance

The applicants proposal adequately addresses the requirements of this section.

Stipulations

None.

Page 8
Susan C. Linner
ACT/041/002
June 1, 1988

UMC 823 Prime Farmland - JSL

Existing Environment and Applicants Proposal

The Soil Conservation Service has submitted a negative determination of Prime Farmland for the waste rock disposal site. This determination is in Exhibit 4 of the plan.

Compliance

The applicants proposal adequately addresses the requirements of this section.

Stipulations

None.

JL/as
cc: R. Harden
1533R/1-8