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

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November 9, 1993

Mr. E.M. Gerick
Vice President of Operations
Western States Minerals Corporation
Suite 130
250 South Rock Blvd.
Reno, Nevada 89502

Re: Response to Reconfiguration Plan for the J.B. King Mine Submitted September 30, 1993 (Violations #N91-32-6-1, N93-25-3-1, and N93-25-5-1), Western States Minerals Corporation, J.B. King Mine, ACT/015/002, Folder #2, Emery County, Utah

Dear Mr. Gerick:

The Division has reviewed the reconfiguration plan submitted September 30, 1993 for the J.B. King Mine. Conceptually, the Division believes that the proposed plan has merits, but specific information was not submitted to fully assess the technical adequacy. The reclamation proposal is general in some aspects and must be revised to be more specific so as to meet the requirements of the R645 Utah Coal Mining Rules. This letter reviews the proposal and enumerates the major technical deficiencies.

This reclamation proposal is a result of violation abatement requirements for violations N91-32-6-1, N93-25-3-1 and N93-25-5-1. This proposal is a culmination of Western States Mineral Corporation efforts to develop a revised reclamation plan for the J.B. King site which is in its eighth year since reclamation was initiated at this mine site. The primary areas of concern are the erosion associated with the channels (main and feeder) (N91-32-6-1), rills and gullies cutting down to the refuse material, erosional stability on site, in particular the erosion on the outslope of the refuse pile (N91-25-3-1), vegetation success (N93-25-5-1), and the disposition of test plots.

Specifics for Channel Reconfiguration and Erosion Reference Area and Parameters

At the meeting held at the Division on September 30, 1993 when this plan was presented, the Division initially had reservations regarding the "traditional" trapezoidal channels presented to be the "stable" channels based on somewhat questionable assumptions in this geomorphic environment. To that end, on October 5, 1993, Mr. Tom Munson, Division Hydrologist, along with Mr. Gregory Poole, consultant for Western States Minerals Corporation, visited two tributary areas adjacent to the Dog Valley Wash. These basins appeared to represent natural channel systems which are controlled by similar geomorphic factors.

During this site visit, channel depths, both top and bottom widths, amplitude of meander, and data on the extent of lateral erosion were plotted. The channels surveyed tended to be deeply incised with very little variability between top width and bottom width if found in shaley substrate. The substrate appears to be the guide to channel shape.

The proposal must clearly state in the plan what parameters will be used in the field to determine the channel shape during construction. Using information collected, the consultant faxed some criteria (see attached) for designing a reclaimed channel using natural channel characteristics (width and depth). However, additional work is now required because a new design has been chosen. Plates must be modified from previous designs, incorporating new design information.

The "zone of impact" will be defined using a drill (auger?) to determine any acid or toxic coal refuse that may be uncovered. A step by step procedure for testing the zone of impact and updating plates and text from the PAP describing the location of drill holes and profiles of new channel designs must be submitted. Additionally, the criteria for monitoring the success or failure of this channel needs to be described as well, so that data is available and the criteria approved to demonstrate "stability" for bond release. The "criteria for stability" must be clearly delineated to determine if the channel does what has been predicted by maintaining the predicted profiles, shapes and location.

Erosion along channels and on hill slopes was not clearly described and defined in regards to specific treatment and potential impact. An investigation on erosion adjacent to the stream channels surveyed on October 5, 1993 indicated that erosion did not migrate any farther than 25 feet from the main channel and could be treated as appropriate within the identified "zone of impact" adjacent to

the main channel, except when significant tributary drainage area is involved. The treatment of erosion on hill slopes was vague in the proposal, and more specifics are required as to "criteria" for treating specific areas for erosion (i.e. will they be flagged in the field, etc?).

An "erosional reference" is referred to on page 3 of the submittal, however, no detail were provided and must be. An "erosional reference site" must be approved, and the monitoring requirements and success standards must be established and agreed upon which are representative of the erosion characteristics of this arid environment. If an "erosional reference area" is employed as a factor in determining reclamation success, only then would statements in the proposal such as "an equivalent erosion stability with the surrounding area" has been met and that "erosion is not currently a problem", be appropriate. These are now premature and must be deleted from the proposal.

Many statements are made, such as "if necessary", "if required' which qualify proposed reclamation activities such as "vegetative enhancement", construction of energy dissipator, areas, to be rock mulched, etc. The permittee must either definitely state his/her intention and/or firmly establish criteria which will be employed to determine whether or not particular reclamation treatments will be employed. The rock mulch has been proposed, however, no specificity is given as to where the mulch will be spread. The type and source of rock and how it will be spread must be specified.

Figure 3.1, catchment basins, was referred to, but not found. Please include.

Specifics for Borrow Material

The proposal states that soils are deficient in nutrients and implies that this is a problem for plant establishment on site and further proposed fertilizer amendments as enhancement measures. However, the proposal does not establish the nutrient requirement for the native vegetation on site nor does it document any visible nutrient problems on existing vegetation. The soil fertilizer enhancement concept identified in Exhibit C for small areas needs additional justification that a deficiency exists prior to acceptance. Soil amendments must be identified.

The proposed use of inorganic fertilizer at the rates recommended is not justifiable at this point due to the fact that the recommendation is based on only

two composite soil samples. Use of inorganic fertilizers on this site may only increase salt activity (which according to the soil information provided, is generally encountered at levels which inhibit water uptake at the root/soil interface and thus inhibit plant growth). Please include more justification in the proposal for the use of inorganic fertilizer.

Reclamation treatments must emphasize activities which will increase the soil water holding capacity (i.e. incorporation of hay mulch, sewage sludge, surface roughening, etc).

The proposal does not specifically address the areas identified by N93-25-5-1, i.e. "the north side of refuse area and area shown in green on permit topographic reclamation map disturbed during channel construction". Statements are included in the proposal that allude to covering the shaley material "if needed" and are not acceptable. Affirmative action must be approved and implemented.

The permittee proposed to cover the refuse pile revegetation test plots and the "shaley" area on the west side of the disturbed area with material excavated in association with the construction of the new feeder ditch and main feeder ditch. However, the suitability of proposed substitute material has not been determined. The details of how the "excavated" material will be determined to be suitable cover must be included.

The Division maintains that the material within the refuse pile is considered acid- and toxic-forming and must be covered with suitable material as specified in the already approved permit.

Enhanced Vegetation

It is suggested that the vegetation "reference area" issue be postponed until either a more definite site plan is given or until after site modification. The reference area issue is somewhat moot, the problems of the site are more specifically associated with erosion and not vegetation. The problem areas identified by N93-25-5-1 cannot be excused due to removal of borrow which has now left the shaley material exposed.

In regards to seeding there are several suggestions: 1) It is recognized that success with seeding forbs has been poor, however, the added diversity of desirable species, if desirable. Suggestions for additional species are-Sphaeralcea,

Hedysarum, Townsendia, Hymenoxys, Astragalus, and/or Erigeron species, 2) The permittee should personally direct the ordering of seed. Each species ordered should be selected on the basis of variety, place of origin and elevation. The permittee should allow for the possibility of obtaining seed from several vendors in order to obtain the most adapted ecotype seed, and 3) The permittee may want to consider some site collection of seed or transplanting grasses from areas to be disturbed to enhance areas which are deficient.

Summary

Specific information is required as outlined in the review of the proposed reconfiguration plan. I have included the technical reviews for your reference.

Please submit more specific information for the reconfiguration plan to the Division by January 17, 1994. This information must be in a format to be inserted into the approved reclamation plan. If you have any questions, please call me.

Sincerely,

Pamela Grubaugh-Littig
Permit Supervisor

Enclosure
cc/enc: Jim Carter
Lowell P. Braxton
John Blake, State Lands

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October 21, 1993

TO: Pamela Grubaugh-Littig, Permit Supervisor

FROM: Susan M. White, Senior Reclamation Biologist SMW

RE: J.B. King Reclamation 1993 Proposed Work, Western States Minerals Corporation, J.B. King Mine, ACT/015/002, Folder #2, Emery County, Utah

SYNOPSIS

The submittal titled J.B. King Reclamation 1993 Proposed Work received September 30, 1993 was reviewed for conceptual and technical adequacy. Conceptually the plan has good merits, however, inadequate information was given to fully access the technical adequacy. The reference area proposal at this time should be withdrawn and the issue revisited after site work has been completed.

ANALYSIS

The proposed work at the J.B. King Mine site appears to be a positive step in correcting the erosion problems which have plagued the site since reclamation. The below itemized list provides for a partial description of deficient technical issues and suggestions for the proposed work.

1. The proposal states that soils are deficient in nutrients and implies that this is a problem for plant establishment on site and further proposes fertilizer amendments as enhancement measures. The document does not establish the nutrient requirements for the native vegetation on site nor does it document any visible nutrient problems in existing vegetation. The soil fertilizer enhancement concept identified in Exhibit C for small areas needs additional justification that a deficiency exists prior to acceptance.

2. The proposal does not specifically address the areas identified by N93-25-5-1. Statements alluding to the covering of shaley material "if needed" are not acceptable, affirmative action must be taken.

3. I have several suggestions for the seeding mix, these are:

a. I recognize that success with seeding forbs has been poor, however the added diversity of desirable forb species is desirable. Suggestions for additions are Sphaeralcea, Hedysarum, Townsendia, Hymenoxys, Astragalus, and/or Erigeron species.
b. The operator should personally direct the ordering of seed. Each species ordered should be selected on the basis of variety, place of origin and elevation. The operator should allow for the possibility of obtaining seed from several vendors in order to obtain the most adapted ecotype of seed.
c. The operator may want to consider some site collection of seed or transplanting grasses from areas to be disturbed to enhance areas which are deficient.

4. No figure 3.1, catchment basins, was found.

5. Soil amendments must be identified.

6. Methods of straw crimping should be identified which do not smooth the soil surface.

7. A rock mulch has been proposed, however no specificity is given as to where the mulch will be spread. The type of rock is not specified. The rock must aesthetically fit the area.

The reference area issue is again revisited in this proposal. At this time I would suggest that the issue be postponed until either a more definite site plan is given or until after site modification. The reference area issue is somewhat moot, the problems of the site are more specifically associated with erosion and not vegetation. The problem areas identified by N93-25-5-1 cannot be excused because of removal of borrow which has now left the shaley material exposed.

The operator makes numerous statements as to the erosional stability of the site and has lengthy discussions on vegetation trends in the proposal. Although I can agree with most of the proposed work, I am not implying agreement with the conclusions stated of vegetation success and erosional stability already acheived.

RECOMMENDATION

Conceptually the plan has merit, however the plan provides for minimal specificity. The operator should provide additional supporting documentation for use of the fertilizer enhancement concept.

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October 25, 1993

TO: Pamela Grubaugh-Littig, Permit Supervisor

FROM: Henry Sauer, Senior Reclamation Soils Specialist

RE: 1993 Reclamation Proposal Subsequent to Issuance of NOV N91-32-6-1, N93-25-3-1 and N93-25-5-1, Western State Minerals, J.B. King Mine, ACT/015/002, Emery County, Utah

SYNOPSIS

The permittee has submitted (received September 30, 1993) a proposal for the reclamation of portions of the mine site. The 1993 reclamation proposal stems from the abatement requirements for the violations enumerated above.

The reclamation submitted is very general and must be revised so as to be more specific and to meet the requirements of the R645 Utah Coal Mining Rules.

Many assumptions and interpretations of soils data presented in the most recent reclamation proposal and the soils information presented within the approved permit are erroneous. The forthcoming analysis is an attempt to clarify some of the permittee's interpretations and enumerate the portions of the reclamation plans which require further discussion and more specificity.

ANALYSIS

The permittee mentions an "erosional reference" area on page 3 of the submittal. However no details are provided.

The permittee continues to purport that "an equivalent erosion stability with the surrounding area" has been met and that "erosion is not currently a problem". The permittee fails to substantiate these claims. This writer believes that these statements are premature.

If an erosional reference area is employed as a factor in determining reclamation success then and only then may the aforementioned statements be appropriate. Regardless, prior to approval of an erosional reference site, an adequate site must be chosen, monitoring requirements and success standards must be established and agreed upon which are truly representative of erosion characteristics in this arid environment.

Many statements are made, such as "if necessary", "if required", which qualify proposed reclamation activities such as "vegetative enhancement", construction of energy dissipators, areas to be rock mulched, etc. The permittee must either definitively state his/hers intentions and/or firmly establish criteria which will be employed to determine whether or not particular reclamation treatments will be employed.

The permittee proposes (pages 4) to cover the refuse pile revegetation test plots and the "shaley" area on the west side of the disturbed area with material excavated in association with the construction of the new feeder ditch and the main feeder ditch. The permittee has not determined the suitability of the proposed substitute topsoil material (i.e. material excavated during the construction of the feeder ditches) and must do so at this time. In addition, the material within the refuse pile is considered acid and toxic forming (see Permit U.M.C. 817.103 and Technical Findings promulgated in April 13, 1993 and November 10, 1992 memos to Pamela Grubaugh-Littig) and must be covered with suitable topsoil material as specified in the approved mining and reclamation permit.

Soil borrow area information may be located under U.M.C. 784.13 of the approved mining and reclamation plan. The area represented by drill hole E (see Drawing 4050-5-13R and U.M.C. 784.13: Drawing 4050-5-28; Table 1) and portions the profile described by drill hole C were classified as clay (i.e. soil containing greater than or equal to 40% clay). Based on the information provided in the mining and reclamation plan it is reasonable to report that soils represented by drill hole E are derived from shale and are saline/sodic soils (Richards, 1954). The clay layer located in drill hole C (between two and five feet) and above an identified (logged) coal layer is the result of past mining activities. This portion of the profile would be considered saline/non-sodic soil. The soil which was removed from the areas identified by drill hole C,D,E and G were considered unsuitable plant growth medium and according to the mining and reclamation plan were placed on top of the slurry ponds and buried with four feet of suitable topsoil material (See Mining and Reclamation Plan UMC 817.22 (e)). The remainder of the borrow material, with the exception of material contaminated with coal (i.e. drill hole D and G), was generally soils derived from sandstone and siltstone with textures ranging from loamy sand to silt loam with one sample (A-4) having a sandy-clay loam texture.

The permittee's contention that the soil material covering the refuse pile is predominantly clay derived from shale is not probable given the soil borrow area information provided within the mining and reclamation plan. In addition, the texture of the composite (JBKO5) soil sample collected by Mr. Bamberg (consultant representing the permittee) on the outslope of the refuse pile may be the result of the accumulation of clay on the soil surface subsequent to topsoil redistribution. The accumulation of clay on the soil surface is the result of fracturing of soil aggregates by raindrop impact followed by the entrainment and redeposition these primary soil particles by microrilling.

The use of inorganic fertilizers at the rates recommended is not encouraged. The recommendations are based on only two composite soil samples (one of which indicates an adequate soil nitrogen status, Soil Nutrient Assessments of Mine Spoils {Tiedemann and Lopez, 1982}). Additional soil samples must be collected and analyzed to adequately assess the macro nutrient status of the soils on site. The use of inorganic fertilizers on this site will only increase salt activity (which according to the soils information provided is generally encountered at levels which inhibit water uptake at the root/soil interface and thus inhibit plant growth) within the soil and will encourage annual weed proliferation. Water availability is the major limiting factor to plant growth at the J.B. King Mine. Reclamation treatments should emphasize activities which will increase the soil water holding capacity (i.e. incorporation of hay mulch, sewage sludge, surface roughening, etc.). The permittee should be aware that although it is common to encounter sodic soil conditions in these geologic, depositional and climatological environments, none of the borrow area soils data or data generated by Mr. Bamberg indicate soil sodicity.

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October 26, 1993

TO: Pamela Grubaugh-Littig, Permit Supervisor

FROM: Thomas Munson, Senior Reclamation Hydrologist

RE: J.B.King Channel Reclamation and other concerns on the overall submittal, Western States Minerals, J. B. King Mine, ACT/015/002, File Folder #2, Emery County, Utah

Synopsis

On 10/25/93 the Division received a Fax from Mr. Greg Poole of Hansen, Allen, & Luce regarding the use of premining channel characteristics of natural channels in the area to design a Reclaimed Channel at the J.B. King Mine. This memo will review this data and submittal.

Analysis

The operator submitted a plan for reclaiming stable channels at the J.B. King Mine using criteria devised based on some somewhat questionable assumptions. If implemented, it would have created a very unnatural looking channel and therefore not taken on any of the premining channel characteristics other than profile. On October 5, 1993 Mr. Greg Poole and myself visited two of the tributary areas to Dog Valley Wash which appeared to represent a natural channel system based on similar geomorphic circumstances found within the watershed of the mine area. We collected channel depths and widths, both top and bottom, amplitude of meander, and data on the extent of lateral erosion. The type of channels surveyed tended to be deeply incised with very little variability between top width and bottom width if found in shalely substrate. Since substrate is the guide to channel shape, the operator must discuss what they will do to determine channel shape in the field during construction.

Using the information collected, the consultant put together some criteria for designing a reclaimed channel using natural channel characteristics (width and depth). Additional work is needed on any plates to be modified from previous

designs. Expecting the channel to move is natural and predictable and this zone of meander will be investigated using a drill (specifics in regards to how and when this will occur need to be included) to determine any coal refuse within an impact area. The criteria for stability will be if the channel does what it is predicted to do by maintaining profile, shape and location. Monitoring rainfall and sediment contributions would also help define the system.

Recommendations

The operator needs to update the PAP to describe the step by step procedures for testing the zone of impact and to provide updated plates and text for the PAP submittal describing location and profile. The criteria for monitoring the success or failure of this channel needs to described as well, so at bond release, there will be data to demonstrate stability as described in the PAP. One other item (Erosion along channels and on hillslopes) was not clearly described and defined in regards to specific treatment. An investigation on erosion adjacent to the stream channels surveyed indicated that erosion did not migrate any farther than 25 feet from the main channel and could be treated as appropriate within the identified zone of impact adjacent to the channel, except when significant tributary drainage area was involved. The treatment of erosion on the hillslopes was vague in its treatment in the plan, more specifics are needed as to a criteria for treating specific areas for erosion. They need to be flagged in the field.