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Copy to Jesse, Susan, Kelly, Henry & Tom

WESTERN STATES MINERALS CORPORATION



November 12, 1990

Ms. Pamela Grubaugh-Littig
Permit Supervisor
Utah Division of Oil, Gas and Mining
355 West North Temple
3 Triad Center, Suite 350
Salt Lake City, UT 84180-1203

Subject: Stipulation Responses, J.B. King Mine, ACT/015/002

Dear Ms. Grubaugh-Littig:

Please find enclosed four sets of color coded replacement pages for the five year permit renewal of the J.B. King site. Responses to the three stipulations listed in the State Decision Package are included.

The aerial topographical map shows that reclamation activities expanded the disturbed area into the SW 1/4 of the NW 1/4 of Section 32. Approximately 2.3 acres of this disturbance plus additional fenced areas are located in this quarter, quarter section which is not currently included in our state grazing lease. I spoke recently with Brad Williams at the Richfield office of State Lands and Forestry (896-6494) regarding this matter. He indicated that a change in legal description of the grazing lease can be processed easily, especially since the fenced acreage remains within the 60 acre limit.

I plan to visit the site during the Thanksgiving holiday and will, at that time, determine the exact location of the west fence line. I will then request the necessary change to our grazing lease and submit an amendment to your Division to modify the permit area accordingly.

The disturbed area outlined in Drawing No. JBK-1 has been modified to include five additional areas not shown on Drawing 4050-5-19-R and exclude two areas which have never been disturbed. These changes were made after numerous site inspections of the seven areas, and after reviewing the history of the site and the ortho maps in the permit package (i.e., 3-1, 3-2A and B). The five areas added to the disturbed area include:

1. The catch pond in the northwest corner of the site.

2. The previous topsoil storage area located south of the catch pond.

4975 Van Gordon Street ▲ Wheat Ridge, Colorado 80033 ▲ (303) 425-7042 ▲ FAX (303) 425-6634

3. The microwave tower area located on the southwest corner of the site. The initial date of this disturbance occurred prior to February, 1977. We may have, however, redisturbed this area during mine expansion activities in 1978.

4. A portion of the southeast corner of the mine site which was stripped of soil in 1978 during the portal development. This area revegetated naturally over the years but is considered as disturbed area by definition.

5. The northeast corner of the reclaimed refuse area.

The two areas excluded from the disturbed area include:

1. The slope area from elevation 6300 to 6325 on the southwest corner of the site except for the old dozer cut up to the microwave tower.

2. The area immediately east of the proposed disturbed area markers 6 and 7. This area shows no evidence of any disturbance during the past 15 years.

I will set temporary disturbed area stakes at the site during my next visit for Division review. Once these locations are approved, we will have more permanent markers installed and update Exhibit A of the bonding agreement. I have enclosed a work map of the area showing the outlines of the currently approved disturbed area from Drawing 4050-5-19 and the proposed change.

If you or your staff have any questions, please call me.

Sincerely,

Frank Filas
Environmental Engineer

cc: A.S. Gordon
S. Bamberg
B. Williams, State Lands (w/o attachments)

Key to the Mining and Reclamation Plan for the J.B. King Mine.

The mining and reclaimation plan for the J.B. King Mine consists of five submittals plus amendments to the plan. These submittals and amendments are consolidated into one document and are color coded as shown below. The more recent submittals serve to both clarify and modify the earlier submittals.

1. Blue - Original March 20, 1981 submittal.

2. Tan - Response to Apparent Completeness Review submitted September 1, 1983.

3. Salmon - Response to Determination of Completeness Review submitted June 29, 1984.

4. White and Gray - Response to Technical Adequacy Review submitted May 1, 1985 plus amendments from May, 1985 to March, 1990.

5. Yellow - Five Year Permit Renewal submitted April 27, 1990 plus subsequent amendments.

UMC 782.13 IDENTIFICATION OF INTEREST

The officers of Western States Minerals Corporation are:

| | | | |
|---|---|---|---|
| President: | A.B. Morrow | Address: | 4975 Van Gordon St. |
| Treasurer: | J.F. Carmody | | Wheat Ridge, CO 80033 |
| Secretary: | A.R. Cerny | | Phone: 303-425-7042 |
| Directors: | A.B. Morrow | | Western States Minerals Corporation |
| | C.S. Yannias | | W.S. Holding Corporation |
| | J. Safra | | W.S. Holding Corporation |

Western States Minerals Corporation was purchased from S.J. Groves and Sons Company on November 15, 1989 by:

W.S. Holding Corporation
Constantine S. Yannias, President
333 West Wacker Drive, Suite 1410
Chicago, IL 60606

Neither Western States Minerals Corporation or W.S. Holding Corporation owns, operates or holds permits on any coal mines other then J.B. King.

UMC 782.14 COMPLIANCE INFORMATION

A description of the violations received and corrective action taken from September, 1985 to April, 1990 for the J.B. King Mine is summarized below:

1. NOV N85-8-14-1, Dated 9/6/85

   A sediment control dike was breached during reclamation.

   The dike was repaired within 72 hours.

2. NOV N88-30-1-2, Dated 9/7/88

   a. Erosion rills greater than 9 inches in depth were present on the east slope.

      The rilling was repaired. Silt fences were reinstalled and bermed.

   b. Tension cracks above the mined out area had not been filled in or covered.

      The cracks were backfilled and seeded.

3. NOV N89-32-1-1, Dated 1/5/89

   Fences surrounding the reclaimed area were in disrepair. Damage to the reclaimed area had been caused by cattle grazing.

   The fence was rebuilt.

4. NOV 89-29-1-1, Dated 6/8/89

   Vegetation monitoring was not performed according to the permit.

   The vegetation was inventoried and a report submitted.

UMC 782.15 RIGHT OF ENTRY AND OPERATION INFORMATION

All J.B. King mineral leases were relinquished in the fall of 1985 after mine reclamation was completed. Western States Minerals Corporation currently holds state grazing permit No. GP-22743. This permit covers 60 acres and includes the entire reclaimed area. A copy of the permit is attached.

THE STATE OF UTAH

DIVISION OF STATE LANDS & FORESTRY

GRAZING PERMIT

PERMIT NUMBER GP 22743 AUM(S) 10.75

In consideration of the rents to be paid and the covenants to be kept and performed, the State of Utah acting by and through its Board of State Lands and Forestry hereinafter referred to as Permitter, does hereby permit, let, and demise unto:

WESTERN STATES MIN CORP.
4975 VAN GORDON STREET
WHEAT RIDGE CO 80033

hereinafter referred to as Permittee, in the following described lands situated in County(s) Emery
STATE OF UTAH:

Description of permitted land:

T 23 S, R 6 E, SLB&M
Sec. 32 SE4NW4, N2NE4SW4

Containing 60.00 acres, more or less.

This permit shall remain in effect, unless sooner terminated as herein provided, for a term of 10 years, beginning 5/01/89; expiring 4/30/99.
This permit is granted subject to the following terms and conditions:

1. Permittee shall pay the Permitter, in advance, the annual fee established by the Division for the above described land, which fee shall not be less than the current approved AUM fee. Permitter reserves the right to adjust the rental at the end of any year during the term hereof if, in Permitter's opinion, such a change is indicated by a range survey or because of sale or lease of part of the permitted premises.

2. Permittee shall have the right to use the above described property only for the purpose of grazing livestock. Permitter reserves the right to determine the number and kinds of livestock, and season of use. When the above described property is located within Permittee's Federal allotment boundary, the number and kinds of livestock, and season of use will concur with the Federal agencies recommendations, unless the Permitter directs otherwise.

3. Permitter may sell or exchange the above described property, in whole or in part, as it may desire, and Permittee shall quit the premises at the end of the calendar year, provided that Permitter shall send notice of sale or exchange to Permittee. Permitter also reserves the right to terminate this permit in whole or in part after not less than 60 days written notice should it desire to do so for any reason whatsoever.

4. Permitter reserves the right to lease said property to third persons for mining or exploration for coal, oil, and gas, and all other minerals.

5. This permit is deemed to incorporate by reference all provisions of applicable laws and rules and regulations of the Board of State Lands and Forestry, and will be deemed modified whenever such rules and regulations are amended hereafter.

6. Permittee shall not cause waste by improper grazing use or otherwise, and shall comply with good conservation practices to safeguard and improve water and other surface resources and shall comply with Permitter's requirements and requests respecting conservation practices.

7. Permittee shall not assign, sub-lease, mortgage, pledge, or otherwise, dispose of any interest in this permit without the consent of Permitter.

8. It is understood this permit is issued only under such title as Permitter may have and that Permitter does not warrant its title; and, in case of title failure, Permittee shall not be entitled to claim any refund or rentals paid to Permitter.

9. Permittee shall not initiate or establish any water right on the permitted premises except in the name of the State of Utah, Division of State Lands and Forestry. Such right initiated or established shall become an appurtenance to the permitted premises.

10. There is reserved to the public access across and upon the land permitted hereunder, for the purpose of hunting, trapping and fishing, as provided in Section 23-12-4, Utah Code Annotated, 1953, as amended. Except for this reservation, the public shall have no right to enter the permitted lands to disturb wildlife. The public shall have no right to disturb livestock on the permitted lands.

IN WITNESS WHEREOF, we have set our hands this 28th day of August A.D. 1989.

APPROVED AS TO FORM:
R. PAUL VAN DAM
ATTORNEY GENERAL

BY _____

DIVISION OF STATE LANDS AND FORESTRY

Previous GP No._____

## UMC 782.19 IDENTIFICATION OF OTHER LICENSES AND PERMITS

All other licenses and permits required for mine operation have either expired or been designated inactive. A 60 acre grazing permit, No. GP-22743, is currently held with Utah State Lands and Forestry.

UMC 783.19 VEGETATION INFORMATION

UMC 784.13 RECLAMATION PLAN: GENERAL REQUIREMENTS

Vegetative cover (total and by species) will be monitored on all revegetated areas during the 4th and 6th years after planting. Woody plant densities will be monitored during the 2nd, 4th and 6th years following initiation of reclamation.

UMC 783.24 - MAPS: GENERAL REQUIREMENTS

The number of disturbed acres was increased during reclamation activities from 28.2 acres to 32.4 acres. The reclaimed topography and new disturbed area are shown on Drawing No. JBK-1.

# UMC 784.13, Reclamation Summary

The J.B. King Coal Mine ceased underground mining operations in May, 1981. The portals were permanently sealed, and the facilities and equipment were removed for salvage during the spring and summer of 1985. Reclamation of the 28 acres of surface disturbance was performed in August, September and October of 1985.

The design and management of the reclamation was performed by Coal Systems, Inc. of Salt Lake City, Utah. Demolition, excavation, and grading were performed by Nielson Construction Company of Huntington, Utah. The total cost of the reclamation excluding engineering design, permitting costs, and salvage values was approximately $260,000 (i.e., $9,000-$10,000/acre).

The J.B. King Mine had been operated intermittently since 1930. Essentially all of the surface area had been disturbed prior to the establishment of the Utah Mine Land Reclamation Act in 1975, and Western States Minerals Corporation's subsequent purchase of the mine site in 1976. Consequently, there was a limited supply of stockpiled topsoil at the site and a large portion of the surface area was contaminated by fine coal dust and sediment.

The first phase of the reclamation consisted of removing six inches to four feet of contaminated surface material from the yard, coal stockpile area, and from the slurry/sedimentation ponds. This material was placed around the toe of the existing coarse refuse area utilizing 20 and 30 cubic yard scrapers.

In conjunction with this work, the cement pads and foundations for the shop and mill were broken up and used as part of the portal backfill. Nonorganic trash and debris were buried in a designated landfill at the southeast end of the mine site. All of the mine wells were plugged according to state requirements except WW #1 which was left intact at the request of Utah State Lands and Forestry.

The second phase of reclamation consisted of grading the refuse area to a rolling topography with a maximum slope of 2H/1V. This area was then dry compacted with a drum roller mounted on a D-6 Dozer. The seven mine portals were backfilled by dozing two foot lifts of material from the portal bench area into and against the portals. Each lift was compacted prior to the placement of the next lift.

The third phase of reclamation consisted of the excavation, haulage and placement of four feet of topsoil and substitute topsoil on the regraded refuse pile and the coal stockpile pad. The topsoil stockpile and the existing sediment control berm were utilized to supply a small portion of the required soil material. The majority of the soil material was borrowed from what is now the main diversion channel which extends from the portal area at the southeast corner of the site to the northwest corner of the mine site. Concurrently with this work, a new sediment pond, sized to contain the 10

year, 24 hour storm event was constructed at the northwest end of the mine site. A D-9 and D-8 Dozer, three large scrapers, and a water truck were utilized during this phase of the project.

The fourth phase of reclamation consisted of:

1. Shaping the main channel,
2. installing check dams in the feeder ditch,
3. building a sedimentation control berm and ditch along the northern perimeter of the refuse area,
4. ripping the soil cover to a depth of 18 inches,
5. and seeding the entire 28 acre site.

Approximately five acres of the site were drill seeded and the remainder was broadcast seeded at double the drill seed rate. The seeded area was also fertilized and mulched according to the schedule below. Equipment used during this phase of the reclamation included a D-9 Dozer w/3 prong ripper, a small backhoe, a D-6 Dozer, a 70 hp farm tractor with disc, a drill seeder, a broadcast seeder/fertilizer, and a 30 hp mulcher. The seeding was completed during early October, 1985.

Fall 1985 Seeding
J.B. King Mine

I. SEED MIX

| A. Grasses | % |
|---|---|
| Western Wheatgrass | 10.1 |
| Thickspike Wheatgrass | 4.5 |
| Streambank Wheatgrass | 4.5 |
| Beardless Wheatgrass | 4.5 |
| Blue Grama | 6.8 |
| Galleta | 4.5 |
| Indian Ricegrass | 9.1 |
| Needle and Thread | 4.5 |
| Big Bluegrass | 2.3 |
| **B. Forbs** | |
| Gooseberry Globemallow | 1.1 |
| Yellow Sweet Clover | 6.8 |
| Palmer Penstemon | 1.1 |

| | | |
|---|---|---|
| C. | Shrubs | % |
| | Fringed Sage | 1.1 |
| | Fourwing Saltbush | 4.5 |
| | Shadscale | 4.5 |
| | Winterfat | 4.5 |
| | Rubber Rabbitbrush | 1.1 |
| D. | Inert | 21.6 |
| E. | Crop | 2.2 |
| F. | Weed | 0.7 |
| | | 100.0 |

G. Prairie Sage: 1.2# applied at rate of 0.1# PLS/A over 12 acres (primarily along borrow pit ditch banks).

II. RATE OF APPLICATION

A. 5 ACRES @ 20#/ACRE; drill seeding was attempted but discontinued due to un-even, rocky surface in many areas and because range in size of seeds was too great which prevented uniform feeding of the mix.

B. 23 ACRES @ 39#/ACRE; the remaining acreage was seeded using a broadcast seeder at a doubled application rate.

III. SEED SUPPLIER - Maple Leaf Industries, Inc., Ephraim, Utah

IV. PLANTING TECHNIQUE - Approximately 5 acres/day were seeded, mulched and crimped. The seed was broadcast during the calm morning hours; mulching and crimping the 5 acres required the rest of the day.

V. MULCHING - A barley straw mulch was blown over the entire seeded area at a rate of 3000#/A. The straw was inspected by a District Agricultural Inspector and determined to be reasonably weed free.

VI. CRIMPING - The straw was crimped into the soil using a double-gang farm disc with the gangs adjusted to prevent furrowing by the discs.

VII. FERTILIZER - Fertilizer was applied prior to planting at a rate of 200#/A (150# Urea, 50# Double superphosphate).

A revegetation test plot was installed during reclamation at the request of the Division of Oil, Gas and Mining. This plot covers approximately one acre and is located at the top of the reclaimed refuse area. This test plot incorporates varying depths of topsoil (0 to 4 feet), and three different fertilizer application rates.

The fifth and final phase of reclamation was performed during the first week of April, 1986 and consisted of the planting of 5,000 seedlings and the construction of 2700 feet of perimeter fence. This work plus the previous fall seeding was performed by Coal Systems, Inc.

Spring 1986 Seedlings Mix
J.B. King Mine

| Item | Quantity | |
|---|---|---|
| Fringed Sage | 500 | |
| Fourwing Saltbrush | 1,450 | |
| Shadescale | 1,450 | |
| Gardner Saltbush | 1,500 | |
| Mormon Tea | 100 | - (total amount available) |
| Total | 5,000 | |

Post reclamation monitoring was conducted on a monthly basis during the first year after reclamation was completed and quarterly thereafter. The sedimentation pond has never overflowed even during the relatively wet period from July, 1986 through November, 1986. There has been no contribution of suspended solids to runoff outside of the reclaimed area. Post reclamation concerns have consisted primarily of erosion, vegetation success, and tension cracks associated with subsidence. Each of these concerns is discussed in more detail below:

Erosion

The main diversion channel and the feeder ditch were originally designed to be unarmored with gently sloping revegetated banks. The design did not properly take into account the intensity of the rainfall events nor the relatively low vegetative cover common to this region. This resulted in excessive erosion of the feeder channel and the upper reaches of the main channel.

In May, 1987, rip rap was installed in the eroded channel areas. Unfortunately, the contractor did not install the rip rap correctly which resulted in continued erosion problems. In June, 1988 the channels were recontoured and the rip rap was installed properly. The check dams in the feeder ditch were also reinstalled. The channels have remained reasonably intact and functional since that time.

A second area of erosion concern has been the west and southwest facing slopes of the reclaimed refuse area. Contour furrows were constructed along this slope during reclamation. It was believed that these furrows in combination with straw bales and silt fences would control erosion until vegetation had been established. In the late summer of 1986, the contour furrows were filled with sediment and breached after the occurrence of several major storm events. This resulted in rilling along most of the slope area. The rilling has continued intermittently since that time and is controlled through the use of silt fencing and the placement of rock anchored straw in the larger rills.

Vegetation

The west and southwest facing slopes of the reclaimed refuse area has been the most difficult area of the site to revegetate. This is due to a combination of the southern exposure, unauthorized cattle grazing, and low precipitation from 1988-1990. In 1989, the perimeter fence was completely rebuilt and a road was relocated outside of the reclaimed area in order to limit cattle trespass. It is believed that hand seeding of the rill areas during the fall plus increased precipitation will gradually increase the vegetative cover in this area.

Some of the areas which were traversed by heavy equipment during the channel reconstruction also have relatively low vegetative cover. These areas which comprise approximately two acres were ripped, reseeded and mulched in mid October, 1989.

Tension Cracks

In May, 1983 an area of subsidence was discovered above the 2nd East Panel. This was the only area of the mine which was completely pillared out. Additional subsidence has not occurred since 1983 as evidenced by the annual subsidence surveys. A series of tension cracks exist along the perimeter of the subsided area. These cracks have measured 6 to 12 inches in width and several hundred feet in length.

Remedial work to close the cracks was first conducted in 1984 and consisted of jamming small timbers into the cracks and backfilling with soil. Additional soil backfill was added in April, 1986. The area remained stable from that time until July, 1988 when a plus 5 magnitude earthquake occurred in the immediate area. This resulted in the redistribution of stresses and the reopening of the tension cracks.

In order to eliminate the possibility of the future reappearance of the cracks, it was decided to excavate down to bedrock and then backfill the cracks with a fine grained sand. This was performed in the fall of 1988, and again in the spring of 1990 after additional settlement was noted. Some additional settlement is expected in the future and will be filled in with sand as needed.

UMC 805.11 BOND AMOUNT

The current bond amount of $126,078 (1996 dollars) represents 40 percent of the bond posted for the mine prior to reclamation. It is more than adequate for post reclamation monitoring and maintenance as is shown below:

1. Quarterly Monitoring

   A contractor from either Salina or Huntington would be employed to inspect the site quarterly, repair fences and fill in erosion rills.

   Cost per inspection:

| | |
|---|---|
| 8 hrs x $30/hr = | $240 |
| 100 miles x $.40/mile = | 40 |
| Materials (wire, straw) | 20 |
| | $300/ea. |

   $300/inspections x 4 inspections/year x 5 years = $6,000

2. Regrade and rip 6 acres (20% of site).

   D-7 w/rippers 8 hrs x $140/hr = $1,100

3. Drill seeding and hand planting of containerized stock (20% of site).

   6 acres x $1,500/acre = $9,000

4. Repair drainage channels - 800 feet (assumes 20% of channels require repair with additional riprap imported for 100 feet of main channel and 100 feet of feeder ditch).

| | |
|---|---|
| Backhoe 40 hrs x $90/hr = | $ 3,600 |
| Hand labor 80 hrs x $25/hr = | 2,000 |
| Riprap 300 tons x $15/ton = | 4,500 |
| | $10,100 |

5. Backfill tension cracks, seed and handrake.

| | |
|---|---|
| Backhoe 16 hrs x $90/hr = | $ 1,400 |
| Hand labor 32 hrs x $25/hr = | 800 |
| Seed 25 lb x $8/lb | 200 |
| | $ 2,400 |

6. Equipment Mob-Demob $ 2,000

Cost Summary

| | | | |
|---|---|---|---|
| 1. | Monitoring | | $ 6,000 |
| 2. | Regrade and rip | | 1,100 |
| 3. | Seeding | | 9,000 |
| 4. | Channel repair | | 10,100 |
| 5. | Subsidence repair | | 2,400 |
| 6. | Mobilization | | 2,000 |
| | | Subtotal | 30,600 |
| 7. | Contingency (10%) | | 3,100 |
| | | Total | $33,700 |

Note: Labor and equipment costs are estimated on the high side to approximate blue book and means rates. Costs for seeding and rip rap are based on previous site costs which have been adjusted for inflation.

UMC 817.44 HYDROLOGIC BALANCE
STREAM CHANNEL DIVERSIONS

Main Channel (Borrow Pit Drainage Ditch)

The main channel design from stations 0+40 to 0+55, 1+00 to 1+30, and 1+85 to 5+70 (refer to Drg. No. JBK-1) is to include riprap as is described below.

Channel Design (Armored Sections):

The channel will consist of a trapezoided ditch with a 6 foot bottom width, 1.7 foot depth and 2/1 side slopes. The channel depth will be in addition to the depth of the riprap and filter layer. The filter layer will consist of 2-inch minus gravel and will be 9 inches deep. The riprap will have a nominal depth of 18.7 inches and will have the following gradation:

| | |
|---|---|
| D100 | 18.7" |
| D85 | 16.0" |
| D50 | 15.0" |
| D20 | 7.5" |
| D10 | 5.0" |

Feeder Ditch Channel

The feeder ditch will be riprapped from Station 2+75 (i.e., 4+00 on main channel) to 2+00. The channel will be installed as described below:

Station 2+00 to 2+75:

The channel will consist of a trapezoidal ditch with a 3 foot bottom width, 1.4 foot depth, and 2/1 sideslopes. The riprap gradation is as follows:

| | |
|---|---|
| D100 | 19.6" |
| D85 | 18.0" |
| D50 | 15.6" |
| D20 | 7.8" |
| D10 | 5.1" |

A 9 inch deep, 2-inch minus gravel filter blanket will be placed under the graded riprap. The depth of the riprap will be 1.63 feet deep. The channel depth will be in addition to the depth of the riprap or the filter blanket.

Station 0+00 to 2+00:

This portion of the channel will be V shaped, 2 feet deep, and 8 feet wide at the top. A 9 inch filter blanket of minus 2 inch gravel will be covered with a riprap layer of the following size distribution.

| | |
|---|---|
| D100 | 13.75 |
| D85 | 12.00 |
| D50 | 11.00 |
| D20 | 5.5 |
| D10 | 3.6 |

Four check dams will be installed at 0+25, 0+75, 1+05, and 1+45.

UMC 817.45 HYDROLOGIC BALANCE:
SEDIMENT CONTROL MEASURES

Contour furrows, silt fences and straw bales have been utilized to control erosion on the reclaimed slopes at the J.B. King Mine. These were intended to serve as temporary erosion control measures until the slopes were stabilized by vegetation. The contour furrows were filled up faster than was originally anticipated which made it necessary to install additional silt fences. A total of 28 silt fences are currently in place as shown in Drawing JBK-1.

The silt fences are semicircular in shape and are bermed on each end. They are typically 20 feet in length on the slopes and from 20 to 60 feet in length on the flatter areas. The silt fences are controlling erosion primarily by channeling the runoff and slowing its velocity. Relatively little sediment has collected behind the silt fences during the past two years.

It is proposed that the silt fences be replaced by shallow sediment basins with a check dam serving as the overflow. Silt fences A-N are scheduled to be replaced during the fall of 1991 and silt fences O-Z3 are scheduled for the fall of 1992.

The sediment basins will consist of an earthen berm in the same shape and length as the silt fence to be replaced. The berms will be a minimum of two feet high. The basins will drain to collection areas located above each of the existing drainage points. There will be typically one to two collection areas per basin. The collection areas will be reinforced with angular sandstone obtained from the surrounding cliffs.

A check dam, approximately one foot in height and three feet long, will be constructed at each collection area. The check dams will be constructed of angular sandstone with a minimum length of one foot. The dams will be hitched a minimum of 9 inches into the sides of the earthen berms. A rock reinforced drop point will be constructed immediately beneath each of the check dams.

The construction of the check dams will require the use of a backhoe and either a light pick-up truck or an ATV vehicle. Special care will be taken to minimize the impact on existing vegetation. Any areas that experience heavy compaction will be ripped and seeded. The earthen berms of the catch basins will also be seeded and hand raked.

The channels that have developed on the slopes between and below the silt fences will be stabilized primarily by vegetation. This has already occurred naturally to some extent. Additional vegetative growth will be encouraged by hand reshaping and seeding of the channels during the fall of 1990 and 1991. Rock anchored straw will be placed on top of the seeded areas to serve as mulch and to minimize erosion.

Any channel areas that have not been stabilized completely with vegetation by the fall of 1992 will be reevaluated and additional stabilization measures will be implemented. Additional stabilization treatments may include:

1. The installation of a series of small check dam structures or gabions.

2. Additional seeding overlayed with an erosion control blanket containing a straw mulch.

During the fall of 1991, additional rip-rap will also be added to the main channel at 0+40 to 0+55. This area has experienced some headcutting during the past which should be eliminated by the extra rip-rap.

UMC 817.53 HYDROLOGIC BALANCE:
TRANSFER OF WELLS

Five of the six mine wells were plugged and reclaimed according to the permit. The sixth well was capped and the title was transferred to the landowner, the Utah Division of State Lands and Forestry. The well is identified as Well # WW-1 on Drawing 4050-5-1.

UMC 817.116 REVEGETATION: STANDARDS FOR SUCCESS

The variance in plant microcommunities composition at the J.B. King site is high due to differences in slope and aspect, soil texture, and varying degrees of moisture retention and erosion. This would account for the wide variability in the plant sample data, and the need for a large number of samples for adequacy if the site is sampled as one unit or type.

Consequently, the previously approved random sampling scheme will be replaced by a stratified vegetative sampling plan. The site will be stratified into similar plant community types for sampling to reduce variability within sample types on the site. The methodology will involve sampling the site as 3 to 5 subtypes based on topography, soils, vegetation, and moisture. Boundaries will be determined by field inspection at start of the 1991 sampling period, and the boundaries will be confirmed by an inspection by personnel from the Division of Oil, Gas and Mining before proceeding.

Each subtype will have a minimum of 10 samples per subtype. Sample adequacy will be analyzed after 10 samples are taken, and more samples will be taken until sample adequacy is obtained in each subtype.

Shrub density and total plant cover for the entire site will be calculated from a weighted average for each subtype. The weighted average for each subtype will be based on a percentage of the size of the area to the total. The following calculations will be used:

$$TC = \sum_{i=n} (SC_i) \times (PC_i)$$

where:

TC = total cover for the site
SC = cover in each subtype
n = number of subtypes
PC = percent of size of each subtype to total site size

The same formula will be used for density with total density (TD) and subtype density (SD) substituted for TC and SC.

After the vegetative sample subtypes are identified during the 1991 vegetative survey, a map delineating these subtypes will be submitted for inclusion into the mining and reclamation plan.

UMC 817.170 - .176 ROADS: CLASS III

The diversion road around the perimeter fence described in the September 18, 1989 amendment and the previously existing southwest extension of this road are being used by ranchers, woodcutters, and hunters on a regular basis. No reclamation of this road is proposed. The 550 feet of road which was replaced by the diversion road was reclaimed.