

APPENDIX M

Reference:  
UMC 784.13 (b) (5)  
UMC 784.21  
UMC 817.97

RECLAMATION PLAN - VALLEY CAMP BELINA MINESCOPE:

The scope of this reclamation plan is to establish a permanent, effective and diverse vegetative cover, capable of self-regeneration and plant succession, for use as rangeland and wildlife habitat. A prompt vegetative cover will be established which, through time, will allow vegetative cover, woody plant density and productivity to recover to levels equal to the cover, density, and productivity of reference areas.

The following procedures are designed to revegetate and control erosion. They should to a large degree, satisfy the commitments made by Valley Camp Mining Company in their permit, while also satisfying QSM regulations as pertaining to wildlife concerns and final reclamation for those areas which will be utilized after mining operations are concluded.

The areas in question are along and adjacent to the Belina Mine and the mine access road, and will be of a permanent nature.

The actual ground involved comprises approximately 16 acres of disturbed land, primarily road disturbance and deck areas. (See maps D-1, and D-2 Volume IV). The actual procedures involve a four phase program; (1) earthwork: To prepare a site which will be stable enough for a period of time to allow vegetation to become established, (2) hydroseed and drillseed the entire area to supplement revegetation and control run-off until stabilization is complete, (3) to plant seedlings to further stabilize the soil and to provide necessary wildlife, hydrological and aesthetic commitments as detailed in mine reclamation permit, and (4) to enhance and reestablish a riparian zone in conjunction to Whiskey Creek.

METHODOLOGY:Phase #1 Earth Moving:

The pad and associated cuts can be brought back to a reasonable configuration by implementation of heavy equipment. The areas where coal has been stacked or handled will be cleaned as much as possible by end loaders and any recoverable coal will be transported to the preparation plant. The remaining material, estimated to be approximately one foot thick, will be scraped up by dozers then loaded into haul trucks. This material will be dumped out by the barrier seals in the mine portals and in by the portal entrance. When disposal is complete, a second seal will be constructed out by the material. In this manner the material will be buried and sealed from contact with air and water.

The Belina numbers 1 and 2 portal entrance areas will then be graded, stabilized, and covered with topsoil. This is shown on plan and cross-section Maps D-1, and D-2, Volume IV. All fill shall be machine compacted. Terraced fill shall be in one foot lifts and of sufficient quality as to assure integrity and stability of embankment and prohibit failure.

Upon completion of grading, all downed trees, brush, etc., adjacent to the disturbed area shall be placed upon the recontoured surface. This material will form a near-natural appearance and enhance the microclimate on each site. All work done along the perimeter of the pad will take into consideration existing vegetation, and all effort will be made to minimize disturbance and utilize existing vegetation. When there is no alternative other than disturbance, an effort can be made to relocate earth and maintain existing vegetation in place, attempting to relocate the vegetation as clumps on the area to be reclaimed. When the desired contour of a mountain park with a meandering stream is obtained, the parent material will be tested to determine its desirability as a growth media. In the event it can be supplemented with the addition of fertilizers, all effort will be made to utilize

existing-in-place materials. Where there is no available growth media, a minimum of 6" of top soil can be brought in and spread on the site. Upon recontouring and top soil application, all areas to be revegetated will be ripped to a minimum depth of 14" immediately prior to revegetation. All buildings will be torn down and removed. The roads, parking areas, and all other areas not regraded will be scarified, fertilized, and covered with topsoil.

Phase #2 Seeding and Mulching:

The entire area of disturbance will be drilled and/or hydroseeded during the first Fall following the complete abandonment and earth work. (September through November)

That portion of the recontoured site that will facilitate drill seeding will be seeded using a rangeland drill seeder pulled behind a small crawler tractor to lessen compaction. A tentative estimate of the area to drill seed is approximately 5.0 acres. The balance of the area would then be hydroseeded. The seed mix and rate of application is found in Appendix B, Volume III. Those portions which require hydroseeding and mulching could be carried out in conjunction with the earth work of Phase #1. Recommendations for the hydroseeding and mulching operation are as follows:

This methodology involves the use of a hydroseeder to apply the seed and tac to all disturbed areas in combination with a wood-fiber mulch (approximately 2,000 lbs./acre long fiber) and fertilizer.

The following rates of material should be utilized:

(Rates of tac were developed with respect to velocity and erosive power of water which is proportional to the square root of the slope.) An empirical factor was determined from laboratory and field studies to arrive at the minimum tac-fiber ratio. Thus, 60 pounds of tac per ton of fiber is about minimum for slopes up to 20% and the empirical factor is determined as  $60 \div 25\% = 12$ .

A 25% slope is about maximum for the minimum amount of tac. For a 100% slope (1:1 or 45°), the ratio of tac to fiber is calculated as:

SUGGESTED RATIOS OF TACK TO FIBER FOR HYDROSEEDING  
AND HYDROMULCHING TO SERVE AS MULCH  
OR SOIL BINDER

<u>SLOPE</u> <u>ANGLE</u>	<u>SLOPE</u> <u>RATIO</u>	<u>PERCENT</u> <u>SLOPE</u>	<u>LBS. TAC</u> <u>PER TON FIBER</u>	<u>RATIO TAC</u> <u>TO FIBER</u>
	Rise:Run			
14	1 : 4	25%	60 (minimum)*	1 : 30
26	1 : 2	50%	80	1 : 25
33	1 : 1½	66%	100	1 : 20
45	1 : 1	100%	120	1 : 16
57	1½ : 1	150%	140	1 : 14
64	2 : 1	200%	160 (minimum)	1 : 12

\*60 pounds is suggested as a minimum to ensure excellent stabilization; however, in many conditions, 40 pounds of tac per acre have given excellent results on a 1:4 or less slope.

In conjunction with the seeding effort, the entire area of disturbance will be hydromulched and fertilized. The rate of application of the mulch is:

1,200 to 1,500 lbs/acre on 1:1 slopes  
2,000 to 3,000 lbs/acre on 3:1 slopes

The following various types and amounts of fertilizer will be applied after seeding and mulching. Fertilizer may be applied in either granular or liquid form:

80 lbs. N/acre  
100 lbs. P<sub>2</sub>O/acre  
100 lbs. K<sub>2</sub>O/acre

The seed mix is composed of rapidly growing interim species, primarily grasses; approximately 14 lbs/acre. This should be used in combination with a cover crop made up of approximately 10 lbs/acre of sweet clover and 15 lbs/acre of oats and/or rye.

Immediately upon completion of the hydroseeding, spot seeding will be implemented, to attempt to reestablish groups of conifers on the newly created meadow. Clumps of trees enhance the utilization of parks by wildlife, while providing cover and protection.

### Seeding Procedures

Seeding should be done utilizing a Panama Direct Seeder or similar tool, with a bushing hole diameter of 8 to 9/32nds of an inch. Spots should be placed approximately 6' X 6' spacing in all areas where conifers are to be reestablished. In all areas in excess of 40° slope, spots to be seeded will require site preparation. In less than 40° slopes, the following methods should be followed:

1. Place drag shoe on soil approximately 9" from seed spot desired,
2. Pull drag shoe through soil and pull trigger to release seed in desired location.
3. Press soil and seed back with sole of shoe.

On north-facing slopes, approximately 40 locations in 20' x 20' clumps will be reseeded with the following species and designated percentages.

50% Engelman Spruce

30% Sub-Alpine Fir

20% Douglas Fir

On south-facing slopes, approximately 20 locations, in 20' X 20' clumps, will be reseeded with the following species and percentages.

50% Ribes Montigenum - Gooseberry Currant

50% Sambucus Racemosa Pubens Microbotrys - Elder Redberry

The above shrub species, supplemental with 1/4 lb/acre P.L.S., of Birchleaf Mountain Mahogany (Cercocarpus Mountannus) in the grass forb seed mixture may also be utilized in the reclamation of the Utah No. area.

### Phase #3 Planting:

The planting of seedlings will be done within 2 years of the seeding effort in order to evaluate the number and species of seedlings necessary to insure both composition and stocking of woody species to maximize utilization by wildlife and domestic grazing.

The species and numbers of individual plants will be correlated to the reference area.

### Planting Procedures

Planting will be done utilizing a powered auger with a capability of drilling a 3 inch plus diameter hole to a depth of 16 inches. The roots of the seedling will be arranged in as near natural position as possible paying special attention not to "J" the root tips. (See Figure 1)

By holding the seedling at the root crown, soil should be compacted back around the roots being careful to leave no air pockets or loose dirt (which would constitute settling). The tree should be firm when light pressure is exerted on the needles and standing in an erect position. Only hands shall be used to pack soil around the tree. The use of a stick or foot is strictly forbidden.

At all times the trees will be protected from direct sun light and special care will be exhibited when lifting the seedling from the planting bag to the prepared hole.

The trees can only be left in the bags for twenty-four hour periods and then must be repacked following approved procedures.

The field handling of packed trees requires the crowns be kept moist and the bags covered with insulated tarps and stored in shaded areas. During breaks, lunch, etc., the crews' planting bags must be placed in shaded areas. At the end of each operational day, all bags must be unpacked and the trees redipped in vermiculite and rerolled in wet burlap and repackaged to be used first the succeeding day.

The planting will be utilized to fill in any voids which may be in evidence after 2 years on either the spot or hydroseeded sites. It is a key methodology in creating covered routes from the surrounding timbered slopes to the water enhancement structure created for wildlife.

Phase #4 Enhance and Reestablish Riparian Zone Along Whiskey Creek and Sediment Pond #4 - Belina Mine.

Due to the apparent lack of any consequential riparian zone along Whiskey Creek, the establishment of one in conjunction with the reclamation effort will constitute enhancement. Ref: Appendix B Volume III.

The principle factors which appear to be limiting a riparian zone are:

1. The extreme angle of the opposing canyon walls, and
2. The dense over-story of both, conifers, to the north, and, deciduous trees on the south.

Both of these obstacle are mitigated through the meadow-park configuration which will be constructed upon final reclamation.

The sediment pond will be thoroughly cleaned. The decant and associated culvert will be removed and that portion of the pond sealed. The interior of the fill slope will then be fortified with a minimum of 18" of additional riprap (12" + material).

In this manner, the stability of the pond will be assured and the pond can be maintained and allowed to go through a normal pond succession. This will eliminate the necessity of subsequent reclamation when this pond would have had to been removed. By utilizing this method of natural succession, the following environmental benefits will be gained:

1. The ponds can be maintained as a valuable reservoir for Macro-invertebrates during dry periods.
2. The salamanders which are presently in abundance in the pond, can be maintained.
3. The pond will act as an enhancement feature in providing additional water in the drainage, and in time will significantly increase the riparian habitat. (Note UDWR comments on pond benefits).

The reclamation and reestablishment of Whiskey Creek across the recontoured lower pad will invoke all of the same methodology as outlined in Phases 1 through 3. The earthwork will constitute the creation of a meandering stream incorporating pools and ripples, along with a stream bank with a maximum slope of 2:1. Due to the open nature of the channel and meander line, those species indigenous to a wetter (riparian) site will establish. This establishment will be aided by utilizing clump planting of native riparian vegetation that will need to be relocated

as the existing stream channel is tied back into the newly created one which will flow across the recontoured lower pad.

The clumps of vegetation perform a multitude of functions:

1. They introduce a valuable native seed source into the interior of the disturbance.
2. They innoculate the newly relocated soil with a host of beneficiary microrihza.
3. They provide instant wildlife habitat and to some degree, forage and cover.
4. They aid in stabilizing the soil and enhancing the microclimate in their immediate proximity.

Again, special emphasis will be placed on planting vegetation which will act both for forage and cover for the wildlife which are most inclined to utilize the meadow, primarily, elk and Mule deer.

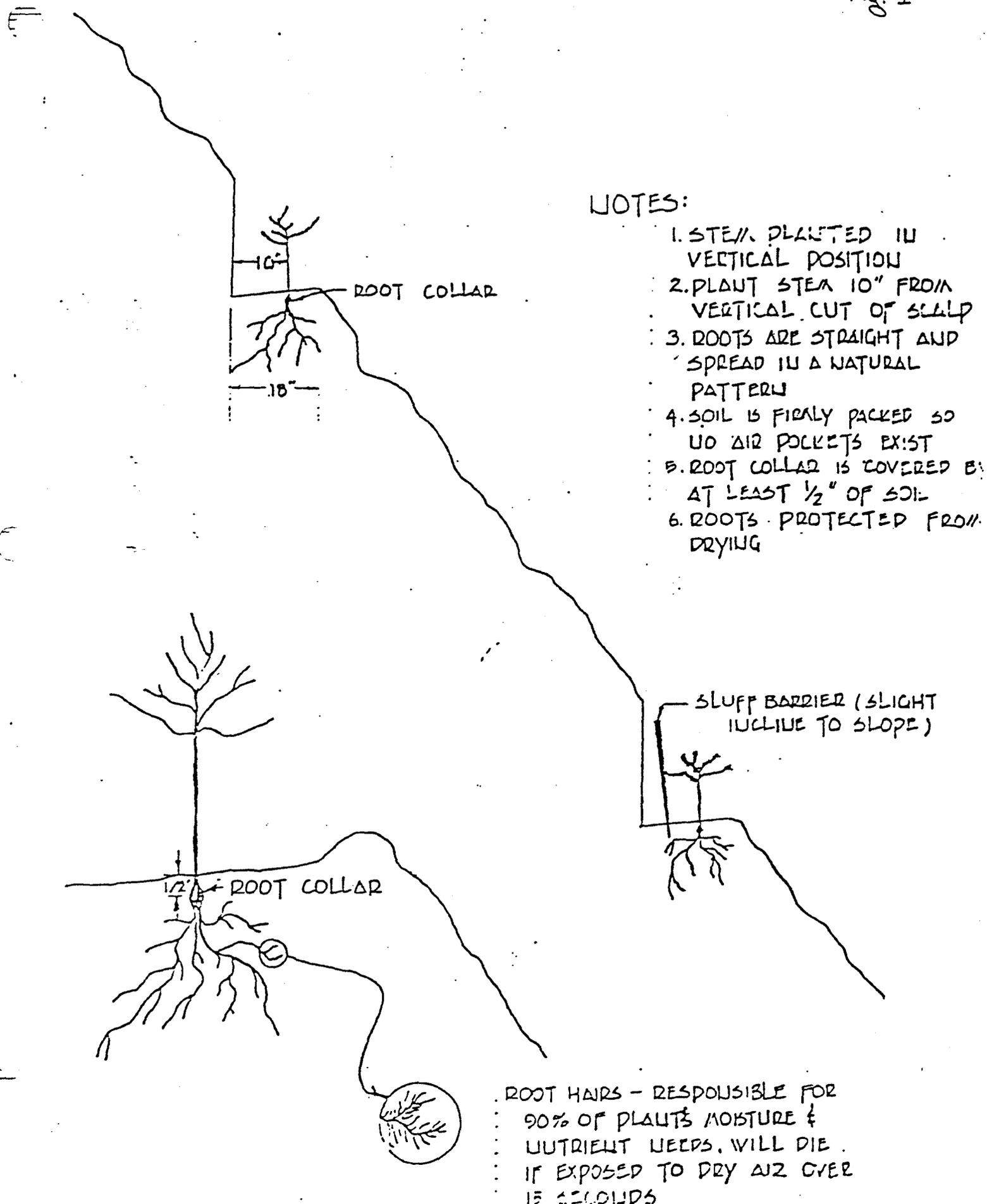
#### Monitoring

Upon completion, the reclaimed area will be monitored to determine when bond release parameters are achieved. If the monitoring indicates inadequacies, the area will be supplemented with additional efforts.

The monitoring procedures will be the same sampling methodologies which were incorporated in establishment of the reference areas.

# CUBIC PLANTING PROBLEMS (DESIRED SLOPE)

Fig. 1



## NOTES:

1. STEM PLANTED IN VERTICAL POSITION
2. PLANT STEM 10" FROM VERTICAL CUT OF SCLLP
3. ROOTS ARE STRAIGHT AND SPREAD IN A NATURAL PATTERN
4. SOIL IS FIRALY PACKED SO NO AIR POCKETS EXIST
5. ROOT COLLAR IS COVERED BY AT LEAST 1/2" OF SOIL
6. ROOTS PROTECTED FROM DRYING

ROOT HARS - RESPONSIBLE FOR 90% OF PLANTS MOISTURE & NUTRIENT NEEDS. WILL DIE IF EXPOSED TO DRY AIR OVER 15 SECONDS

ATTACHMENT 1  
(APPENDIX M)

INVENTORY OF RIPARIAN VEGETATION  
WHISKEY GULCH CREEK

On September 4 and 6, 1983, an inventory of Whiskey Gulch was conducted by M. A. Coonrod of the consulting firm of Environmental Industrial Supply. The purposes of the inventory were to establish an estimate of the riparian habitat lost in construction of the Belina Mine, locate and identify a riparian reference area, and determine the net increase of riparian habitat as a result of post-mining reclamation.

Conventional vegetation inventory methods were not utilized due to the narrowness of the channel and the scattered small area disposal of any riparian zones.

The applied methodology consisted of measuring out 100 meter distances above and below the mine disturbance, determining the average width of the existing riparian zone at five meter intervals, averaging the distances, and by utilizing the mean and applying it to the overall distance of the disturbed area, the amount of lost riparian habitat was derived. From this application, a total of 4,723 sq. ft. or 439.35 sq. meters of loss were estimated. Calculations supporting this total are as follows:

Average width above mine = .176 meters

Average width below mine = 1.58 meters

mean = .88 meters

mean .88m x 499.26m disturbance = 439.35m<sup>2</sup> or 4,723 ft<sup>2</sup>

The proposed reclamation plan calls for a meander line distance of 366 meters at an average width of 4.88 meters, which would yield a potential of 1,786 square meters or 19,200 ft.<sup>2</sup>. This area is in addition to the small islands of vegetation which should establish on silt shelves accumulated behind check dams and water bars and, also, the riparian zone established around the sediment pond.

A total re-established riparian habitat, including all areas, could be estimated at 1,950 square meters or 20,964 square feet. Calculations supporting this figure are as follows:

Overland Channel	4.88m x 366m = 1,786m <sup>2</sup> (19,200 ft <sup>2</sup> )
Sediment Pond	0.50m x 244m = 122m <sup>2</sup> (1,312 ft <sup>2</sup> )
Check Dams (2)	1.07m x 3.66m = 3.92m <sup>2</sup> x 4 = 15.66m <sup>2</sup> (168ft <sup>2</sup> )
Bar Deflectors (9)	1.07m x 2.74m = 2.93m <sup>2</sup> x 9 = 26.39m <sup>2</sup> (284ft <sup>2</sup> )
	<hr style="width: 100%; border: 0.5px solid black;"/> Total = 1,950.05m <sup>2</sup> (20,964ft <sup>2</sup> )

Using only the overland channel, the potential for re-established riparian habitat totals 19,200 ft.<sup>2</sup>. This amount less the estimated loss of 4,723 ft.<sup>2</sup> as a result of development, will result in a net gain of riparian habitat of 14,477 square feet.

6 January 1984

A representative riparian species list is included in Appendix B of Volume III.

The proposed revegetation effort for this area is found in UMC 784.21, Volume VI.

ATTACHMENT 2  
WILDLIFE MITIGATION PLAN  
(APPENDIX M)

Reference:  
UMC 784.21  
UMC 817.97

WILDLIFE MITIGATION PLAN

Mitigation of mining impacts on and management of wildlife are usually considered and the plans for implementation approved prior to any perturbation. These actions often follow one of three general forms: (1) design of facilities and access or transportation modes to minimize impacts, (2) operation of the mine and associated facilities to minimize impact, and (3) enhancement of wildlife habitat both in the vicinity of and away from the mine in order to mitigate losses that may occur.

In new mine operations it is easy to suggest, provide, and implement mitigative and management measures, but in the case of Valley Camp, Inc., which is already in operation, preconstruction design and associated mitigation and management does not apply. The terrestrial wildlife inhabiting and utilizing the area of concern are accustomed to the present facilities and have adjusted their behavior, including migration patterns, so that change from existing conditions would be of more impact than would retaining the status quo.

The new construction areas do warrant mitigative and management action. Construction and operation of the proposed overland conveyor could potentially disturb wildlife. To minimize habitat disturbance and habitat loss, surface disturbance will be kept to a minimum through the application of helicopter during the construction of the conveyor. The conveyor activities will take into consideration potential conflict with deer and elk reproductive activity and the small acreage involved will be restored as quickly as possible by redistribution of topsoil within the disturbed area, with immediate reseeding and replanting of native seeds and vegetation. Because of the small size of the area, natural reseeding will also occur from the surrounding area. The seral stage habitat created will be beneficial to deer and elk, who readily utilize seral stages of mixed conifer-aspen forest.

Much of the proposed conveyor area is accessed by an existing road. A helicopter will be utilized to construct the remaining portion.

There will be minimal additional surface activity and disturbance of less than 3 acres which will reduce habitat loss and minimize human activity on the surface during the summer range.

All reasonable effort to protect the riparian habitats within the area, will be implemented. All water is ephemeral (class 6), but since water is such a limiting resource to game animals, care will be taken to prevent disturbance, erosion, or coal deposition in the ephemeral channels. Roads will be routed or acceptable crossings built to avoid disturbance or erosion. Coal will be wetted to prevent blowing if necessary.

As determined in consultation with UDWR, all hazards associated with expansion and mine operation will have safeguards to prevent damage to wildlife of concern. In addition, the plans for the proposed conveyor have been reviewed and found acceptable by Mr. Larry Dalton, Resource Analyst, UDWR.

Since there are crucial critical periods in the life history of high interest species such as Mule deer and elk, the applicant will communicate such to their employees who will be admonished to avoid all unnecessary disturbance and harassment of wildlife species. In addition, all employees will be required to view a wildlife enhancement film during annual training sessions, as recommended by UDWR as a tool to educate the mine personnel on their role in safeguarding Utah's wildlife.

In any situation not previously mentioned where wildlife habitats are disturbed, reclamation will be implemented by the best available methods and as approved by the Division and the appropriate land management agencies. Should temporary control of rodents or other pests be required to ensure successful reclamation, appropriate authorities will be consulted to determine the method of control. No control measures will be used without prior approval by the Division.

ENHANCEMENT

Prior to the implementation and construction of the Belina Mine, Whiskey Gulch in the vicinity of the mine, contained at best, was an intermittent stream. This stream was most likely, dry during the majority of the summer and fall. (Ref: interviews with UDWR personnel). With the advent of the mine and the subsequent mine water discharge and sediment pond, there now exists a year-round aquatic habitat, evidence of a biotic community, and the existence of a rudimentary riparian habitat zone. Valley Camp has also undertaken an extensive and successful interim revegetation program. Due to the large areas of dense conifer stands adjacent to the property, this highly accessible and lush revegetated area is being utilized by the local big game population as documented by frequent sighting and evidence of grazing activity.

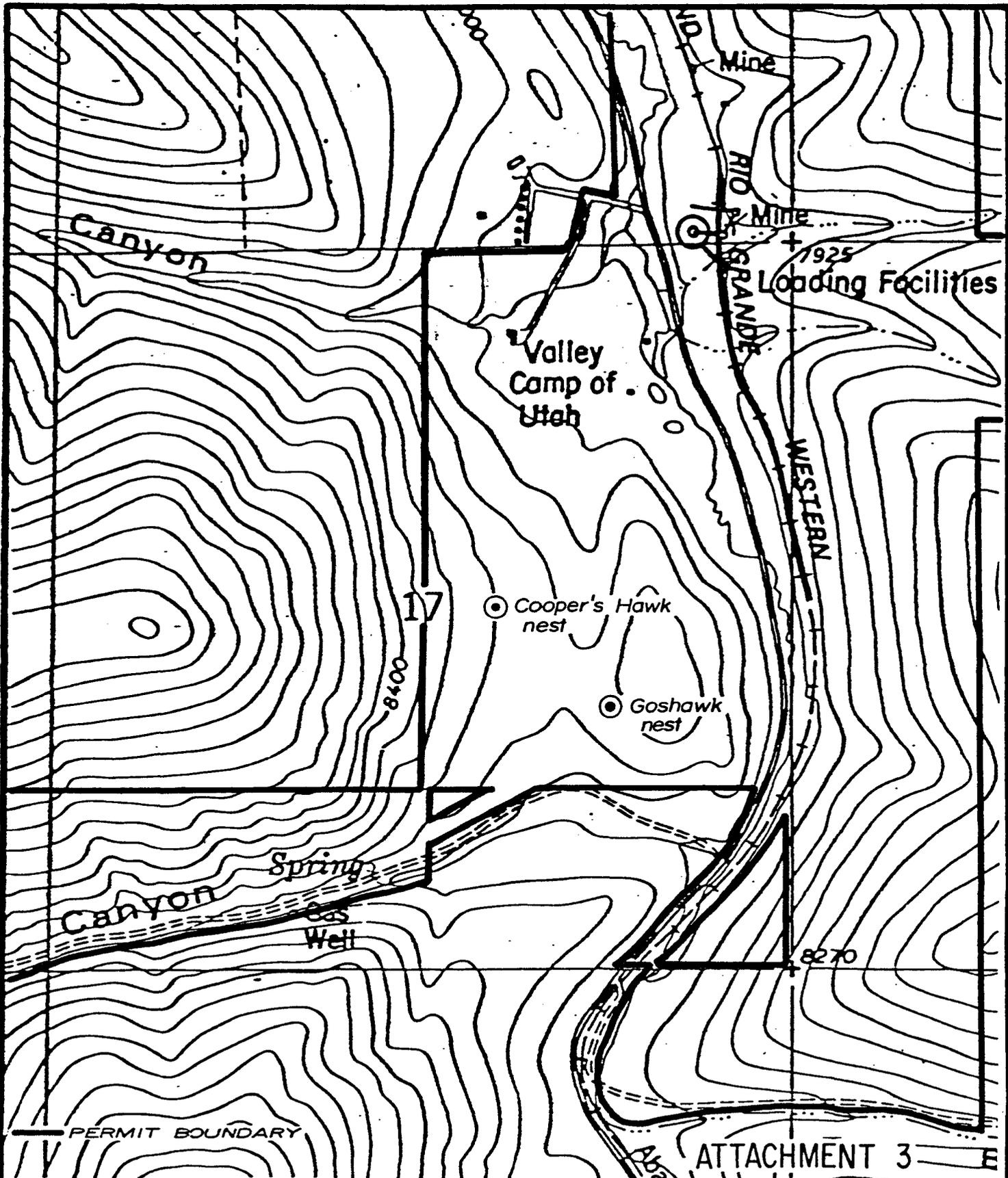
With the paving of the access and haul road to the property, possible contamination of adjacent streams through run-off of the road, will be greatly minimized as well as eliminating fugitive dust. However, with the improved road, the potential for animal vehicle encounters are increased. To help mitigate for this potential hazard, Valley Camp is committed to posting game crossing signs, one at each end of access roads, and, reduced speed signs. They have also committed to monitor any road fatalities and keep the UDWR informed as to their findings. These commitments plus their continuing educational program directed to protecting and preserving Utah's wildlife must surely constitute an enhancement feature.

It was also interesting to note that the most extensive riparian zone was created within the disturbed area of the mine at the by-pass inlet and along the sediment pond discharge. Sediment pond #4 presently has one of the highest populations of salamanders found anywhere in the state. The UDWR lists this animal as a "high interest" species. The high population of salamanders in this pond also indicates a high proportion of macro-invertebrates which presently lend themselves through down stream migration as a potentially valuable food source

15 September 1983

for the resident trout populations in Eccles and Clear Creek. The pond in itself, is an enhancement feature offering both a year-around water source for wildlife, an aquatic habitat, plus an emerging riparian zone. When this reclamation plan is implemented, the pond should add several valuable wildlife nitches. In addition, it will be a major wildlife enhancement feature during the course of mining.

All of the above, plus Valley Camp's eagerness to cooperate with the UDWR, is evidence on the mine's committment of wildlife and wildlife concerns.



DRAWN BY: Ed Sanderson	DATE: Sept. 14, 83
CHECKED BY:	DATE:
REVISED BY:	SCALE: 1" = 1000'
APPROVAL ENG.:	TITLE: RAPTOR NEST LOCATIONS
APPROVAL SAFETY:	DRAWING NO. A5-0068
APPROVAL MINE:	REV. NO. 0



**VALLEY CAMP of UTAH**  
**SCOFIELD ROUTE**  
**HELPER, UTAH 84526**

ATTACHMENT 3 — E