Road") and appurtenances for the purpose of connecting Lessee's mining properties with the existing public road in Eccles Canyon, over, in, under, across and along a single strip or width of the following described property situate in Carbon County, State of Utah:

Township 13 South, Range 7 East, SLBM

Section 19
Section 20
Section 30: N½NW¼

together with a right of way to construct, use, maintain, operate, alter, add to, repair, replace and/or remove its facilities, consisting of a conveyor system, an access road to be constructed immediately adjacent to and parallel with said line for use in the construction and maintenance of said conveyor system, one electric transmission line and one communication line with poles, and appurtenances, also to be constructed immediately adjacent to and parallel thereto, for the transportation of said products of mining operations, over, in, under, across and along said part of the following described property situate in Carbon County, State of Utah:

> From a point within the SW¼ of § 19, or the N½NW¼ of § 30, or both, in a direct line from said point northeast to a transfer point in Eccles Canyon lying within the N½N½ of § 19, or the S½S½ of § 18 south of Eccles Creek, or both, thence easterly through the S½S½ of §§ 17 and 18 south of Eccles Creek, or the N½N½ of §§ 19 and 20, or both, all within T. 13 S., R. 7 E., SLBM, not more than 40 feet wide.

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together with a 40-acre parcel lying with SW¼ § 19, or N½NW¼ § 30, or both, T. 13 S., R. 7 E., SLBM, for the purpose of conducting underground coal mining operations and related activities, including, without limitation, the construction of portals, buildings and facilities useful to such operations, but not including strip mining or the construction of housing. All of the above-described property is hereinafter referred to as the "Property."

2. Location of Parcel and Rights of Way. Lessee shall have the sole discretion to fix the initial location of said parcel and rights of way upon the Property; provided, however, that in exercising such discretion and in conducting operations upon said parcel and rights of way Lessee will observe the following criteria:

a. In locating said parcel and rights of way, and in constructing any facilities thereupon, Lessee shall confine its operation strictly to the Property;

b. The location of said parcel and rights of way will be selected in such manner as to make the most economical use of the land, consistent with Lessee's reasonable mining needs, and to cause the least damage to lessors' surface ownership;

c. Lessee's operations in building, maintaining and using any structures upon said parcel and rights of way will be conducted in such a manner as to minimize fire hazards, to destroy the least amount of forage and trees, to cause the least interference with the movement of game animals and livestock and to cause the least amount of dust and erosion, all consistent with Lessee's reasonable mining needs;

d. Neither said road nor conveyor or other lines shall be fenced, except where required by state or federal regulation; and

e. All land used in the construction of either the conveyor system, access road, lines, poles, portals, buildings and related appurtenances upon said parcel or rights of way but not needed for the maintenance and use of such facilities, will be restored at Lessee's expense as nearly as reasonably practicable to its original condition within 180 days or such longer period as may be necessitated by conditions of weather.

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Chapter 2

Replace Plate

R645-301-242 Topsoil Redistribution

Chapter 5

Replace Plates

Plate R645-301-521.150 Sheet 4c of 4

Plate R645-301-527 Sheet 12

Plate R645-301-527 Sheet 13

Chapter 9

Replace Plates

Figure 9-3 Temporary Spoil Storage

Reclamation Plan

Redline / strikeout

RECLAMATION PLAN

INTRODUCTION

This Reclamation Plan has been developed based upon information contained within the 1990 permit submittal made by Valley Camp of Utah, Inc. (now White Oak) as well as information obtained subsequent to that submittal as required under regulations promulgated by the Utah Division of Oil, Gas & Mining (UDOGM). The existing reclamation agreement is found in Appendix R-4. This plan was developed for the purpose of showing and explaining how the Operator will reestablish the disturbed areas created during mining, to conform with the contiguous environment. This submittal contains a narrative regarding the Reclamation Plan and activities as submitted and discussed with UDOGM personnel on various occasions. The following narrative does not respond to the regulations in a regulation by regulation format since it was determined in conjunction with UDOGM personnel prior to it's compilation that a story book format would be more conducive to review. The following Reclamation Plan has been separated into the major sections with content as described in the following table.

SECTION	CONTENT
HISTORICAL OVERVIEW	A discussion related overall reclamation, its history and current status
RECLAMATION REQUIREMENTS	General requirements of the R645 rules which apply to all other sections of the plan.
RECLAMATION DETAILS	A physical description of each aspect of reclamation
MONITORING AND MAINTENANCE	Monitoring and maintenance requirements both during and after reclamation activities
TIMING AND RECLAMATION SEQUENCE	An outline of reclamation activities to be completed along with a time schedule for completion
RECLAMATION COSTS	Summary of reclamation costs based on the plan

This plan has been developed in such a way that reclamation operations will be carried out according to regulations required under Sections 240, 340, 540, 640, and 760. Bonding and insurance requirements are met as per Section 800 of PAP Volume 1. General concepts and intent associated with the Reclamation Plan include the following major points:

At such time that the mining activities are completed, the Operator will close, backfill or otherwise permanently reclaim all affected (disturbed) areas and restore the hydrologic system in accordance with the R645 Rules and the approved Reclamation Plan.

No public road was or will be relocated in conjunction with mining and reclamation activities.

Reclamation activities will be confined to disturbed permitted areas and will not involve the disturbance or relocation of public transportation facilities or corridors.

All utility installations associated with reclamation operations will also be conducted in a manner which minimizes damage, destruction, or disruption of services provided by oil, gas, and water wells; oil, gas, and coal-slurry pipelines, railroads; electric and telephone lines; and water and sewage lines which pass over, under, or through the Permit Area, unless otherwise approved by the owner of those facilities and the Division.

It was the intent of the previous Operator to utilize the General Office Area and accompanying property (with associated runoff control facilities) located west of the loadout facilities and Highway 96 as an intermountain office facility which would have excluded it from reclamation activities (see Map 527 Sheet 4). If it is decided at a later date by White Oak not to utilize the property this manner or to sell or donate it to another entity which desires the facility, then the General Office Area will be reclaimed under the same guidelines agreed upon for the Loadout Facility, where-after complete reclamation details will be provided to UDOGM.

At present the Operator does not propose the use of cut-and-fill terraces in conjunction with the Reclamation Plan. However, as part of reclamation, benches and grade breaks will be incorporated into surface contouring for the purpose of enhancing vegetation and wildlife habitat.

The White Oak No. 1 & 2 Mines (formerly known as Belina No. 1 & 2 Mines) were developed by Valley Camp of Utah, Inc. and do not contain any previously mined areas within the current mine plan area which have been or are proposed to be re-mined. The surface mining at the White Oak Complex will be conducted within 500 feet of the inactive White Oak #1& #2 Mines. The Utah No. 2 Mine within the Loadout Facility area does however, encroach upon old Utah No. 1 Mine disturbed areas, but the Loadout facility will be reclaimed in its entirety.

Sediment removed over time from local ponds within both the Loadout Facility Area and White Oak Complex areas will be used in the reclamation process as long as the sediment is found to be non-toxic.

The revegetation on all disturbed land by the coal mining and reclamation operations will be done as contemporaneous as possible.

Reclamation of each disturbed area will begin during the first appropriate season following the time when that area becomes available for such activities.

Once an area has been prepared (maximizing roughness), the Vegetation-Supporting-Material (VSM) will be redistributed in ranges of thickness appropriate to the prior vegetation as possible as soon as ground conditions allow in the spring. All VSM, whether stored or reharvested during reclamation, will be disc or broken up prior to placement. Preparation of the "proven" VSM will not occur unless seed bed preparation, planting, fertilization (if required) and mulching conditions are favorable and can follow immediately.

Areas occupied by support facilities will not be reclaimed until they are no longer required as part of current and future mining activities.

Prior to final reclamation, the Operator, land owner and other appropriate regulatory agencies will have reviewed the disturbed areas and agreed upon a mutually acceptable Reclamation Plan. This will allow land owner(s) and appropriate agencies the opportunity to review the Reclamation Plan. At some point in time, should the land owner(s) desire to change the post-mining land use to be other than full reclamation, the alternate post-mining land use, landowners written request, and their letter of understanding will be submitted for approval. Once that alternate post-mining land use is approved, revised drawings and cross sections will be submitted for approval. Information related to current lease agreements obtained from land owners or surface managers is available at the offices of Lodestar Energy, Inc. - Mountain Operations.

In general, reclamation of the White Oak mining operation includes:

White Oak Loadout Facility

The removal of all surface facilities, concrete demolition to 18" below final grade, the restoration of the culverted stream emanating from the hills to the east of the facility, the regrading and shaping of the Loadout Facility, and the grading and recontouring of sedimentation ponds. Sediment Pond backfill material will consist of clean fill material which will be tested to ensure that only non acid-toxic materials are used.

White Oak Haul Road

Reclamation of the White Oak Haul Road includes the removal of the ~~ashpalted~~asphalted roadway, culverts an concrete channel linings and the restoration (including reshaping and grading) of ~~hillslopes~~hill slopes between Eccles Canyon and the White Oak Complex. Reclamation will also include the removal of existing culverts and the restoration of natural drainage channels at 1) the bottom of the haul road at the junction with Eccles canyon and 2) at the "Big Fill".

White Oak Complex

This area will be completed in phases. Prior to the startup of the surface mine, facilities located in the area of operation of the surface mine will be removed. The surface mining process will create topsoil storage areas and a temporary spoil storage area. The process of surface mining will complete rough grading of the slopes removing highwall remnants. Cross sections of the surface mining at White Oak Complex are shown on Maps R645-301-521.160 (Sheets a-d) showing the elimination of the highwalls created during the surface mining process. The temporary spoil storage area will be used to make up material short fall during the mining process and to fill the final pit. Concrete material removed from the structures and foundations will be buried in the first few pits and covered with greater than four feet of non-toxic material. The placement of topsoil will start prior to fall seeding or at the end of the surface mining when seeding can follow immediately after placement. The upper portion of Whisky Creek will be affected during this surface mining and the restoration of this stream will occur during the months of low to no flow. The removal of Dugout D-1 will occur after vegetation has been adequately established in the drainage above this pond.

The rest of the site located below the surface mining operation will be reclaimed once the use of the coal storage and truck loadout facilities are no longer required for the extraction of coal in the area adjacent to the White Oak Complex. Removal of these surface facilities, concrete demolition to 18" below final grade, the restoration of 1) the main Whisky Creek channel (culverted) entering the fill area below the coal storage area. In addition, reclamation will include the removal of the fill pad, regrading and shaping of the remaining disturbance, and the grading and recontouring of Sedimentation Pond No.

~~004A. Sediment pond backfill material will consist of clean fill material. Additional topsoil materials removed during the surface mining operation will be used on this area.~~

004A. Sediment pond backfill material will consist of clean fill material. Additional topsoil materials removed during the surface mining operation will be used on this area.

Reclamation design details provided as part of this submittal indicate mine disturbance boundaries which will be honored during the reclamation phase of the mining operation.

HISTORICAL OVERVIEW

Surface facilities located within the Permit Area are generally divided into one of three time periods, those facilities constructed pre-law, those constructed post-law but prior to topsoil requirements and those constructed post-law with topsoil requirements. The General Office Area, Utah No. 2 mine site and VALCAM Loadout Facility (now referred to as the Loadout Facility), the White Oak No. 1 and No. 2 mine sites (White Oak Complex) and the White Oak Haul Road were pioneered pre-law. Additional improvements at both Loadout Facility and the White Oak Complex were constructed post-law but prior to topsoil requirements. Topsoil requirements came into play during the opening of the White Oak No. 2 Mine whereafter some topsoil substitute has been salvaged and stored for reclamation activities. During the surface mining of the barrier coal at the White Oak site, additional topsoil will be recovered. Please refer to the Topsoil Salvage Area Map R645-301-232.100.

No topsoil will be required for reclamation of the General Office Area since it is the current plan that it be retained as a field office for White Oak upon completion of mining.

Since the Loadout Facility was also established prior to the topsoil requirement and no topsoil was preserved, a search for an acceptable substitute for topsoil which could be utilized during reclamation was initiated. Existing soils have proven that they will support vegetation. Some selected soils identified on site were analyzed for applicability as a substitute for topsoil, approved by UDOGM for reclamation use and harvested. This approved material has been stored at the White Oak Complex for use in that area. The substitute for topsoil has been stabilized with vegetation and erosion control measures and contains approximately 975 cu. yds. of soil which came from the enlargement of the Sediment Pond 002a, near the truck scale at the Loadout Facility. The volume of soil was approximated using the Average End Area (AEA) method. As shown on the Reclamation Mapping, roads (including the railroad access road) and selected culverts found within the Loadout Facility such are currently owned or will continue to be utilized by the railroad will remain upon final reclamation.

The White Oak Haul Road however will be reclaimed wherein VSM will be needed. Although no topsoil was formally preserved, the haul road does exhibit the same natural revegetation capabilities as does the White Oak Complex and Loadout Facility areas.

Permanent runoff conveyance facilities capable of controlling the post mining 100 Year - 6 Hour precipitation event have been designed for the Loadout Facility Area, the White Oak Haul Road and the White Oak Complex. As required under the regulations, all existing siltation structures (with the exception of Sediment Pond 004A) will be 1) maintained until removal is authorized by UDOGM and the disturbed area has been regraded, stabilized and revegetated, and 2) maintained for a minimum of two years following the last augmented seeding. The phased reclamation of the White Oak Complex will allow a large portion of the site to have vegetation re-established prior to the removal of the sedimentation ponds. Sediment Pond 004A will remain in place as long as possible during the recontouring process of re-establishing the main channel of Whisky Creek through the coal storage and

truck loop area. The material used to construct the pond will be required to reclaim the White Oak Haul Road. It is also understood that all culverts within the Permit Area are to be removed unless approval is ~~given by the regulatory agency that their retention meets post mining land use requirements. Culverts to remain following reclamation are bolded as appropriate on reclamation mapping. Additional information related to timing of reclamation activities will follow.~~

given by the regulatory agency that their retention meets post mining land use requirements. Culverts to remain following reclamation are bolded as appropriate on reclamation mapping. Additional information related to timing of reclamation activities will follow.

POST-MINING LAND USE

Pre-mining land use classifications for the Permit Area are as follows:

Carbon County

All of the Permit Area situated in Carbon County is zoned for Recreation, Forestry and Mining with the exception of the West half of the South West Quarter of Section 9, T13S, R7E SLB&M.

Emery County

All of the Permit Area situated in Emery County is zoned for Recreation, Forestry and Mining.

White Oak Loadout Facility

Post-mining land use for the permitted areas will be consistent with pre-disturbance use. Prior to disturbance the land was primarily shrub and brush range-land. Also included within its use was a right-of-way for the railroad (Pleasant Valley Agreement) complete with access roadways. No change from pre-mining to post-mining land use is planned.

General Office Area

It was the intent of the previous Operator to utilize the General Office Area and accompanying property (with associated runoff control facilities) located west of the loadout facilities and Highway 96 as an intermountain office facility which would have excluded it from reclamation activities (see Map 527 Sheet 4). If it is decided at a later date by White Oak not to utilize the property this manner or to sell or donate it to another entity which desires the facility, then the General Office Area will be reclaimed under the same guidelines agreed upon for the Loadout Facility, where-after complete reclamation details will be provided to UDOGM.

White Oak Haul Road

At this time the post-mining land use for the White Oak Haul Road will be a continuation of shrub and brush range-land and wildlife habitat since the road will be removed and reclaimed. It is also possible that the area might receive some slight recreational use via foot traffic which would be similar in nature to that which transpired prior to disturbance.

White Oak Complex

Land at the White Oak Complex will return to a shrub and brush rangeland use, wildlife habitat, and grazing use. The individual from whom the mine site is leased has interest in using the area as a cattle holding facility to enhance his grazing program. Grazing on the mine site will be according to a grazing management plan after bond release. The landowner and land manager has expressed the use of the mine site area for cabin sites. Lodestar has obtained the land owners priorities relating to roadway access to the property and the reinstallation of a road through the surface mining area of the barrier coal. See Oman Lease Appendix 1-2.

RECLAMATION REQUIREMENTS

Some of the more generalized requirements given within the regulations are more easily separated and discussed than would be if incorporated directly into the overall text. Those regulations which can be addressed quickly and efficiently are provided within this section of the Reclamation Plan.

Blasting

As required by 524.400, unscheduled blasts will be conducted only when public or Operator health and safety so requires and for emergency blasting actions. When an unscheduled surface blast incidental to the coal mining and reclamation operation occurs, the use of audible signals, will notify residents within one-half mile of the blasting site and will be recorded in the blasting records of why the unscheduled blasting was required. During the removal of barrier coal and initial reclamation at the White Oak Complex, additional blasting will be conducted. Please refer to Section 524.400 for blasting details.

Casing & Sealing of Underground Openings

As required within 551, 631 & 765; all underground openings will be permanently sealed. Permanent closure measures are designed to prevent access to the mine workings by people, livestock, wildlife, machinery and to keep acid or other toxic drainage from entering ground or surface waters.

The Utah No. 2 Mine is located at the Loadout Facility just east of the D&RGW railroad and north of the crusher building and is in the Upper O'Connor coal seam. The mine was officially closed September, 1989. All portals at the Loadout Facility have caved tight near the 25' area and were considered dangerous and were barricaded as per MSHA instruction. Portals 1 through 5 were removed and the openings were backfilled approximately 25' to 30' with the aid of heavy equipment. Portal 6 was backfilled, however, the portal headwall will remain to support the highwall until such time as reclamation is accomplished. At that time Portal 6 will be removed or be covered with at least four feet of compacted material and the highwall stabilized. Entry 7 has been sealed, but Portal 7 will remain until reclamation takes place as the belt line tailpiece for the crusher building is located in the portal mouth.

All mine openings at the White Oak Complex will be sealed with spoil (backfill material generated by the

surface mined barrier coal. The portal closure plan will utilize a natural french drain system. This system will occur in the natural gradation of the broken spoil material where the larger material will be at the lowest levels of coal removal. Allowing water migration out of the toe of the spoil fill against the remaining unbroken rock surfaces. The approximate depth of cover to be placed over the portals is depicted on cross-sections (**F, G, H and I**) found on Maps R645-301-521.160 Sheets a and b in Chapter 5. Actual depths of cover will be verified by Certified "As-Built" Post-mining Land Use Reclamation maps generated from ground surveys which will be done upon completion of reclamation.

MAP 5OO. MAP INDEX
MAP 527 - SHEETS 1 THROUGH 14. RECLAMATION DETAILS

Mine closures will be accomplished in accordance with the requirements of the Division and consistent with MSHA, 30 CFR 75.1711.

All exploration drill holes have been plugged using the procedures required by the U.S. Forest Service. The drill holes were filled with drill cuttings except in specific areas of the hole requiring concrete plugs.

Concrete plugs were required, and were extended ten feet above and below any aquifer encountered, as well as being placed across all coal seams. In the vicinity of the surface, all drill holes were backfilled with at least a five foot concrete plug upon which a soil layer was added to conform to local soil conditions.

Attempts will be made at the time of mine closure to transfer ownership of all existing wells located on or utilized in conjunction with the mining operation to other interested parties. If such transfers are not realized or possible, then each well site (including the culinary water well being used by the Operator) will be reclaimed as part of mine closure and be permanently sealed as required. Upon reclamation:

All pumps, equipment, etc. will be removed from the well.

The well will be completely filled with sealing material such as to prevent the vertical movement of water within the well. Sealing materials may include the following:

- Neat Cement conforming to ASTM standard C150 of sufficient weight (not less than 15 lbs/gallon) to prevent the flow of any water into the hole from any aquifer penetrated.

- Cement grout consisting of equal parts of cement conforming to ASTM standard C150 and sand/aggregate with no more than 6 gallons of water per sack of cement.

- Bentonite-based products specifically designed for permanent well abandonment, which are mixed and placed according to manufacturer's recommended procedures (i.e. Plug-Gel, Shur-Gel , etc.).

- The liquid phase of the abandonment fluid shall be non-saline water containing no chemicals or toxic materials or other substances which may decompose or possibly contaminate the ground water supply.

If bentonite-based products are utilized in the reclamation process they will not be used within the

uppermost five feet of the well. Cement or cement grout are required for the uppermost five feet.

Neat cement or cement grout used as a sealing material in abandonment operations shall be introduced at the bottom of the well or interval to be sealed (or filled) and placed progressively upward to the top of the well. All such sealing materials shall be placed by the use of a grout pipe, a tremie line, or a dump bailer, in such a way as to avoid segregation or dilution of the sealing materials.

Disposition of Site Materials

Coal and Coal Fines

At the time final reclamation of the Permit Area occurs, the coal and coal fines which are considered unsalable (stockpile bases and short term coal storage area bases, roadways, etc.) after the marketable coal has been-shipped, will be placed in a controlled manner to prevent combustion, ensure stability, and movement and environmental degradation after reclamation.

Exposed Coal Seams, Acid and Toxic-Forming Materials

Exposed coal seams, acid-and toxic-forming materials and combustible materials exposed, used, or produced during mining will be adequately covered with nontoxic and noncombustible materials, or treated and will be placed in suitable fill areas with four feet of cover material to control the impact on surface and ground water in accordance with the regulations, to prevent sustained combustion, and to minimize adverse effects of plant growth and the approved post-mining land use. These areas will be determined just prior to reclamation so as to select the most effective areas to ensure environmental security.

The spoil material generated during the surface mining process has been tested to a depth of 277 feet. The results of the testing showed most intervals had high neutralizing capacity. The coal seams tested not to be acid toxic by 1998 Division standards.

Non-coal Mine Wastes

Any non-coal waste material which is considered to be toxic or hazardous material will be disposed of in accordance with federal, state and local regulations. This includes any non-coal mine waste materials which might be encountered during reclamation. When found, such materials will be transported from the Permit Area by licensed contractors and disposed of in a State approved solid waste landfill or disposed of by another approved method available at the time of reclamation.

Refuse Materials

No refuse materials are generated as part of the White Oak mining process and therefore Section 553.250 (or other sections dealing with refuse concerns) of the regulations are not considered applicable to this plan. Therefore no permanent disposal structures for refuse will be needed or constructed within the Permit Area. Should however refuse materials be encountered in the future prior to reclamation, the requirements of appropriate regulations will be met.

Spoil and Waste

A spoil disposal area is permitted at the White Oak Mine Complex. See Section 9 and Map R645-301-521.150 Sheet 4 of 4. However, all spoil and waste materials detected or encountered at the time of reclamation will be placed in suitable locations within the affected area(s) to ensure stability and or to prevent leaching. The placement of such materials found during reclamation (if any) will depend upon the location in which the material was encountered, and will be placed in appropriate locations and covered with four feet of non toxic material as determined jointly by White Oak and UDOGM.

Extended Responsibility Period

Since the precipitation is near 26 inches annually, the five-year extended responsibility period may apply. Attached in Appendix 7-1 is rainfall data from mid-1984 to 2000. This data will be updated as reclamation becomes imminent.

Fish and Wildlife Protection Plan

The fish and wildlife protection plan during reclamation includes the following.

Construction will be limited to summertime periods thereby eliminating disturbances to big game on nearby high priority winter range. The total area of the permit is considered summer range for elk, deer, and moose. There is no winter range use with the exception of the riparian habitat areas used by moose, as well as for spring calving.

Wildlife habitat will be enhanced through restoration of habitat features and selection of reclamation materials that will improve the quality and or quantity of forage and or cover. Ledges, boulders, logs and game trails will also be utilized.

All riparian habitat disturbed by the Operator will be reclaimed.

Straw bales and/or other appropriate sediment control devices will be utilized at the downstream end of all construction zones at the Loadout Facility and White Oak Complex to control stream influents.

A bermed staging area for refueling and self contained servicing of equipment will be established by the contractor with a minimum buffer zone of 100 feet from any stream or water source.

Land Agreements

Prior to final reclamation, White Oak, the land owner and other appropriate regulatory agencies will have reviewed the disturbed areas and Reclamation Plan. Final Reclamation Plans will thus meet the needs and desires of current surface owners as well as meet the requirements of the regulations. Information related to current agreements obtained from land owners or surface managers is available at the offices of Lodestar Energy, Inc..

Temporary Cessation of Reclamation

The Division will be notified by registered letter should it become evident that a temporary cessation of reclamation operations will extend for a period of 30 days or more occur as required under 515.320. The

notification letter will contain the following required information.

Exact number of surface acres and the horizontal and vertical extent of subsurface strata which have been in the Permit Area prior to cessation,

Extent and kind of reclamation of surface area which will have been accomplished, and identification of the backfilling, regrading, revegetation, environmental monitoring, portal closures and water treatment activities taking place during temporary cessation.

Topsoil Storage

The Topsoil stockpile (located south of the main substation S44) is closely surrounded by dense forest exhibiting a medium amount of deadfall and heavy ground cover. This provides excellent protection against wind erosion as well as rapid snowmelt in the spring. The storage area has been bermed to prevent access by motor vehicles, as well as to prevent erosion of the material from the storage area. Straw bales are also used along the down gradient end (north end) of the storage area to assist in containment, should a slope failure of the stockpile occur.

Additional topsoil material, recovered during the surface mining operation at the White Oak Complex, will be placed on a stable area within the permit area and protected from contamination, compaction, and erosion. The location of storage areas are shown on Map R645-301-521.150 Sheet 4b of 4. Additional storage areas may be operationally necessary and will meet the regulation requirements for a topsoil storage area.

RECLAMATION DETAILS

Overall Reclamation Plans include an organized procedure for the removal of mine related facilities and the restoration of the environment. Included within the complete plan is 1) the removal of all surface facilities with the exception of non-White Oak railroad lines and concrete foundations buried 18" below final grade, 2) the restoration of the land surface to a configuration which conforms as much as practical and/or possible to the undisturbed natural topography, 3) the installation of runoff control channels and/or erosion protection devices, and 4) the restoration and/or augmentation of vegetation. The following discussion identifies planned reclamation activities and concerns including demolition and cleanup, reclamation contouring, runoff conveyance control, and vegetation.

Demolition and Cleanup

All mining related structures located within disturbed areas will be demolished, salvaged or otherwise removed with the exception of concrete foundations buried 18" below final grade, all mine portals will be properly sealed, and the area cleaned up, regraded and restored to meet reclamation requirements as identified

herein. All asphalt will either be hauled to a State approved disposal facility, reprocessed and donated to UDOT for use as a resource for State highways. Reclamation costs have been calculated based upon the assumption that all asphalt will be hauled to an appropriate disposal facility. The concrete will be scarified and crushed with heavy equipment and utilized to backfill the portals, used as aggregate for lean concrete to backfill the portals, placed as fill against the toe of the back-slope in the first lift placed during reclamation or in the bottom of open pits during the surface mining process.. Specifics related to planned demolition and cleanup activities for each major category are hereafter described.

Disposal Facilities

Should a disposal facility be required during reclamation to aid in the demolition and cleanup phase, it will be designed using current prudent engineering practices and will meet the regulations set forth by the Division. The actual location for this type of facility (should it be needed) will be determined during reclamation so as to insure that the most advantageous location can be utilized. Location will take into account AOC concerns, stability of existing foundations and or abutments, weak zones and groundwater effects upon the facility. Such a facility will be approved by the Division prior the implementation.

Mine Openings

All mine openings, at the White Oak site will be sealed with 25 feet of spoil material and covered with spoil material generated by the surface mining of the barrier coal. All portals at the Loadout Facility have caved tight near the 25 foot area, were considered dangerous, and were barricaded (backfilled) as per MSHA instruction. In addition to current backfilling, each opening will be recontoured at the time of reclamation to the approximate original contour as shown on the reclamation design drawings.

Roads

Any road not to be retained for postmining land use or is no longer needed for mining and reclamation operations will be immediately closed to public travel, whereafter all culverts will be removed, roadbeds ripped or scarified and disturbed surfaces recontoured and revegetated as per this Reclamation Plan.

White Oak Loadout Facility. The existing paved road at the Loadout Facility connecting the highway with the railroad tracks by the coal stockpile tube will be stripped of its oil surface and disposed of as previously mentioned, leaving the gravel road base for continued railroad access. The D & RGW (SP) will continue to utilize the graveled road to gain access by railroad personnel to the tracks and adjacent area in the vicinity of the stockpile tube. Should the operators of the railroad desire an oiled road surface rather than a gravel road at the time of reclamation, then the oiled surface will be remain.

All other roads associated with the Loadout Facility will be removed upon reclamation. Removal of the existing White Oak railroad spur (most easterly track) will allow continued north and south access along the east side of the railroad tracks. Ongoing roadbed maintenance will be the responsibility of the D&RGW (SP) railroad company.

General Office Area. Since the General Office is to remain upon reclamation, no changes will be made to existing roadways essential to its continued use. If the post mining land use changes, an amendment to the Reclamation Plan will be submitted.

White Oak Haul Road. All asphalt associated with the White Oak Haul Road will be removed upon reclamation. Asphalt product salvaged will be either 1) crushed and hauled to a State approved facility 2) recycled and reprocessed for use in neighboring towns or by UDOT for streets or road construction purposes. All asphalt will be removed from the White Oak Haul Road during the Phase I reclamation of the coal stockpile, truck loadout and Pond 004 removal so as to minimize impacts to the surrounding environment

during the reclamation period. This asphalt disposal plan supercedes the asphalt disposal plan in Appendix 527.

White Oak Complex. All asphalt roads associated with the White Oak Complex will be reclaimed in the same fashion as those for the White Oak Haul Road. ~~A gravel jeep trail will be provided from above the White Oak Mine site to replace the current road that will be removed during surface mining per the land owner's request in the Oman Agreement amended in February, 2001~~An access trail will be established across the initial reclamation to facilitate revegetation of the site. The downgrade side of the trail will be graded out during the revegetation process leaving a grade break and drainage break within the side slopes.

Structures

All surface equipment, structures, or other facilities found within the White Oak Permit Area not required for continued mining activities and monitoring (unless approved by the Division as suitable for post mining land use or environmental monitoring) will be removed and the affected lands reclaimed. Exceptions to the removal of all structures include the roadbed associated with the operation of the railroad which traverse the Loadout Facility site, or which are associated with the office facilities located west of the Loadout Facility and Highway 96 as discussed earlier. Railroad facilities to remain consist of two railroad lines, an access road, and railroad drainage culverts. Drainage culverts which will remain meet the post mining land use requirements of the railroad since they are used to control surface water runoff.

Reclamation Contouring

Reclamation activities for the White Oak property include the stabilization of slopes, minimization of erosion, reduction of water pollution, and the supporting of approved postmining land uses. The plan included herein for backfilling, soil stabilization, compacting and grading includes contour maps, cross sections and three dimensional views exhibiting the anticipated final surface configuration of the disturbed areas, in accordance with the applicable regulations. Where reasonably possible the final reclaimed contour will resemble the approximate original contour (AOC) of the predisturbance contour as represented on maps included with this Reclamation Plan. All maps included herein have been prepared and certified as described under Section 512 of the rules and regulations.

In general, all drainages will be restored to the degree possible to premined conditions by removing all fill material, regrading and reshaping of the adjacent terrain. Reclamation contours will match those found naturally at the point of contact, and where possible, reclaimed contours will be constructed at slope angles less than those found naturally. Generally speaking, all fill material placed as a result of road construction in the vicinity of local drainages will be removed, and the reclaimed drainages will be excavated (or filled) to the degree possible to local natural grades as determined in the field.

In order to develop reclamation contouring and associated volumes, both existing and future reclaimed contours have been entered into AUTOCAD for the entire disturbed area. Cut and fill volumes associated with reclamation activities were then developed utilizing Survcadd and Engineering Data Systems (EDS) software. Since soils which will be removed are not native undisturbed soils, but were placed during mine development, it was recommended by a professional geotechnical engineer that a compaction factor of 5% be added to the calculation of all cut materials. Calculations shown in Appendix R2 reflect this recommendation.

Once cut and fill volumes were determined, mapping was prepared to illustrate both reclaimed contours as well as computer generated renderings of final surface configurations for critical areas. Three dimensional renderings have been completed for the Loadout Facility Area, the White Oak Haul Road, and two areas

along the White Oak Haul Road including a typical view along the north slope of the lower section of the road and a view of the Big Fill area (see Figures R-1 through R11).

FIGURE R-1. White Oak - RECLAIMED CONTOUR
FIGURE R-2. White Oak - DISTURBED 3-D VIEW
FIGURE R-3. White Oak - RECLAIMED 3-D VIEW
FIGURE R-4. White Oak Haul Road - RECLAIMED CONTOUR
FIGURE R-5. White Oak Haul Road - DISTURBED 3-D VIEW
FIGURE R-6. White Oak Haul Road - LOWER SECTION DISTURBED 3-D VIEW
FIGURE R-7. White Oak Haul Road - BIG FILL SECTION DISTURBED 3-D VIEW
FIGURE R-8. White Oak Haul Road - RECLAIMED 3-D VIEW
FIGURE R-9. White Oak Haul Road - LOWER SECTION RECLAIMED 3-D VIEW
FIGURE R-10. White Oak Haul Road - BIG FILL SECTION RECLAIMED 3-D VIEW
FIGURE R-11. White Oak Complex - SPOIL BACKFILL & RECLAMATION DETAILS

Because cut and fill volumes were determined via AUTOCAD, numerous cross sections typically required for hand calculation are not shown as part of the reclamation calculations. However, typical sections have been added at each of the major areas to show typical reclaimed sections. Specifically, cross sections have

been developed for selected areas of the Loadout Facility, the White Oak Haul Road, and the White Oak Complex. These cross sections are included within Appendix R2. Additional cross sections for the surface mining at the White Oak Complex are included within Chapter 5, Maps R645-301-521.160 (Sheets a, b, c, and d) . Slope stability analysis is found in Appendix R2.

Additional general concepts associated with reclamation contouring which have been implemented (or will be at the time of construction) into the Reclamation Plan throughout the disturbed Permit Area include:

Areas having either undisturbed or re-established vegetation will not be disturbed upon reclamation unless it is it is necessary to obtain the approximate final surface configuration identified within this Reclamation Plan. Contour limits presented on reclamation drawings were developed based upon photographic and field observation of established vegetation. At the time of reclamation, representatives from both the Operator and UDOGM will concur on appropriate field staking for undisturbed or naturally re-vegetating areas which will not be redisturbed with reclamation activities.

Prior to any earth moving activities all areas affected by noxious weeds will be sprayed.

Pad areas and associated cuts will be restored to the approximate original contour through the use of heavy equipment.

All fill material shall be machine compacted where accessible and shall be placed in a controlled manner.

Benches shall be constructed in lifts and compacted to assure integrity and stability of the embankment.

After the coal handling areas have had the recoverable coal removed, the remaining bed material will be intermingled in a base lift near the mine portals.

Constructed slope angles will not exceed those of the surrounding hillsides. As a general rule slope

angles will not exceed 2:1 except at points of intersection where steeper slopes are required to tie into existing hillsides. Slopes will be graded to concave and complex shapes rather than uniform grades or convex shapes.

Extreme surface roughening will be used on all slopes after the distribution of topsoil. Roughening will be completed as described in the Division's reclamation manual, The Practical Guide to Reclamation in Utah, found at ftp://dogm.nr.state.ut.us/PUB/MINES/Coal Related/RecMan/Reclamation Manual.PDF

Maximizing the roughness of the reclaimed surface will be paramount at most locations to achieve moisture retainage, enhance vegetative growth and reduce local erosion.

The placement of large exposed boulders or deadfall within reclaimed areas will provide a varied land surface and enhance both the visual aspects of reclamation as well as local wildlife.

Reclaimed slopes greater than 2:1 will be reviewed and a geotechnical analysis completed at the time of final reclamation in order to eliminate potential stability problems. This effort must be delayed until the time of reclamation since it is not possible at this time to precisely identify the soils to be placed at any given area.

Small depressions may be left throughout the reclaimed area on an as needed basis to retain moisture, minimize erosion, create and enhance wildlife habitat, or assist revegetation. The actual locations of small depressions will be decided upon during final grading. These small depressions will not be left in areas subject to erosion resulting from upgradient drainage flowpaths.

All lifts will be overfilled, compacted and the loose material on the outslope incorporated in the next lift. This technique decreases the chance of superficial failures of the outslope and leaves the soil surface compatible for revegetation. Each lift will be keyed into the existing backslope to increase stability. The location of each keyway will be determined at the time of reclamation based upon information gathered in the field.

Reclaimed areas will be treated with a surface bonding agent if necessary to reduce potential slippage of the material.

The following discussion presents the anticipated scope of reclamation for each disturbed area. A discussion related to projected timing for each phase of reclamation (once mining operations permanently cease) is included near the end of the Reclamation Plan.

White Oak Loadout Facility

As shown on Maps 527 Sheets 1 through 3, disturbed areas will be backfilled and graded to achieve the approximate original contour. No highwalls are planned to remain upon final reclamation within this area and all slopes will be approved by the Division prior to final abandonment. It is anticipated that no additional fill will be required for reclamation of this facility as shown by volume estimates included within reclamation Appendix R2, nor will material be moved between the Loadout Facility and the White Oak Complex at the time of reclamation. Cross sections of the surface mining at White Oak Complex are shown on Maps R645-301-521.160 (Sheets a-d) showing the elimination of the highwalls created during the surface mining process.

Modifications to the land surface topography or facilities which vary from premining conditions include:

An additional railroad spur associated with the Coastal States Energy mining operation. Upon reclamation backslopes associated with this D&RGW Railroad right-of-way will be regraded to maximize reclamation at the Loadout Facility.

Prior to reclamation the railroad had the potential of utilizing two separate roadways for access as shown on 1973 aerial photography. The main access appeared to leave the highway just south of existing Sedimentation Pond 003A. This access road traveled to the north where it was intersected by a less traveled connecting road adjacent to existing Sediment Pond 002A. Reclaimed access is shown to be limited to a single access in the location of the existing asphalt roadway. This access is in the approximate location of the historic north access road.

The premining access road consisted of native soils. Upon reclamation the asphalt layer will be removed from the existing roadway leaving the gravel roadbase for improved railroad accessibility. At the time of reclamation the roadway will be narrowed to accommodate a single lane of traffic so as to approach premined conditions.

Graphical representations of existing and reclaimed land surfaces are shown on Figures R-1 through R-13.

General Office Area

As indicated previously, no changes to the existing configuration of the land surface nor structures are planned as part of reclamation activities.

White Oak Haul Road

The White Oak Haul Road was originally constructed between 1975 and 1976 and subsequently widened in 1976. The great majority of the road was excavated as is evidenced by the lack of fill on road outslopes noted in the field. Any excess material obtained at the White Oak Complex will be placed along the White Oak Haul Road. The replacement of excavated road material will not generally entail the direct attempt to match upgradient and downgradient contours with even intermediate grades since some questions have historically arisen as to the long term stability of the road under those conditions.

According to the stability analysis found in the M-K report (identified and discussed within the 1993 PAP), it is unlikely that the White Oak Haul Road would exhibit long term stability if it were put back to the original premining contour. The overall potential natural instability of the area is evidenced in the form of two small slides which occurred within the lower portions of the road below the fill lines of the constructed toe. Short term stability of the road itself however does appear to have been obtained since the road has survived an earthquake and three years of +200 percent of normal precipitation. The three years of above normal precipitation include years 1983, 1984 and 1993.

It is the intent of reclamation to achieve slope stability, minimize erosion and water pollution, and support approved postmining land use. Upon completion of mining that would utilize the paved haul road the White Oak Haul Road will be reclaimed to a condition of stability commensurate with the surrounding slopes and should not be any more susceptible to failure than any other slopes within the adjacent area. In fact, some reclaimed surfaces may indeed be less susceptible to failure than natural slopes since their grades will be less severe than those shown to have existed historically. In addition, attempts have been made to create relatively level areas along the roadway to 1) reduce the long term potential for slope failure, 2)

enhance wildlife habitat, and 3) reduce runoff potential by retaining or detaining some local waters. Various sections of the road are discussed below separately since reclamation styles will change along the length of the White Oak Haul Road.

The White Oak Haul Road is comprised of in-place materials and is for the most part, built on cut not fill. Several slope areas on the White Oak Haul Road have deciduous and conifer growing adjacent to the concrete lined ditch and shoulder of the road. All disturbed areas along the roadway will be evaluated prior to completion of reclamation efforts to verify areas which redisturbance is not desired or would be unrealistic.

Where there are well traveled game trails crossing the White Oak Haul Road, new trails will be incorporated into the recontoured slope in an effort to minimize the erosion that could occur by animals traversing the newly constructed areas at alternate locations. Where identified, game trails are shown on Maps 527 - Sheets 1 through 14.

Eccles Canyon Junction. The culvert located within Eccles Creek will be removed and the land surface re-established to the approximate original contour and alignment as shown on Map 527 Sheet 5.

White Oak Haul Road - Lower Section near Pipeline. This area of the roadway is of a critical nature due to its visibility from Eccles Canyon. The Reclamation Plan includes the installation of rock lifts at periodic intervals along the roadway to 1) minimize the potential for long term slope failure, 2) reduce overall road grade and hence erosion, 3) blend the reclaimed roadway into existing rock ledges, and 4) enhance wildlife habitat. In addition to the rock lifts, some large boulders may be placed along the route (with UDOGM approval) for use as wildlife enhancement. Available logs (deadfall) are also planned to be utilized for reclamation enhancement. A computer generated 3-D image of existing as well as reclaimed surfaces showing these rock lifts are shown on Figures R-5, R-6, R-8 and R-9.

White Oak Haul Road - Big Fill Area. The fill currently found within the "Big Fill" area will be removed and the contour re-established to approximate original contour. Some small heights of disturbed area may remain at the upper end of the reclaimed slope within the area since natural slopes are slightly greater than 2:1. It was also the desired intent to provide some flat or level areas within this vicinity for wildlife enhancement, however, the overall steepness of the surrounding terrain made that impossible without the construction of non-acceptable post mining facilities such as concrete retaining walls. The small stream bed will be re-established at the time of reclamation as shown on reclamation Map 527 - Sheet 8, in calculation details provided in Appendix R1, and as shown topographically as existing and reclaimed 3-D views on Figures R-5, R-7, R-8 and R-10.

White Oak Haul Road - Upper Section. Reclamation contouring of the upper section of the White Oak Haul Road above the "Big Fill" consists mostly of uniform regrading and the development of minimum slopes (thereby creating benches). In many instances the existing road base has been utilized to aid in the development of these terraces. As with other areas, these terraces have been created to enhance local wildlife habitat. A graphical 3-D view of the existing and reclaimed White Oak Haul Road is shown on Figures R-5 and R-8.

White Oak Complex

Initial reclamation will be completed as part of the surface mining of the barrier coal at the White Oak Complex. This area is identified on Map 527 - Sheet 12. Temporarily stored spoil material removed

from the initial cuts will be hauled to reclaim the final cut. The spoil balance provides for sufficient material to complete the reclamation of this initial phase.

Excess material excavated at the time of final reclamation from the coal loadout pad will be placed appropriately either along the White Oak Haul Road or as backfill material near the White Oak Complex as shown on the reclamation drawings previously discussed. The majority of fill material used to achieve the recontouring efforts at the White Oak Complex will be obtained from the lower pad area and the embankment and foundation associated with Sediment Pond 004A. No material will be moved or transported between the Loadout Facility and White Oak Complex areas.

Recontouring of disturbed areas at the White Oak Complex has been governed through the re-establishment of approximate original premined contour along the drainage flow path and the design requirements of runoff conveyance channels. At the time of reclamation, disturbed areas will be recontoured as represented on Maps 527 - Sheets 12 through 13 in such a manner that either 1) the approximate original contour is re-established or 2) deliberate variations are incorporated to enhance local wildlife and/or vegetation. No recontouring of slopes along the power supply lines entering the White Oak Complex are planned at this time because of 1) little overall disturbance has occurred along the power line, 2) additional disturbance will only increase the potential for environmental damage, and 3) extensive natural revegetation which has been re-established over time would be destroyed.

Enhanced surface variations from premined or undisturbed conditions may include the creation of flatter areas, ledges or meadows consistent with those created along the White Oak Haul Road, or the unmodified exposure of rock outcrops such as the one found immediately southeast of the coal stockout tube. The Reclamation Plan includes these planned surface features as a method on enhancing wildlife and vegetation while at the same time providing a varied and visually attractive land surface.

Other specifics dealing with local reclamation include:

Reclamation of UDD-4 will consist of selective re-contouring. Some sections of this channel have re-established itself as a result of encroachment by adjacent vegetation. Recontouring in these areas will be conducted by either small machinery or by hand in order to preserve as much of the existing vegetation as possible. Ditch UDD-5 and UDD-2 will be surface mined through during the barrier coal mining at White Oak.

Postmining slopes will not exceed the angle of repose unless they meet the minimum long-term static safety factor of 1.3.

Because much of the surface disturbances located within the Permit Area were completed prior to these regulations being enforced, little topsoil exists on the site which can be used for regrading and reshaping during reclamation. A small topsoil storage area has been dedicated for use at the White Oak Complex. Presently, the stockpile contains approximately 975 cubic yards of substitute topsoil which came from the enlargement of Sediment Pond 002A. This material met the criteria of and was approved by the Utah Division of Oil, Gas and Mining for use as a substitute topsoil material. Upon reclamation this substitute topsoil will be placed at the White Oak Complex along the access road to the storage area. Additional topsoil material will be recovered during the barrier coal mining. This topsoil will be stored in areas designated on the Topsoil Salvage Areas Map 231.100.

Unacceptable soil material associated with the coal loadout pad will be placed against the vertical wall adjacent to the truck loop and covered to a minimum depth of four feet.

Since Sediment Pond 004A is located upon fill material associated with the coal loadout pad it is not possible to retain it throughout the reclamation period. Main concerns with leaving the pond in place are that 1) it is located upon fill material which thereby presents long term stability concerns, and 2) the discharge channel is excessively steep and could not adequately be design to ensure long term protection of the downstream embankment. The pond will however be retained as long as practical during reclamation until its removal is required for construction of the reclaimed Whisky Creek channel and the White Oak Haul Road.

Grade breaks ~~and a jeep trail~~ are planned for the surface mined area on the portal side of the White Oak complex along what is the current upper mine bench between the bathhouse and the current location of the power substation.

The slope failure located on the hillside west of the bathhouse will be included in the surface mining and be reclaimed as part of the regrading of the surface mined slopes.

The White Oak Haul Road will be used for access to the White Oak Complex for the reclamation on the surface mining area and the removal of facilities upon the completion of mining activities that will use the coal storage and truck loadout facilities. Once the ~~culvert located at the junction of the White Oak Haul Road and Eccles Canyon is removed and reclamation of the White Oak Haul Road indicated recountouring, the~~facilities have been removed as part of the final reclamation, the reshaping of the site and the Whisky Creek relocation will take place. The removal of haulroad materials will take place prior to earthwork to move yardage from the site to the haul road. An access road will be maintained along the haulroad pathway for the revegetation. Once distribution of backfill material is completed, the access road pathway will be removed as revegetation is completed. The removal of the Eccles Creek culvert, regrading and revegetation will be the last step of the haulroad reclamation. Access to the site will be through Boardinghouse Canyon on the existing jeep trail for maintenance and inspection of the site through bond release. The jeep trail to Boardinghouse Canyon across the top of the ridge west of the White Oak Complex will be used throughout the remainder of the reclamation process. This jeep trail from Boardinghouse Canyon will remain as part of the final reclamation. The installation of a jeep trail across the reclamation at the White Oak Complex will be completed after bond release by the landowner as specified in the Supplemental Agreement (see Appendix 1-2). Consent and letters of understanding or lease agreements will be obtained from the various land owners as per their requirements for White Oak to access their properties during reclamation activities and will be submitted to UDOGM prior to reclamation of the White Oak Complex or the White Oak Haul Road. See Appendix 1-2 for Lease Agreements.

Soils Replacement

During reclamation excavated materials will theoretically return the soils to the cut areas in the reverse sequence of the original excavation cycle. Harvesting the materials under this concept would place the "Pre-law topsoil and associated soils" last or at least intermingle them the lower strata soils (downcast materials) lastly, improving the cover material ("VSM") characteristics.

Those areas at the White Oak Complex and Loadout Facility areas studied by Cedar Creek Associates and depicted on Map 231.300 Sheets 1 through 4 identified as "proven" VSM, will be scalped to a depth 3" (inches) below the root zone. The area at the White Oak Complex, identified on Map R645-301-231-100 as VSM will be scalped to a depth of 9" (3" below the root zone of the VSM). This is an area of 3.6 acres and should yield 4,300 cubic yards of soil.

Scalped materials will be placed directly upon reclaimed areas or temporarily stockpiled and protected if it becomes necessary. The most suitable soils will be used as VSM, with the least suitable soils being used as fill material.

MAP 231.300 - SHEETS 1 THROUGH 4.
SUITABILITY OF TOPSOIL SUBSTITUTES VSM

Where possible or practical paddle wheel scrapers, dozers, and or backhoes will be used to scalp existing slopes of VSM before recontouring. Scraped material may need to be stockpiled on the lower pad area, near the No. 1 fan or on the storage yard area while recontouring takes place. The potential VSM harvested during construction of the Whisky Creek Channel will placed upon the newly configured slopes.

Once an area has been prepared (maximizing roughness), the "proven" VSM will be redistributed as uniformly as possible as soon as ground conditions allow in the spring. All VSM, whether stored or reharvested during reclamation, will be disc or broken up prior to placement. Preparation of the "proven" VSM will not occur unless seed bed preparation, planting, fertilization (if required) and mulching conditions are favorable and can follow immediately.

Test plots (required by OSM) were implemented in the late 1980's to demonstrate the suitability of in-situ materials and the necessary depth of cover needed. Results from these test plots will be utilized at least in part as well as the SCS recommendations and Division Guidelines to determine actual specifications for revegetation of the disturbed areas.

Ripping depth required for successful vegetative growth and soil stability will be determined at the time of reclamation with the aid of a soils and vegetation specialist when a more accurate determination of site specific soil conditions can be determined.

Runoff Conveyance Plan

The runoff conveyance plan for reclamation includes the re-establishment of well defined drainage channels for those channels which existed prior to mining, and the reshaping or recontouring of disturbed areas to help eliminate or control post mining runoff conditions. The reshaping and recontouring of disturbed areas is highly dependent upon stream channel design since grade control is critical to long term channel stability. Recontouring of adjacent land is secondary to the establishment of adequate and well defined drainage channels.

As required under the regulations, all ditch and culvert sections will be removed upon mine reclamation according to the Reclamation Plan provided by the Operator to the Utah Division of Oil, Gas & Mining. In general, mine reclamation as it relates to runoff control will proceed as follows: **White Oak Complex** - Ditches, culverts and Filter pond 005A not required for the surface mine drainage will be removed as the mining process crosses the area impacted by the operation. The ditches required for the surface mine will be installed. Once the surface mining operation is completed and the material from the temporary spoil storage pile is redistributed, Phase I will be completing the upper Whisky Creek restoration . Phase II will be the removal of ditches 1001,1002, and Dugout D-1. Upper Whisky Creek will be directed to C-40-42. Adequate spoil material left adjacent to the pond to be pushed into the pond to fill the void. The coal storage, truck loadout and loop and Pond 004a will be removed after coal reserves that would use these facilities are depleted. Phase I of this area would involve the removal of culverts and ditches remaining in the area except for culvert C-40-42 under the coal pad that Whisky Creek is diverted through. Phase II of the operation would be the restoration of the main Whisky Creek channel , the removal of Sedimentation Pond 004A, and the removal of any down stream portions of culvert C-40-42 covered with less than four feet of material

along with the removal of the White Oak Haul Road. Reclamation will start at Eccles Canyon and proceed to the south with culvert removal and reclamation proceeding simultaneously. Phase III would be the activation of the Whisky Creek Channel and the removal of at least forty feet of culvert C-40-42 from the upstream end. **Loadout Facility** - Phase I will include the removal of ditches and culverts, Phase II will include the removal UPDES discharge locations 001A through 003A. During Phase I, reclamation will generally proceed from upgradient to downgradient directions with culverts being removed as reclamation proceeds.

Mapping and design details associated with hydrologic mine reclamation is included within this Reclamation Plan on Maps 527 Sheets 1 through 16. As shown on the maps, surface drainage facilities have been designed where possible to convey all surface drainage waters from undisturbed areas above reclaimed mine areas, to downstream undisturbed areas. It is understood that any and all interim sediment control measures implemented as outlined below (such as straw bales or excelsior mats, etc.) will be removed subsequent to the required reclamation bonding period. It is also understood that all reclamation channels and/or structures will be renovated to the original design specification, including revegetation if required, at the termination of the reclamation bonding period.

MAP 527 - SHEETS 15 AND 16. RECLAMATION CHANNEL DETAILS

The following discussion provides a description of reclamation runoff conveyance facilities for all four general mine permitted areas, ie: the Loadout Facility, General Office, White Oak Haul Road, and White Oak Complex areas.

White Oak Loadout Facility

The long range plan for channel reclamation at the Loadout Facility includes 1) the construction of a rip-rap channel (RC-1) throughout much of the length of present culvert C-14-42, 2) the recontouring of

disturbed areas, and 3) the removal of sedimentation structures following successful reclamation. Loadout Facility reclamation details are shown on Map 527 - Sheets 1 through 3.

Drainage areas for the reclaimed Loadout Facility are not shown on mapping submitted because 1) the general drainage area is relatively narrow with small flow path lengths, and 2) the railroad tracks provide an effective hydrologic barrier. In essence, the tracks are an easterly hydrologic barrier wherein runoff water is prevented from moving from up-gradient hill-slopes to the east to regraded slopes west of the tracks.

The Operator and the D&RGW Railroad will concur on the inlet/outlet locations of culverts effecting their grade regarding postmining land use and the Pleasant Valley Agreement. Culverts not required for railroad right-of-way or access roads will be removed during reclamation. Culverts to remain following reclamation are shown in bold typeface on the reclamation drawings.

Hydrologic reclamation of the Loadout Facility will proceed initially with the construction of reclamation Channel RC-1. This channel is planned to be constructed first in order to divert the majority of undisturbed area waters through the reclaimed facility with minimal impact. Subsequent to the construction of this channel, the remaining area will be graded, reshaped, recontoured, and revegetated according to Reclamation Plans, details and specifications. Sediment Ponds 001A, 002A and 003A will be removed during the final stages of contour reshaping. Straw bales and the use of straw will be an integral part of sediment control until revegetation of the area has been completed. Straw bales of other sediment control

measures will be placed in a staggered pattern as discussed with UDOGM, and 2) that the erosion control devices will traverse the entire reclaimed area of the Loadout Facility where contours will be regraded. Final reclamation efforts will include the removal of existing undisturbed area diversion ditch UDD-1. Additional undisturbed area diversion ditches are not planned to be constructed prior to or during reclamation. Reclaimed channel RC-1 begins at a location approximately 300 feet east of the railroad tracks. The existing culvert passing beneath the railroad tracks will be modified in that the upstream and downstream sections will be removed, and replaced with the riprapped channel as shown in the design details. The riprapped channel design is based upon a 100 year - 6 hour precipitation event of 2.3 inches and a design flow rate of 23.0 cfs. Channel RC-1 has a five foot bottom width and uses a riprap D_{50} of 1.0 feet except at the reclaimed outlet of Culvert C-14-42 where it is 1.25 feet. All channels have a design freeboard of 0.5 feet which is essentially equal to the flow depth. Complete design details are shown on Maps 527 Sheets 1 through 3 and Sheets 12 through 16.

As shown on Map 527 Sheets 1 through 3, culverts C-1-32, C-4-42, C-14-42 and C-15-24 will remain in place as required for continued drainage of the railroad right-of-way. At the time of reclamation, a riprap pad will be installed at the outlet of all three culverts. The riprap pad design will be similar in nature to other adjacent railroad culverts not installed or owned by White Oak. The only exception to this will be that Culvert C-4-42 will be extended to Mud Creek in order to eliminate erosion on the reclaimed contour.

General Office Area

Because the office and related facility will remain upon reclamation (as discussed previously), no runoff modifications are planned. Checks were made however of the hydrologic capacities of the two culverts located adjacent to the office. Hydrologic calculations show that the culverts will pass the 100 Year - 6 Hour runoff event with a portion of the flow overtopping the culvert as sheet flow. This sheet flow is a planned part of design and will not negatively impact the integrity of the culvert.

White Oak Haul Road

In determining appropriate reclamation activities at each of the culverts along the White Oak Haul Road it should be remembered that the culverts may have differing functions. Some of the existing culverts found along the road are located to divert road runoff water while others have been placed at channel crossings in order to convey channelized runoff water across the White Oak Haul Road. During road reclamation those culverts currently conveying channelized runoff water from the upgradient watershed will be replaced with an erosion resistant channel as described hereafter. Culverts currently diverting road runoff water will not be replaced with designed channels because the post mining contours have generally been

designed so that flow will not travel parallel to the road cut. Reclaimed contours will generally create sheet flow, not concentrated channelized flow where channel design would be required.

Based upon the above mentioned observations, options for reclamation at existing culvert locations are 1) restore hill-slope contour to create sheet flow by filling excavated road areas to approximated natural grades with road fill materials, or 2) where natural channelization occurs design an erosion resistant channel.

It has been determined through observations made during site visits and through available data and mapping that culverts C-22-24, C-23-24, and C-27-24 do not require reclamation channel design because they are located in areas where reclaimed contours will develop local sheet flow. Culverts C-25-36 and C-28-24 will however require rip-rapped channel design, and culverts C-24-24, C-26-24, and C-26A-24 will require a "non rip-rap" erosion resistant channel design.

Existing culvert C-21-48 will be reclaimed to match natural grades and road fill grades as much as practical. Design has been completed for this channel reach as presented in Appendix R1.

Culvert No. C-25-36 at the "Big Fill", which carries the drainage from the Big Fill Area, will also be removed and the stream channel reconstructed (as shown on reclamation mapping) to the natural ground as much as possible. The majority of the fill is to be removed and utilized during reclamation at other reclamation sites within the Permit Area.

Channel Design Using Rip-rap. Two reclamation channels, RC-4 and RC-5 to be constructed along the White Oak Haul Road using rip-rap as the erosion protection medium. Channels RC-4 and RC-5 are located along the drainage channels currently occupied by culverts C-25-36 (often referred to as the "Big Fill" or the "Bowl" culvert) and C-28-24 respectively. At some point in the future if other more efficient methods of erosion protection become practical, the designs for both reclaimed channels should be re-evaluated.

The drainage occupied by culvert C-28-24 (reclaimed channel RC-5) has a total tributary area of 35 acres, an overall channel gradient of 34%, and a 100 year - 6 hour storm runoff design event of 7.84 cfs. A reclaimed rip-rap channel has been designed for the channel using the OSM "Steep Channel Rip-rap Design" criteria. Utilizing this design method for a 6 foot channel width; an average rip-rap size (D_{50}) of

0.75 feet and a total channel depth of 1.25 feet was calculated as being required. Design calculations are shown in Appendix R1 with plan and cross section details being shown on Map 527 Sheets 12 through 16.

The drainage occupied by culvert C-25-36 (reclaimed channel RC-4) has a channel gradient of 31.6%, a watershed of approximately 140 acres, and a 100 Year - 6 Hour precipitation event of approximately 34 cfs. Using the OSM "Steep Channel Rip-rap Design" method, a D_{50} of 1.5 feet and a channel bottom width of 6.0 feet was found to be adequate. Complete plan and cross section details are shown on Map 527 Sheets 12 through 16 with design calculations being presented in Appendix R1.

Channel Design using Vegetative Matting. Reclaimed channels C-24-24, C-26-24, and C-26A-24 are relatively small drainage channels located on steep side hills. Flows predicted for each of the channels are 1.2, 2.5, and 1.24 cfs with estimated slopes of 54, 57, and 48 percent respectively. The design of these ~~flowsonflows on~~ steep embankments is limited by 1) the ability of the channel to control the flow without flow and erosion, 2) the physical ability to construct the channel on the steep slope sections, and 3) by the long term stability of both the embankment and rip-rap. Even if rip-rap were adequately designed and could be placed effectively, concerns related to a potential slope failure subsequent to construction are important considerations.

In an effort to eliminate some of these concerns, an alternate method of erosion protection has been devised to protect the hillside and reduce the failure potential. Vegetative matting will be installed within the disturbed bottom portions of the newly formed reclaimed channels at the above mentioned locations. This vegetative matting is shown in Appendix R1 in schematic form. Note from the design details provided that the uppermost section of matting be buried two feet, with all upstream layers overlying downstream layers where joints are required. The downstream section would be buried at depth of one foot and all sides would be

staked to prevent movement. As an added measure, trees will be planted within all matted sections to ~~aid in~~aid in the long term stabilization of the channel. At least two trees (either deciduous or conifer per 10 foot length of each matted section. Through time, channel stabilization will occur through vegetative growth

from seeds within the matting itself as well as through root structure growth from natural or planted trees. Aspen or other rapid growth native vegetation are planned for use under these conditions.

White Oak Complex

Activities to be completed during reclamation of the surface mining activity are the redistribution of the temporary spoil storage pile, the restoration of the upper Whisky Creek, the placement of the stored topsoil and the revegetation. As vegetation becomes adequate in this area of reclamation Dugout D-1 will be removed and upper Whisky Creek will report directly to culvert C-40-42. When reclamation activities begin in the remaining area the activities to be completed are the removal of fill associated with the coal loadout pad; the restoration of the main Whisky Creek channel, the regrading of the coal storage pad and loadout area, the removal of Sediment Pond 004A and the regrading of that area; the removal of portions of culvert C-40-42 at both ends and plugging the ends with concrete 3 times the diameter; the placement of topsoil stored from the surface mining activity, and revegetation of this area. The removal of Sediment Pond 004A at this stage of reclamation is necessary because of general local topography and the pond's location. The pond is located within a relatively narrow canyon at the downstream end of the coal loadout pad. In order to prepare a reclamation design plan which would consider adequately the long term protection of the environment, the pond was removed. Main concerns with leaving the pond in place were that 1) it is located upon fill material, and 2) the discharge channel is excessively steep and could not adequately be design to ensure long term protection of the downstream embankment.

Whisky Creek is currently diverted beneath the coal loadout pad and sedimentation pond via a 42 inch corrugated metal culvert. Upon reclamation, the coal loadout pad will be removed and a new stream channel will be constructed. No culverts will remain subsequent to reclamation within the White Oak Complex area. Reclaimed channel RC-2 (as shown on Map 527 Sheets 12 through 14) extends from the inlet to Culvert C-40-42 to the downstream undisturbed sections of Whisky Creek. The general hydrologic drainages for the White Oak Complex area are relatively simple in nature and are therefore not shown on the detailed reclamation mapping. The drainage boundaries for this area are shown on Map R645-301-742-310b. Other drainage areas utilized during reclamation design as well as design calculations are however presented as part of Appendix R1.

The upper portion of Whisky Creek that presently reports to Culvert C-40-42 will be disturbed during the surface mining of the barrier coal and the initial phase of reclamation. A stream alteration permit for this area is included in Appendix R-1. The surface water flow on this portion of Whisky Creek will report to The active surface mining pit while the mining in the stream channel is occurring then to dugout D-1 pond for sediment control before reporting to Culvert C-40-42. The stream channel will be restored according to the stream alteration permit and the methods approved in the MRP. Dugout D-1 will be removed once adequate vegetation has been established in the drainage area it controls.

The reclamation channels as presented on Map R645-301-527(Reclamation Channel Details Sheets 15 and 16 of 16) have been designed to provide for the required conveyance of the 100 Year - 6 Hour precipitation event with a freeboard of 0.5 feet. The flow rate calculated for the entire White Oak Complex area is 32.2 cfs. This flow rate was used for the lower section of channel RC-2 below the confluence with channel RC-3. The upper section of RC-2 was calculated to have a design flow rate of 13.4 cfs. A design flow rate of 3.1 cfs was calculated and used in the design for channel RC-3. Reclaimed channel design calculations are included within Appendix R1 as required by the agency. With channel flow depths in the range of 0.5 feet, an additional freeboard depth of 0.5 feet provides adequate channel capacity for runoff design, and to protect against overtopping.

The maximum size riprap which is required for use in the reclamation channels has a D_{50} of 1.5 feet (Average diameter of 1.5 feet). This maximum rip-rap size was determined based upon the design criteria given by the average channel slope between undisturbed up-gradient and down-gradient channel sections. Maximum channel slopes at the White Oak Complex are approximately 12% and 33 % for channels RC-2 and RC-3 respectively. Complete channel plan and cross section details are shown on Maps 527 Sheets 1 through 16.

Sediment Pond 004A will remain intact as long as practical during the final reclamation phase of the mine area. As reclamation proceeds, excavation of the coal loadout pad material will reach a point where the construction of the restored Whisky Creek channel reach Sediment Pond 004A. At this time, Sediment Pond 004A will have to be removed to complete the channel restoration. Existing culvert C-40-42 will remain during construction of RC-2 in order to safely bypass area waters from Whisky Creek through the area. Upon completing construction of the reclaimed channels, forty feet of the culvert will be removed on the up stream end to activate the newly constructed channel and the adjacent hillsides will be 1)graded to the approximate final contour patterns shown on Map 527 Sheets 12 through 14, 2) revegetated and 3) protected against excessive erosion through the installation of alternate sediment control devices such as straw bales, etc.. The erosion control devices will been placed in a herringbone fashion using relatively short fence sections. The short sections are utilized in an effort to minimize the potential for a general fence failure due to wind or to another natural event. Because it is not possible to retain Sediment Pond 004A throughout the normal revegetation period, straw bales or erosion fencing will be placed on regraded slopes throughout the reclaimed area.

Water Quality Impacts of Runoff Conveyance Plan

The effects upon the surface water system due to reclamation activities is anticipated to be generally confined to increased sediment loadings during heavy construction periods. As required, all surface water sedimentation ponds found within the Loadout Facility area will remain in place until final reclamation in order to collect and retain disturbed area water. As a result, the majority of heavily sediment laden runoff will be contained within the respective sediment pond. No ponds will be removed during the initial phase of reclamation at the White Oak Complex. Dugout D-2 will remain in place until once vegetative cover on the reclaimed area up-gradient has been well established. Sediment Pond 004A located at the White Oak Complex must be removed during the final portions of reclamation when material is required for the reclamation of the White Oak Haul Road and the restoration of the Whisky Creek Channel RC-2 as discussed above. It is recognized that increased sediment loadings do occur with construction activities, and therefore increases in sediment loadings may occur until the area is regraded and vegetative growth is re-established. Attempts to mitigate these normal increases in sediment loadings the Reclamation Plan includes a timely revegetation program and the installation of straw bales (or other approved erosion control devices) downstream of all disturbed areas. Specifics related to reclamation timing and activities are found in a following section entitled "Timing and Reclamation Sequence".

Vegetation Requirements

Vegetation requirements required for reclamation are as outlined below. It is important to note that revegetation will generally require a 12 to 18 month delay between the time vegetation is ordered and the time it is ready for delivery. This delay indicates that vegetation required for reclamation should be ordered at the time reclamation begins during the initial period of structure removal so that it will be ready for planting upon completion of resurfacing operations.

Test Plot Studies

All results from test plot studies are contained in the following reports located in Appendix 341.300 of the PAP submitted in 1993.

Cover and Productivity Analysis of Temporary Revegetation Sites at Valley Camp of Utah, Inc.'s Utah #2 and Belina Operations", 1986, prepared by Cedar Creek Associates, Inc.

"1988 Results of Vegetation Sampling and Test Plot Monitoring", and "Summary of Vegetation Monitoring For The Utah & Belina Test Plots, 1988 - 1992", prepared by Mt. Nebo Scientific Research and Consulting.

Letters from Paul Baker, UDOGM Reclamation Biologist, dated August 31, 1992, and October 9, 1992. See Map 231.300 Sheets 1 through 4 for the locations of areas discussed in these letters.

Soil Characteristics

Soil characteristics are described in Section 200 of the "Operation Plan". Vegetation success resulting from interim reclamation suggests that the disturbed area materials are suitable for use as (VSM). The re-seeded cut/fill slopes, some with and some without topsoil, are supporting vegetation after two years of 200%+ of normal precipitation followed by several dry years. During this period the re-seeded slopes received no additional treatment. The only cut slopes which are not supporting vegetation are those which are nearly vertical. Map 231.300 Sheets 1 through 4, Suitability of Topsoil Substitutes, shows the re-seeded slope areas.

Areas containing "proven soil" are shown on Map 231.300, Sheets 1 through 4. The previous operator, Valley Camp of Utah, Inc., requested that the Soil Conservation Service evaluate Permit Area soils to determine the suitability of disturbed area materials as VSM. If the SCS determines that a soil survey is required then the Operator will furnish the SCS with necessary mapping. The results of the soil survey will be submitted to the Division for placement in the Reclamation Plan and a copy will also be submitted in the "Annual Summary".

During reclamation, re-contouring will take place as required and the re-contoured surfaces will be scarified. Any areas not containing "proven soils" will be sampled to determine suitability as a VSM. The samples will be tested for pH, texture, soluble Ca, Na, Mg, cation exchange capacity, nitrate, nitrogen, phosphorus, potassium, boron, selenium, acid/toxic forming potential, oil and grease, gasoline and diesel and associated benzene, toluene, ethylene, xylene, and naphthalene. All tests will be conducted according to EPA Guidelines. Acid/toxic forming material detected by the sampling and testing program, if any, will be replaced to prevent any detrimental effects to the environment. If required fertilizers, nutrients, and soil conditioners will be applied using acceptable methods and under favorable conditions as practicable.

Plant Type, Density, and Planting Procedures

The objective of the 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. The vegetative cover will be comprised of native species, or of introduced species which are compatible with the post-mining land use and with the natural plant and animal species of this area.

The Operator will comply with all applicable State and Federal regulations regarding seeds, poisonous and noxious plants, and introduced species. The Reclamation Plan will be accomplished in four phases described as follows:

1. Earthwork to prepare a stable seed-bed.

2. Planting of grasses and forbs to control erosion and to enhance habitat.

3. Planting of seedlings to further stabilize the soil and further enhance habitat.

4. Planting of riparian zones.

Earthwork. All areas to be reclaimed will be graded to the reclamation contours shown on Maps 527 Sheets 1 through 14. All surface grades will be roughened by dozer tracks and topsoil placed by methods that leave a roughened surface by gouging for water retention and certified weed free alfalfa at the rate 1 to 2 tons per acre will incorporated into the topsoil during this process for erosion control.

During earthwork every effort will be made to minimize disturbance to surrounding areas and existing vegetation. If disturbance is necessary the disturbed soil and vegetation will be relocated together as clumps if possible.

After the earthwork has been completed the soils will be tested as described above in the soils section and fertilizers, nutrients, and conditioners will be applied as needed. After seeding, it is anticipated that mulching will be required for erosion control using a combination of straw and wood fiber mulch. The straw is applied at a rate of one ton per acre after which the area is hydro-mulched with 500 pounds per acre of wood fibre mulch combined with 80 pounds per acre of tackifier. Fertilizer will be applied at the following rates if necessary in either granular or liquid forms:

N	30 pounds per acre.
P20	100 pounds per acre.
K20	100 pounds per acre.

These rates may be revised based on testing. With the approval of the Division available natural material such as brush, downed trees, rocks, etc. will be placed on the recontoured surfaces to achieve a more natural appearance and to enhance the habitat. It is not anticipated that husbandry practices will be employed at White Oak.

Grasses and Forbs. Normal time for seeding in Utah is best accomplished in the fall, especially in the higher evelations. The seeding for final reclamation will occur during this period. Broadcast methods will be used to plant grasses and forbs on reclaimed areas. Rates for seeding are shown in Table R-1. If possible, seeds will be gathered from areas adjacent to the reclaimed areas. Seeds not able to be gathered locally will be purchased from a certified supplier and will be warranted for use at reclamation sites.

Broadcast methods of seeding will be used on all slope grades found in the areas of reclamation. All seeded areas will be hydro-mulched. No seeding will be attempted on surfaces of exposed rock or where rock is so close to the surface that seeding is impractical.

Seedlings. Seedlings will be planted during the fall as soon as possible after seeding to take full advantage of the spring moisture. Where cuttings are used, they can be planted as early in the spring as possible. With proper care, such as stripping leaves, they can be planted later in the season. Soil roughening will provide microsites to collect moisture. These depressions will be used for seedling sites. Shrubs and trees will be grouped in areas to develop an edge effect for wildlife shelter. These grove areas will be located in areas where trees existed and near the restored stream channel. The types and planting rates of permanent seed mixtures to be used to reclaim mining facilities are shown in Table R-1.

Where possible revegetation stock will be harvested from areas adjacent to the areas being revegetated. If seedling stock cannot be gathered locally seedlings will be purchased from a certified supplier and shall be warranted for use at reclaimed sites. All stock will be properly stored and prepared prior to transplanting.

Following initial planting, additional seedlings will be planted if required in order to make the reclaimed areas match the surrounding undisturbed areas.

Noxious Weed Control. In order to control the infestation of noxious weeds in the reclaimed areas, a weed control program will be instituted. The program will consist of spraying after emergence and prior to flowering in the spring and in the fall. Application of 24D, Tordon, Escort or equivalent in direct application in small patches and area applications in large infestations. Topping of plants may also be used as a control method. Other methods of control may be instituted as recommended by County Weed Control and the Division.

Riparian Zones. All natural riparian habitat disturbed by mining operations will be reclaimed to premining condition. A vegetation survey was completed by JBR Environmental Consultants in the Whisky Creek channel that will be disturbed during the surface mining at the White Oak Complex. A minimum of 18% of the relocated stream channel will be riparian and will meet the cover and diversity standards that were measured and identified in the JBR study in Appendix 3-1. The revegetation plan for this area is derived from this report. See Appendix 3-1. Riparian zones will be established 5-10 feet on either side of the top width of reclaimed channels. Planting to occur after water flow has been re-established in the channel. Spring and fall planting seasons. These zones will be planted with willow slips and clumps gathered from adjacent areas, and appropriate sedges, shrubs and trees.

Removal Of Sedimentation Structures. Sedimentation ponds within the Permit Area will be removed and reclaimed at the end of reclamation contouring with the exception of Sediment Pond 004A which will be removed during the final stages of recontouring. Excavation of the coal loadout pad and the restoration of RC-2 Whisky Creek Channel at the mine will require removal of portions of Culvert C-40-42 and Sediment Pond 004A. During the construction of the channel, the adjacent hillsides will be graded to approximate final configuration as represented by the contours shown on Map 527 Sheets 12 through 14, and then revegetated. Because Sediment Pond 004A will not be retained during the reclamation period straw bales (or other acceptable erosion control devices) will be installed in a herringbone patter to prevent excessive erosion and minimize the potential for, and effects of partial failure. At the end of the reclamation period, bypass ditches UDD-2 through UDD-5 and all erosion control devices will be removed.

TABLE R-1.
APPROVED RECLAMATION GRASSES, WILDFLOWERS AND FORBS, LEGUMES, TREES AND SHRUBS PERMANENT SEED MIXTURES

SPECIES—	PLS LBS/AC
WHITE OAK LOADOUT FACILITY	
GRASSES: Any 5 species of approved grasses listed below will be planted.	
	4.0
Agropyron smithii - Western wheatgrass	4.0
~~4.0~~	5.0
Agropyron dasystacyum - Thickspike wheatgrass	2.0
~~4.0~~	0.2
Bromus marginatus – Mountain Brome	1.0
~~5.0~~	
Elymus cinereus – Basin Wild Rye	
~~2.0~~	
Poa pratensis - Kentucky bluegrass	
~~0.2~~	
Stipa comata - Needle and Thread grass	
FORBS: Any 5 species of approved forbes listed below will be planted.	
	0.1
Artemisia ludoviciana - Prairie sage	0.5
~~0.1~~	1.0
Aster glaucodes - Blueleaf aster	1.0
~~0.5~~	0.5
Hedysarum boreale - Utah sweetvetch	
~~1.0~~	
Linum lewisii - Blue flax	
~~1.0~~	
Penstemon strictus - 'Bandera' Rocky Mountain penstemon	
SHRUBS:	
	0.1
Artemisia tridentata vaseyana - Mountain big sagebrush	0.5
~~0.1~~	
Chrysothamnus nauseosus - Rubber rabbitbrush	

SPECIES—	PLS LBS/AC
SHRUBS: ~~(Hand sets/acre)~~	
~~Amelanchier alnifolia - Saskatoon Serviceberry~~	300
~~300~~	300
~~Purshia tridentata - Bitterbrush~~	300
~~300~~	300
~~Rosa Woodsii - Woods rose~~	
~~300~~	
~~Symphoricarpos oreophilus - Mountain snowberry~~	
~~300~~	
~~TREES~~ : (Hand sets/acre) -Any combination of 2 species of hand sets shrubs will be planted.	
Amelanchier alnifolia - Saskatoon Serviceberry	
Purshia tridentata - Bitterbrush	
Rosa Woodsii - Woods rose	
Symphoricarpos oreophilus - Mountain snowberry	
TREES: (Hand sets/acre)	
Abies Concolor - White fir	50
~~50~~	250
Populus tremuloides - Quaking aspen	
NOTE: Seed application is calculated for a broadcast application.	
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~~October, 2001~~	
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~~SPECIES PLS LBS/AC~~	
RIPARIAN AREAS - WHISKY ~~CREEKGRASSES~~CREEK	

SPECIES	PLS LBS/AC
GRASSES:	
Carex microptera - Smallwing sedge	2.0
~~2.0~~	1.0
Juncus longistylis - Longstyle rush	1.0
~~1.0~~	2.0
Equisetum arvense - Field horsetail	1.0
~~1.0~~	2.0
Scirpus cespitosus - Tufted bulrush	2.0
~~2.0~~	
Poa reflexa - Nodding bluegrass	
~~1.0~~	
Hordeum brachyantherum - Meadow barley	
~~2.0~~	
Elymus glaucus - Blue wildrye	
FORBS:	
Ranunculus alismaefolius - Dwarf buttercup	1.0
	1.0
	1.0
~~1.0~~	1.0
Rudbeckia occidentalis - Western coneflower	
~~1.0~~	
Mimulus guttatus - Seep monkeyflower ~~1.0~~	
Wyethia mollis - Wooly wyethia	
SHRUBS: (Hand sets/acre)	
Mahonia repens - Creeping Oregon grape	300
~~300~~	300
Rubus idaeus sachalinenis - American red raspberry	2,000
~~300~~	
Symphoricarpos albus - Common snowberry	
WHITE OAK COMPLEX AND UPPER AND LOWER SECTIONS OF THE WHITE OAK HAUL ROAD	
(ALL ASPECTS)	**PLS LBS/AC**

GRASSES: Any 5 species of approved grasses listed below will be planted.	
Agropyron spicatum - Bluebunch wheatgrass ~~3.0~~	3.0
Agropyron smithii - Western wheatgrass ~~4.0~~	4.0
Agropyron trachycaulum - Slender wheatgrass ~~3.0~~	3.0
Bromus marginatus - Mountain brome ~~5.0~~	5.0
Poa Canbyi - Canby bluegrass ~~0.4~~	0.4
Poa pratensis - Kentucky bluegrass ~~0.25~~	0.25
Stipa columbiana - Columbia needlegrass ~~1.0~~	1.0
Stipa lettermannii - Letterman's needlegrass	1.0
FORBS: Any 6 species of approved forbs listed below will be planted.	
Viguiera multiflora - Showy goldeneye ~~0.2~~	~~Page R-27 of 35~~ ~~October, 2001~~
Achillia millefolium – Yarrow ~~0.2~~	~~SPECIES~~ ~~PLS~~
Hedysarum boreale - Northern sweetvetch ~~1.5~~	~~LBS/AC~~ 0.2
Aster engelmannii - Engelmann aster ~~0.5~~	0.2
Rudbeckia occidentalis - Western coneflower ~~1.0~~	1.5
Lupinus sericeus - Silky lupine ~~2.0~~	0.5
Penstemon strictus - 'Bandera' Rocky Mountain penstemon ~~0.5~~	1.0
	2.0
	0.5

SPECIES	PLS LBS/AC
SHRUBS: (Hand sets/acre) -Any combination of 3 species of hand set shrubs will be planted.	
-Ribes cereum - Blue currant ~~300~~	300 300
-Sambucus coerulea - Blue elderberry ~~300~~	300 300
-Symphoricarpos oreophilus - Mountain snowberry ~~300~~	300 300
Prunus virginia - Chokecherry ~~300~~	300
Mahonia repens - Oregon grape ~~300~~	
Rosa woodsii - Woods rose ~~300~~	
Pachystima myrsinites - Mountain lover (north aspect)	
(SOUTH-WEST FACING ASPECTS)	
TREES: (Hand sets/acre)	
-Populus tremuloides - Quaking aspen ~~400~~	400
(Aspen will be placed on 5' to 6' centers in 1/4 - 1/2 acre clumps/acre)	
(NORTH-EAST FACING ASPECTS)	
TREES: (Hand sets/acre)	
-Abies Concolor - White fir ~~200~~	200 150 200
-Abies laiocarpa - sub-alpine fir (Balsum fir) ~~150~~	
-Picea pungens - Blue spruce	

MONITORING AND MAINTENANCE

During Reclamation

The Reclamation Plan includes continued monitoring and maintenance of constructed facility throughout the reclamation period by qualified individuals who can certify as to the current status of conditions or facility. All surface features included within the plan are covered by this monitoring and maintenance plan including wholly or partially constructed items including runoff conveyance channels, erosion control devices, and re-vegetated areas.

Construction Observation

Personnel will be assigned to observe ongoing construction related activities throughout the reclamation period. These activities will include the observation of all construction operations. Initial observation activities will consist of reviews of the removal of surface related facility where after excavation, re-contouring, channel construction and revegetation will be observed.

Environmental Observation

Stockpiled topsoil material excavated from fill areas which will not be placed during the construction season in which it was removed will be stabilized with seed during the first normal period favorable for planting. In should placement not be planned during the construction season and erosion control measures will be implemented. These actions will protect the pile from environmental degradation.

The effects upon the surface water system due to reclamation activities is anticipated to be generally confined to increased sediment loadings during heavy construction periods. As required, all surface water sedimentation ponds will remain in place until final reclamation in order to collect and retain disturbed area water. As a result, the majority of heavily sediment laden runoff will be contained within the respective sediment pond. It is recognized however that increased sediment loadings do occur with construction activities, and therefore increases in sediment loadings may occur until the area is re-graded and vegetative growth is re-established.

Water Quality Monitoring

Water quality sampling will continue throughout the reclamation period as required under Section 700 hydrology regulations according to the approved analytical schedule shown in the MRP in Table 731.211a. Water quality data collected during this period will be reviewed and compared to data collected during baseline and operational monitoring periods to identify impacts related to ongoing reclamation activities. Current plans include a proposal to drop operational and baseline water monitoring stations which lie outside surface disturbance areas within the first five years subsequent to the cessation of mining. However, the water monitoring program as accepted at the time of reclamation will be followed until a formal request for monitoring program modification has been submitted to, and accepted by the regulatory agency.

Post Reclamation

Prior to abandoning the Permit Area or seeking bond release, an aerial survey will be completed and used to generate final configuration contour maps ("Certified as-built maps") as evidence that all temporary facility have been removed, all areas have been reclaimed, and that all permanent structures exhibit stability. Specific monitoring and maintenance plans include:

Erosion Protection

Erosion pins will be placed on slopes at the time of re-seeding operations using a table of random numbers to determine location. These pins will then be used as a guide to overall erosion characteristic of the reclaimed area. All rills or gullies which form in areas that have been re-graded and topsoiled and which either; disrupt the approved postmining land use or the reestablishment of the vegetative cover, or cause or contribute to a violation of water quality standards for receiving streams will be filled, re-graded, or otherwise stabilized; topsoil will be replaced; and the areas will be re-seeded or replanted. All slopes will be monitored for such failures and corrected within 60 days of detection (unless environmental

conditions limit restoration under which condition correction will occur at the earliest period feasibly possible).

The effectiveness of in place erosion control devices and practices will be based upon the "Erosion Condition Classification System - Technical Note - Method for Evaluation of Erosion of Reclaimed Coal Lands in Western United States" (Office of Surface Mining, 1990) or another definable method agreed upon by both the Division and the Operator.

Adequate siltation structures to help prevent or control erosion will be maintained until the site has been vegetated and stabilized and either approved to be left or removal is authorized by the Division. If these structures are removed the affected area will be re-vegetated in accordance with this Reclamation Plan.

Annual site visits planned in conjunction with the Division of Oil, Gas & Mining will review erosional conditions and document possible problem areas.

Subsidence Monitoring

The Subsidence Monitoring Plan outlined within Section 525 of the "Operation Plan" will continue for at least five years following reclamation of the underground portal areas and the completion of the surface mining at the White Oak Complex.

Water Quality Monitoring

The post reclamation water quality monitoring program will continue at all White Oak Complex and Loadout Facility monitoring stations as either currently outlined within Section 700 of the "Operation Plan" or then approved by the regulatory agency. Monitoring will continue throughout the mine reclamation time period and bond release. Sampling will continue at both existing up-gradient and down-gradient water quality monitoring stations in order to obtain data which will reflect changes in water quality from reclaimed sites. These samples will provide water quality documentation necessary for bond release.

Vegetation Monitoring

Vegetation monitoring will use approved methodologies and will be completed during the middle of each growing season during which time it is most feasible to conduct cover and composition studies. Annual monitoring will occur over the entire reclamation area during the first 5 years of the reclamation period whereafter monitoring will be selectively reduced. Final acceptance and or modification to the monitoring program will be based upon a 90% statistical standard of reclaimed cover and composition to undisturbed cover and composition. In areas in which a cover of 90 percent of reference area cover is achieved, monitoring will be reduced to once every 5 years until bond release. Areas will be reevaluated for which a cover less than 90% is achieved within the initial 5 year period. Modification to revegetation efforts or other corrective action will be taken if the reevaluation so indicates that such measures are warranted. If corrective action is warranted and/or taken, annual monitoring will continue for an additional five year time period, until bond release, or until 90% of reference cover is obtained.

Techniques used to determine percent cover and composition of revegetated areas will be consistent with those recommended by the Division or is standard monitoring practice at the time of reclamation. Transplant survival will be monitored for the first 3 years. Data regarding cover, productivity, and woody plant density, will be collected, using acceptable statistical techniques, for reclaimed areas and reference areas during the last 2 years of the reclamation period.

Success of revegetation will be judged on the effectiveness of the vegetation for the approved postmining land use, the extent of cover compared to the extent of cover of the respective reference area or other approved success standard, and the General Requirements of Section 353. Reference areas for each reclaimed surface will be taken as those undisturbed areas found adjacent to the reclaimed surface. Reference areas are shown on map R645-301-323.100. Two types of reference areas are indicated. The first containing sagebrush and the second grass-forbs-elderberry communities. Reference areas will come from those areas shown in Table R-2. The diversity will be determined by the use of three methods of comparison between the reclaimed land and the reference areas. These are measures of the mean number of species encountered per sample, the total number of species (species richness), and the MacArthur's Index.

TABLE R-2.
VEGETATION REFERENCE AREAS

Permit ~~Area~~	**Reference ~~Area~~**	**Comment**
White Oak ~~—~~Loadout Facility	Slopes above White Oak Loadout Facility	Reference area will apply to reclaimed slopes (except for ~~White Oak~~ ~~White Oak~~ areas immediately adjacent to Mud Creek) ~~Loadout Facility~~ ~~Loadout Facility~~
	Land ~~A~~adjacent to Mud Creek	Reference area will apply to reclaimed areas immediately ~~Mud Creek~~ adjacent to Mud Creek
General Office	N/A	No reclamation ~~is~~ planned
White Oak Haul~~-~~ Road	Whisky Canyon	Reference areas lie immediately up-gradient of reclaimed ~~Road~~ road sections
White Oak~~—~~ Complex	Whisky Canyon	Reference areas lie immediately up-gradient of the reclaimed ~~Complex~~ area

TIMING AND RECLAMATION SEQUENCE

The timing and reclamation sequence are an integral part of the Reclamation Plan since each phase of reclamation is dependent upon other phases. An overall sequence for reclamation includes Demolition and Cleanup, Scalping of Slopes for VSM's, Construction of Runoff Control Channels, Recontouring of Slopes, and Revegetation. The speed at which each of these activities can be accomplished varies greatly depending upon the area to be reclaimed. For example, the Loadout Facility can be reclaimed much more

easily and quickly than can the White Oak Complex simply because of location and accessibility.

The overall operational sequence for reclamation will span several years and will include the activities outlined in the following reclamation time table. Specifics regarding each activity follow Table R-3.

TABLE R-3.
RECLAMATION TIME TABLE

~~ACTIVITY 1 2 3 4 5 Period until Bond Release WHITE OAK LOADOUT FACILITY~~

emolition ~~and Cleanup (Salvage Operations)~~

~~Harvest Vegetation-Supporting Material[1] (VSM)~~

~~YEAR~~

~~ACTIVITY 1 2 3 4 5 Period until Bond Release~~

~~Construction of Runoff Control Channels[1,2]~~
~~Slope Recontouring[1,2]~~
~~Revegetation~~

YEAR						
ACTIVITY	1	2	3	4	5	Period until Bond Release
WHITE OAK LOADOUT FACILITY						
Demolition and Cleanup (Salvage Operations)						

Harvest Vegetation-Supporting Material[1] (VSM)						
Construction of Runoff Control Channels[1,2]						
Slope Recontouring[1,2]						
Revegetation[1,3]						
Monitoring and Maintenance[4]						

GENERAL OFFICE AREA

N/A

~~General Office to Remain.~~

General Office Area to Remain

No reclamation planned

~~WHITE OAK HAUL ROAD~~

~~Remove asphalt, road base, guard rails[5] and culverts.~~

~~Slope Recontouring[6]~~

~~Construction of Runoff Control Channels[7]~~

~~Revegetation[8]~~

~~Monitoring and Maintenance[4]~~

~~WHITE OAK COMPLEX (Surface Mining Area)~~

~~Redistribution of Temporary Spoil Storage~~

~~Slope Recontouring[2,10]~~

~~Construction of Upper Whisky Creek Channel[2]~~

~~Distribution of Topsoil~~

YEAR

ACTIVITY	1	2	3	4	5	Period until Bond Release
WHITE OAK HAUL ROAD						
Remove asphalt, road base, guard rails[5] and culverts.						
Slope Recontouring[6]						
Construction of Runoff Control Channels[7]						
Revegetation[8,10]						
Monitoring and Maintenance[4]						

TABLE R-3.
RECLAMATION TIME TABLE (continued)

	YEAR					
ACTIVITY	1	2	3	4	5	Period until Bond - Release
WHITE OAK COMPLEX (Surface Mining Area)						
Redistribution of Temporary Spoil Storage						
Slope Recontouring [2,10]						
Construction of Upper Whisky Creek Channel[2]						
Distribution of Topsoil						
Revegetation[8,10]						
Monitoring and Maintenance[4]						
WHITE OAK COMPLEX (Coal Storage & Truck Loadout Area)						
Demolition and Cleanup (Salvage Operations)						

Harvest Vegetation-Supporting Material[9] ~~(VSM)~~ (VSM)					
Construction of Whisky Creek Channel[2]					
Slope Recontouring[2,10]					
Revegetation[8,10]					
Monitoring and Maintenance[4]					

NOTES:

1. Timing of reclamation activities may vary slightly due to the possibility of the loadout area being used as a temporary storage facility for reclamation materials such as riprap. If upon reclamation it is found that the area is not needed for storage, then reclamation recontouring will begin in year 2. If it is needed, then recontouring will begin during year 4.

2. The construction of stream channel and the construction of recontoured slopes may occur simultaneously within the reclamation area.

3. Slopes will be revegetated at the earliest time in which establishment of growth will be most promising as indicated by seed and plant suppliers.

4. All aspects of reclamation will be monitored according to the schedule previously discussed.

5. Road must remain during first year of reclamation to facilitate the removal of all surface facility and or the delivery of equipment and supplies required for reclamation.

6. Recontouring efforts will begin at the lower end of the White Oak Haul Road and proceed upgradient to the big fill midway to allow for the importation of rock and fill material from the excavation of the White Oak Complex. A narrow trail to allow equipment movement will remain at the top of the fill material until the removal of the big fill occurs during the final recontouring during revegetation.

7. The construction of runoff control channels will proceed as reclamation of the road progresses upgradient.

8. Because of limited access once reclamation has been completed, the White Oak Haul Road will be revegetated in segments. Revegetation will follow localized resurfacing efforts.

9. Scalped or scraped White Oak Complex materials may require stockpiling for later use. Storage location options include the upper and/or lower pad areas. The potential VSM harvested during construction of the Whisky Creek Channel will be placed upon adjacent newly configured slopes or along the Haul Road.

10. Final regrading, recontouring and revegetation of access roadways may be delayed upon the completion of all other reclamation activities in order to provide continued access to the property should maintenance be required prior to bond release.

White Oak Loadout Facility

Surface reclamation of the Loadout Facility all occur with relative ease due to the general nature of the facility and property access. Reclamation activities will begin with the removal and salvage of all surface facilities located on the site with the exception of two railroad lines not associated with the Loadout Facility, an access roadway to the railroad and concrete foundations buried 18" below final grade. During year 1 it is planned that all surface facility will be removed with the exception of those facility discussed. Sediment Ponds 001A, 002A and 003A will be removed during the final phases of recontouring whereafter alternative sediment control measures will be implemented according to best technology currently available at the time of reclamation. The sediment ponds will be removed as part of the recontouring effort since 1) the ponds are too high to receive reclaimed area surface runoff water, 2) natural runoff characteristics (including premining railroad culvert locations) will not allow for concentration of flows to existing sediment pond locations, and 3) if left, a significant area would require redisturbance upon final pond reclamation thereby destroying several years of vegetative growth.

As indicated as a footnote to Table R-3 there is a possibility that the Loadout Facility will be required as a holding or storage area for reclamation materials including such items as machinery or channel riprap. If requested by the reclamation contractor, restoration of the surface of the Loadout Facility area will be postponed until it is no longer needed. Surface drainage facility capable of diverting runoff waters away from disturbed areas as well as those required to capture and treat disturbed area waters will be maintained throughout this period. Recontouring of the Loadout Facility will be begin as soon as it is no longer needed for reclamation activities or storage.

General Office Area

No reclamation is planned for the General Office Area consistent with its planned post mining land use.

White Oak Haul Road

Reclamation of the White Oak Haul Road will begin during year 2 of the reclamation of the coal storage and truck loadout at the White Oak Complex. The road will remain open during year 1 to allow the removal of the remaining surface facilities associated with the White Oak Complex. At the beginning of year 2 or 3, the removal of road surface, concrete and guardrail will occur. Surplus fill material will be moved from the mine site and placed on the roadway raising the elevation of the access. Once this material is placed and the mine site has been completely regraded, the final regrading and revegetation will start at the mine site working downgrade to the big fill area. The big fill area will be regraded moving surplus material down the road grade with final grading and revegetation following. The culvert in Eccles Canyon will be removed last thereby requiring future access to the White Oak Complex area via Boardinghouse Canyon. ~~Reclamation of the road must begin at the bottom and work to the top because fill materials being used will be generated from fill currently at the mine site.~~ Timing and sequence of reclamation operations will be coincident with those occurring at the White Oak Complex as shown in Table R-3.

White Oak Complex

Surface reclamation of the White Oak Complex will begin during the surface mining of the barrier coal. The facilities located in the bench prepared to access White Oak No.1 will be removed upon the completion of underground mining activity in the White Oak No.2 mine. The surface mining process will be completed in 14 to 20 months. During that time, the removal and salvage of all surface facilities located on the site with the exception of concrete foundations buried 18" below final grade. After surface mining is completed the completed installation of upper Whisky Creek and the redistribution of the temporary spoil storage pile will be completed along with the re-contouring of the area. The coal storage tube and belt, the truck loadout and the possibly the well located near the bottom of Sediment Pond 004A and Sediment Pond 004A will be reclaimed later with the White Oak Haulroad. The final reclamation of the remainder of the site will begin once the site is no longer necessary for the transporting of coal from adjacent reserves. Year 1 of the final reclamation of the White Oak Complex will consist of removal of the remaining facilities and cleanup and the start of harvest of any useable VSM from slopes to be re-contoured.

Year 2 of the reclamation of the surface mining area will involve topsoil distribution and the start of revegetation. Year 2 of final reclamation of the lower mine site will consist of the initial phases of fill removal from the coal storage pad and truck loop and the construction of the main Whisky Creek channel. During this phase re-contouring will occur. Once the stream reconstruction reaches sediment pond 004A, Sediment Pond 004A will be removed since it is located upon fill material to be used along the haul road as well as the White Oak Complex. Because the sediment pond must be removed in order to reclaim the road, a variance from Section 763.100 must be granted. It is anticipated that existing culvert C-40-42 will remain

As indicated as a footnote to Table R-3 there is a possibility that the Loadout Facility will be required as a holding or storage area for reclamation materials including such items as machinery or channel riprap. If requested by the reclamation contractor, restoration of the surface of the Loadout Facility area will be postponed until it is no longer needed. Surface drainage facility capable of diverting runoff waters away from disturbed areas as well as those required to capture and treat disturbed area waters will be maintained throughout this period. Recontouring of the Loadout Facility will be begin as soon as it is no longer needed for reclamation activities or storage.

General Office Area

No reclamation is planned for the General Office Area consistent with its planned post mining land use.

White Oak Haul Road

Reclamation of the White Oak Haul Road will begin during year 2 of the reclamation of the coal storage and truck loadout at the White Oak Complex. The road will remain open during year 1 to allow the removal of the remaining surface facilities associated with the White Oak Complex. At the beginning of year 2 or 3, the removal of road surface, concrete and guardrail will occur. Surplus fill material will be moved from the mine site and placed on the roadway raising the elevation of the access. Once this material is placed and the mine site has been completely regraded, the final regrading and revegetation will start at the mine site working downgrade to the big fill area. The big fill area will be regraded moving surplus material down the road grade with final grading and revegetation following. The culvert in Eccles Canyon will be removed last thereby requiring future access to the White Oak Complex area via Boardinghouse Canyon. Reclamation of the road must begin at the bottom and work to the top because fill materials being used will be generated from fill currently at the mine site. Timing and sequence of reclamation operations will be coincident with those occurring at the White Oak Complex as shown in Table R-3.

White Oak Complex

Surface reclamation of the White Oak Complex will begin during the surface mining of the barrier coal. The facilities located in the bench prepared to access White Oak No.1 will be removed upon the completion of underground mining activity in the White Oak No.2 mine. The surface mining process will be completed in 14 to 20 months. During that time, the removal and salvage of all surface facilities located on the site with the exception of concrete foundations buried 18" below final grade. After surface mining is completed the completed installation of upper Whisky Creek and the redistribution of the temporary spoil storage pile will be completed along with the re-contouring of the area. The coal storage tube and belt, the truck loadout and the possibly the well located near the bottom of Sediment Pond 004A and Sediment Pond 004A will be reclaimed later with the White Oak Haulroad. The final reclamation of the remainder of the site will begin once the site is no longer necessary for the transporting of coal from adjacent reserves. Year 1 of the final reclamation of the White Oak Complex will consist of removal of the remaining facilities and cleanup and the start of harvest of any useable VSM from slopes to be re-contoured.

Year 2 of the reclamation of the surface mining area will involve topsoil distribution and the start of revegetation. Year 2 of final reclamation of the lower mine site will consist of the initial phases of fill removal from the coal storage pad and truck loop and the construction of the main Whisky Creek channel. During this phase re-contouring will occur. Once the stream reconstruction reaches sediment pond 004A, Sediment Pond 004A will be removed since it is located upon fill material to be used along the haul road as well as the White Oak Complex. Because the sediment pond must be removed in order to reclaim the road, a variance from Section 763.100 must be granted. It is anticipated that existing culvert C-40-42 will remain

in place until completion of the main Whisky Creek channel. The area will be final graded , topsoil and revegetation will be started in the non-riparian areas. Where after, the culvert will be partially removed and capped and the stream diverted through the new channel. Once the new channel has water, the revegetation of the riparian areas can proceed. Because of limited construction seasons and the fact that removal of fill can proceed only as fast as fill can be utilized on the White Oak Haul Road, it is anticipated that channel construction and re-contouring may require an approximate two year time period as shown in Table R-3.

When re-contoured, these areas will be re-vegetated and protected against erosion through the use of alternative erosion control devices in a timely manner subsequent to final grading. It is planned that any existing undisturbed area bypass ditches will remain in place as throughout the reclamation construction period. These ditches will help reduce the amount of surface runoff water which will traverse the area thereby reducing the potential for damage to newly reclaimed hillsides.

WHISKY CREEK STREAM RESTORATION

The Division of Water Rights has approved a plan for the relocation and restoration of the upper portion of Whisky Creek that will be affected by the surface mining at the White Oak Complex. See approval and attached plan in Appendix R2. This plan contains general structure and stream bed material placement drawings and dimensions that will be utilized during the stream restoration.

A survey of the present stream was completed from late May to early August 2001 along with a vegetation study of the stream by JBR Environmental Consultants, Inc. in mid-August of 2001. These two surveys were enacted to determine the stream characteristics and vegetation that is occurring in the upper Whisky Creek drainage.

The stream survey set out to determine the slope of the actual stream. Features such as drop structures, channel width and depth, flood plains, stream meander frequency and amplitude, formation, frequency, and dimension of pools. Bottom samples were taken along the channel to determine the size fraction of the material in the bottom of the stream. Pictures were taken during spring flow during snow melt and also in August during the no flow period of late summer and winter. The data and pictures with descriptions along with profiles and cross-sections are included in Stream Restoration Plan Section.

The design to restore the upper portion of Whisky Creek will use empirical data and sound engineering design principles . Lodestar intends to replace the stream with features that occurred naturally at the before stream slopes in the restored stream slopes. These features will come from the collected data from the natural stream rather than an unnatural engineered channel. Plans are to recover material from the bottom of the channel for application to the restored stream channel. The average width of ten feet and a depth of one foot will be retained for the length of the section of stream to be disturbed. This collection will occur after the installation of Dugout D-1 pond for sediment control.

The restoration of the stream channel will start once the spoil material has been placed and rough graded in the area where the relocated stream channel is to be installed. Construction is planned to start after the end of spring runoff. In the event of the formation of an erosion channel, this channel will be used were possible in the stream restoration process. Material in the stream channel bottom will be compacted prior to the installation of the drop structures. The areas around the structures will then be re-compacted. The types of structures and channel characteristics will be modeled from the natural data collected and applied to the similar slopes of the restored channel. Natural materials, rock and logs will be incorporated in the installed structures. The channel meanders and pools will be incorporated in the flatter slopes. The natural materials collected at the start of the project will then be distributed in and along the restored channel.

RECLAMATION COSTS

Reclamation cost estimates have been developed for major tasks including the removal of buildings, the removal of facility, earthwork, and revegetation. A summary breakdown of estimated costs developed for each category and the methods used to determine costs are identified along with calculation details in Appendix R3.

Reclamation Plan

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RECLAMATION PLAN

INTRODUCTION

This Reclamation Plan has been developed based upon information contained within the 1990 permit submittal made by Valley Camp of Utah, Inc. (now White Oak) as well as information obtained subsequent to that submittal as required under regulations promulgated by the Utah Division of Oil, Gas & Mining (UDOGM). The existing reclamation agreement is found in Appendix R-4. This plan was developed for the purpose of showing and explaining how the Operator will reestablish the disturbed areas created during mining, to conform with the contiguous environment. This submittal contains a narrative regarding the Reclamation Plan and activities as submitted and discussed with UDOGM personnel on various occasions. The following narrative does not respond to the regulations in a regulation by regulation format since it was determined in conjunction with UDOGM personnel prior to it's compilation that a story book format would be more conducive to review. The following Reclamation Plan has been separated into the major sections with content as described in the following table.

SECTION	CONTENT
HISTORICAL OVERVIEW	A discussion related overall reclamation, its history and current status
RECLAMATION REQUIREMENTS	General requirements of the R645 rules which apply to all other sections of the plan.
RECLAMATION DETAILS	A physical description of each aspect of reclamation
MONITORING AND MAINTENANCE	Monitoring and maintenance requirements both during and after reclamation activities
TIMING AND RECLAMATION SEQUENCE	An outline of reclamation activities to be completed along with a time schedule for completion
RECLAMATION COSTS	Summary of reclamation costs based on the plan

This plan has been developed in such a way that reclamation operations will be carried out according to regulations required under Sections 240, 340, 540, 640, and 760. Bonding and insurance requirements are met as per Section 800 of PAP Volume 1. General concepts and intent associated with the Reclamation Plan include the following major points:

At such time that the mining activities are completed, the Operator will close, backfill or otherwise permanently reclaim all affected (disturbed) areas and restore the hydrologic system in accordance with the R645 Rules and the approved Reclamation Plan.

No public road was or will be relocated in conjunction with mining and reclamation activities.

Reclamation activities will be confined to disturbed permitted areas and will not involve the disturbance or relocation of public transportation facilities or corridors.

All utility installations associated with reclamation operations will also be conducted in a manner which minimizes damage, destruction, or disruption of services provided by oil, gas, and water wells; oil, gas, and coal-slurry pipelines, railroads; electric and telephone lines; and water and sewage lines which pass over, under, or through the Permit Area, unless otherwise approved by the owner of those facilities and the Division.

It was the intent of the previous Operator to utilize the General Office Area and accompanying property (with associated runoff control facilities) located west of the loadout facilities and Highway 96 as an intermountain office facility which would have excluded it from reclamation activities (see Map 527 Sheet 4). If it is decided at a later date by White Oak not to utilize the property this manner or to sell or donate it to another entity which desires the facility, then the General Office Area will be reclaimed under the same guidelines agreed upon for the Loadout Facility, where-after complete reclamation details will be provided to UDOGM.

At present the Operator does not propose the use of cut-and-fill terraces in conjunction with the Reclamation Plan. However, as part of reclamation, benches and grade breaks will be incorporated into surface contouring for the purpose of enhancing vegetation and wildlife habitat.

The White Oak No. 1 & 2 Mines (formerly known as Belina No. 1 & 2 Mines) were developed by Valley Camp of Utah, Inc. and do not contain any previously mined areas within the current mine plan area which have been or are proposed to be re-mined. The surface mining at the White Oak Complex will be conducted within 500 feet of the inactive White Oak #1& #2 Mines. The Utah No. 2 Mine within the Loadout Facility area does however, encroach upon old Utah No. 1 Mine disturbed areas, but the Loadout facility will be reclaimed in its entirety.

Sediment removed over time from local ponds within both the Loadout Facility Area and White Oak Complex areas will be used in the reclamation process as long as the sediment is found to be non-toxic.

The revegetation on all disturbed land by the coal mining and reclamation operations will be done as contemporaneous as possible.

Reclamation of each disturbed area will begin during the first appropriate season following the time when that area becomes available for such activities.

Once an area has been prepared (maximizing roughness), the Vegetation-Supporting-Material (VSM) will be redistributed in ranges of thickness appropriate to the prior vegetation as possible as soon as ground conditions allow in the spring. All VSM, whether stored or reharvested during reclamation, will be disc or broken up prior to placement. Preparation of the "proven" VSM will not occur unless seed bed preparation, planting, fertilization (if required) and mulching conditions are favorable and can follow immediately.

Areas occupied by support facilities will not be reclaimed until they are no longer required as part of current and future mining activities.

Prior to final reclamation, the Operator, land owner and other appropriate regulatory agencies will have reviewed the disturbed areas and agreed upon a mutually acceptable Reclamation Plan. This will allow land owner(s) and appropriate agencies the opportunity to review the Reclamation Plan. At some point in time, should the land owner(s) desire to change the post-mining land use to be other than full reclamation, the alternate post-mining land use, landowners written request, and their letter of understanding will be submitted for approval. Once that alternate post-mining land use is approved, revised drawings and cross sections will be submitted for approval. Information related to current lease agreements obtained from land owners or surface managers is available at the offices of Lodestar Energy, Inc. - Mountain Operations.

In general, reclamation of the White Oak mining operation includes:

White Oak Loadout Facility

The removal of all surface facilities, concrete demolition to 18" below final grade, the restoration of the culverted stream emanating from the hills to the east of the facility, the regrading and shaping of the Loadout Facility, and the grading and recontouring of sedimentation ponds. Sediment Pond backfill material will consist of clean fill material which will be tested to ensure that only non acid-toxic materials are used.

White Oak Haul Road

Reclamation of the White Oak Haul Road includes the removal of the asphalted roadway, culverts an concrete channel linings and the restoration (including reshaping and grading) of hill slopes between Eccles Canyon and the White Oak Complex. Reclamation will also include the removal of existing culverts and the restoration of natural drainage channels at 1) the bottom of the haul road at the junction with Eccles canyon and 2) at the "Big Fill".

White Oak Complex

This area will be completed in phases. Prior to the startup of the surface mine, facilities located in the area of operation of the surface mine will be removed. The surface mining process will create topsoil storage areas and a temporary spoil storage area. The process of surface mining will complete rough grading of the slopes removing highwall remnants. Cross sections of the surface mining at White Oak Complex are shown on Maps R645-301-521.160 (Sheets a-d) showing the elimination of the highwalls created during the surface mining process. The temporary spoil storage area will be used to make up material short fall during the mining process and to fill the final pit. Concrete material removed from the structures and foundations will be buried in the first few pits and covered with greater than four feet of non-toxic material. The placement of topsoil will start prior to fall seeding or at the end of the surface mining when seeding can follow immediately after placement. The upper portion of Whisky Creek will be affected during this surface mining and the restoration of this stream will occur during the months of low to no flow. The removal of Dugout D-1 will occur after vegetation has been adequately established in the drainage above this pond.

The rest of the site located below the surface mining operation will be reclaimed once the use of the coal storage and truck loadout facilities are no longer required for the extraction of coal in the area adjacent to the White Oak Complex. Removal of these surface facilities, concrete demolition to 18" below final grade, the restoration of 1) the main Whisky Creek channel (culverted) entering the fill area below the coal storage area. In addition, reclamation will include the removal of the fill pad, regrading and shaping of the remaining disturbance, and the grading and recontouring of Sedimentation Pond No.

004A. Sediment pond backfill material will consist of clean fill material. Additional topsoil materials removed during the surface mining operation will be used on this area.

Reclamation design details provided as part of this submittal indicate mine disturbance boundaries which will be honored during the reclamation phase of the mining operation.

HISTORICAL OVERVIEW

Surface facilities located within the Permit Area are generally divided into one of three time periods, those facilities constructed pre-law, those constructed post-law but prior to topsoil requirements and those constructed post-law with topsoil requirements. The General Office Area, Utah No. 2 mine site and VALCAM Loadout Facility (now referred to as the Loadout Facility), the White Oak No. 1 and No. 2 mine sites (White Oak Complex) and the White Oak Haul Road were pioneered pre-law. Additional improvements at both Loadout Facility and the White Oak Complex were constructed post-law but prior to topsoil requirements. Topsoil requirements came into play during the opening of the White Oak No. 2 Mine whereafter some topsoil substitute has been salvaged and stored for reclamation activities. During the surface mining of the barrier coal at the White Oak site, additional topsoil will be recovered. Please refer to the Topsoil Salvage Area Map R645-301-232.100.

No topsoil will be required for reclamation of the General Office Area since it is the current plan that it be retained as a field office for White Oak upon completion of mining.

Since the Loadout Facility was also established prior to the topsoil requirement and no topsoil was preserved, a search for an acceptable substitute for topsoil which could be utilized during reclamation was initiated. Existing soils have proven that they will support vegetation. Some selected soils identified on site were analyzed for applicability as a substitute for topsoil, approved by UDOGM for reclamation use and harvested. This approved material has been stored at the White Oak Complex for use in that area. The substitute for topsoil has been stabilized with vegetation and erosion control measures and contains approximately 975 cu. yds. of soil which came from the enlargement of the Sediment Pond 002a, near the truck scale at the Loadout Facility. The volume of soil was approximated using the Average End Area (AEA) method. As shown on the Reclamation Mapping, roads (including the railroad access road) and selected culverts found within the Loadout Facility such are currently owned or will continue to be utilized by the railroad will remain upon final reclamation.

The White Oak Haul Road however will be reclaimed wherein VSM will be needed. Although no topsoil was formally preserved, the haul road does exhibit the same natural revegetation capabilities as does the White Oak Complex and Loadout Facility areas.

Permanent runoff conveyance facilities capable of controlling the post mining 100 Year - 6 Hour precipitation event have been designed for the Loadout Facility Area, the White Oak Haul Road and the White Oak Complex. As required under the regulations, all existing siltation structures (with the exception of Sediment Pond 004A) will be 1) maintained until removal is authorized by UDOGM and the disturbed area has been regraded, stabilized and revegetated, and 2) maintained for a minimum of two years following the last augmented seeding. The phased reclamation of the White Oak Complex will allow a large portion of the site to have vegetation re-established prior to the removal of the sedimentation ponds. Sediment Pond 004A will remain in place as long as possible during the recontouring process of re-establishing the main channel of Whisky Creek through the coal storage and truck loop area. The material used to construct the pond will be required to reclaim the White Oak Haul Road. It is also understood that all culverts within the Permit Area are to be removed unless approval is

given by the regulatory agency that their retention meets post mining land use requirements. Culverts to remain following reclamation are bolded as appropriate on reclamation mapping. Additional information related to timing of reclamation activities will follow.

POST-MINING LAND USE

Pre-mining land use classifications for the Permit Area are as follows:

Carbon County

All of the Permit Area situated in Carbon County is zoned for Recreation, Forestry and Mining with the exception of the West half of the South West Quarter of Section 9, T13S, R7E SLB&M.

Emery County

All of the Permit Area situated in Emery County is zoned for Recreation, Forestry and Mining.

White Oak Loadout Facility

Post-mining land use for the permitted areas will be consistent with pre-disturbance use. Prior to disturbance the land was primarily shrub and brush range-land. Also included within its use was a right-of-way for the railroad (Pleasant Valley Agreement) complete with access roadways. No change from pre-mining to post-mining land use is planned.

General Office Area

It was the intent of the previous Operator to utilize the General Office Area and accompanying property (with associated runoff control facilities) located west of the loadout facilities and Highway 96 as an intermountain office facility which would have excluded it from reclamation activities (see Map 527 Sheet 4). If it is decided at a later date by White Oak not to utilize the property this manner or to sell or donate it to another entity which desires the facility, then the General Office Area will be reclaimed under the same guidelines agreed upon for the Loadout Facility, where-after complete reclamation details will be provided to UDOGM.

White Oak Haul Road

At this time the post-mining land use for the White Oak Haul Road will be a continuation of shrub and brush range-land and wildlife habitat since the road will be removed and reclaimed. It is also possible that the area might receive some slight recreational use via foot traffic which would be similar in nature to that which transpired prior to disturbance.

White Oak Complex

Land at the White Oak Complex will return to a shrub and brush rangeland use, wildlife habitat, and grazing use. The individual from whom the mine site is leased has interest in using the area as a cattle holding facility to enhance his grazing program. Grazing on the mine site will be according to a grazing management plan after bond release. The landowner and land manager has expressed the use of the mine site area for cabin sites. Lodestar has obtained the land owners priorities relating to roadway access to the property and the reinstallation of a road through the surface mining area of the barrier coal. See Oman Lease Appendix 1-2.

RECLAMATION REQUIREMENTS

Some of the more generalized requirements given within the regulations are more easily separated and discussed than would be if incorporated directly into the overall text. Those regulations which can be addressed quickly and efficiently are provided within this section of the Reclamation Plan.

Blasting

As required by 524.400, unscheduled blasts will be conducted only when public or Operator health and safety so requires and for emergency blasting actions. When an unscheduled surface blast incidental to the coal mining and reclamation operation occurs, the use of audible signals, will notify residents within one-half mile of the blasting site and will be recorded in the blasting records of why the unscheduled blasting was required. During the removal of barrier coal and initial reclamation at the White Oak Complex, additional blasting will be conducted. Please refer to Section 524.400 for blasting details.

Casing & Sealing of Underground Openings

As required within 551, 631 & 765; all underground openings will be permanently sealed. Permanent closure measures are designed to prevent access to the mine workings by people, livestock, wildlife, machinery and to keep acid or other toxic drainage from entering ground or surface waters.

The Utah No. 2 Mine is located at the Loadout Facility just east of the D&RGW railroad and north of the crusher building and is in the Upper O'Connor coal seam. The mine was officially closed September, 1989. All portals at the Loadout Facility have caved tight near the 25' area and were considered dangerous and were barricaded as per MSHA instruction. Portals 1 through 5 were removed and the openings were backfilled approximately 25' to 30' with the aid of heavy equipment. Portal 6 was backfilled, however, the portal headwall will remain to support the highwall until such time as reclamation is accomplished. At that time Portal 6 will be removed or be covered with at least four feet of compacted material and the highwall stabilized. Entry 7 has been sealed, but Portal 7 will remain until reclamation takes place as the belt line tailpiece for the crusher building is located in the portal mouth.

All mine openings at the White Oak Complex will be sealed with spoil (backfill material generated by the surface mined barrier coal. The portal closure plan will utilize a natural french drain system. This system will occur in the natural gradation of the broken spoil material where the larger material will be at the lowest levels of coal removal. Allowing water migration out of the toe of the spoil fill against the remaining unbroken rock surfaces. The approximate depth of cover to be placed over the portals is depicted on cross-sections (**F, G, H and I**) found on Maps R645-301-521.160 Sheets a and b in Chapter 5. Actual depths of cover will be verified by Certified "As-Built" Post-mining Land Use Reclamation maps generated from ground surveys which will be done upon completion of reclamation.

MAP 5OO. MAP INDEX
MAP 527 - SHEETS 1 THROUGH 14. RECLAMATION DETAILS

Mine closures will be accomplished in accordance with the requirements of the Division and consistent with MSHA, 30 CFR 75.1711.

All exploration drill holes have been plugged using the procedures required by the U.S. Forest Service. The drill holes were filled with drill cuttings except in specific areas of the hole requiring concrete plugs.

Concrete plugs were required, and were extended ten feet above and below any aquifer encountered, as well as being placed across all coal seams. In the vicinity of the surface, all drill holes were backfilled with at least a five foot concrete plug upon which a soil layer was added to conform to local soil conditions.

Attempts will be made at the time of mine closure to transfer ownership of all existing wells located on or utilized in conjunction with the mining operation to other interested parties. If such transfers are not realized or possible, then each well site (including the culinary water well being used by the Operator) will be reclaimed as part of mine closure and be permanently sealed as required. Upon reclamation:

All pumps, equipment, etc. will be removed from the well.

The well will be completely filled with sealing material such as to prevent the vertical movement of water within the well. Sealing materials may include the following:

- Neat Cement conforming to ASTM standard C150 of sufficient weight (not less than 15 lbs/gallon) to prevent the flow of any water into the hole from any aquifer penetrated.

- Cement grout consisting of equal parts of cement conforming to ASTM standard C150 and sand/aggregate with no more than 6 gallons of water per sack of cement.

- Bentonite-based products specifically designed for permanent well abandonment, which are mixed and placed according to manufacturer's recommended procedures (i.e. Plug-Gel, Shur-Gel , etc.).

- The liquid phase of the abandonment fluid shall be non-saline water containing no chemicals or toxic materials or other substances which may decompose or possibly contaminate the ground water supply.

If bentonite-based products are utilized in the reclamation process they will not be used within the uppermost five feet of the well. Cement or cement grout are required for the uppermost five feet.

Neat cement or cement grout used as a sealing material in abandonment operations shall be introduced at the bottom of the well or interval to be sealed (or filled) and placed progressively upward to the top of the well. All such sealing materials shall be placed by the use of a grout pipe, a tremie line, or a dump bailer, in such a way as to avoid segregation or dilution of the sealing materials.

Disposition of Site Materials

Coal and Coal Fines

At the time final reclamation of the Permit Area occurs, the coal and coal fines which are considered unsalable (stockpile bases and short term coal storage area bases, roadways, etc.) after the marketable coal has been-shipped, will be placed in a controlled manner to prevent combustion, ensure stability, and movement and environmental degradation after reclamation.

Exposed Coal Seams, Acid and Toxic-Forming Materials

Exposed coal seams, acid-and toxic-forming materials and combustible materials exposed, used, or produced during mining will be adequately covered with nontoxic and noncombustible materials, or treated and will be placed in suitable fill areas with four feet of cover material to control the impact on surface and ground water in accordance with the regulations, to prevent sustained combustion, and to minimize adverse effects of plant growth and the approved post-mining land use. These areas will be determined just prior to reclamation so as to select the most effective areas to ensure environmental security.

The spoil material generated during the surface mining process has been tested to a depth of 277 feet. The results of the testing showed most intervals had high neutralizing capacity. The coal seams tested not to be acid toxic by 1998 Division standards.

Non-coal Mine Wastes

Any non-coal waste material which is considered to be toxic or hazardous material will be disposed of in accordance with federal, state and local regulations. This includes any non-coal mine waste materials which might be encountered during reclamation. When found, such materials will be transported from the Permit Area by licensed contractors and disposed of in a State approved solid waste landfill or disposed of by another approved method available at the time of reclamation.

Refuse Materials

No refuse materials are generated as part of the White Oak mining process and therefore Section 553.250 (or other sections dealing with refuse concerns) of the regulations are not considered applicable to this plan. Therefore no permanent disposal structures for refuse will be needed or constructed within the Permit Area. Should however refuse materials be encountered in the future prior to reclamation, the requirements of appropriate regulations will be met.

Spoil and Waste

A spoil disposal area is permitted at the White Oak Mine Complex. See Section 9 and Map R645-301-521.150 Sheet 4 of 4. However, all spoil and waste materials detected or encountered at the time of reclamation will be placed in suitable locations within the affected area(s) to ensure stability and or to prevent leaching. The placement of such materials found during reclamation (if any) will depend upon the location in which the material was encountered, and will be placed in appropriate locations and covered with four feet of non toxic material as determined jointly by White Oak and UDOGM.

Extended Responsibility Period

Since the precipitation is near 26 inches annually, the five-year extended responsibility period may apply. Attached in Appendix 7-1 is rainfall data from mid-1984 to 2000. This data will be updated as reclamation becomes imminent.

Fish and Wildlife Protection Plan

The fish and wildlife protection plan during reclamation includes the following.

Construction will be limited to summertime periods thereby eliminating disturbances to big game on nearby high priority winter range. The total area of the permit is considered summer range for elk, deer, and moose. There is no winter range use with the exception of the riparian habitat areas used by moose, as well as for spring calving.

Wildlife habitat will be enhanced through restoration of habitat features and selection of reclamation materials that will improve the quality and or quantity of forage and or cover. Ledges, boulders, logs and game trails will also be utilized.

All riparian habitat disturbed by the Operator will be reclaimed.

Straw bales and/or other appropriate sediment control devices will be utilized at the downstream end of all construction zones at the Loadout Facility and White Oak Complex to control stream influents.

A bermed staging area for refueling and self contained servicing of equipment will be established by the contractor with a minimum buffer zone of 100 feet from any stream or water source.

Land Agreements

Prior to final reclamation, White Oak, the land owner and other appropriate regulatory agencies will have reviewed the disturbed areas and Reclamation Plan. Final Reclamation Plans will thus meet the needs and desires of current surface owners as well as meet the requirements of the regulations. Information related to current agreements obtained from land owners or surface managers is available at the offices of Lodestar Energy, Inc..

Temporary Cessation of Reclamation

The Division will be notified by registered letter should it become evident that a temporary cessation of reclamation operations will extend for a period of 30 days or more occur as required under 515.320. The notification letter will contain the following required information.

Exact number of surface acres and the horizontal and vertical extent of subsurface strata which have been in the Permit Area prior to cessation,

Extent and kind of reclamation of surface area which will have been accomplished, and identification of the backfilling, regrading, revegetation, environmental monitoring, portal closures and water treatment activities taking place during temporary cessation.

Topsoil Storage

The Topsoil stockpile (located south of the main substation S44) is closely surrounded by dense forest exhibiting a medium amount of deadfall and heavy ground cover. This provides excellent protection against wind erosion as well as rapid snowmelt in the spring. The storage area has been bermed to prevent access by motor vehicles, as well as to prevent erosion of the material from the storage area. Straw bales are also used along the down gradient end (north end) of the storage area to assist in containment, should a slope failure of the stockpile occur.

Additional topsoil material, recovered during the surface mining operation at the White Oak Complex, will be placed on a stable area within the permit area and protected from contamination, compaction, and erosion. The location of storage areas are shown on Map R645-301-521.150 Sheet 4b of 4. Additional storage areas may be operationally necessary and will meet the regulation requirements for a topsoil storage area.

RECLAMATION DETAILS

Overall Reclamation Plans include an organized procedure for the removal of mine related facilities and the restoration of the environment. Included within the complete plan is 1) the removal of all surface facilities with the exception of non-White Oak railroad lines and concrete foundations buried 18" below final grade, 2) the restoration of the land surface to a configuration which conforms as much as practical and/or possible to the undisturbed natural topography, 3) the installation of runoff control channels and/or erosion protection devices, and 4) the restoration and/or augmentation of vegetation. The following discussion identifies planned reclamation activities and concerns including demolition and cleanup, reclamation contouring, runoff conveyance control, and vegetation.

Demolition and Cleanup

All mining related structures located within disturbed areas will be demolished, salvaged or otherwise removed with the exception of concrete foundations buried 18" below final grade, all mine portals will be properly sealed, and the area cleaned up, regraded and restored to meet reclamation requirements as identified herein. All asphalt will either be hauled to a State approved disposal facility, reprocessed and donated to UDOT for use as a resource for State highways. Reclamation costs have been calculated based upon the assumption that all asphalt will be hauled to an appropriate disposal facility. The concrete will be scarified and crushed with heavy equipment and utilized to backfill the portals, used as aggregate for lean concrete to backfill the portals, placed as fill against the toe of the back-slope in the first lift placed during reclamation or in the bottom of open pits during the surface mining process.. Specifics related to planned demolition and cleanup activities for each major category are hereafter described.

Disposal Facilities

Should a disposal facility be required during reclamation to aid in the demolition and cleanup phase, it will be designed using current prudent engineering practices and will meet the regulations set forth by the Division. The actual location for this type of facility (should it be needed) will be determined during reclamation so as to insure that the most advantageous location can be utilized. Location will take into account AOC concerns, stability of existing foundations and or abutments, weak zones and groundwater effects upon the facility. Such a facility will be approved by the Division prior the implementation.

Mine Openings

All mine openings, at the White Oak site will be sealed with 25 feet of spoil material and covered with spoil material generated by the surface mining of the barrier coal. All portals at the Loadout Facility have caved tight near the 25 foot area, were considered dangerous, and were barricaded (backfilled) as per MSHA instruction. In addition to current backfilling, each opening will be recontoured at the time of reclamation to the approximate original contour as shown on the reclamation design drawings.

Roads

Any road not to be retained for postmining land use or is no longer needed for mining and reclamation operations will be immediately closed to public travel, whereafter all culverts will be removed, roadbeds ripped or scarified and disturbed surfaces recontoured and revegetated as per this Reclamation Plan.

White Oak Loadout Facility. The existing paved road at the Loadout Facility connecting the highway with the railroad tracks by the coal stockpile tube will be stripped of its oil surface and disposed of as previously mentioned, leaving the gravel road base for continued railroad access. The D & RGW (SP) will continue to utilize the graveled road to gain access by railroad personnel to the tracks and adjacent area in the vicinity of the stockpile tube. Should the operators of the railroad desire an oiled road surface rather than a gravel road at the time of reclamation, then the oiled surface will be remain.

All other roads associated with the Loadout Facility will be removed upon reclamation. Removal of the existing White Oak railroad spur (most easterly track) will allow continued north and south access along the east side of the railroad tracks. Ongoing roadbed maintenance will be the responsibility of the D&RGW (SP) railroad company.

General Office Area. Since the General Office is to remain upon reclamation, no changes will be made to existing roadways essential to its continued use. If the post mining land use changes, an amendment to the Reclamation Plan will be submitted.

White Oak Haul Road. All asphalt associated with the White Oak Haul Road will be removed upon reclamation. Asphalt product salvaged will be either 1) crushed and hauled to a State approved facility 2) recycled and reprocessed for use in neighboring towns or by UDOT for streets or road construction purposes. All asphalt will be removed from the White Oak Haul Road during the Phase I reclamation of the coal stockpile, truck loadout and Pond 004 removal so as to minimize impacts to the surrounding environment during the reclamation period. This asphalt disposal plan supercedes the asphalt disposal plan in Appendix 527.

White Oak Complex. All asphalt roads associated with the White Oak Complex will be reclaimed in the same fashion as those for the White Oak Haul Road. An access trail will be established across the initial reclamation to facilitate revegetation of the site. The downgrade side of the trail will be graded out during the revegetation process leaving a grade break and drainage break within the side slopes.

Structures

All surface equipment, structures, or other facilities found within the White Oak Permit Area not required for continued mining activities and monitoring (unless approved by the Division as suitable for post mining land use or environmental monitoring) will be removed and the affected lands reclaimed. Exceptions to the removal of all structures include the roadbed associated with the operation of the railroad which traverse the Loadout Facility site, or which are associated with the office facilities located west of the Loadout Facility and Highway 96 as discussed earlier. Railroad facilities to remain consist of two railroad lines, an access road, and railroad drainage culverts. Drainage culverts which will remain meet the post mining land use requirements of the railroad since they are used to control surface water runoff.

Reclamation Contouring

Reclamation activities for the White Oak property include the stabilization of slopes, minimization of erosion, reduction of water pollution, and the supporting of approved postmining land uses. The plan included herein for backfilling, soil stabilization, compacting and grading includes contour maps, cross sections and three dimensional views exhibiting the anticipated final surface configuration of the disturbed areas, in accordance with the applicable regulations. Where reasonably possible the final reclaimed contour will resemble the approximate original contour (AOC) of the predisturbance contour as represented on maps included with this Reclamation Plan. All maps included herein have been prepared and certified as described under Section 512 of the rules and regulations.

In general, all drainages will be restored to the degree possible to premined conditions by removing all fill material, regrading and reshaping of the adjacent terrain. Reclamation contours will match those found naturally at the point of contact, and where possible, reclaimed contours will be constructed at slope angles less than those found naturally. Generally speaking, all fill material placed as a result of road construction in the vicinity of local drainages will be removed, and the reclaimed drainages will be excavated (or filled) to the degree possible to local natural grades as determined in the field.

In order to develop reclamation contouring and associated volumes, both existing and future reclaimed contours have been entered into AUTOCAD for the entire disturbed area. Cut and fill volumes associated with reclamation activities were then developed utilizing Survcadd and Engineering Data Systems (EDS) software. Since soils which will be removed are not native undisturbed soils, but were placed during mine development, it was recommended by a professional geotechnical engineer that a compaction factor of 5% be added to the calculation of all cut materials. Calculations shown in Appendix R2 reflect this recommendation.

Once cut and fill volumes were determined, mapping was prepared to illustrate both reclaimed contours as well as computer generated renderings of final surface configurations for critical areas. Three dimensional renderings have been completed for the Loadout Facility Area, the White Oak Haul Road, and two areas along the White Oak Haul Road including a typical view along the north slope of the lower section of the road and a view of the Big Fill area (see Figures R-1 through R11).

FIGURE R-1. White Oak - RECLAIMED CONTOUR
FIGURE R-2. White Oak - DISTURBED 3-D VIEW
FIGURE R-3. White Oak - RECLAIMED 3-D VIEW
FIGURE R-4. White Oak Haul Road - RECLAIMED CONTOUR
FIGURE R-5. White Oak Haul Road - DISTURBED 3-D VIEW
FIGURE R-6. White Oak Haul Road - LOWER SECTION DISTURBED 3-D VIEW
FIGURE R-7. White Oak Haul Road - BIG FILL SECTION DISTURBED 3-D VIEW
FIGURE R-8. White Oak Haul Road - RECLAIMED 3-D VIEW
FIGURE R-9. White Oak Haul Road - LOWER SECTION RECLAIMED 3-D VIEW
FIGURE R-10. White Oak Haul Road - BIG FILL SECTION RECLAIMED 3-D VIEW
FIGURE R-11. White Oak Complex - SPOIL BACKFILL & RECLAMATION DETAILS

Because cut and fill volumes were determined via AUTOCAD, numerous cross sections typically required for hand calculation are not shown as part of the reclamation calculations. However, typical sections have been added at each of the major areas to show typical reclaimed sections. Specifically, cross sections have

been developed for selected areas of the Loadout Facility, the White Oak Haul Road, and the White Oak Complex. These cross sections are included within Appendix R2. Additional cross sections for the surface mining at the White Oak Complex are included within Chapter 5, Maps R645-301-521.160 (Sheets a, b, c, and d) . Slope stability analysis is found in Appendix R2.

Additional general concepts associated with reclamation contouring which have been implemented (or will be at the time of construction) into the Reclamation Plan throughout the disturbed Permit Area include:

Areas having either undisturbed or re-established vegetation will not be disturbed upon reclamation unless it is it is necessary to obtain the approximate final surface configuration identified within this Reclamation Plan. Contour limits presented on reclamation drawings were developed based upon photographic and field observation of established vegetation. At the time of reclamation, representatives from both the Operator and UDOGM will concur on appropriate field staking for undisturbed or naturally re-vegetating areas which will not be redisturbed with reclamation activities.

Prior to any earth moving activities all areas affected by noxious weeds will be sprayed.

Pad areas and associated cuts will be restored to the approximate original contour through the use of heavy equipment.

All fill material shall be machine compacted where accessible and shall be placed in a controlled manner.

Benches shall be constructed in lifts and compacted to assure integrity and stability of the embankment.

After the coal handling areas have had the recoverable coal removed, the remaining bed material will be intermingled in a base lift near the mine portals.

Constructed slope angles will not exceed those of the surrounding hillsides. As a general rule slope angles will not exceed 2:1 except at points of intersection where steeper slopes are required to tie into existing hillsides. Slopes will be graded to concave and complex shapes rather than uniform grades or convex shapes.

Extreme surface roughening will be used on all slopes after the distribution of topsoil. Roughening will be completed as described in the Division's reclamation manual, The Practical Guide to Reclamation in Utah, found at ftp://dogm.nr.state.ut.us/PUB/MINES/Coal Related/RecMan/Reclamation Manual.PDF

Maximizing the roughness of the reclaimed surface will be paramount at most locations to achieve moisture retainage, enhance vegetative growth and reduce local erosion.

The placement of large exposed boulders or deadfall within reclaimed areas will provide a varied land surface and enhance both the visual aspects of reclamation as well as local wildlife.

Reclaimed slopes greater than 2:1 will be reviewed and a geotechnical analysis completed at the time of final reclamation in order to eliminate potential stability problems. This effort must be delayed until the time of reclamation since it is not possible at this time to precisely identify the soils to be placed at any given area.

Small depressions may be left throughout the reclaimed area on an as needed basis to retain moisture, minimize erosion, create and enhance wildlife habitat, or assist revegetation. The actual locations of small depressions will be decided upon during final grading. These small depressions will not be left in areas subject to erosion resulting from upgradient drainage flowpaths.

All lifts will be overfilled, compacted and the loose material on the outslope incorporated in the next lift. This technique decreases the chance of superficial failures of the outslope and leaves the soil surface compatible for revegetation. Each lift will be keyed into the existing backslope to increase stability. The location of each keyway will be determined at the time of reclamation based upon information gathered in the field.

Reclaimed areas will be treated with a surface bonding agent if necessary to reduce potential slippage of the material.

The following discussion presents the anticipated scope of reclamation for each disturbed area. A discussion related to projected timing for each phase of reclamation (once mining operations permanently cease) is included near the end of the Reclamation Plan.

White Oak Loadout Facility

As shown on Maps 527 Sheets 1 through 3, disturbed areas will be backfilled and graded to achieve the approximate original contour. No highwalls are planned to remain upon final reclamation within this area and all slopes will be approved by the Division prior to final abandonment. It is anticipated that no additional fill will be required for reclamation of this facility as shown by volume estimates included within reclamation Appendix R2, nor will material be moved between the Loadout Facility and the White Oak Complex at the time of reclamation. Cross sections of the surface mining at White Oak Complex are shown on Maps R645-301-521.160 (Sheets a-d) showing the elimination of the highwalls created during the surface mining process.

Modifications to the land surface topography or facilities which vary from premining conditions include:

An additional railroad spur associated with the Coastal States Energy mining operation. Upon reclamation backslopes associated with this D&RGW Railroad right-of-way will be regraded to maximize reclamation at the Loadout Facility.

Prior to reclamation the railroad had the potential of utilizing two separate roadways for access as shown on 1973 aerial photography. The main access appeared to leave the highway just south of existing Sedimentation Pond 003A. This access road traveled to the north where it was intersected by a less traveled connecting road adjacent to existing Sediment Pond 002A. Reclaimed access is shown to be limited to a single access in the location of the existing asphalt roadway. This access is in the approximate location of the historic north access road.

The premining access road consisted of native soils. Upon reclamation the asphalt layer will be removed from the existing roadway leaving the gravel roadbase for improved railroad accessibility. At the time of reclamation the roadway will be narrowed to accommodate a single lane of traffic so as to approach premined conditions.

Graphical representations of existing and reclaimed land surfaces are shown on Figures R-1 through R-13.

General Office Area

As indicated previously, no changes to the existing configuration of the land surface nor structures are planned as part of reclamation activities.

White Oak Haul Road

The White Oak Haul Road was originally constructed between 1975 and 1976 and subsequently widened in 1976. The great majority of the road was excavated as is evidenced by the lack of fill on road outslopes noted in the field. Any excess material obtained at the White Oak Complex will be placed along the White Oak Haul Road. The replacement of excavated road material will not generally entail the direct attempt to match upgradient and downgradient contours with even intermediate grades since some questions have historically arisen as to the long term stability of the road under those conditions.

According to the stability analysis found in the M-K report (identified and discussed within the 1993 PAP), it is unlikely that the White Oak Haul Road would exhibit long term stability if it were put back to the original premining contour. The overall potential natural instability of the area is evidenced in the form of two small slides which occurred within the lower portions of the road below the fill lines of the constructed toe. Short term stability of the road itself however does appear to have been obtained since the road has survived an earthquake and three years of +200 percent of normal precipitation. The three years of above normal precipitation include years 1983, 1984 and 1993.

It is the intent of reclamation to achieve slope stability, minimize erosion and water pollution, and support approved postmining land use. Upon completion of mining that would utilize the paved haul road the White Oak Haul Road will be reclaimed to a condition of stability commensurate with the surrounding slopes and should not be any more susceptible to failure than any other slopes within the adjacent area. In fact, some reclaimed surfaces may indeed be less susceptible to failure than natural slopes since their grades will be less severe than those shown to have existed historically. In addition, attempts have been made to create relatively level areas along the roadway to 1) reduce the long term potential for slope failure, 2) enhance wildlife habitat, and 3) reduce runoff potential by retaining or detaining some local waters. Various sections of the road are discussed below separately since reclamation styles will change along the length of the White Oak Haul Road.

The White Oak Haul Road is comprised of in-place materials and is for the most part, built on cut not fill. Several slope areas on the White Oak Haul Road have deciduous and conifer growing adjacent to the concrete lined ditch and shoulder of the road. All disturbed areas along the roadway will be evaluated prior to completion of reclamation efforts to verify areas which redisturbance is not desired or would be unrealistic.

Where there are well traveled game trails crossing the White Oak Haul Road, new trails will be incorporated into the recontoured slope in an effort to minimize the erosion that could occur by animals traversing the newly constructed areas at alternate locations. Where identified, game trails are shown on Maps 527 - Sheets 1 through 14.

Eccles Canyon Junction. The culvert located within Eccles Creek will be removed and the land surface re-established to the approximate original contour and alignment as shown on Map 527 Sheet 5.

White Oak Haul Road - Lower Section near Pipeline. This area of the roadway is of a critical nature due to its visibility from Eccles Canyon. The Reclamation Plan includes the installation of rock lifts at periodic intervals along the roadway to 1) minimize the potential for long term slope failure, 2) reduce overall road grade and hence erosion, 3) blend the reclaimed roadway into existing rock ledges, and 4) enhance wildlife habitat. In addition to the rock lifts, some large boulders may be placed along the route (with UDOGM approval) for use as wildlife enhancement. Available logs (deadfall) are also planned to be utilized for reclamation enhancement. A computer generated 3-D image of existing as well as reclaimed surfaces showing these rock lifts are shown on Figures R-5, R-6, R-8 and R-9.

White Oak Haul Road - Big Fill Area. The fill currently found within the "Big Fill" area will be removed and the contour re-established to approximate original contour. Some small heights of disturbed area may remain at the upper end of the reclaimed slope within the area since natural slopes are slightly greater than 2:1. It was also the desired intent to provide some flat or level areas within this vicinity for wildlife enhancement, however, the overall steepness of the surrounding terrain made that impossible without the construction of non-acceptable post mining facilities such as concrete retaining walls. The small stream bed will be re-established at the time of reclamation as shown on reclamation Map 527 - Sheet 8, in calculation details provided in Appendix R1, and as shown topographically as existing and reclaimed 3-D views on Figures R-5, R-7, R-8 and R-10.

White Oak Haul Road - Upper Section. Reclamation contouring of the upper section of the White Oak Haul Road above the "Big Fill" consists mostly of uniform regrading and the development of minimum slopes (thereby creating benches). In many instances the existing road base has been utilized to aid in the development of these terraces. As with other areas, these terraces have been created to enhance local wildlife habitat. A graphical 3-D view of the existing and reclaimed White Oak Haul Road is shown on Figures R-5 and R-8.

White Oak Complex

Initial reclamation will be completed as part of the surface mining of the barrier coal at the White Oak Complex. This area is identified on Map 527 - Sheet 12. Temporarily stored spoil material removed from the initial cuts will be hauled to reclaim the final cut. The spoil balance provides for sufficient material to complete the reclamation of this initial phase.

Excess material excavated at the time of final reclamation from the coal loadout pad will be placed appropriately either along the White Oak Haul Road or as backfill material near the White Oak Complex as shown on the reclamation drawings previously discussed. The majority of fill material used to achieve the recontouring efforts at the White Oak Complex will be obtained from the lower pad area and the embankment and foundation associated with Sediment Pond 004A. No material will be moved or transported between the Loadout Facility and White Oak Complex areas.

Recontouring of disturbed areas at the White Oak Complex has been governed through the re-establishment of approximate original premined contour along the drainage flow path and the design requirements of runoff conveyance channels. At the time of reclamation, disturbed areas will be recontoured as represented on Maps 527 - Sheets 12 through 13 in such a manner that either 1) the approximate original contour is re-established or 2) deliberate variations are incorporated to enhance local wildlife and/or vegetation. No recontouring of slopes along the power supply lines entering the White Oak Complex are planned at this time because of 1) little overall disturbance has occurred along the power line, 2) additional disturbance will only increase the potential for environmental damage, and 3) extensive natural revegetation which has been re-established over time would be destroyed.

Enhanced surface variations from premined or undisturbed conditions may include the creation of flatter areas, ledges or meadows consistent with those created along the White Oak Haul Road, or the unmodified exposure of rock outcrops such as the one found immediately southeast of the coal stockout tube. The Reclamation Plan includes these planned surface features as a method on enhancing wildlife and vegetation while at the same time providing a varied and visually attractive land surface.

Other specifics dealing with local reclamation include:

Reclamation of UDD-4 will consist of selective re-contouring. Some sections of this channel have re-established itself as a result of encroachment by adjacent vegetation. Recontouring in these areas will be conducted by either small machinery or by hand in order to preserve as much of the existing vegetation as possible. Ditch UDD-5 and UDD-2 will be surface mined through during the barrier coal mining at White Oak.

Postmining slopes will not exceed the angle of repose unless they meet the minimum long-term static safety factor of 1.3.

Because much of the surface disturbances located within the Permit Area were completed prior to these regulations being enforced, little topsoil exists on the site which can be used for regrading and reshaping during reclamation. A small topsoil storage area has been dedicated for use at the White Oak Complex. Presently, the stockpile contains approximately 975 cubic yards of substitute topsoil which came from the enlargement of Sediment Pond 002A. This material met the criteria of and was approved by the Utah Division of Oil, Gas and Mining for use as a substitute topsoil material. Upon reclamation this substitute topsoil will be placed at the White Oak Complex along the access road to the storage area. Additional topsoil material will be recovered during the barrier coal mining. This topsoil will be stored in areas designated on the Topsoil Salvage Areas Map 231.100.

Unacceptable soil material associated with the coal loadout pad will be placed against the vertical wall adjacent to the truck loop and covered to a minimum depth of four feet.

Since Sediment Pond 004A is located upon fill material associated with the coal loadout pad it is not possible to retain it throughout the reclamation period. Main concerns with leaving the pond in place are that 1) it is located upon fill material which thereby presents long term stability concerns, and 2) the discharge channel is excessively steep and could not adequately be design to ensure long term protection of the downstream embankment. The pond will however be retained as long as practical during reclamation until its removal is required for construction of the reclaimed Whisky Creek channel and the White Oak Haul Road.

Grade breaks are planned for the surface mined area on the portal side of the White Oak complex along what is the current upper mine bench between the bathhouse and the current location of the power substation.

The slope failure located on the hillside west of the bathhouse will be included in the surface mining and be reclaimed as part of the regrading of the surface mined slopes.

The White Oak Haul Road will be used for access to the White Oak Complex for the reclamation on the surface mining area and the removal of facilities upon the completion of mining activities that will use the coal storage and truck loadout facilities. Once the facilities have been removed as part of the final reclamation, the reshaping of the site and the Whisky Creek relocation will take place. The removal of haulroad materials will take place prior to earthwork to move yardage from the site to the haul road. An access road will be maintained along the haulroad pathway for the revegetation. Once distribution of backfill material is completed, the access road pathway will be removed as revegetation is completed. The removal of the Eccles Creek culvert, regrading and revegetation will be the last step of the haulroad reclamation. Access to the site will be through Boardinghouse Canyon on the existing jeep trail for maintenance and inspection of the site through bond release. The jeep trail to Boardinghouse Canyon across the top of the ridge west of the White Oak Complex will be used throughout the remainder of the reclamation process. This jeep trail from Boardinghouse Canyon will remain as part of the final reclamation. The installation of a jeep trail across the reclamation at the White Oak Complex will be completed after bond release by the landowner as specified in the Supplemental Agreement (see Appendix 1-2). Consent and letters of understanding or lease agreements will be obtained from the various land owners as per their requirements for White Oak to access their properties during reclamation activities and will be submitted to UDOGM prior to reclamation of the White Oak Complex or the White Oak Haul Road. See Appendix 1-2 for Lease Agreements.

Soils Replacement

During reclamation excavated materials will theoretically return the soils to the cut areas in the reverse sequence of the original excavation cycle. Harvesting the materials under this concept would place the "Pre-law topsoil and associated soils" last or at least intermingle them the lower strata soils (downcast materials) lastly, improving the cover material ("VSM") characteristics.

Those areas at the White Oak Complex and Loadout Facility areas studied by Cedar Creek Associates and depicted on Map 231.300 Sheets 1 through 4 identified as "proven" VSM, will be scalped to a depth 3" (inches) below the root zone. The area at the White Oak Complex, identified on Map R645-301-231-100 as VSM will be scalped to a depth of 9" (3" below the root zone of the VSM). This is an area of 3.6 acres and should yield 4,300 cubic yards of soil.

Scalped materials will be placed directly upon reclaimed areas or temporarily stockpiled and protected if it becomes necessary. The most suitable soils will be used as VSM, with the least suitable soils being used as fill material.

MAP 231.300 - SHEETS 1 THROUGH 4.
SUITABILITY OF TOPSOIL SUBSTITUTES VSM

Where possible or practical paddle wheel scrapers, dozers, and or backhoes will be used to scalp existing slopes of VSM before recontouring. Scraped material may need to be stockpiled on the lower pad area, near the No. 1 fan or on the storage yard area while recontouring takes place. The potential VSM harvested during construction of the Whisky Creek Channel will placed upon the newly configured slopes.

Once an area has been prepared (maximizing roughness), the "proven" VSM will be redistributed as uniformly as possible as soon as ground conditions allow in the spring. All VSM, whether stored or reharvested during reclamation, will be disc or broken up prior to placement. Preparation of the "proven" VSM will not occur unless seed bed preparation, planting, fertilization (if required) and mulching conditions are favorable and can follow immediately.

Test plots (required by OSM) were implemented in the late 1980's to demonstrate the suitability of in-situ materials and the necessary depth of cover needed. Results from these test plots will be utilized at least in part as well as the SCS recommendations and Division Guidelines to determine actual specifications for revegetation of the disturbed areas.

Ripping depth required for successful vegetative growth and soil stability will be determined at the time of reclamation with the aid of a soils and vegetation specialist when a more accurate determination of site specific soil conditions can be determined.

Runoff Conveyance Plan

The runoff conveyance plan for reclamation includes the re-establishment of well defined drainage channels for those channels which existed prior to mining,, and the reshaping or recontouring of disturbed areas to help eliminate or control post mining runoff conditions. The reshaping and recontouring of disturbed areas is highly dependent upon stream channel design since grade control is critical to long term channel stability. Recontouring of adjacent land is secondary to the establishment of adequate and well defined drainage channels.

As required under the regulations, all ditch and culvert sections will be removed upon mine reclamation according to the Reclamation Plan provided by the Operator to the Utah Division of Oil, Gas & Mining. In general, mine reclamation as it relates to runoff control will proceed as follows: **White Oak Complex -** Ditches, culverts and Filter pond 005A not required for the surface mine drainage will be removed as the mining process crosses the area impacted by the operation. The ditches required for the surface mine will be installed. Once the surface mining operation is completed and the material from the temporary spoil storage pile is redistributed, Phase I will be completing the upper Whisky Creek restoration . Phase II will be the removal of ditches 1001,1002, and Dugout D-1. Upper Whisky Creek will be directed to C-40-42. Adequate spoil material left adjacent to the pond to be pushed into the pond to fill the void. The coal storage, truck loadout and loop and Pond 004a will be removed after coal reserves that would use these facilities are depleted. Phase I of this area would involve the removal of culverts and ditches remaining in the area except for culvert C-40-42 under the coal pad that Whisky Creek is diverted through. Phase II of the operation would be the restoration of the main Whisky Creek channel , the removal of Sedimentation Pond 004A, and the removal of any down stream portions of culvert C-40-42 covered with less than four feet of material along with the removal of the White Oak Haul Road. Reclamation will start at Eccles Canyon and proceed to the south with culvert removal and reclamation proceeding simultaneously. Phase III would be the activation of the Whisky Creek Channel and the removal of at least forty feet of culvert C-40-42 from the upstream end. **Loadout Facility -** Phase I will include the removal of ditches and culverts, Phase II will include the removal UPDES discharge locations 001A through 003A. During Phase I, reclamation will generally proceed from upgradient to downgradient directions with culverts being removed as reclamation proceeds.

Mapping and design details associated with hydrologic mine reclamation is included within this Reclamation Plan on Maps 527 Sheets 1 through 16. As shown on the maps, surface drainage facilities have been designed where possible to convey all surface drainage waters from undisturbed areas above reclaimed mine areas, to downstream undisturbed areas. It is understood that any and all interim sediment control measures implemented as outlined below (such as straw bales or excelsior mats, etc.) will be removed subsequent to the required reclamation bonding period. It is also understood that all reclamation channels and/or structures will be renovated to the original design specification, including revegetation if required, at the termination of the reclamation bonding period.

MAP 527 - SHEETS 15 AND 16. RECLAMATION CHANNEL DETAILS

The following discussion provides a description of reclamation runoff conveyance facilities for all four general mine permitted areas, ie: the Loadout Facility, General Office, White Oak Haul Road, and White Oak Complex areas.

White Oak Loadout Facility

The long range plan for channel reclamation at the Loadout Facility includes 1) the construction of a rip-rap channel (RC-1) throughout much of the length of present culvert C-14-42, 2) the recontouring of disturbed areas, and 3) the removal of sedimentation structures following successful reclamation. Loadout Facility reclamation details are shown on Map 527 - Sheets 1 through 3.

Drainage areas for the reclaimed Loadout Facility are not shown on mapping submitted because 1) the general drainage area is relatively narrow with small flow path lengths, and 2) the railroad tracks provide an effective hydrologic barrier. In essence, the tracks are an easterly hydrologic barrier wherein runoff water is prevented from moving from up-gradient hill-slopes to regraded slopes west of the tracks.

The Operator and the D&RGW Railroad will concur on the inlet/outlet locations of culverts effecting their grade regarding postmining land use and the Pleasant Valley Agreement. Culverts not required for railroad right-of-way or access roads will be removed during reclamation. Culverts to remain following reclamation are shown in bold typeface on the reclamation drawings.

Hydrologic reclamation of the Loadout Facility will proceed initially with the construction of reclamation Channel RC-1. This channel is planned to be constructed first in order to divert the majority of undisturbed area waters through the reclaimed facility with minimal impact. Subsequent to the construction of this channel, the remaining area will be graded, reshaped, recontoured, and revegetated according to Reclamation Plans, details and specifications. Sediment Ponds 001A, 002A and 003A will be removed during the final stages of contour reshaping. Straw bales and the use of straw will be an integral part of sediment control until revegetation of the area has been completed. Straw bales of other sediment control measures will be placed in a staggered pattern as discussed with UDOGM, and 2) that the erosion control devices will traverse the entire reclaimed area of the Loadout Facility where contours will be regraded. Final reclamation efforts will include the removal of existing undisturbed area diversion ditch UDD-1. Additional undisturbed area diversion ditches are not planned to be constructed prior to or during reclamation. Reclaimed channel RC-1 begins at a location approximately 300 feet east of the railroad tracks. The existing culvert passing beneath the railroad tracks will be modified in that the upstream and downstream sections will be removed, and replaced with the riprapped channel as shown in the design details. The riprapped channel design is based upon a 100 year - 6 hour precipitation event of 2.3 inches and a design flow rate of 23.0 cfs. Channel RC-1 has a five foot bottom width and uses a riprap D_{50} of 1.0 feet except at the reclaimed outlet of Culvert C-14-42 where it is 1.25 feet. All channels have a design freeboard of 0.5 feet which is essentially equal to the flow depth. Complete design details are shown on Maps 527 Sheets 1 through 3 and Sheets 12 through 16.

As shown on Map 527 Sheets 1 through 3, culverts C-1-32, C-4-42, C-14-42 and C-15-24 will remain in place as required for continued drainage of the railroad right-of-way. At the time of reclamation, a riprap pad will be installed at the outlet of all three culverts. The riprap pad design will be similar in nature to other adjacent railroad culverts not installed or owned by White Oak. The only exception to this will be that Culvert C-4-42 will be extended to Mud Creek in order to eliminate erosion on the reclaimed contour.

General Office Area

Because the office and related facility will remain upon reclamation (as discussed previously), no runoff modifications are planned. Checks were made however of the hydrologic capacities of the two culverts located adjacent to the office. Hydrologic calculations show that the culverts will pass the 100 Year - 6 Hour runoff event with a portion of the flow overtopping the culvert as sheet flow. This sheet flow is a planned part of design and will not negatively impact the integrity of the culvert.

White Oak Haul Road

In determining appropriate reclamation activities at each of the culverts along the White Oak Haul Road it should be remembered that the culverts may have differing functions. Some of the existing culverts found along the road are located to divert road runoff water while others have been placed at channel crossings in order to convey channelized runoff water across the White Oak Haul Road. During road reclamation those culverts currently conveying channelized runoff water from the upgradient watershed will be replaced with an erosion resistant channel as described hereafter. Culverts currently diverting road runoff water will not be replaced with designed channels because the post mining contours have generally been designed so that flow will not travel parallel to the road cut. Reclaimed contours will generally create sheet flow, not concentrated channelized flow where channel design would be required.

Based upon the above mentioned observations, options for reclamation at existing culvert locations are 1) restore hill-slope contour to create sheet flow by filling excavated road areas to approximated natural grades with road fill materials, or 2) where natural channelization occurs design an erosion resistant channel.

It has been determined through observations made during site visits and through available data and mapping that culverts C-22-24, C-23-24, and C-27-24 do not require reclamation channel design because they are located in areas where reclaimed contours will develop local sheet flow. Culverts C-25-36 and C-28-24 will however require rip-rapped channel design, and culverts C-24-24, C-26-24, and C-26A-24 will require a "non rip-rap" erosion resistant channel design.

Existing culvert C-21-48 will be reclaimed to match natural grades and road fill grades as much as practical. Design has been completed for this channel reach as presented in Appendix R1.

Culvert No. C-25-36 at the "Big Fill", which carries the drainage from the Big Fill Area, will also be removed and the stream channel reconstructed (as shown on reclamation mapping) to the natural ground as much as possible. The majority of the fill is to be removed and utilized during reclamation at other reclamation sites within the Permit Area.

Channel Design Using Rip-rap. Two reclamation channels, RC-4 and RC-5 to be constructed along the White Oak Haul Road using rip-rap as the erosion protection medium. Channels RC-4 and RC-5 are located along the drainage channels currently occupied by culverts C-25-36 (often referred to as the "Big Fill" or the "Bowl" culvert) and C-28-24 respectively. At some point in the future if other more efficient methods of erosion protection become practical, the designs for both reclaimed channels should be re-evaluated.

The drainage occupied by culvert C-28-24 (reclaimed channel RC-5) has a total tributary area of 35 acres, an overall channel gradient of 34%, and a 100 year - 6 hour storm runoff design event of 7.84 cfs. A reclaimed rip-rap channel has been designed for the channel using the OSM "Steep Channel Rip-rap Design" criteria. Utilizing this design method for a 6 foot channel width; an average rip-rap size (D_{50}) of

0.75 feet and a total channel depth of 1.25 feet was calculated as being required. Design calculations are shown in Appendix R1 with plan and cross section details being shown on Map 527 Sheets 12 through 16.

The drainage occupied by culvert C-25-36 (reclaimed channel RC-4) has a channel gradient of 31.6%, a watershed of approximately 140 acres, and a 100 Year - 6 Hour precipitation event of approximately 34 cfs. Using the OSM "Steep Channel Rip-rap Design" method, a D_{50} of 1.5 feet and a channel bottom width of 6.0 feet was found to be adequate. Complete plan and cross section details are shown on Map 527 Sheets 12 through 16 with design calculations being presented in Appendix R1.

Channel Design using Vegetative Matting. Reclaimed channels C-24-24, C-26-24, and C-26A-24 are relatively small drainage channels located on steep side hills. Flows predicted for each of the channels are 1.2, 2.5, and 1.24 cfs with estimated slopes of 54, 57, and 48 percent respectively. The design of these flows on steep embankments is limited by 1) the ability of the channel to control the flow without flow and erosion, 2) the physical ability to construct the channel on the steep slope sections, and 3) by the long term stability of both the embankment and rip-rap. Even if rip-rap were adequately designed and could be placed effectively, concerns related to a potential slope failure subsequent to construction are important considerations.

In an effort to eliminate some of these concerns, an alternate method of erosion protection has been devised to protect the hillside and reduce the failure potential. Vegetative matting will be installed within the disturbed bottom portions of the newly formed reclaimed channels at the above mentioned locations. This vegetative matting is shown in Appendix R1 in schematic form. Note from the design details provided that the uppermost section of matting be buried two feet, with all upstream layers overlying downstream layers where joints are required. The downstream section would be buried at depth of one foot and all sides would be staked to prevent movement. As an added measure, trees will be planted within all matted sections to aid in the long term stabilization of the channel. At least two trees (either deciduous or conifer per 10 foot length of each matted section. Through time, channel stabilization will occur through vegetative growth from seeds within the matting itself as well as through root structure growth from natural or planted trees. Aspen or other rapid growth native vegetation are planned for use under these conditions.

White Oak Complex

Activities to be completed during reclamation of the surface mining activity are the redistribution of the temporary spoil storage pile, the restoration of the upper Whisky Creek, the placement of the stored topsoil and the revegetation. As vegetation becomes adequate in this area of reclamation Dugout D-1 will be removed and upper Whisky Creek will report directly to culvert C-40-42. When reclamation activities begin in the remaining area the activities to be completed are the removal of fill associated with the coal loadout pad; the restoration of the main Whisky Creek channel, the regrading of the coal storage pad and loadout area, the removal of Sediment Pond 004A and the regrading of that area; the removal of portions of culvert C-40-42 at both ends and plugging the ends with concrete 3 times the diameter; the placement of topsoil stored from the surface mining activity, and revegetation of this area. The removal of Sediment Pond 004A at this stage of reclamation is necessary because of general local topography and the pond's location. The pond is located within a relatively narrow canyon at the downstream end of the coal loadout pad. In order to prepare a reclamation design plan which would consider adequately the long term protection of the environment, the pond was removed. Main concerns with leaving the pond in place were that 1) it is located upon fill material, and 2) the discharge channel is excessively steep and could not adequately be design to ensure long term protection of the downstream embankment.

Whisky Creek is currently diverted beneath the coal loadout pad and sedimentation pond via a 42 inch corrugated metal culvert. Upon reclamation, the coal loadout pad will be removed and a new stream channel will be constructed. No culverts will remain subsequent to reclamation within the White Oak Complex area. Reclaimed channel RC-2 (as shown on Map 527 Sheets 12 through 14) extends from the inlet to Culvert C-40-42 to the downstream undisturbed sections of Whisky Creek. The general hydrologic drainages for the White Oak Complex area are relatively simple in nature and are therefore not shown on the detailed reclamation mapping. The drainage boundaries for this area are shown on Map R645-301-742-310b. Other drainage areas utilized during reclamation design as well as design calculations are however presented as part of Appendix R1.

The upper portion of Whisky Creek that presently reports to Culvert C-40-42 will be disturbed during the surface mining of the barrier coal and the initial phase of reclamation. A stream alteration permit for this area is included in Appendix R-1. The surface water flow on this portion of Whisky Creek will report to The active surface mining pit while the mining in the stream channel is occurring then to dugout D-1 pond for sediment control before reporting to Culvert C-40-42. The stream channel will be restored according to the stream alteration permit and the methods approved in the MRP. Dugout D-1 will be removed once adequate vegetation has been established in the drainage area it controls.

The reclamation channels as presented on Map R645-301-527(Reclamation Channel Details Sheets 15 and 16 of 16) have been designed to provide for the required conveyance of the 100 Year - 6 Hour precipitation event with a freeboard of 0.5 feet. The flow rate calculated for the entire White Oak Complex area is 32.2 cfs. This flow rate was used for the lower section of channel RC-2 below the confluence with channel RC-3. The upper section of RC-2 was calculated to have a design flow rate of 13.4 cfs. A design flow rate of 3.1 cfs was calculated and used in the design for channel RC-3. Reclaimed channel design calculations are included within Appendix R1 as required by the agency. With channel flow depths in the range of 0.5 feet, an additional freeboard depth of 0.5 feet provides adequate channel capacity for runoff design, and to protect against overtopping.

The maximum size riprap which is required for use in the reclamation channels has a D_{50} of 1.5 feet (Average diameter of 1.5 feet). This maximum rip-rap size was determined based upon the design criteria given by the average channel slope between undisturbed up-gradient and down-gradient channel sections. Maximum channel slopes at the White Oak Complex are approximately 12% and 33 % for channels RC-2 and RC-3 respectively. Complete channel plan and cross section details are shown on Maps 527 Sheets 1 through 16.

Sediment Pond 004A will remain intact as long as practical during the final reclamation phase of the mine area. As reclamation proceeds, excavation of the coal loadout pad material will reach a point where the construction of the restored Whisky Creek channel reach Sediment Pond 004A. At this time, Sediment Pond 004A will have to be removed to complete the channel restoration. Existing culvert C-40-42 will remain during construction of RC-2 in order to safely bypass area waters from Whisky Creek through the area. Upon completing construction of the reclaimed channels, forty feet of the culvert will be removed on the up stream end to activate the newly constructed channel and the adjacent hillsides will be 1)graded to the approximate final contour patterns shown on Map 527 Sheets 12 through 14, 2) revegetated and 3) protected against excessive erosion through the installation of alternate sediment control devices such as straw bales, etc.. The erosion control devices will been placed in a herringbone fashion using relatively short fence sections. The short sections are utilized in an effort to minimize the potential for a general fence failure due to wind or to another natural event. Because it is not possible to retain Sediment Pond 004A throughout the normal revegetation period, straw bales or erosion fencing will be placed on regraded slopes throughout the reclaimed area.

Water Quality Impacts of Runoff Conveyance Plan

The effects upon the surface water system due to reclamation activities is anticipated to be generally confined to increased sediment loadings during heavy construction periods. As required, all surface water sedimentation ponds found within the Loadout Facility area will remain in place until final reclamation in order to collect and retain disturbed area water. As a result, the majority of heavily sediment laden runoff will be contained within the respective sediment pond. No ponds will be removed during the initial phase of reclamation at the White Oak Complex. Dugout D-2 will remain in place until once vegetative cover on the reclaimed area up-gradient has been well established. Sediment Pond 004A located at the White Oak Complex must be removed during the final portions of reclamation when material is required for the reclamation of the White Oak Haul Road and the restoration of the Whisky Creek Channel RC-2 as discussed above. It is recognized that increased sediment loadings do occur with construction activities, and therefore increases in sediment loadings may occur until the area is regraded and vegetative growth is re-established. Attempts to mitigate these normal increases in sediment loadings the Reclamation Plan includes a timely revegetation program and the installation of straw bales (or other approved erosion control devices) downstream of all disturbed areas. Specifics related to reclamation timing and activities are found in a following section entitled "Timing and Reclamation Sequence".

Vegetation Requirements

Vegetation requirements required for reclamation are as outlined below. It is important to note that revegetation will generally require a 12 to 18 month delay between the time vegetation is ordered and the time it is ready for delivery. This delay indicates that vegetation required for reclamation should be ordered at the time reclamation begins during the initial period of structure removal so that it will be ready for planting upon completion of resurfacing operations.

Test Plot Studies

All results from test plot studies are contained in the following reports located in Appendix 341.300 of the PAP submitted in 1993.

Cover and Productivity Analysis of Temporary Revegetation Sites at Valley Camp of Utah, Inc.'s Utah #2 and Belina Operations", 1986, prepared by Cedar Creek Associates, Inc.

"1988 Results of Vegetation Sampling and Test Plot Monitoring", and "Summary of Vegetation Monitoring For The Utah & Belina Test Plots, 1988 - 1992", prepared by Mt. Nebo Scientific Research and Consulting.

Letters from Paul Baker, UDOGM Reclamation Biologist, dated August 31, 1992, and October 9, 1992. See Map 231.300 Sheets 1 through 4 for the locations of areas discussed in these letters.

Soil Characteristics

Soil characteristics are described in Section 200 of the "Operation Plan". Vegetation success resulting from interim reclamation suggests that the disturbed area materials are suitable for use as (VSM). The re-seeded cut/fill slopes, some with and some without topsoil, are supporting vegetation after two years of 200%+ of normal precipitation followed by several dry years. During this period the re-seeded slopes received no additional treatment. The only cut slopes which are not supporting vegetation are those which are nearly vertical. Map 231.300 Sheets 1 through 4, Suitability of Topsoil Substitutes, shows the re-seeded slope areas.

Areas containing "proven soil" are shown on Map 231.300, Sheets 1 through 4. The previous operator, Valley Camp of Utah, Inc., requested that the Soil Conservation Service evaluate Permit Area soils to determine the suitability of disturbed area materials as VSM. If the SCS determines that a soil survey is required then the Operator will furnish the SCS with necessary mapping. The results of the soil survey will be submitted to the Division for placement in the Reclamation Plan and a copy will also be submitted in the "Annual Summary".

During reclamation, re-contouring will take place as required and the re-contoured surfaces will be scarified. Any areas not containing "proven soils" will be sampled to determine suitability as a VSM. The samples will be tested for pH, texture, soluble Ca, Na, Mg, cation exchange capacity, nitrate, nitrogen, phosphorus, potassium, boron, selenium, acid/toxic forming potential, oil and grease, gasoline and diesel and associated benzene, toluene, ethylene, xylene, and naphthalene. All tests will be conducted according to EPA Guidelines. Acid/toxic forming material detected by the sampling and testing program, if any, will be replaced to prevent any detrimental effects to the environment. If required fertilizers, nutrients, and soil conditioners will be applied using acceptable methods and under favorable conditions as practicable.

Plant Type, Density, and Planting Procedures

The objective of the 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. The vegetative cover will be comprised of native species, or of introduced species which are compatible with the post-mining land use and with the natural plant and animal species of this area.

The Operator will comply with all applicable State and Federal regulations regarding seeds, poisonous and noxious plants, and introduced species. The Reclamation Plan will be accomplished in four phases described as follows:

1. Earthwork to prepare a stable seed-bed.

2. Planting of grasses and forbs to control erosion and to enhance habitat.

3. Planting of seedlings to further stabilize the soil and further enhance habitat.

4. Planting of riparian zones.

Earthwork. All areas to be reclaimed will be graded to the reclamation contours shown on Maps 527 Sheets 1 through 14. All surface grades will be roughened by dozer tracks and topsoil placed by methods that leave a roughened surface by gouging for water retention and certified weed free alfalfa at the rate 1 to 2 tons per acre will incorporated into the topsoil during this process for erosion control.

During earthwork every effort will be made to minimize disturbance to surrounding areas and existing vegetation. If disturbance is necessary the disturbed soil and vegetation will be relocated together as clumps if possible.

After the earthwork has been completed the soils will be tested as described above in the soils section and fertilizers, nutrients, and conditioners will be applied as needed. After seeding, it is anticipated that mulching will be required for erosion control using a combination of straw and wood fiber mulch. The straw is applied at a rate of one ton per acre after which the area is hydro-mulched with 500 pounds per acre of wood fibre mulch combined with 80 pounds per acre of tackifier. Fertilizer will be applied at the following rates if necessary in either granular or liquid forms:

N	30 pounds per acre.
P20	100 pounds per acre.
K20	100 pounds per acre.

These rates may be revised based on testing. With the approval of the Division available natural material such as brush, downed trees, rocks, etc. will be placed on the recontoured surfaces to achieve a more natural appearance and to enhance the habitat. It is not anticipated that husbandry practices will be employed at White Oak.

Grasses and Forbs. Normal time for seeding in Utah is best accomplished in the fall, especially in the higher evelations. The seeding for final reclamation will occur during this period. Broadcast methods will be used to plant grasses and forbs on reclaimed areas. Rates for seeding are shown in Table R-1. If possible, seeds will be gathered from areas adjacent to the reclaimed areas. Seeds not able to be gathered locally will be purchased from a certified supplier and will be warranted for use at reclamation sites.

Broadcast methods of seeding will be used on all slope grades found in the areas of reclamation. All seeded areas will be hydro-mulched. No seeding will be attempted on surfaces of exposed rock or where rock is so close to the surface that seeding is impractical.

Seedlings. Seedlings will be planted during the fall as soon as possible after seeding to take full advantage of the spring moisture. Where cuttings are used, they can be planted as early in the spring as possible. With proper care, such as stripping leaves, they can be planted later in the season. Soil roughening will provide microsites to collect moisture. These depressions will be used for seedling sites. Shrubs and trees will be grouped in areas to develop an edge effect for wildlife shelter. These grove areas will be located in areas where trees existed and near the restored stream channel. The types and planting rates of permanent seed mixtures to be used to reclaim mining facilities are shown in Table R-1.

Where possible revegetation stock will be harvested from areas adjacent to the areas being revegetated. If seedling stock cannot be gathered locally seedlings will be purchased from a certified supplier and shall be warranted for use at reclaimed sites. All stock will be properly stored and prepared prior to transplanting.

Following initial planting, additional seedlings will be planted if required in order to make the reclaimed areas match the surrounding undisturbed areas.

Noxious Weed Control. In order to control the infestation of noxious weeds in the reclaimed areas, a weed control program will be instituted. The program will consist of spraying after emergence and prior to flowering in the spring and in the fall. Application of 24D, Tordon, Escort or equivalent in direct application in small patches and area applications in large infestations. Topping of plants may also be used as a control method. Other methods of control may be instituted as recommended by County Weed Control and the Division.

Riparian Zones. All natural riparian habitat disturbed by mining operations will be reclaimed to premining condition. A vegetation survey was completed by JBR Environmental Consultants in the Whisky Creek channel that will be disturbed during the surface mining at the White Oak Complex. A minimum of 18% of the relocated stream channel will be riparian and will meet the cover and diversity standards that were measured and identified in the JBR study in Appendix 3-1. The revegetation plan for this area is derived from this report. See Appendix 3-1. Riparian zones will be established 5-10 feet on either side of the top width of reclaimed channels. Planting to occur after water flow has been re-established in the channel. Spring and fall planting seasons. These zones will be planted with willow slips and clumps gathered from adjacent areas, and appropriate sedges, shrubs and trees.

removed and reclaimed at the end of reclamation contouring with the exception of Sediment Pond 004A which will be removed during the final stages of recontouring. Excavation of the coal loadout pad and the restoration of RC-2 Whisky Creek Channel at the mine will require removal of portions of Culvert C-40-42 and Sediment Pond 004A. During the construction of the channel, the adjacent hillsides will be graded to approximate final configuration as represented by the contours shown on Map 527 Sheets 12 through 14, and then revegetated. Because Sediment Pond 004A will not be retained during the reclamation period straw bales (or other acceptable erosion control devices) will be installed in a herringbone patter to prevent excessive erosion and minimize the potential for, and effects of partial failure. At the end of the reclamation period, bypass ditches UDD-2 through UDD-5 and all erosion control devices will be removed.

TABLE R-1.
APPROVED RECLAMATION GRASSES, WILDFLOWERS AND FORBS, LEGUMES, TREES AND SHRUBS PERMANENT SEED MIXTURES

SPECIES	PLS LBS/AC
WHITE OAK LOADOUT FACILITY	
GRASSES: Any 5 species of approved grasses listed below will be planted.	
Agropyron smithii - Western wheatgrass	4.0
Agropyron dasystacyum - Thickspike wheatgrass	4.0
Bromus marginatus – Mountain Brome	5.0
Elymus cinereus – Basin Wild Rye	2.0
Poa pratensis - Kentucky bluegrass	0.2
Stipa comata - Needle and Thread grass	1.0
FORBS: Any 5 species of approved forbes listed below will be planted.	
Artemisia ludoviciana - Prairie sage	0.1
Aster glaucodes - Blueleaf aster	0.5
Hedysarum boreale - Utah sweetvetch	1.0
Linum lewisii - Blue flax	1.0
Penstemon strictus - 'Bandera' Rocky Mountain penstemon	0.5
SHRUBS:	
Artemisia tridentata vaseyana - Mountain big sagebrush	0.1
Chrysothamnus nauseosus - Rubber rabbitbrush	0.5
SHRUBS : (Hand sets/acre) Any combination of 2 species of hand sets shrubs will be planted.	
Amelanchier alnifolia - Saskatoon Serviceberry	300
Purshia tridentata - Bitterbrush	300
Rosa Woodsii - Woods rose	300
Symphoricarpos oreophilus - Mountain snowberry	300
TREES: (Hand sets/acre)	
Abies Concolor - White fir	50
Populus tremuloides - Quaking aspen	250
NOTE: Seed application is calculated for a broadcast application	

SPECIES	PLS LBS/AC
RIPARIAN AREAS - WHISKY CREEK	
GRASSES:	
Carex microptera - Smallwing sedge	2.0
Juncus longistylis - Longstyle rush	1.0
Equisetum arvense - Field horsetail	1.0
Scirpus cespitosus - Tufted bulrush	2.0
Poa reflexa - Nodding bluegrass	1.0
Hordeum brachyantherum - Meadow barley	2.0
Elymus glaucus - Blue wildrye	2.0
FORBS:	
Ranunculus alismaefolius - Dwarf buttercup	1.0
Rudbeckia occidentalis - Western coneflower	1.0
Mimulus guttatus - Seep monkeyflower	1.0
Wyethia mollis - Wooly wyethia	1.0
SHRUBS: (Hand sets/acre)	
Mahonia repens - Creeping Oregon grape	300
Rubus idaeus sachalinenis - American red raspberry	300
Symphoricarpos albus - Common snowberry	2,000

WHITE OAK COMPLEX AND UPPER AND LOWER SECTIONS OF THE WHITE OAK HAUL ROAD	
(ALL ASPECTS)	**PLS LBS/AC**
GRASSES: Any 5 species of approved grasses listed below will be planted.	
Agropyron spicatum - Bluebunch wheatgrass	3.0
Agropyron smithii - Western wheatgrass	4.0
Agropyron trachycaulum - Slender wheatgrass	3.0
Bromus marginatus - Mountain brome	5.0
Poa Canbyi - Canby bluegrass	0.4
Poa pratensis - Kentucky bluegrass	0.25
Stipa columbiana - Columbia needlegrass	1.0
Stipa lettermannii - Letterman's needlegrass	1.0
FORBS: Any 6 species of approved forbs listed below will be planted.	
Viguiera multiflora - Showy goldeneye	0.2
Achillia millefolium – Yarrow	0.2
Hedysarum boreale - Northern sweetvetch	1.5
Aster engelmannii - Engelmann aster	0.5
Rudbeckia occidentalis - Western coneflower	1.0
Lupinus sericeus - Silky lupine	2.0
Penstemon strictus - 'Bandera' Rocky Mountain penstemon	0.5

SPECIES	PLS LBS/AC
SHRUBS: (Hand sets/acre) Any combination of 3 species of hand set shrubs will be planted.	
Ribes cereum - Blue currant	300
Sambucus coerulea - Blue elderberry	300
Symphoricarpos oreophilus - Mountain snowberry	300
Prunus virginia - Chokecherry	300
Mahonia repens - Oregon grape	300
Rosa woodsii - Woods rose	300
Pachystima myrsinites - Mountain lover (north aspect)	300
(SOUTH-WEST FACING ASPECTS)	
TREES: (Hand sets/acre)	
Populus tremuloides - Quaking aspen (Aspen will be placed on 5' to 6' centers in 1/4 - 1/2 acre clumps/acre)	400
(NORTH-EAST FACING ASPECTS)	
TREES: (Hand sets/acre)	
Abies Concolor - White fir	200
Abies laiocarpa - sub-alpine fir (Balsum fir)	150
Picea pungens - Blue spruce	200

MONITORING AND MAINTENANCE

During Reclamation

The Reclamation Plan includes continued monitoring and maintenance of constructed facility throughout the reclamation period by qualified individuals who can certify as to the current status of conditions or facility. All surface features included within the plan are covered by this monitoring and maintenance plan including wholly or partially constructed items including runoff conveyance channels, erosion control devices, and re-vegetated areas.

Construction Observation

Personnel will be assigned to observe ongoing construction related activities throughout the reclamation period. These activities will include the observation of all construction operations. Initial observation activities will consist of reviews of the removal of surface related facility where after excavation, re-contouring, channel construction and revegetation will be observed.

Environmental Observation

Stockpiled topsoil material excavated from fill areas which will not be placed during the construction season in which it was removed will be stabilized with seed during the first normal period favorable for planting. In should placement not be planned during the construction season and erosion control measures will be implemented. These actions will protect the pile from environmental degradation.

The effects upon the surface water system due to reclamation activities is anticipated to be generally confined to increased sediment loadings during heavy construction periods. As required, all surface water sedimentation ponds will remain in place until final reclamation in order to collect and retain disturbed area water. As a result, the majority of heavily sediment laden runoff will be contained within the respective sediment pond. It is recognized however that increased sediment loadings do occur with construction activities, and therefore increases in sediment loadings may occur until the area is re-graded and vegetative growth is re-established.

Water Quality Monitoring

Water quality sampling will continue throughout the reclamation period as required under Section 700 hydrology regulations according to the approved analytical schedule shown in the MRP in Table 731.211a. Water quality data collected during this period will be reviewed and compared to data collected during baseline and operational monitoring periods to identify impacts related to ongoing reclamation activities. Current plans include a proposal to drop operational and baseline water monitoring stations which lie outside surface disturbance areas within the first five years subsequent to the cessation of mining. However, the water monitoring program as accepted at the time of reclamation will be followed until a formal request for monitoring program modification has been submitted to, and accepted by the regulatory agency.

Post Reclamation

Prior to abandoning the Permit Area or seeking bond release, an aerial survey will be completed and used to generate final configuration contour maps ("Certified as-built maps") as evidence that all temporary facility have been removed, all areas have been reclaimed, and that all permanent structures exhibit stability. Specific monitoring and maintenance plans include:

Erosion Protection

Erosion pins will be placed on slopes at the time of re-seeding operations using a table of random numbers to determine location. These pins will then be used as a guide to overall erosion characteristic of the reclaimed area. All rills or gullies which form in areas that have been re-graded and topsoiled and which either; disrupt the approved postmining land use or the reestablishment of the vegetative cover, or cause or contribute to a violation of water quality standards for receiving streams will be filled, re-graded, or otherwise stabilized; topsoil will be replaced; and the areas will be re-seeded or replanted. All slopes will be monitored for such failures and corrected within 60 days of detection (unless environmental conditions limit restoration under which condition correction will occur at the earliest period feasibly possible).

The effectiveness of in place erosion control devices and practices will be based upon the "Erosion Condition Classification System - Technical Note - Method for Evaluation of Erosion of Reclaimed Coal Lands in Western United States" (Office of Surface Mining, 1990) or another definable method agreed upon by both the Division and the Operator.

Adequate siltation structures to help prevent or control erosion will be maintained until the site has been vegetated and stabilized and either approved to be left or removal is authorized by the Division. If these structures are removed the affected area will be re-vegetated in accordance with this Reclamation Plan.

Annual site visits planned in conjunction with the Division of Oil, Gas & Mining will review erosional conditions and document possible problem areas.

Subsidence Monitoring

The Subsidence Monitoring Plan outlined within Section 525 of the "Operation Plan" will continue for at least five years following reclamation of the underground portal areas and the completion of the surface mining at the White Oak Complex.

Water Quality Monitoring

The post reclamation water quality monitoring program will continue at all White Oak Complex and Loadout Facility monitoring stations as either currently outlined within Section 700 of the "Operation Plan" or then approved by the regulatory agency. Monitoring will continue throughout the mine reclamation time period and bond release. Sampling will continue at both existing up-gradient and down-gradient water quality monitoring stations in order to obtain data which will reflect changes in water quality from reclaimed sites. These samples will provide water quality documentation necessary for bond release.

Vegetation Monitoring

Vegetation monitoring will use approved methodologies and will be completed during the middle of each growing season during which time it is most feasible to conduct cover and composition studies. Annual monitoring will occur over the entire reclamation area during the first 5 years of the reclamation period whereafter monitoring will be selectively reduced. Final acceptance and or modification to the monitoring program will be based upon a 90% statistical standard of reclaimed cover and composition to undisturbed cover and composition. In areas in which a cover of 90 percent of reference area cover is achieved, monitoring will be reduced to once every 5 years until bond release. Areas will be reevaluated for which a cover less than 90% is achieved within the initial 5 year period. Modification to revegetation efforts or other corrective action will be taken if the reevaluation so indicates that such measures are warranted. If corrective action is warranted and/or taken, annual monitoring will continue for an additional five year time period, until bond release, or until 90% of reference cover is obtained.

Techniques used to determine percent cover and composition of revegetated areas will be consistent with those recommended by the Division or is standard monitoring practice at the time of reclamation. Transplant survival will be monitored for the first 3 years. Data regarding cover, productivity, and woody plant density, will be collected, using acceptable statistical techniques, for reclaimed areas and reference areas during the last 2 years of the reclamation period.

Success of revegetation will be judged on the effectiveness of the vegetation for the approved postmining land use, the extent of cover compared to the extent of cover of the respective reference area or other approved success standard, and the General Requirements of Section 353. Reference areas for each reclaimed surface will be taken as those undisturbed areas found adjacent to the reclaimed surface. Reference areas are shown on map R645-301-323.100. Two types of reference areas are indicated. The first containing sagebrush and the second grass-forbs-elderberry communities. Reference areas will come from those areas shown in Table R-2. The diversity will be determined by the use of three methods of comparison between the reclaimed land and the reference areas. These are measures of the mean number of species encountered per sample, the total number of species (species richness), and the MacArthur's Index.

TABLE R-2.
VEGETATION REFERENCE AREAS

Permit	Reference	Comment
White Oak Loadout Facility	Slopes above White Oak Loadout Facility	Reference area will apply to reclaimed slopes (except for areas immediately adjacent to Mud Creek)
	Land adjacent to Mud Creek	Reference area will apply to reclaimed areas immediately adjacent to Mud Creek
General Office	N/A	No reclamation planned
White Oak Haul Road	Whisky Canyon	Reference areas lie immediately up-gradient of reclaimed road sections
White Oak Complex	Whisky Canyon	Reference areas lie immediately up-gradient of the reclaimed area

TIMING AND RECLAMATION SEQUENCE

The timing and reclamation sequence are an integral part of the Reclamation Plan since each phase of reclamation is dependent upon other phases. An overall sequence for reclamation includes Demolition and Cleanup, Scalping of Slopes for VSM's, Construction of Runoff Control Channels, Recontouring of Slopes, and Revegetation. The speed at which each of these activities can be accomplished varies greatly depending upon the area to be reclaimed. For example, the Loadout Facility can be reclaimed much more easily and quickly than can the White Oak Complex simply because of location and accessibility.

The overall operational sequence for reclamation will span several years and will include the activities outlined in the following reclamation time table. Specifics regarding each activity follow Table R-3.

TABLE R-3.
RECLAMATION TIME TABLE

	YEAR					
ACTIVITY	1	2	3	4	5	Period until Bond Release
WHITE OAK LOADOUT FACILITY						
Demolition and Cleanup (Salvage Operations)						
Harvest Vegetation-Supporting Material[1] (VSM)						
Construction of Runoff Control Channels[1,2]						
Slope Recontouring[1,2]						
Revegetation[1,3]						
Monitoring and Maintenance[4]						

GENERAL OFFICE AREA

N/A No reclamation planned	General Office Area to Remain					
	YEAR					
ACTIVITY	1	2	3	4	5	Period until Bond Release
WHITE OAK HAUL ROAD						
Remove asphalt, road base, guard rails[5] and culverts.						
Slope Recontouring[6]						
Construction of Runoff Control Channels[7]						
Revegetation[8]						
Monitoring and Maintenance[4]						

TABLE R-3.
RECLAMATION TIME TABLE (continued)

	YEAR					
ACTIVITY	1	2	3	4	5	Period until Bond Release
WHITE OAK COMPLEX (Surface Mining Area)						
Redistribution of Temporary Spoil Storage	■					
Slope Recontouring [2,10]	■					
Construction of Upper Whisky Creek Channel[2]	■					
Distribution of Topsoil		■				
Revegetation[8,10]		■	■			
Monitoring and Maintenance[4]	■	■	■	■	■	■
WHITE OAK COMPLEX (Coal Storage & Truck Loadout Area)						
Demolition and Cleanup (Salvage Operations)	■					
Harvest Vegetation-Supporting Material[9] (VSM)		■	■			
Construction of Whisky Creek Channel[2]		■	■			
Slope Recontouring[2,10]		■	■			
Revegetation[8,10]		■	■	■		
Monitoring and Maintenance[4]	■	■	■	■	■	■

NOTES:

1. Timing of reclamation activities may vary slightly due to the possibility of the loadout area being used as a temporary storage facility for reclamation materials such as riprap. If upon reclamation it is found that the area is not needed for storage, then reclamation recontouring will begin in year 2. If it is needed, then recontouring will begin during year 4.

2. The construction of stream channel and the construction of recontoured slopes may occur simultaneously within the reclamation area.

3. Slopes will be revegetated at the earliest time in which establishment of growth will be most promising as indicated by seed and plant suppliers.

4. All aspects of reclamation will be monitored according to the schedule previously discussed.

5. Road must remain during first year of reclamation to facilitate the removal of all surface facility and or the delivery of equipment and supplies required for reclamation.

6. Recontouring efforts will begin at the lower end of the White Oak Haul Road and proceed upgradient to the big fill midway to allow for the importation of rock and fill material from the excavation of the White Oak Complex. A narrow trail to allow equipment movement will remain at the top of the fill material until the removal of the big fill occurs during the final recontouring during revegetation.

7. The construction of runoff control channels will proceed as reclamation of the road progresses upgradient.

8. Because of limited access once reclamation has been completed, the White Oak Haul Road will be revegetated in segments. Revegetation will follow localized resurfacing efforts.

9. Scalped or scraped White Oak Complex materials may require stockpiling for later use. Storage location options include the upper and/or lower pad areas. The potential VSM harvested during construction of the Whisky Creek Channel will be placed upon adjacent newly configured slopes or along the Haul Road.

10. Final regrading, recontouring and revegetation of access roadways may be delayed upon the completion of all other reclamation activities in order to provide continued access to the property should maintenance be required prior to bond release.

White Oak Loadout Facility

Surface reclamation of the Loadout Facility all occur with relative ease due to the general nature of the facility and property access. Reclamation activities will begin with the removal and salvage of all surface facilities located on the site with the exception of two railroad lines not associated with the Loadout Facility, an access roadway to the railroad and concrete foundations buried 18" below final grade. During year 1 it is planned that all surface facility will be removed with the exception of those facility discussed. Sediment Ponds 001A, 002A and 003A will be removed during the final phases of recontouring whereafter alternative sediment control measures will be implemented according to best technology currently available at the time of reclamation. The sediment ponds will be removed as part of the recontouring effort since 1) the ponds are too high to receive reclaimed area surface runoff water, 2) natural runoff characteristics (including premining railroad culvert locations) will not allow for concentration of flows to existing sediment pond locations, and 3) if left, a significant area would require redisturbance upon final pond reclamation thereby destroying several years of vegetative growth.

As indicated as a footnote to Table R-3 there is a possibility that the Loadout Facility will be required as a holding or storage area for reclamation materials including such items as machinery or channel riprap. If requested by the reclamation contractor, restoration of the surface of the Loadout Facility area will be postponed until it is no longer needed. Surface drainage facility capable of diverting runoff waters away from disturbed areas as well as those required to capture and treat disturbed area waters will be maintained throughout this period. Recontouring of the Loadout Facility will be begin as soon as it is no longer needed for reclamation activities or storage.

General Office Area

No reclamation is planned for the General Office Area consistent with its planned post mining land use.

White Oak Haul Road

Reclamation of the White Oak Haul Road will begin during year 2 of the reclamation of the coal storage and truck loadout at the White Oak Complex. The road will remain open during year 1 to allow the removal of the remaining surface facilities associated with the White Oak Complex. At the beginning of year 2 or 3, the removal of road surface, concrete and guardrail will occur. Surplus fill material will be moved from the mine site and placed on the roadway raising the elevation of the access. Once this material is placed and the mine site has been completely regraded, the final regrading and revegetation will start at the mine site working downgrade to the big fill area. The big fill area will be regraded moving surplus material down the road grade with final grading and revegetation following. The culvert in Eccles Canyon will be removed last thereby requiring future access to the White Oak Complex area via Boardinghouse Canyon. Timing and sequence of reclamation operations will be coincident with those occurring at the White Oak Complex as shown in Table R-3.

White Oak Loadout Facility

Surface reclamation of the Loadout Facility all occur with relative ease due to the general nature of the facility and property access. Reclamation activities will begin with the removal and salvage of all surface facilities located on the site with the exception of two railroad lines not associated with the Loadout Facility, an access roadway to the railroad and concrete foundations buried 18" below final grade. During year 1 it is planned that all surface facility will be removed with the exception of those facility discussed. Sediment Ponds 001A, 002A and 003A will be removed during the final phases of recontouring whereafter alternative sediment control measures will be implemented according to best technology currently available at the time of reclamation. The sediment ponds will be removed as part of the recontouring effort since 1) the ponds are too high to receive reclaimed area surface runoff water, 2) natural runoff characteristics (including premining railroad culvert locations) will not allow for concentration of flows to existing sediment pond locations, and 3) if left, a significant area would require redisturbance upon final pond reclamation thereby destroying several years of vegetative growth.

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White Oak Haul Road

Reclamation of the White Oak Haul Road will begin during year 2 of the reclamation of the coal storage and truck loadout at the White Oak Complex. The road will remain open during year 1 to allow the removal of the remaining surface facilities associated with the White Oak Complex. At the beginning of year 2 or 3, the removal of road surface, concrete and guardrail will occur. Surplus fill material will be moved from the mine site and placed on the roadway raising the elevation of the access. Once this material is placed and the mine site has been completely regraded, the final regrading and revegetation will start at the mine site working downgrade to the big fill area. The big fill area will be regraded moving surplus material down the road grade with final grading and revegetation following. The culvert in Eccles Canyon will be removed last thereby requiring future access to the White Oak Complex area via Boardinghouse Canyon. Reclamation of the road must begin at the bottom and work to the top because fill materials being used will be generated from fill currently at the mine site. Timing and sequence of reclamation operations will be coincident with those occurring at the White Oak Complex as shown in Table R-3.

White Oak Complex

Surface reclamation of the White Oak Complex will begin during the surface mining of the barrier coal. The facilities located in the bench prepared to access White Oak No.1 will be removed upon the completion of underground mining activity in the White Oak No.2 mine. The surface mining process will be completed in 14 to 20 months. During that time, the removal and salvage of all surface facilities located on the site with the exception of concrete foundations buried 18" below final grade. After surface mining is completed the completed installation of upper Whisky Creek and the redistribution of the temporary spoil storage pile will be completed along with the re-contouring of the area. The coal storage tube and belt, the truck loadout and the possibly the well located near the bottom of Sediment Pond 004A and Sediment Pond 004A will be reclaimed later with the White Oak Haulroad. The final reclamation of the remainder of the site will begin once the site is no longer necessary for the transporting of coal from adjacent reserves. Year 1 of the final reclamation of the White Oak Complex will consist of removal of the remaining facilities and cleanup and the start of harvest of any useable VSM from slopes to be re-contoured.

Year 2 of the reclamation of the surface mining area will involve topsoil distribution and the start of revegetation. Year 2 of final reclamation of the lower mine site will consist of the initial phases of fill removal from the coal storage pad and truck loop and the construction of the main Whisky Creek channel. During this phase re-contouring will occur. Once the stream reconstruction reaches sediment pond 004A, Sediment Pond 004A will be removed since it is located upon fill material to be used along the haul road as well as the White Oak Complex. Because the sediment pond must be removed in order to reclaim the road, a variance from Section 763.100 must be granted. It is anticipated that existing culvert C-40-42 will remain in place until completion of the main Whisky Creek channel. The area will be final graded , topsoil and revegetation will be started in the non-riparian areas. Where after, the culvert will be partially removed and capped and the stream diverted through the new channel. Once the new channel has water, the revegetation of the riparian areas can proceed. Because of limited construction seasons and the fact that removal of fill can proceed only as fast as fill can be utilized on the White Oak Haul Road, it is anticipated that channel construction and re-contouring may require an approximate two year time period as shown in Table R-3.

When re-contoured, these areas will be re-vegetated and protected against erosion through the use of alternative erosion control devices in a timely manner subsequent to final grading. It is planned that any existing undisturbed area bypass ditches will remain in place as throughout the reclamation construction period. These ditches will help reduce the amount of surface runoff water which will traverse the area thereby reducing the potential for damage to newly reclaimed hillsides.

WHISKY CREEK STREAM RESTORATION

The Division of Water Rights has approved a plan for the relocation and restoration of the upper portion of Whisky Creek that will be affected by the surface mining at the White Oak Complex. See approval and attached plan in Appendix R2. This plan contains general structure and stream bed material placement drawings and dimensions that will be utilized during the stream restoration.

A survey of the present stream was completed from late May to early August 2001 along with a vegetation study of the stream by JBR Environmental Consultants, Inc. in mid-August of 2001. These two surveys were enacted to determine the stream characteristics and vegetation that is occurring in the upper Whisky Creek drainage.

The stream survey set out to determine the slope of the actual stream. Features such as drop structures, channel width and depth, flood plains, stream meander frequency and amplitude, formation, frequency, and dimension of pools. Bottom samples were taken along the channel to determine the size fraction of the material in the bottom of the stream. Pictures were taken during spring flow during snow melt and also in August during the no flow period of late summer and winter. The data and pictures with descriptions along with profiles and cross-sections are included in Stream Restoration Plan Section.

The design to restore the upper portion of Whisky Creek will use empirical data and sound engineering design principles . Lodestar intends to replace the stream with features that occurred naturally at the before stream slopes in the restored stream slopes. These features will come from the collected data from the natural stream rather than an unnatural engineered channel. Plans are to recover material from the bottom of the channel for application to the restored stream channel. The average width of ten feet and a depth of one foot will be retained for the length of the section of stream to be disturbed. This collection will occur after the installation of Dugout D-1 pond for sediment control.

The restoration of the stream channel will start once the spoil material has been placed and rough graded in the area where the relocated stream channel is to be installed. Construction is planned to start after the end of spring runoff. In the event of the formation of an erosion channel, this channel will be used were possible in the stream restoration process. Material in the stream channel bottom will be compacted prior to the installation of the drop structures. The areas around the structures will then be re-compacted. The types of structures and channel characteristics will be modeled from the natural data collected and applied to the similar slopes of the restored channel. Natural materials, rock and logs will be incorporated in the installed structures. The channel meanders and pools will be incorporated in the flatter slopes. The natural materials collected at the start of the project will then be distributed in and along the restored channel.

RECLAMATION COSTS

Reclamation cost estimates have been developed for major tasks including the removal of buildings, the removal of facility, earthwork, and revegetation. A summary breakdown of estimated costs developed for each category and the methods used to determine costs are identified along with calculation details in Appendix R3.

Appendix R2
Reclamation Details
Replace Plate
Appendix R2 Figure R-11 Sheet B