B.7 EROSION CONTROL, REVEGETATION, AND RESTORATION GUIDELINES

Standard procedures for the Company will include implementation of erosion control and revegetation measures to assure that lands disturbed by construction and operation activities will be restored to a stable, productive, and aesthetically acceptable condition.

A detailed, site-specific reclamation plan will be developed and become part of the Construction and Use (CU) Plan submitted by each company under the requirements of the rights-of-way grants. Because the proposed rights-of-way are composed of many types of terrain, soils, vegetation, land uses, and climatic conditions, the detailed plan will include sets of techniques and measures tailored to each condition encountered. Preparation of the plans will use existing soils and geologic data and where determined necessary by the Authorized Officer, additional data will be collected. Local expertise and locally effective reclamation methods will be followed when the site-specific procedures for the detailed reclamation plan are developed. The CU Plan will approved by the Authorized Officer and implemented by the companies.

Detailed information regarding applicable techníques and technical assistance to private landowners concerning erosion control measures and reclamation procedures will be obtained from the Soil Conservation Service through local Soil Conservation Districts. Technical assistance and approval of written plans for federal lands would be obtained from the BLM and FS prior to any construction.

During construction, operation, and abandonment of the project, applicants will provide an experienced reclamation specialist for (1) liaison with private landowners, federal agencies, and local government; (2) direction for timely restoration requirements; and (3) favorable public relations.

General erosion control and restoration guidelines have been developed for the following areas and will be included as part of the CU Plan:

- Right-of-Way and Site Clearing.
- Site Preparation, Trenching, and Preservation of Topsoil.
- Backfilling and Grading.
- Land Preparation and Cultivation.
- Revegetation.
- Maintenance and Monitoring.
- Use of Chemicals.
- Construction Timing.
- Stream Protection.

RIGHT-OF-WAY AND SITE CLEARING

Emphasis will be placed on protecting existing vegetation and minimizing disturbance of the existing environment.

- Land grading will be done only on the area required for construction.
- Existing roads will be used for vehicle traffic where possible; vehicles and equipment will not be allowed in streambeds unless specified by the authorizing agency.
- Sidehill cuts will be kept to a minimum to ensure resource protection and a safe and stable plane for efficient equipment use. The authorizing agency will provide assistance and will approve sidehill cuts prior to construction.
- Existing ground cover such as grasses, leaves, roots, brush, and tree trimmings will be cleared and piled only to the extent necessary. Slash will be piled for later use in restoration operations or disposed of at the discretion of the authorized agency official.
- Trees and shrubs on the right-of-way that are not cleared will be protected from damage during construction.
- Where the right-of-way crosses streams and other water bodies, the banks will be stabilized to prevent erosion. Construction techniques will minimize damage to shorelines, recreational areas, and fish and wildlife habitat. A channel stability evaluation will be completed before stream crossing locations are finalized. Channel stability ratings of 3 or 4 shall be avoided (Forest Service 1978b).
- Care will be taken to avoid oil spills and other types of pollution in all areas, including streams and other water bodies and in their immediate drainages. All spills will be immediately cleaned up following notification of applicable State and Federal agencies.

- Design and construction of all temporary and permanent roads will be based on an approved transportation plan and will ensure proper drainage, minimize soil erosion, and preserve topsoil. After abandonment, these roads will be closed and areas restored without undue delay or maintained at the discretion of the landowners. Restoration, including redistribution of topsoil and establishment of natural surface drainage patterns, will be to the satisfaction of the landowner and/or authorizing official.

- During adverse weather conditions, as determined by the on-site reclamation specialist and federal agency officials, the authorizing agency will issue stop and start orders to prevent rutting or excessive tracking of soil and deterioration of vegetation in the right-of-way area.

- During construction activities in or near streams or lakes, sedimentation (detention) basins and/or straw bale filters will be constructed to prevent suspended sediments from reaching downstream water courses or lakes as required by the authorizing officer.

- If construction through extensive wetland areas is deemed necessary, construction will occur during the driest period of the year and/or erosion control mats will be used to minimize erosion damage to wetland sites, as required by the Authorizing Officer.

- Actual construction activities and implementation of erosion control measures will immediately follow clearing operations, especially in areas with soils that are highly susceptible to wind or water erosion and other special areas.

SITE PREPARATION, TRENCHING, AND PRESERVATION OF TOPSOIL

Site Preparation and trenching methods and techniques will ensure that:

- Topsoil is removed from the trench area, windrowed separately, protected, and replaced last during backfilling. This procedure and the depth of such topsoil removal will be specified by the Authorizing Officer.

- Topsoil will be removed from facility site areas (e.g., drill pads and roads) and stored for replacement on disturbed surface areas after final backfilling and grading.

- Remaining unearthed materials are removed and stored in a manner that facilitates backfilling procedures, uses a minimum amount of right-of-way area, and protects the excavated material from vehicular and equipment traffic.

- A specific trenching and excavated material stockpiling procedure will be used on steep-sloping and rough, broken terrain to ensure minimum disturbance as outlined in the CU Plan. This procedure will be developed by both the Authorized Officer and applicant.

BACKFILLING AND GRADING

The following backfilling and grading techniques will be used:

- Backfill will be replaced in a sequence and density similar to the preconstruction soil condition.
- Backfilling operations will be conducted in a manner that would minimize further disturbance of vegetation.
- The contour of the ground will be restored to permit normal surface drainage.
- In strongly sloping and steep terrain, erosion control structures such as water bars, diversion channels, and terraces will be constructed to divert water away from the pipeline trench and reduce soil erosion along the right-of-way and other adjoining areas disturbed during construction.
- All structures such as terraces, levees, underground drainage systems, irrigation pipelines and canals will be restored to preconstruction conditions.
- The surface will be graded to conform to the existing surface of the adjoining areas except for a slight crown over the trench to compensate for natural subsidence. In cropland areas, especially border and furrow irrigated cropland, the soils will be compacted and the crown will be smoothed to match the bordering area to allow surface irrigation.
- Topsoil will be uniformly replaced over the trench fill and other disturbed areas to restore productivity to its preconstruction condition.
- Materials unsuitable for backfilling or excess backfill material will be disposed of as arranged by the authorizing officials.
- Temporary work space areas used at stream and highway crossings and other special sites will be restored to approximate preconstruction conditions and to the satisfaction of the authorizing officials.
- The right-of-way at stream crossings will be restored to preconstruction conditions. The upland areas and banks will be revegetated to preconstruction conditions. Where this is not possible, they will be mulched with rock. The size of the rock mulch will be larger in diameter than materials excavated from the trench. The streambed will be returned to its original contours with sediments like those that were excavated.
- Well sites will be restored without undue delay and maintained at the discretion of the landowners. Restoration including grading and redistribution of topsoil, will be to the satisfaction of the landowner and/or Authorized Officer.

LAND PREPARATION FOR SEEDING AND CULTIVATION

Construction, backfilling, and grading activities commonly cause compaction and alter soil conditions that affect soil productivity and/or seeding success in the right-of-way area. The following practices and techniques will be used to improve these soil conditions, protect soil from erosion, and provide a favorable seedbed:

- In cropland areas, as required by the authorizing agency or landowner, subsoiling or chiseling will be used to ensure that soil compaction is reduced and preconstruction soil permeability is restored.

- Chiseling will be used, unless objected to by the landowner or authorizing agency, in rangeland areas to reduce compaction and improve soil permeability. Pitting and contour furrowing as directed by the authorizing agency or landowner will be done on steep slopes of disturbed areas to increase infiltration and to reduce runoff and erosion.

- Suitable mulches and other soil stabilizing practices will be used on all regraded and topsoiled areas to protect unvegetated soil from wind and water erosion and to improve water absorption.

- Special mulching practices or matting will be used, as necessary, in critical areas where wind and water are serious erosion hazards to protect seeding, seedlings after germination, and plantings.

- Commercial fertilizers will be applied to soil areas with low inherent fertility to maintain crop yields and establish grass seedings. Application rates will be commensurate with annual precipitation and available irrigation water.

- Seedbeds for areas seeded to grass will be prepared to provide a firm and friable condition suitable for the establishment of vegetation.

- Rock mulches will be used in steep-sloping rock outcrop areas and low precipitation areas to reduce erosion and promote vegetal growth.

- Cultivation and land preparation operations on steeply sloping areas will be done on the contour to minimize erosion.

- Soil area with rock fragments, such as very coarse gravel, cobble, or stone scattered on the surface, will be restored to the original preconstruction surface condition to blend with the adjoining area, to avoid a smooth surface right-of-way area, and to control accelerated erosion.

REVEGETATION (RESEEDING AND PLANTING)

The loss of vegetation from lands disturbed by pipeline construction can be mitigated only by satisfactory revegetation. To ensure a successful revegetation program, methods and procedures will be consistent with local climate and soil conditions and will consider recommendations and directions of local experts. Revegetation efforts will be continued until a satisfactory vegetative cover is established. The following practices and techniques will be used in areas where reseeding is suitable as determined by the authorizing agency:

- A firm seedbed will be prepared prior to seeding. This will include a mulch of plant residues or other suitable materials. A cover crop will be used as necessary in larger disturbed areas.

- Seed will be planted by drilling, broadcasting, or hydroseeding. Drilling is the preferred method because it is usually most successful. Drill seeding with a grass drill equipped with depth bands will be used where topography and soil conditions allow operation of equipment to meet the seeding requirements of the species being planted. Broadcast seeding will be used for inaccessible or small areas. Seed will be covered by raking or harrowing. Hydroseeding will be done in critical areas determined by the reclamation specialist or authorizing officer.

- Only species adaptable to local soil and climatic conditions will be used. Generally, these will be native species. However, introduced species may be considered for specific conditions when approved by the landowner and regulatory authority. Seeding rates in critical area plantings and generally throughout the right-of-way will be increased 100 percent over regular seeding rates to allow for seed mortality due to adverse growing conditions.

- Seed testing will be conducted to meet state, federal, and agency seed requirements.

- Seeding will be done when seasonal or weather conditions are most favorable, as determined by the landowner or authorizing officer.

- Grazing or mowing may be delayed at least one season after seeding to provide time for vegetation to become established, especially in highly erodible areas, unless objected to by the landowner or lessee. Protective fencing may be necessary in special areas and will be constructed, maintained, and removed according to authorizing agency specifications.

- In areas of low annual precipitation (generally less than 8 to 10 inches), where reseeding is not suitable or as successful, erosion control structures and measures will be applied on sloping areas

to reduce accelerated erosion, to allow re-establishment of preconstruction surface soil conditions, and to allow natural revegetation.

- Trees and shrubs will be reestablished in areas as specified in the revegetation plan. Temporary and/or permanent barriers to off-road vehicle access will be installed by the Company at specific locations along the right-of-way and other disturbed sites to prevent off-road vehicle access as specified by the authorizing agency.

MAINTENANCE AND MONITORING

Joint inspection of the right-of-way by the applicant and authorizing agency will be conducted to monitor the success and maintenance of erosion control measures and revegetation programs on disturbed land for two growing seasons, or for a period determined by the landowner on private land, or the authorized agency official on state or federal land. The monitoring program will identify problem areas and corrective measures to ensure vegetation cover and erosion control. Certification of successful revegetation and erosion control will be determined by the landowner or authorized agency official.

USE OF CHEMICALS

The use of biochemicals such as herbicides, fungicides, and fertilizers will comply with state and federal laws, regulations, and policies regarding the use of poisonous, hazardous, or persistent substances. State and federal wildlife agencies will be contacted if application of any of these substances will be on or near sensitive wildlife areas. Application of these substances will be by ground methods or by helicopter as approved by landowner and authorizing officer. Prior to the use of such substances on or near the permit or grant area, the applicant will obtain approval of a written plan for such use from the authorizing officer, landowner, and appropriate wildlife agency. The plan will outline the kind of chemical, method of application, purpose of application, and other information as required, and will be considered as the authorized procedure for all applications until revoked by the Authorized Officer, landowner, or appropriate wildlife agency. This plan will become part of the CU Plan.

CONSTRUCTION TIMING

Pipeline construction activities on irrigated hay or cropland will be timed, as possible, to avoid disruption of irrigation delivery systems during the major irrigation season to reduce effects on crop production in areas of construction as well as adjoining irrigated cropland areas served by the systems.

Pipeline construction activities in narrow floodplain areas subject to high erosion hazards would be timed to avoid high water flows as much as possible, this would reduce the effects of construction on erosion and sedimentation.

STREAM PROTECTION

To maintain stream bank stability, preserve the hydrologic characteristics of the existing stream channel and flood plain effectiveness, and minimize adverse changes in stream water chemistry, physical properties, or associated aquatic organisms, the following will be emphasized:

- The natural drainage channels of any stream will be maintained during construction activities wherever possible.
- Clear water diversion methods will be employed whenever construction activities such as pipeline trenching must pass through a stream channel.
- Tree or shrub vegetation, which give greater stability due to rooting structure, will be replaced during the revegetation of channel banks following construction.
- Construction staging and equipment service areas will be located outside of riparian areas.
- Following construction activities, the stream channel will be returned to as nearly the original width, depth, gradient, and curvature as possible.