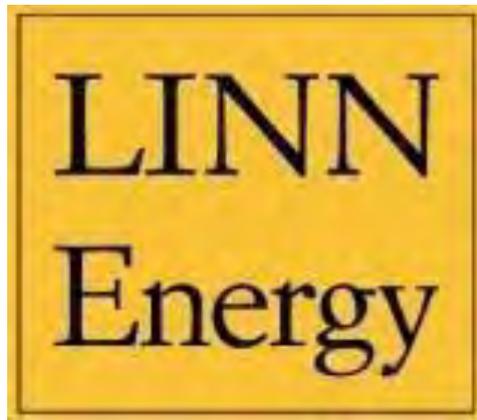


# **Rule 908.g(1) Closure Plan**

**LINN Operating Inc.  
O-29 Centralized E&P Waste  
Management Facility**

**OA Project No. 014-1565**

THIS PAGE LEFT BLANK FOR TWO-SIDED DUPLICATION.



LINN Operating, Inc.

Master Reclamation Plan

Piceance Basin Operations



## TABLE OF CONTENTS

1.0	INTRODUCTION .....	1
2.0	RECLAMATION OBJECTIVES.....	1
3.0	AFFECTED PLANT COMMUNITIES AND SOILS.....	2
3.1	Plant Communities in the Project Area.....	2
3.2	Soils in the Project Area.....	2
4.0	PREDISTURBANCE INVENTORY AND SITE PLANNING.....	3
5.0	SITE STABILIZATION DURING AND AFTER CONSTRUCTION .....	3
5.1	Well Pad and Facility Site Construction .....	3
5.2	Roads.....	4
5.3	Pipelines.....	4
5.4	Soil Salvage.....	4
5.5	Temporary Revegetation Efforts for Topsoil Stockpiles.....	5
5.6	Best Management Practices .....	6
6.0	INTERIM RECLAMATION AND MONITORING .....	7
6.1	Surface Preparation .....	7
6.2	Soil Replacement .....	9
6.3	Seeding Methods.....	9
6.4	Fencing .....	10
6.5	Weed Control.....	11
7.0	FINAL RECLAMATION AND SUCCESS MONITORING .....	11
7.1	Facility and Structure Removal.....	11
7.2	Reclamation Success Monitoring and Revegetation Inspections .....	12



## **1.0 INTRODUCTION**

LINN Operating, Inc. (LINN) has prepared this Master Reclamation Plan to describe the various stages of the reclamation process at its well pad locations, associated off-pad facilities including but not limited to Centralized E&P Waste Management facilities, access roads, and pipelines in its Piceance Basin natural gas fields, Garfield County, Colorado. In brief, the reclamation activities covered include preliminary planning, pad construction, soil salvage, soil stockpiling, backfilling and grading, re-topsoiling, soil amendments/fertilization, seeding, seed mixtures, Best Management Practices (BMPs), fencing, weed control, revegetation inspections and revegetation monitoring. The Plan covers all of LINN's locations both in the bottom of Parachute Canyon and on the plateau tops to the east (Long Ridge and Old Mountain) and west (Garden Gulch).

It is important to note that all of LINN's well pads, off-pad facilities, roads, and pipelines are located on non-cropland areas. Accordingly, COGCC reclamation requirements that apply to cropland areas are not addressed in this Plan.

## **2.0 RECLAMATION OBJECTIVES**

In general, a successful reclamation program will accomplish the following primary objectives:

- The segregation and proper handling of undesirable materials (e.g., poor-quality subsoil, contaminated soil) to protect the reclaimed landscape from contamination and poor reclamation performance;
- Re-contouring and implementation of other soil conservation, surface manipulation, and water management techniques to establish stable slopes, water courses, and drainage features to minimize erosion and sedimentation;
- Revegetation of reclaimed areas to stabilize soils and establish a self-sustaining vegetation cover integrated with the surrounding ecosystems; and
- Minimization of visual contrasts to promote the long-term aesthetic quality of reclaimed sites and their surroundings.

The reclamation process in this Plan has been divided into four major phases: 1) pre-disturbance planning and site preparation, 2) site stabilization during well construction, 3) interim reclamation and monitoring, and 4) final reclamation and success monitoring.

By minimizing the amount of land disturbed through pre-disturbance planning and initially preparing the site for construction activities with the understanding that the area will eventually be reclaimed (e.g., topsoil stripping and stockpiling for later use during site reconstruction, minimizing cut-and-fill slopes, and disturbing as small an area as possible), the acreage requiring disturbance will be reduced and reclamation success will be facilitated.

Site stabilization during construction consists of salvage of all usable topsoil and subsoil, immediate revegetation of all topsoil and subsoil stockpiles, and immediate stabilization of disturbed areas to control erosion and provide protection from adjacent undisturbed areas from unnecessary degradation. Erosion will be considered controlled when water naturally infiltrates into the soil; gullying, head cutting, or slumping is not observed; and rills are less than 6 inches deep. Specific measures to attain these goals are discussed in Section 6.5 (BMPs).

Interim reclamation involves the reclamation of those areas disturbed during construction, but not needed during the productive life of the site. These items consist of final grading, relieving of compaction, subsoil and topsoil replacement, seeding, mulching and fence installation to prevent future activity on the interim reclamation areas. Interim reclamation may also include roads leading to sites. Depending on the location of the well pad, off-pad facility, road, or pipeline, seeding will utilize either the valley bottom mix or the plateau mix to establish ground cover. These mixes are identified in Tables 6-1 and 6-2. Interim sites will be monitored for reclamation success on an annual basis. Interim reclamation shall occur no later than 12 months after completion the last well on a pad or the end of construction of the facility, road, or pipeline and will last for the life of the facility or road.

Final reclamation includes the removal of all remaining production equipment, tanks and structures at the well pad after the wells have been plugged and abandoned or the facility or road after they are no longer necessary for natural gas production, final backfilling of remaining disturbed areas, and revegetation of disturbed areas not reclaimed during interim reclamation. The same reclamation procedures described for interim reclamation will be employed. The seed mixes for final reclamation are the same as those for interim reclamation (Tables 6-1 and 6-2). Non-producing well locations and associated access roads would undergo final reclamation within 12-months after drilling ceases. Upon project completion, all disturbed areas except roads to be retained for other land uses will be reclaimed as designated by the landowner. Reclamation success monitoring involves assessing the status of reclaimed areas to ensure they meet desired site stability and productivity standards. Reclamation monitoring will include an evaluation of plant cover, density, and diversity as well as erosion and weed control. Given the reclamation objectives of providing vegetation that is integrated with the surrounding ecosystems and minimization of long-term visual impacts, revegetation will be expected to contain a diverse mixture of grasses, forbs, and shrubs as described in Tables 6-1 and 6-2.

### **3.0 AFFECTED PLANT COMMUNITIES AND SOILS**

#### **3.1 Plant Communities in the Project Area**

There are two distinct geographic areas where LINN's facilities are located in Garfield County: locations in the valley bottom of Parachute Canyon, and locations on top of the plateaus east and west of the canyon. Each of these geographic areas has its own vegetative communities and soil characteristics.

On the valley bottom of Parachute Canyon, the predominate plant community that is present at LINN's locations is the steep-slope xeric shrub. The steep-slope xeric shrub community contains primarily warm weather annual grasses, rabbitbrush, and some antelope bitterbrush.

On the plateau tops, the predominate plant communities are sagebrush-shrub and mountain shrub, with scattered aspen woodlands in the north-facing drainages. In general, the sagebrush- shrub community is present along the open ridge tops. The mountain shrub community is found on other ridge tops and on virtually all of the side slopes. Vegetative cover is moderate to dense in many portions of the plateau areas, and consists of grasses and sagebrush in the more open areas and serviceberry, snowberry, and chokecherry in the mountain shrub areas. Some Gambel oak brush woodlands are also present on the plateau top. As mentioned previously, groves of quaking aspen are present in the wetter, north-facing drainages.

#### **3.2 Soils in the Project Area**

The soils in the bottom of Parachute Canyon/Grand Valley tend to be shallow soils derived from alluvial and colluvial material. Restrictive features for plant growth result from high coarse fragment content, alkalinity, lack of carbonaceous material and poor soil texture. Existing sparse vegetative cover and the lack of desirable plant species in undisturbed areas reflects the shallow nature of in-situ soils. In some

cases, overgrazing has enhanced the presence of invasive species (noxious weeds). For LINN, the bottom lands of the parachute Canyon/Grand Valley make up a very small minority of the company's total leased area. A total of just 7 well pads will be constructed in the valley bottom.

The soils of the plateau areas adjacent to Parachute Canyon, which make up the vast majority of LINN's leasehold, tend to be loamy and well-drained. They are generally derived from parent material consisting of marl and/or weathered sandstone. Soil depths range from 5 inches on the ridge tops, to as much as 60 inches in swales. The loamy soil types present on the plateaus, combined with greater amounts of annual precipitation, provide for denser vegetation growth than in the valley bottom.

#### **4.0 PREDISTURBANCE INVENTORY AND SITE PLANNING**

LINN personnel and their reclamation contractors will review locations of well pads, off-pad facilities, access roads, and pipelines prior to actual construction activities. The following items will be evaluated and/or inventoried.

- Suitability of slopes steeper than 2:1 for construction activities with special erosion control and slope stability measures as needed.
- Evaluation of true riparian/wetland areas for exclusion from construction disturbance vs. fringe areas that can be properly reclaimed without long-term damage to true wetlands and as agreed to by land owners.
- Identify an appropriate buffer from intermittent and ephemeral streams.
- Inventory any noxious weeds listed in the Colorado Noxious Weed Act (Colorado Department of Agriculture, 1996) and Garfield County Noxious Weed Management Plan (Garfield County Vegetation Management, 2000).
- Prepare a preliminary list of BMPs to be utilized during construction and as a part of interim reclamation efforts. The list of actual BMPs may be refined immediately prior to completion of construction activities.

#### **5.0 SITE STABILIZATION DURING AND AFTER CONSTRUCTION**

A comprehensive description of site stabilization and erosion control techniques is described in each of the following sections of this Plan.

##### **5.1 Well Pad and Facility Site Construction**

Prior to construction, proposed pad and facility site locations will be surveyed and staked. Locations will be designed to parallel the contour in most cases with reserve pits on the uphill/"cut" side of pads whenever possible. Well pads and off-pad facilities will be designed and constructed to disturb the smallest area necessary to provide for efficient and safe operations.

Excess cut material will be incorporated into fill slopes or placed in designated areas and stabilized. Backsloping will be necessary only in areas of steep terrain (>3:1 slopes). This material shall be utilized during the reclamation process.

During construction, interceptor ditches will be installed above cuts and around reserve pits, as necessary. Collector ditches and sediment control structures constructed for a storm event will be installed below fill areas. Smaller flows will be diverted and/or collected before being discharged from the disturbed area.

Qualified personnel will supervise the installation of all erosion control structures, including berms, dikes and trenches.

## **5.2 Roads**

New roads generally will follow natural contours and will be constructed in accordance with industry road standards. For roads on slopes of less than 15%, available strippable/useable topsoil will be stripped from the construction area and placed in windrows within the construction ROW by side casting with a grader. Where roads must be constructed on slopes greater than 15%, and significant topsoil is present, topsoil will be transported to a more level terrain for storage. After road construction, strippable/useable topsoil, if any, will be replaced on road cut and fill slopes, and these areas will be reseeded, as described in Section 6.0.

## **5.3 Pipelines**

When constructing and reclaiming pipelines, existing crowned-and-ditched roads will be used for access, where practical, to minimize surface disturbance. Pipeline trenches will not be placed in access road borrow ditches unless other reasonable locations are unavailable. Gathering pipelines may be installed on the surface in areas where slopes are greater than 25% and/or where rock outcrops are crossed; when possible, they will be built perpendicular to the contour to minimize the area required for construction.

Vegetation will be removed from pipeline ROWs so as to leave the root systems intact and the removed vegetation will be spread over disturbed areas to provide protection, nutrient recycling, and a natural seed source. If pipelines are trenched rather than plowed in, trenches will be excavated with a backhoe to minimize disturbance.

Frozen soils, vegetation, and snow will not be used to backfill pipeline trenches. This action will reduce trench compaction needs. In no event will backfill berms in excess of 6 inches in height be placed over backfilled trenches.

Construction of pipelines in wetlands will comply with U.S. Army Corps of Engineers (COE) permit requirements. Silt fences or other sediment control devices will also be installed along channel banks where sedimentation is excessive and at the bases of slopes adjacent to wetland/riparian areas (as necessary to control sediment).

Temporary sediment barriers will remain in place until final revegetation measures have been successfully implemented.

## **5.4 Soil Salvage**

Site-specific topsoil salvage will range from 0" to 12" based on observed topsoil depth.

Research indicates that it is better to replace a shallower layer of topsoil than to co-mingle it with deeper subsoil with undesirable physical and chemical properties.

Any surplus topsoil material that is generated during the topsoil stripping operation will be stockpiled in a safe location on the property from which it was taken and utilized for other well site reclamation activities where a deficiency may exist. A deficiency in topsoil cover is defined as less than 3 inches of suitable un-amended topsoil.

Care will be taken to avoid stripping soils with coarse fragments greater than 35% in volume as severe rooting restrictions may result in areas containing higher amounts of rock fragments. If high coarse fragments are encountered, LINN's reclamation contractor may recommend rock picking, rock screening, or

import of topsoil material. Screened or picked rock material will be buried in cuts, or placed deep enough below the soil surface to avoid rooting restrictions for reclamation efforts.

Alternate site preparation procedures may be applied in some areas to facilitate reclamation; however, it is assumed that most, if not all, of these areas can be avoided. In potential wetland areas, vegetation will be cut to ground level, leaving existing root systems intact. Grading activities will be limited to areas directly over pipeline trenches and road surface areas, and at least 12 inches of topsoil will be salvaged and replaced except in areas with standing water or saturated soils. Construction when the ground is frozen may be implemented as an alternative to minimize damage. Use of construction equipment will be limited, and if standing water or saturated soils are present, wide-track or balloon-tire construction equipment or normal construction equipment operated on equipment pads or geotextile fabric overlain with gravel fill may be used. Equipment pads will be removed immediately following the completion of construction activities. Trench spoil will be placed at least 10 feet from drainage channel banks. All operations within jurisdictional wetlands areas will comply with COE permit stipulations as necessary.

#### Topsoil Stockpiling

Topsoil will be stockpiled in such a manner that it can be readily recovered for reclamation purposes. Topsoil stockpiles will be located away from natural drainage courses. Stockpiles should be constructed with no greater than 3:1 side slopes and with a height of three to six feet where possible, given the flexibility needed in confined areas for stockpiles on drill sites. By constructing stockpiles in this manner, valuable soil fungi and bacteria will not be lost.

#### Subsoil Handling

During the installation of well pad sites, subsoil materials will be utilized to construct well pads. Poor quality subsoil materials may consist of calcareous, alkaline, and high coarse fragments soils, etc. Poor quality subsoil materials will be kept lower in the profile of well pads so as not to interfere with future plant growth.

#### Pit Soil Stockpiling

Drilling pits are constructed by removing adequate subsoil and overburden materials to accommodate drilling fluids generated during the actual drilling process. The subsoil material will be stockpiled in an easily accessible area. Pit soils will be stockpiled in such a manner so as to avoid co-mingling with topsoil stockpiles.

### **5.5 Temporary Revegetation Efforts for Topsoil Stockpiles**

Topsoil stockpiles will be seeded immediately after placement with a quick germinating cover of Winter Triticale, a sterile cover crop which is a cross between winter wheat and rye. Topsoil stockpiles will be dozer tracked on the contour to create cleat marks that will serve as erosion basins. Also, a continuous berm will be placed around any down slope sides of the topsoil stockpile to prevent additional runoff and potential erosion.

#### Soil Amendments

At the advice of our reclamation consultant, LINN may elect to use one or more soil amendments to overcome poor chemical and physical conditions in existing surface soils. Poor soil conditions typically involve shallow depth or low nutrient/organic matter content.

LINN's reclamation consultant will determine the well sites that may benefit from soil amendments and their application rates. One or both of the following amendments may be utilized where 12 inches of favorable growth media cannot be salvaged and replaced at each well site and poor growth performance is observed.

- Humates, consisting of humic and fulvic acids, help create soil aggregation. These materials will be mixed with the existing soil material on site. They will be applied at the rate of 800-2,000 pounds per acre.
- Fertilizers will be applied to the soil surface as determined by soil test results indicating the need for nitrogen, phosphorous, or potassium fertilizers. Nitrogen fertilizer may not be added in many cases at the time of seeding because of its influence on rapid weed invasion at the expense of more desirable species. The revegetation specialist will make the final determination on the need for fertilizer applications and their application rates. Any application of fertilizer will be followed by soil tillage to incorporate the material properly.

## **5.6 Best Management Practices**

A number of different BMPs may be used on the various future well pad sites. They are listed and described below.

### Continuous Berms, Ditches, and Diversions

These types of controls use ditches, berms of soil, or both (diversions) to convey surface runoff from disturbed areas to a stabilized outlet or to divert surface runoff away from disturbed areas. A stabilized outlet can be any kind of sediment trapping device or simply a well-vegetated and stabilized area.

Continuous berms, ditches and diversions are useful for erosion and sediment control around the perimeter of construction sites. The berms either detain and pond sediment laden storm water, or direct it to a stabilized outlet.

### Sediment Basins or Traps

Sediment basins or traps are used to either detain storm water by slowing the flow of water and/or storing water behind an embankment. These pond-like structures reduce the velocity of storm water flow and allow sediments and suspended solids to settle out of the storm water. Water remains in the sediment basin until evaporation occurs, water seeps into the subsurface, or the water reaches the level of a stabilized outflow and is discharged. Since sediment basins are temporary, they must be maintained until the disturbance area is permanently stabilized.

### Check Dams

Check dams are small temporary dams constructed of rock, sandbags, or wattles across a diversion or roadside ditch. Check dams are used to slow the velocity of runoff, reduce erosion, and capture sediment.

### Riprap

Riprap is a permanent, erosion-resistant layer of rock, it is intended to stabilize areas subject to erosion, such as fill slopes, and protect against scour of the soil caused by concentrated, high velocity flows.

### Straw Bale Dikes

Straw bale dikes intercept and detain small amounts of sediment transported by sheet and rill type runoff. The dikes trap sediment by ponding water and allowing sediment to settle out. Straw bale dikes also slow runoff velocities acting to reduce sheet, rill and cully erosion. Straw bale dikes may also be used when installed to reduce erosion and sedimentations around the disturbance area perimeter. All straw bales will consist of certified weed-free materials. Given the presence of grazing cattle within LINN's lease areas, the use of straw bales is less favorable than the structural BMPs described above.

### Wattles

A wattle (also called a fiber roll) consists of a tight tubular roll of straw, flax, or other similar materials. Wattles can be used along slopes, as check dams in ditches, or at outlets of sediment basins/traps to reduce erosion, reduce runoff velocity, and capture sediment.

### Silt Fence

Silt fence is a temporary polypropylene sediment barrier placed on the slope contour to trap sediment by ponding water behind it and allowing sediment to settle out. Silt fence can effectively trap sheet and rill erosion within small drainage areas and on slopes with gradients up to 2:1. Silt fence is the most cost effective when used for sediment and erosion control around the perimeter of a disturbance area. Given the presence of cattle in much of LINN's leasehold and the need for frequent maintenance of silt fence, this BMP is also considered to be less favorable, relative to the structural BMPs listed above.

## **6.0 INTERIM RECLAMATION AND MONITORING**

Disturbed areas subject to interim reclamation include portions of each site not needed for long-term production-related activities, road cut-and-fill areas, and pipeline corridors. In general, reserve pits and portions of facility pads not needed for production will undergo interim reclamation and the size of the operating pads will be substantially reduced to simply accommodate routine operations and periodic workovers (COGCC Rule 1003).

Interim reclamation and stabilization objectives include:

- Stabilization of disturbed areas by providing wind and water erosion control to reduce soil loss and the chance of slope failure. This will primarily involve establishment of non- intrusive plant communities to protect soil resources;
- Minimization of surface runoff to prevent the degradation of downstream receiving waters through the use of stormwater management techniques (e.g., facility sites will be required to approach zero runoff from the location using BMPs); and
- Minimization of visual impacts.

### **6.1 Surface Preparation**

Surface preparation includes backfilling, grading, and ripping of compacted soils in the areas subject to interim reclamation.

### Removal of Waste Materials

In accordance with COGCC Rule 1003(a), all debris and waste materials including concrete, bentonite and other drilling additives, sand, plastic, pipe, cable, trash, and drilling and completion-related equipment will be removed from the site.

### Drilling Pit Closure

In accordance with COGCC Rule 1003(d)(2 and 3), all drilling fluids shall be disposed of as required in the 900 series rules. Once the pits are dry, they will be backfilled. Pit materials will be covered with at least 3 feet of subsoil material and then a final layer of topsoil. All pit-related muds and solids will be confined to the pit and will not be squeezed out and incorporated into surface soils.

### Backfilling and Grading

Immediately following well drilling and completion on a pad, all pits, cellars, rat holes, and other boreholes not necessary for lease operations will be filled.

Within 12 months after drilling operations have been completed on a pad, interim reclamation of pad areas not needed for production and along roads will be conducted in accordance with COGCC Rule 1003 (these are non-croplands). Interim reclamation will be conducted in a manner to minimize any additional disturbance of previously reclaimed areas. Where possible, disturbed areas will be graded and contoured to slopes of 3:1 (horizontal: vertical) or less, or as required to stabilize the area and provide a suitable seedbed. Grading will be conducted as necessary to provide a surface suitable for the replacement of a uniform depth of topsoil, while promoting cohesion between subsoil and topsoil layers, reducing wind erosion, and facilitating moisture capture.

Specialized grading techniques at well pads will be applied as necessary and may include slope rounding, benching grading, stair-step grading, and/or contour furrowing. Equipment selection will be determined on a site-specific basis, depending upon the material to be graded, the size of the area, on-site operating conditions, and equipment availability.

No visible soil berm (i.e., in excess of 3 inches) will be allowed above pipeline trenches. LINN contract reclamation specialists will ensure that backfilling and grading operations are conducted so as to provide a landscape suitable for successful reclamation. Ripping of the subsoil material will occur to a depth of 16 inches (where the nature of the material permits) to relieve compaction of the subsoil and provide better rooting medium for later plant growth. No heavy equipment will be moved over the prepared surface once it has been ripped. Small dozers will be used to replace subsoil and topsoil.

### Centralized E&P Waste Management Facilities

In accordance with COGCC Rule 908.g, each centralized E&P waste management facility will be closed according to the plan set forth in the Form 28 permit. Tank and pond sediments will be tested for the constituents and levels in Table 910-1. The soil beneath the containment and pond liners will be tested for the constituents and levels in Table 910-1. All contaminated sediments and soils either will be treated for beneficial reuse or disposed of at an appropriate licensed disposal facility. Liners will be properly disposed of at an appropriate licensed disposal facility. Prior to final closure, a detailed Site Investigation and Remediation Workplan, Form 27 will be submitted to the COGCC for approval.

Further site reclamation will occur as outlined in this plan once compliance with Table 910-1 soil and ground water standards has been verified.

## **6.2 Soil Replacement**

In accordance with COGCC Rule 1003(e)(2), all segregated soil horizons will be replaced to their original positions.

### Topsoil Replacement

Following backfilling and grading, LINN will rip the existing subsoil surface to a depth of 18 inches (or that allowable if large rock fragments are present). Topsoil will then be replaced evenly over all disturbed areas using small dozers to prevent re-compaction of the growth medium. Topsoil will not be replaced in extremely wet or frozen conditions. As described in Section 5.5, soil amendments may be added to enhance the fertility of the replaced topsoil to ensure greater revegetation success. The decision to use soil amendments will be made on a case-by-case basis.

### Wetland Soils

All operations within jurisdictional wetland areas will comply with COE permit stipulations as necessary.

### Seedbed Preparation/Soil Tillage

If the re-topsoiled surface is not loose and friable after topsoil application, soil tillage will be performed. Acceptable methods of soil tillage will consist of disking, chisel plowing, or harrowing to a depth of 4 inches. No more than 10% of the reclaimed area will contain rocks greater than 8" in diameter. The only exception to this condition will be in-situ soils that naturally contain greater amounts of rock material.

## **6.3 Seeding Methods**

### Seeding Times

Seeding shall be completed at any time of year except during ground freeze conditions and except from May 31 to August 15.

### Seeding Methods

On slopes of 3:1 or flatter, drill seeding shall be utilized. Drill seeders shall be capable of handling a variety of different seed textures. Drill rows shall be no greater than 12 inches on center. All drilling shall be completed on the parallel to the contour of the land where practical. Seed will be drilled to a depth of .25 to .50 inches.

Steeper slope areas will be broadcast seeded or seeded with other methods. Broadcast seeding will be accomplished with hand held, ATV mounted, or tractor mounted spreaders and will be capable of spreading seed uniformly. All seed will be raked or harrowed to lightly cover seed with soil.

### Seed Mixtures

Based on the fact that LINN has well pads and other facilities both on the valley bottom and on the plateau tops, two distinct seed mixes will be used for interim and final reclamation, as described below.

Table 6-1. Valley Bottom Seed Mix

Species
Lincoln Smooth Brome
Hycrest Crested Wheatgrass
Dahurian Wildrye
Full Throttle Tetraploid Perennial Ryegrass
Renegade Orchardgrass
Oahe Intermediate Wheatgrass

To be applied at the rate of 15-25 pounds per acre when drilled

<sup>2</sup> To be applied at the rate of 30-50 pounds per acre when broadcast

Table 6-2. Plateau Seed Mix

Species
Slender Wheatgrass
Mountain Brome
Nodding Brome
Idaho Fescue
Letterman's Needlegrass
Rocky Mountain Penstemon
Cicer Milkvetch
Utah Sweetvetch
Western Yarrow
American Vetch
Antelope Bitterbrush

To be applied at the rate of 18 pounds per acre when drilled

<sup>2</sup> To be applied at the rate of 36 pounds per acre when broadcast

Areas that have been seeded will be visually monitored for seedling establishment and the presence of erosional features and will be re-stabilized and reseeded, as necessary, until adequate vegetation establishment and site stability is achieved. To minimize sedimentation of drainage channels and wetlands during the interim reclamation process, BMPs, as described in Section 5.6 will be utilized. BMPs will be maintained in functional condition until revegetation/reclamation efforts yield a stable vegetation cover.

In general, the annual reclamation success monitoring and revegetation inspection procedures specified in Section 7.0 will also be applied at interim reclamation sites until revegetation success has been achieved.

#### **6.4 Fencing**

A four-strand barbed wire fence will be erected around the largest possible portion of the site during interim reclamation to exclude cattle from entering the reclaimed area and grazing on the new vegetation. Adequate access will be left open to the actual wellhead and ancillary facilities.

T-posts will be placed every 16 feet with line braces installed for every 1,300 feet of run. Steel corner sets will be placed on every corner and either compacted in-place or cemented in. Fences will be inspected on a regular basis and repaired as needed. Fences will be kept in-place as necessary to allow vegetation in reclaimed areas to reach a self-sustaining cover.

## **6.5 Weed Control**

The Colorado Noxious Weed Management Act (Colorado Department of Agriculture-1996) and the Garfield County Weed Management Plan (Garfield County Vegetation Management- 2000) provide for control of noxious weeds on all unincorporated lands within the county. LINN will comply with state and county policies. There are 21 noxious weeds listed in the county list and 68 plants on the state list.

### Post Revegetation Weed Inspections

A third party reclamation/revegetation specialist will conduct a reclamation and revegetation success inspection annually, after green up of vegetation. If during these inspections it is determined that the noxious weed species presence and densities represent a threat to the revegetated areas or surrounding lands, mechanical or chemical control measures will be employed.

### Weed Control Implementation

During the first growing season of native grasses, forbs, and shrubs, use of chemical herbicides will not be feasible. Until newly reseeded species reach a height of 3-6 inches they are susceptible to damage from herbicides. Therefore, mechanical weed control is proposed for the first growing season if re-seeded species are not determined to be mature enough to withstand herbicide spray. Brush Hog mowers, weedeaters, and/or hand pulling of weeds will be employed as mechanical control devices. During subsequent years, herbicide applications will be utilized when weed densities are determined to pose a threat to revegetation success or spread to surrounding lands.

The county weed management specialist will be consulted to determine what chemical herbicides will be the most beneficial for controlling noxious weeds. It is anticipated that an aggressive revegetation and weed management program will result in weed control only needing to be performed during the first three years after re-seeding efforts. A self-sustaining native species cover is the best mechanism for discouraging weed growth and spread to surrounding land areas.

## **7.0 FINAL RECLAMATION AND SUCCESS MONITORING**

Final reclamation will be completed as soon as practical, within 12 months after plugging the last well on a pad or removing all facility equipment. Permanent reclamation objectives include all those listed for interim reclamation (Section 6.0), plus the following:

- The re-establishment of desirable self-sustaining vegetation communities that approximate pre-disturbance parameters for cover, density, and diversity, as measure at adjacent undisturbed areas;
- The development of hydrologically stable landforms that meet future land uses including wildlife habitat, livestock grazing, and mineral exploration; and
- Establish conditions for the further restoration of the visual quality of the area.

### **7.1 Facility and Structure Removal**

All gas wells will be abandoned according to Colorado Oil and Gas Conservation Commission (COGCC) regulations. All above ground well pad, pipeline, and water disposal facilities, including buildings, structures, tanks, and associated hardware, will be closed or dismantled and removed from the site. These materials will be salvaged and re-used or disposed of at approved sites.

Any concrete foundations, pads, or footings will be adequately broken up and covered or removed. All aggregate used for well pad, road, and/or ancillary facility site construction also will be removed or suitably buried.

Road reclamation will be conducted as deemed appropriate by COGCC and the surface landowners; some roads may remain after project completion. Road reclamation will include the removal of bridges, culverts, cattle guards, sediment control structures, and signs. Drainage- crossing side slopes will be reduced in order to minimize bank erosion and produce stable side slopes. In addition, road barriers or signs may be used to discourage travel on reclaimed road surfaces.

## **7.2 Reclamation Success Monitoring and Revegetation Inspections**

### Inspections

On an annual basis, inspections will be performed on each facility site. Observations will be made for weed species presence, fence damage, erosion problems, and bare ground resulting from revegetation failure. Evaluation of the vegetation will include estimates of species type, diversity, and ground cover. Reclamation success monitoring will commence during the first growing season and continue until interim and final reclamation and revegetation efforts meet or exceed 70% of the desirable plant cover found on the adjacent reference areas. Reference areas are adjacent areas that best represent the original pad site before disturbance.

The reclamation specialist will estimate the percent live cover of the reclaimed area and make a comparison to the reference area(s). A report of this data as well as other inspection data, such as presence of noxious weeds, erosion, fence status, grazing, etc. will be incorporated into the annual inspection report for the specified well sites.

### Follow Up Revegetation

Observations of any problems will result in additional revegetation/reclamation efforts. Erosional features will be repaired by filling-in wash outs greater than 6 inches deep and re-grading. Areas containing less than 2 desirable species per square foot and/or areas greater than

2 square feet will result in touch-up hand seeding and raking. Larger areas exhibiting revegetation failure will be re-tilled and seeded as described above in corresponding sections of the Plan.