Section 2.11 Reclamation Plan

Section 2.11.1 Introduction

Numerous components of LQD Noncoal Rules and Regulations Chapter 2, Chapter 3 and Chapter 13 and W.S. § 35-11-406 and W.S. § 35-11-415 outline Reclamation Plan elements. This section of the permit seeks to organize these components and where applicable, makes clear the distinctions established by Chapter 13.

The commitments outlined in this section apply to most lands affected in recent years and to all lands permitted under the A1 and A2 amendments. All variations to these general plans which may apply to specific Chapter 13 Updates or amendments will be submitted as individual subsections of Section 2.11 in the respective Chapter 13 Update or amendment application.

Section 2.11.2 Postmining Land Uses

LQD Noncoal Rules and Regulations Chapter 3, Section 2(a)(i) establishes the overall reclamation standard that "reclamation shall restore the land to a condition equal to or greater than the highest previous use". Section 2.1.1 of this permit establishes the premining land use of grazingland.

The permittee will restore these postmining land uses as stated in Section 2.1.2. The collective reclamation techniques discussed below will ensure achievement of the "equal to or greater than" standard.

Chapter 3, Section 2(a)(ii) requires restoration of postmining wildlife habitat unless the proposed uses preclude use as wildlife habitat. The collective reclamation techniques discussed below will restore wildlife habitat which is commensurate with habitat conditions which existed prior to the mining operation. The postmining reclaimed surface configurations, restored drainage patterns, approved postmining stockponds, and the type and vigor of seeded plant species will ensure wildlife use.

Section 2.11.3 Backfill, Grading And Contouring Plans And Schedules

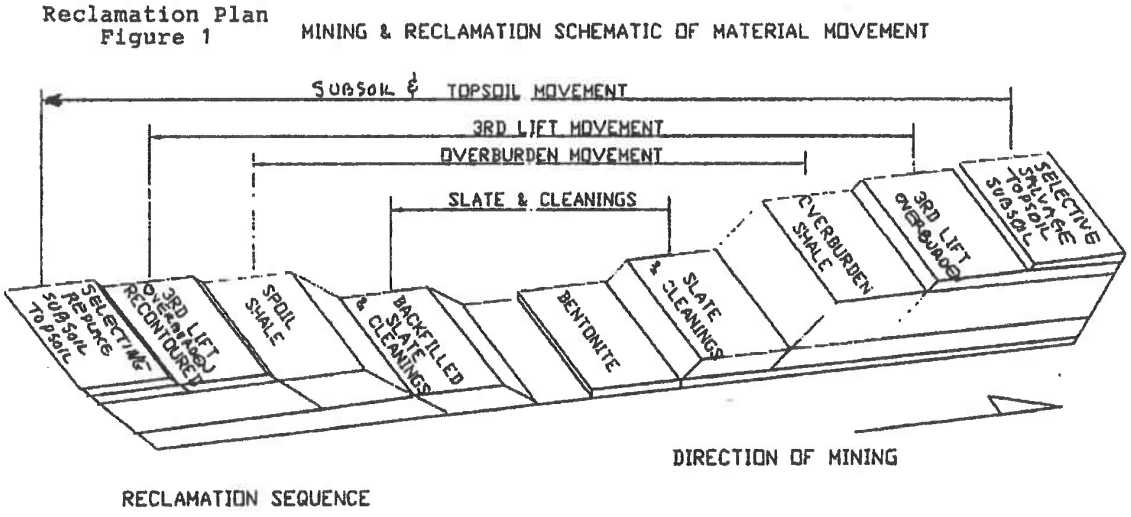
Mine Plan Sections 2.10.6 and 2.10.7 outline the general mining progressions and schedule. This Reclamation Plan section describes detailed but general reclamation practices which show that reclamation is timely and concurrent with the mining operations and that reclamation provides surface configurations which support the specified land uses.

The permittee uses no tailings impoundments, tailings disposal areas, head leaching facilities nor spent ore disposal areas as listed in Chapter 2, Section 2 (b)(iii)(F). This Reclamation Plan does not address such facilities or areas.

Section 2.11.3.1 Backfill Progressions, Temporary Overburden Stockpiles And Schedules

Mine Plan Section 2.10.6 and Mine Plan Figure 1 outline the general backfill progression and demonstrate that backfill is placed at approximately the same stratigraphic level from which it was removed. The cleanings from the top of the bentonite bed and other slate/shale cleanings are backfilled on the previous pit bottom. The "tiered" system (Reclamation Plan Figure 1) continues by replacing the lower overburden layers from the current pit over the cleanings. The upper portion of the mined overburden from the current pit is placed at an intermediate level in the backfilled pit. Lastly, the third lift (immediately below the subsoil) from the current pit is placed closest to the surface. This third lift is graded to the desired contour and surface configuration as shown in Reclamation Plan Figure 1.

Reclamation Plan
Figure 1



All temporary overburden stockpiles will be used in backfill as soon as possible consistent with reclamation progressions and schedules outlined in Section 2.11.3.3.

Section 2.11.3.2 Permanent Out Of Pit Overburden

Mine Plan Section 2.10.6 outlines three "schedules" or different pit series development sequences. Schedule A allows the possibility of permanent, out-of-pit overburden stockpiles. Schedules B and C commit to backfilling all mined overburden material.

When the permittee creates permanent overburden stockpiles, the reclamation will achieve all the performance standards of LQD Noncoal Rules and Regulations Chapter 3, Section 2(i)(iv)(B)(II) including:

- overburden placement will not occur on native slopes that exceed 20 degrees (approximately 33% or 3:1 slopes).

- stabilizing the overburden slopes by grading and contouring them to blend with adjacent native and reclaimed lands.
- covering the stabilized overburden with subsoil and topsoil.
- seeding the topsoil with an approved permanent seed mix.
- overburden placement will not block ephemeral, intermittent or perennial drainage channels.
- overburden which is placed on pre-Act affected lands will be subject to the other reclamation practices following in this section.

Section 2.11.3.3 Reclamation Progression Maps And Schedules

Various citations in the Wyoming Environmental Quality Act and LQD Noncoal Rules and Regulations Chapters 2 and 3 and 13 require "plans" or "detailed plans" and various "maps" and projected "time schedules" for the reclamation processes. As stated in Mine Plan Sections 2.10.6 and 2.10.7 and Section 2.11.3 above, the permittee commits to reclaiming land concurrently with each new cut in each pit sequence.

Furthermore, LQD Noncoal Rules and Regulations Chapter 13, Section 3(a)(vi) establishes a specific time schedule for reclamation of all lands affected after August 31, 1983 (including all lands under approved A1 and A2 and subsequent amendments). Since the permittee sometimes field dries the bentonite and in consultation with the LQD District III staff, the permittee commits to the following schedule for all permitted lands affected after August 31, 1983:

- reclamation backfilling in a specific cut will begin within three (3) years from the date the cut was initiated and permanent seeding will be completed no later than five (5) years from the date the cut was initiated.
- each specific deviation which exceeds this schedule will be individually identified in the appropriate Annual Report as a Variance requested under provisions of W.S. § 35-11-601(a). The Variance request will specify the alternate reclamation schedule and explain reasons for the adjusted schedule. The permittee understands that the LQD will decide whether Variance request will be formally processed under W.S. § 35-11-601(a).
- each Annual Report will clearly identify the status of all affected land within the permit area using at least the following categories:

  - open pit affected land
  - unreclaimd associated affected land
  - backfilled, graded and contoured land
  - subsoiled/topsoiled land

- permanently seeded land
- full bond release land

➢ each Annual Report will clearly identify the new cuts (proposed mining) in all pit sequences which will experience mining operations during the next (upcoming) Annual Report cycle.

These commitments and Annual Report information will collectively satisfy requirements to present detailed reclamation plans, maps and schedules which establish that reclamation is concurrent with mining operations.

Section 2.11.4 Postmining Slopes, Topography And Through Drainage

Section 2.11.4.1 Postmining Slopes

In general, the postmining slopes will approximate the premining slope configurations except where initial "box cut" overburden material is permanently reclaimed (see Section 2.11.3.2) or where a permanent postmining impoundment is created (see Section 2.11.5). The reconstruction of approximate original slope gradients and timely completion of reclamation will assure stability of postmining landscapes.

LQD Noncoal Rules and Regulations Chapter 3, Section 2(b)(ii)(A) states that "individual slope measurements...shall be submitted with the reclamation plan". Because of the discussion above and under agreement with the LQD District III, these measurements will not normally be submitted. The permittee understands that the LQD reserves the option to ask for such slope measurements at the time of final bond release or if the reclaimed surfaces prove to be unstable and erosive.

The slopes on the final pit in any given sequence may have slopes as steep as 3:1 (18 degrees or 33%). The permittee will ensure that these slopes blend with surrounding native lands and reclaimed lands, that the slopes support the postmining land uses and that the slopes are stable.

Section 2.11.4.2 Postmining Topography

All postmining topography will blend smoothly with the surrounding topography and terrain and will reestablish stable contours consistent with postmining land uses.

W.S. § 35-11-406 (b)(vii) and LQD Noncoal Rules and Regulations Chapter 2, Section 2 (b)(iii)(B)(I) require description of the reclaimed land surface using contour maps or cross-sections. By agreement with the LQD District III, the permittee will not submit cross-section drawings for reclamation of lands affected by the general mining operations. In general, the permittee will not include contours on Reclamation Plan maps unless specifically requested by the LQD. The primary reason for this approach is that the mine site topography is relatively gentle and detail would not show useful information. There will be no postmining depressions with internal drainage.

The permittee understands that the LQD may request contour based maps and drawings for final bond release request and where certain drainage channels are restored.

Under the Schedule A (Mine Plan Section 2.10.6), the permittee reclaims the final pit in a pit series by reducing the highwall and creating through drainage where necessary. The reduced highwall slopes may be as steep as 3:1 (18 degrees or 33%) if those slopes will clearly be stable. To ensure stability on steeper slopes and long slope lengths, the permittee will break up these slopes by creating terraces during grading the Third Lift backfill. These terraces will generally be approximately the width of a single pass of reclamation equipment. The gradient of the terraces will be as gentle as possible and non-erosive. The downstream end of terraces will feather into the reclaimed surfaces to create non-erosive transitions.

Section 2.11.4.3 Through Drainage

All backfilling, grading and contouring operations will restore existing drainage patterns and create through drainage on all reclaimed lands. There will be no depressions which accumulate water unless the permittee secures approval from the LQD prior to constructing the feature. The restored drainage patterns and through drainage will be adequate to prevent pollution or diminution of the quantity and quality of surface and groundwater.

Section 2.11.5 Permanent Postmining Impoundments

Section 2.11.5.1 Historical Reclamation Practices

Prior to the construction of an official permit document, the current permittee and its predecessors occasionally constructed postmining impoundments (stock ponds) on reclaimed lands. In general, the LQD requested no designs for or knowledge of the impoundments prior to their construction. The LQD will resolve the status and function of these historically constructed permanent impoundments during final bond release procedures.

Section 2.11.5.2 Reclamation Practices After July, 2000

Prior to constructing permanent impoundments on lands which are reclaimed after July 31, 2000, the permittee will submit information and drawings which fulfill the intent of the following provisions of the LQD Noncoal Rules and Regulations:

Chapter 2, Section 2(b)(iii)(B)(Ill)
Chapter 2, Section 2(b)(iii)(E)(I)-(V)
Chapter 3, Section 2(a)(iii)
Chapter 3, Section 2(b)(i)(D)
Chapter 3, Section 2(b)(ii)(C)
Chapter 3, Section 2(g)(i)-(iv)

This information will be formatted as a specific section of this Reclamation Plan and will be submitted under Noncoal Rules and Regulations Chapter 7 as a revision to the permit.

Section 2.11.6 Ephemeral Drainage Reconstruction

Section 2.11.6.1 Introduction

This section outlines the basic strategy followed by the current permittee and its predecessors in the reclamation of major ephemeral stream channels. This program was tailored for the ecosystem of northeastern Wyoming and the equipment available for construction. Drainages constructed in the described manner have proven stable through several major flood events.

Section 2.11.6.2 Drainage Size And Other Characteristics

Only relatively large channels have been and will continue to be built under this approach. As a rule, channels which qualify as large, are classified as third order drainages and have a minimum watershed size between 50 and 100 acres. Such channels are characterized by a generally sinuous character and a concave-up (concave while looking upstream) stream profile. Drainages which have relatively straight channels and straight or convex-up profiles are categorized as minor and will not undergo the calculated channel reconstruction effort described here. A return of the approximate original contours and original slopes following mining assures a return of minor drainages which are at least as stable as those which existed in the pre-mine area.

Headcuts and minor gullies will exist in the reclaimed channel because the native stream channels which serve as a model for this method contain headcuts. The approximate return of the pre-mine hydrologic character required by the Wyoming Environmental Quality Act intends creation of a landscape which will behave in the same manner as the pre-mine area. The permittee is aware that it has the option to more thoroughly document the premining conditions of all drainages which it will affect.

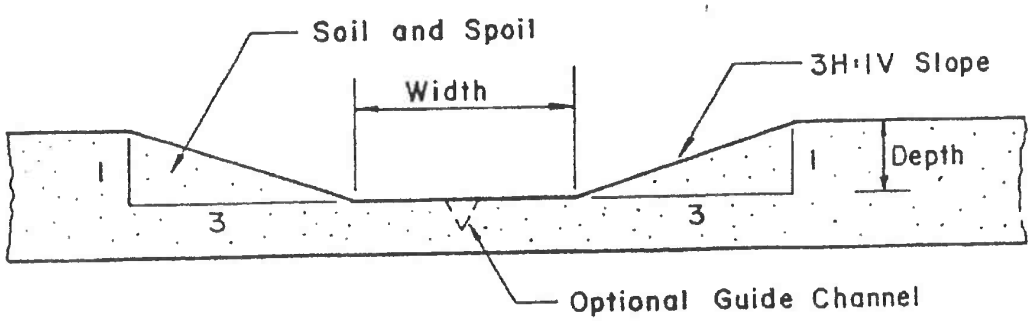
In addition to the fact that headcuts are a natural phenomenon, their presence cannot be considered destructive nor indicative of instability. Studies show that headcuts account for a minor portion of the total sediment lost from a typical watershed in northeastern Wyoming. Sheet flow was reported as the major source of eroded material, while an average total of only 25% of the sediment loss could be attributed to headcuts (Rank1 1987). This would seem to indicate that elimination of headcuts in favor of a "smoother" slope would increase erosion and conflict with the Wyoming Environmental Quality Act's goal of rebuilding a geomorphically suitable landscape. In order to look and act like a native drainage, erosion must occur in the same places at about the same rate as occurs naturally. Channels which are designed in order to lower the natural rate of erosion have proven as unstable and unacceptable as channels designed without consideration for erosion control.

With this understanding, this construction method was designed so that the natural rate of erosion would neither be increased nor decreased. A system is created which directs erosion.

Section 2.11.6.3 Design Elements

Past reclamation efforts indicate that channels built strictly according to engineering designs, such as Manning's model, result in an inappropriate amount of sediment loss. Geomorphic sizing methods have also failed to provide consistently successful channel designs. However both mathematical and geomorphic sizing methods have positive aspects. This method takes an approach which combines the strongest features of Manning's equation and geomorphic approaches.

The stream channel reconstruction program implemented in 1987, and the method followed to date, involves transposing an ideal pre-mine channel section within a broad flood valley. Manning's equation is used to calculate the 100-year flood path, which is referred to as the valley (Reclamation Plan Figure 2). The low-flow, sinuous channel will course within the valley. Soil bars are placed within the valley in order to guarantee that the low-flow channels follow the ideal path.



Reclamation Plan
Figure 2. Trapezoidal cross-section of typical Manning's channel.

Every effort is made to create a constant, concave-up valley grade with no areas which are steeper or with a profile shape other that than dictated by the stream order. Pre-mine streambeds in the Colony, Wyoming mining area have no structural controls, such as bedrock, which would produce sharp changes in valley grade. This means that stable convex-up (convex while looking upstream) valley profiles cannot exist in the undisturbed area. To be stable each reconstructed valley profile must therefore be built in a concave-up shape.

In order to determine the proper shape and degree of valley slope, the geomorphic character of the valley portions above and below the affected reach are examined. The reclaimed valley must have a concave slope intermediate between the unaffected stream sections above and below the zone of disturbance. Therefore, depending on the location and extent of mine disturbance, the target valley grade may vary greatly from site to site. However, the slope of the channel which will flow within Manning's valley cannot be allowed to be outside the bounds of the maximum and minimum slope percentages which have been determined to be erosionally stable for the area of disturbance.

Steady state third order stream courses in the Colony area maintain slopes which range between one and two percent. Because low spots have resulted in as many long-term reclamation problems as over-steep sections, a minimum slope percentage of one percent is equal in importance to the two percent maximum grade. Accordingly, neither a portion nor the entirety of the reconstructed channel must be allowed to fall outside these bounds. Guaranteeing formation of a sinuous channel course which has a grade within the critical slope range requires placement of a water guidance system within the valley.

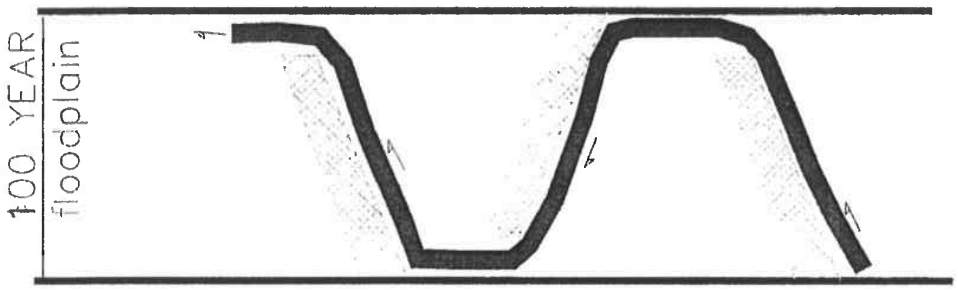
Manning's 100-year flood channel is the foundation of this program because channels described by this formula have proven erosionally stable during major floods. Additionally, Manning's provides the width and depth of a structure which will theoretically promote formation of a stable meandering water channel. However the ability of Manning's channels to induce sinuosity is dependent on a consistent valley bed slope. This requirement cannot be met due to the nature of the material mined and the tools used to mine. The bumps and ridges left by the equipment used to construct the drainage, as well as natural spoil slumping, frequently result in grade inconsistency. These slumps and ridges are not part of the original design and often lead to valley slopes outside the necessary one to two percent range.

In order to assure sinuous flow, rectangular shaped bars are constructed within Manning's valley. Placement of these bars is modeled after the area stream channel section which is considered the most stable and aesthetically appropriate. One end of each channel bar is tied into the valley bank while the distal end juts into the 100-year flood valley (Reclamation Plan Figure 3).

With minor variations, the aerial appearance of the bars are copied from the natural bars located within the model unaffected channel reach. Only the leading edge of the ellipsoidal native bar will be built. The angle of the upstream portion of the native bar will be copied as closely as possible but the length of the native bar may not be duplicated. The designed bars will be built so that Manning's 10-year flood channel can flow around the tip (Reclamation Plan Figure 4). The constructed soil bars may therefore be longer or shorter than the model.

The width and depth of the 25, 50, and 75 year flood courses are calculated using Manning's equation. For design purposes these sub-100 year flood channels are considered solid boxes. The derived flood paths are then stacked within the 100-year valley (Reclamation Plan Figure 4). The angle made by the lower edge of the stacked "boxes" describes the slope of the soil bars.

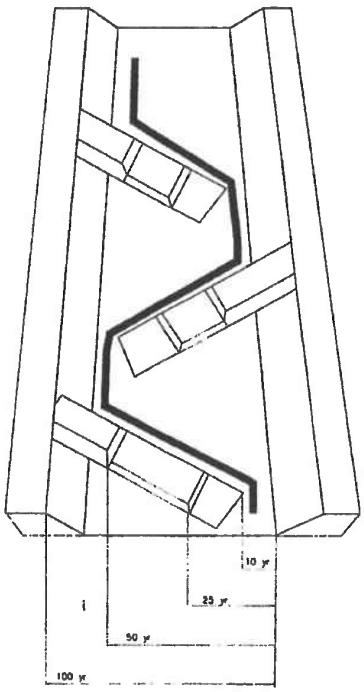
Reclamation Plan Figure 3.



Reconstructed channe bars

Extremely large flood flows overtop the bars

Reclamation Plan Figure 4



By accommodating major floods, the bars will not obstruct or deflect flows into potentially destructive directions. Rather, large flood events will be allowed to course freely over each bar without causing excess sediment loss to the valley walls or the bars themselves.

The cornerstone of this approach is a wide, concave-up valley floor with dimensions described by Manning's equation using the 100-year, 6-hour flood event. The valley profile is intermediate between the areas above and below the disturbance with a valley sinuosity which is copied from the undisturbed area. This provides assurance that the pre-mine slope gradient and shape will be returned to the reclaimed area.

Vertical bar dimensions are also critical since bars which have been built without regard to flood courses have frequently resulted in failure of the bars and/or the valley. Geomorphic measures cannot be used to design the vertical dimensions of the soil bars because the native meander bars do not show a repeatable three-dimensional shape which could serve as a blueprint. Manning's mathematical sizing method is used as an alternative.

In design planning, the ideal native channel is superimposed onto the valley floor. Using the sinuosity of this ideal channel reach as the template, soil bars can be installed which counteract valley-slope inconsistencies and assure formation of a stable meandering channel. By constructing each bar at a height which compensates for major flows, large floods are allowed to course unencumbered within the valley. Sinuosity is introduced without compromising long-term stability.

The end result is a channel which has a concave-up profile with a slope less than the containing valley. Since this slope relationship exists in the pre-mine area, long term stability is assured. Channels constructed using this combination of Manning's and geomorphic sizing methods are more visually acceptable and have shown reduced sediment loss compared to those constructed strictly according to either approach alone.

Section 2.11.6.4 Notes On The Use Of Manning's Formula

Manning's Formula is expressed as $Vp = 1.49/n \times R^{2/3} \times$ the square root of the slope. The presentation of this formula is in Barfield, B.J., R.C. Warner and C.T. Haan, 1981. Applied Hydrology and Sedimentology for Disturbed Areas, 161-165 1st Edition, Oklahoma Technical Press, Stillwater, Oklahoma.

Runoff is calculated using USDA, SCS, Engineering Division-Hydrology Branch, Engineering Field Manual (EFM), Notice-4, 5/71; Kent, K.M. (comp.), W.A. Styner (rev.), 55 pp., Western Regional Technical Service Center, SCS, Portland Oregon.

Precipitation amount is derived from the Precipitation-Frequency Atlas of the Western United States, Atlas 2, Vol. IT-Wyoming, Miller, J.F., R.H. Frederick, and R.J. Tracy, U.S. Dept. Commerce, National Oceanic and Atmospheric Administration, National Weather Service, Office of Hydrology, Silver Spring, MD, 1973.

"Q" is estimated using drainage area and slope calculated from 7.5 minute quadrangle

maps and/or company surveying of watershed area and slope. The range condition and soil type of the watershed are determined in the field and subsequently used to determine the curve number (CN) value according to the EFM Notice-4, 5/71.

A negative solution represents an impossible construction format and will therefore be discarded as a possible solution.

Section 2.11.7 Subsoil And Topsoil Redistribution Methods

Section 2.11.7.1 Introduction

Mine Plan Section 2.10.8 outlines the permittee's topsoil and subsoil salvage and storage (stockpile) procedures. The permittee will always seek to minimize the amount of time topsoil and subsoil remains in stockpiles.

Chapter 3, Section 2 (d)(ii) states that "Land which did not support vegetation prior to becoming affected land need not be revegetated unless subsoil or overburden from such affected land will support vegetation". When such native lands exist, they will be identified in the baseline vegetation studies. As noted below, the permittee will respread subsoil and topsoil on all affected lands because historical practices have demonstrated that all lands can be successfully revegetated. The special case of reaffected pre-Act lands is also discussed below.

Section 2.11.7.2 Topsoil Nutrient Analyses And Subsoil Suitability Tests

Chapter 3, Section 2 (c)(i)(C) states "Where topsoil has been stockpiled for more than one year, the operator may be required to conduct nutrient analyses to determine if soil amendments are necessary". The LQD has never required such analyses for any historical reclamation completed under the Wyoming Environmental Quality Act. The permittee does not see any need for these analyses based upon the facts of the historical record of reclamation success and full bond release.

Chapter 13, Section 3 (a)(i) allows the LQD Administrator to request subsoil suitability tests. The premining subsoil characterizations outlined in Section 2.7 and the subsoil salvage techniques outlined in Mine Plan Section 2.10.8 ensure that subsoil is handled in a manner which will facilitate successful revegetation. The LQD has never required subsoil suitability testing prior to redistribution of subsoil. The permittee does not see any need for additional suitability testing based upon the facts of the historical record of reclamation success and full bond release.

Section 2.11.7.3 Subsoil Redistribution Methods And Depths

If the permittee determines that the "third lift" backfill has been unduly compacted, the high compaction areas will be ripped to eliminate slippage between the backfill and subsoil.

The permittee will use scrapers to replace all subsoil. As shown in Reclamation Plan Figure 1, the available subsoil will be replaced on top of the recontoured "third lift" overburden. If the permittee is direct hauling from a new pit cut, all the salvaged subsoil will be redistributed at approximately uniform depths. When redistributing stockpiled subsoil, the redistribution depths will be approximately uniform. The subsoil will be graded as necessary, but any grading will avoid excessive compaction.

In select cases, the permittee may redistribute some subsoil on pre-Act lands which have been reaffected by ongoing mining operations. In these cases, the permittee will ensure that the Subsoil use does not reduce the potential for reclamation success on other lands. When used in this manner, the subsoil depths will vary and will be graded to blend with the adjacent pre-Act lands and the standard reclamation.

Section 2.11.7.4 Topsoil Redistribution Methods And Depths

The permittee will use scrapers to replace all topsoil as illustrated in Reclamation Plan Figure 1. If the permittee is direct hauling from a new pit cut, all the salvaged topsoil will be redistributed on available subsoil at approximately uniform depths. When redistributing stockpiled topsoil, the redistribution depth will be approximately uniform.

The redistributed topsoil may be graded, but will always be left in a roughened condition to protect the topsoil from wind and water erosion. The permittee will always conduct operations to limit excessive compaction of the redistributed topsoil.

Chapter 3, Section 2 (c)(i)(F) states that "If abundant topsoil is present, and it is not all needed to accomplish the reclamation required in the approved reclamation plan, the Administrator may approve of use of this topsoil.....in another area for reclamation purposes". In select cases, the permittee will exercise this option to spread topsoil on pre-Act lands which have been reaffected by ongoing mining operations. In these select cases, the permittee will ensure that the topsoil used will not reduce the potential for reclamation success on other lands. When used in these cases, the topsoil depths will vary and will be graded to blend with the adjacent pre-Act lands and the standard reclamation.

Section 2.11.8 Revegetation and Seeding Method

Section 2.11.8.1 Seedbed Preparation, Seed Mix and Seeding

The permittee prepares the seedbed with a spring-tooth chisel plow. This technique leaves deep furrows which trap available moisture and assist in controlling wind and water erosion.

The permittee plants the seed mix in Reclamation Plan Table 2.11.8.1 on all permanently reclaimed lands.

Reclamation Plan Table 2.11.8.1 Permanent Seed Mix and Seeding Rates

Scientific Name	Species	Lbs of PLS/acre*
Calamovilfa longifolia	Prairie Sandreed	1.0
Agropyron dasystachyum	Thickspike Wheatgrass	1.0
Agropyron smithii	Western Wheatgrass	1.0
Oryzopsis hymenoides	Indian Ricegrass	1.0
Elymus cinereus	Great Basin Wildrye	1.0
Stipa viridula	Green Needlegrass	1.0
Agropyron spicatum	Bluebunch Wheatgrass	2.0
Buchloe dactyloides	Buffalo Grass	1.0
Bouteloua gracilis	Blue Grama	1.0
Vicia Americana	American Vetch	1.0
Ratibida columnifera	Prairie Coneflower	1.0
Achillea millefolium	Western Yarrow	1.0
Sphaeralcea coccinea	Scarlet Globemallow	1.0
Sporobolus airoides	Alkali Sacaton	1.0
Secale cereale or Triticale	Fall Rye or Triticale	5.0-25.0**
Total		30.0

*PLS (Pure Live Seed) **15.0 lbs of PLS/acre used for Total figure

The seed mix includes a variety of species selected for their drought and alkaline tolerance; most species were discovered during the baseline study. A few species were selected because of their revegetation success on previous seeding. Additionally some were added due to the forage capacity they hold for certain species of wildlife. All species are self-renewing except the rye and Triticale. Fall rye or Triticale is seeded as a nurse crop with the permanent seed mix. The nurse crop protects the soil from erosion, adds organic mulch and reduces weed infestation.

The seed box is mounted on the chisel plow and set so that the seed is released into the chisel plow furrows.

The permanent seeding will occur from September to November each year as long as the topsoil is not frozen.

Seeding will be on the topographic contour unless safety considerations overrule or are perpendicular to the to the prevailing wind direction on very flat lands.

The permittee does not propose irrigation of any reclaimed and revegetated lands in the original permit area or on any amendment lands.

Any permanent topsoil redistributed outside the designated September through November permanent seeding window will be seeded with a temporary cover crop as long as topsoil conditions allow. The temporary cover will protect the topsoil and help conserve available

moisture.

Section 2.11.8.2 Shrub Species In Seed Mix

Shrubs are planted in late winter or early spring in addition to the permanent seed mix, to reestablish wildlife habitat.

Reclamation Plan Table 2.11.8.2 Shrub Mix and Seeding Rates

Scientific Name	Species	Lbs of PLS/acre*
Artemisia tridentate	Big Sagebrush	0.5
Artemisia Cana	Silver Sage	1.0
Artemisia frigida	Fringed Sagewort	1.0
Krascheninnikovia lanata	Winterfat	1.0

Historically, the LQD has accepted the absence of shrub species in the permanent seed mix if the permittee documents that each surface owner does not want shrubs seeded. In each Chapter 13 Update and all amendment applications after the A2 amendment, the permittee will present and briefly note the presence of written statements for each surface owner.

If the permittee does not secure written surface owner statements, a specific section of text will list the site specific seed mix.

Section 2.11.8.3 Seed Mix Substitutions

The permittee commits to the permanent seed mix in Table 2.11.8.1 when the mix components are readily available. History has shown that individual species may be unavailable at a given seeding because:

- The species and/or the preferred variety may not be available because of a poor seed crop or because federal or state agencies have purchased large quantities of seed.
- The cost may be excessive.
- The amount of available seed may not be adequate for the reclamation acreage.

In any given seeding effort, the permittee may need to substitute a small number of species. If the total number of substitutions is three (3) or more, the permittee will secure prior approval from the LQD District Office. Otherwise, the permittee will substitute a native or naturalized species of the same life form with similar characteristics. The permittee will report the substitutions in the first available Annual Report.

Section 2.11.8.4 Historic Seed Mixes And Methods

The permittee has used several different seed mixes and planting methods over the history of reclamation since July 1, 1973. The respective Annual Reports have

documented the historic combinations. The methods and seed mix outlined above are current commitments for the historic permit area and the A1 and A2 amendment areas. The permittee will revise this section via the amendment or Noncoal Rules and Regulations Chapter 7 procedures as appropriate.

Section 2.11.8.5 Other Postmining Plant Communities

The LQD Noncoal Rules and Regulations Chapter 3, Section 2 (d)(vi)(E) and (F) allow for reforestation and cropland. The permittee will generally not restore such communities unless they were present on the premining landscape and only when they are specified in this Reclamation Plan.

Section 2.11.8.6 Postmining Tree Restoration

The permittee occasionally affects lands which have one or more tree species present. These affected lands most often comprise haul/access road corridors and lands which are back-sloped above reclaimed highwalls of the last pit in a sequence. Section 2.8 (Appendix D-8) will include description of the tree composition and locations for all Chapter 13 Updates and all amendment lands after June 23, 2000 (approval date for the Al and A2 amendments).

The permittee will not replant the destroyed trees unless the surface owner specifically requests restoration in writing. If a surface owner wants trees replanted, the permittee will include specific Reclamation Plan text which details the replanting methods and locations.

Section 2.11.9 Husbandry Practices On Revegetated Lands

Section 2.11.9.1 Noxious Weed Control

The permittee will use certified weed-free seed and standard agricultural practices to minimize the introduction of noxious weeds. The permittee will consult with appropriate county and state agencies when other weed control methods, e.g. spraying, appear appropriate to control localized weed infestations on stockpiles on revegetated lands. The permittee will continue these practices until the reclaimed lands are fully released from the reclamation performance bond.

The use of the fall rye cover crop and nurse crop will assist in reduction of all weed species.

Section 2.11.9.2 Protection Of Revegetated Lands

Chapter 3, Section 2 (d)(viii) requires a mutual agreement among the LQD Administrator, permittee, land owner or land managing agency which determine when the revegetated land is ready for the initial episode of domestic livestock grazing. As per current LQD

procedures, the permittee does not make projections regarding initial grazing on reclamation in the permit document. The LQD requests and the permittee provide this information in each Annual report.

The permittee will protect young vegetative growth from being destroyed by livestock until the vegetation is capable of renewing itself. The permittee will employ some combination of the following practices to accomplish this standard:

A. Selective Fencing

Based upon agreements with respective surface owners, the permittee may selectively fence reclaimed lands to control the pattern and duration of domestic cattle grazing. The fences will be removed after bond release if the surface owner requests.

B. Grazing Deferral and Controlled Grazing

Based upon agreement with respective surface owners and grazing lessees, the permittee will seek to properly manage domestic cattle grazing on revegetated lands so that the self renewing capacity of the revegetation is not negatively impacted.

Section 2.11.10 Evaluation of Revegetation Success and Bond Release

By definition from the Wyoming Environmental Quality Act (WEQA) reclamation seeks to reestablish "... use for grazing, agricultural, recreational, wildlife purposes, or any other purpose of equal or greater value". The permittee will restore a stable, non-erosive postmining surface which promotes a postmining land use of "grazingland" as defined in the WEQA. Revegetation practices will establish cover sufficient to prevent undue erosion. Revegetation will establish cover and production and species diversity and composition which support the land use and which meet the performance standards of LQD Noncoal R&R Chapter 3, Section 2.(d)(vi).

Prior to sampling for final bond release, a plan for evaluating reclamation success will be submitted and mutually agreed upon by Bentonite Performance Minerals, LLC and LQD.

Section 2.11.10.1 Full Bond Release Application Content

The permittee will submit each full bond release application separate from other permitting actions such as Annual Reports, amendments, Chapter 13 Updates, etc. The permittee will endeavor to submit each application at a time during the year which allows some LQD staff review time and which allows the field inspection to be conducted between late May and mid-September.

Prior to submitting an application for final bond release, a plan for evaluating application content will be submitted and mutually agreed upon by Bentonite Performance Minerals, LLC and LQD.

The permittee will submit the following information in each full bond release application.

- Tabulate the lands by legal description and acreage and reference these lands to accompanying maps. The maps must clearly identify the potential release units.
- Clearly state the premining and postmining land uses. The land use categories should be only those listed in W.S. § 35-11-103(e) (xxvi) and (xxvii).
- Outline the specific seed mix applied and date of seeding for each potential release unit. Note any remedial actions or husbandry practices applied after original seeding.
- Include a signed Landowner Statement of Satisfactory Reclamation from each surface owner for each release unit. A suitable form is available from LQD.
- Include approved State Engineer Office Permits for all postmining impoundments constructed on each potential release unit.
- Include quality photographs which are representative and illustrative of the characteristics of the release units. These photographs are not required, but very useful.
- Identify any formally designated Reference Area or Comparison Area which occurs in the close proximity to a potential release unit.
- Specifically note the status (active, reclaimed, etc.) of any haul access roads which served the potential release unit or which traverse the units.

The LQD Staff will review the application for complete and accurate information and arrange a suitable date for a field inspection.

Section 2.11.10.2 Office And Field Inspection Procedures

Chapter 13 of the LQD Noncoal Rules & Regulations establishes this category. As far in advance of submitting a bond release application, the permittee will endeavor to have an LQD staff member view the reclaimed lands to aid in development of a suitable bond release plan and give the preliminary opinion that the lands appear suitable for full bond release. The permittee and the LQD will also use this field exercise to establish Comparison Areas (as necessary) or confirm the use of established Extended Reference Areas. The native lands may be inside or outside the permit area boundary as long as management histories are comparable.

According the Guideline 2 it is agreed upon during field inspection that prior to initiating any field sampling program for final bond release the permittee will secure written agreement with the LQD District III concerning the specific formulation of the Null and Alternative Hypotheses and statistical test of means.

The LQD field inspection will evaluate the permittee's attainment of the performance standards of LQD Noncoal R&R Chapter 3, Sections 2.(a), 2.(d)(vi) and 2.(d)(ix).

- The total vegetation cover on the reclaimed lands must be at least equal to the total vegetation cover of nearby native lands, or to nearby designated Reference or Comparison Areas. This assessment of cover will be based upon desirable, non-weedy species.
- The reclaimed lands must be relatively free of designated noxious weeds or other troublesome, undesirable weedy species. No weedy species should dominate the reclaimed vegetation community.
- The permanent species must be evident and persistent in the postmining community. There should be clear evidence of species self-renewal.

Inspection Report and Bond Release Decision

The final decision will detail the lands granted final bond release and record the process as a numbered change to Permit No. 267C.