1.0 PURPOSE

The purpose of the procedure is to describe the methods for revegetating disturbed surface areas and controlling weeds on the Mill property.

2.0 APPLICABILITY

This procedure applies to all revegetation and/or weed control conducted on or adjacent to the Mill property.

3.0 OTHER DOCUMENTS

3.1 *REFERENCES*

3.1.1 References are included in Appendices A and B.

3.2 *APPENDICES*

3.2.1 Appendix A - Revegetation Methods

3.2.2 Appendix B - Weed Control Methods

3.3 *EXHIBITS*

3.3.1 None

4.0 EQUIPMENT AND MATERIALS

4.1 *EQUIPMENT*

4.1.1 Earth moving equipment suitable for the scope of the project (e.g., dozer, grader, skid steer).

4.1.2 Scarification equipment suitable for the scope of the project (e.g., dozer or grader with rippers, tractor with plow or discs).

4.1.3 Drill seeder, broadcast seeder, or hydroseeder.

4.1.4 Herbicide applicator (hand held or truck/trailer mounted).

4.2 *MATERIALS*

4.2.1 9 in. x 13 in. self-sealing plastic bags for collecting soil samples.

4.2.2 Soil amendments and/or fertilizer as indicated by soil testing results.

4.2.3 The appropriate seed mixture and quantity of pure live seed for the area of the mill site to be seeded and the proposed planting method (see Appendix A, Revegetation Methods).

4.2.4 Weed-free, small-grain straw or hay mulch (two tons/acre).

4.2.5 Appropriate herbicide for weed control applications (see Appendix B, Weed Control Methods).

5.0 RESPONSIBILITY

5.1 The Radiation Safety Officer (RSO) or his designee is responsible for:

5.1.1 Determining the locations that require revegetation and/or weed control.

APPROVALS	*Signature*	*Date*
RSO		
Plant Manager		

5.1.2 Assigning the Radiation Security Technician (RST) to take soil samples and ship these samples to an appropriate laboratory for nutrient testing.

5.1.3 Ensuring that the sampling technician has sufficient experience and knowledge of the procedures to correctly obtain and ship the samples.

5.1.4 Providing the Plant Manager and General Mill Foreman with a list of materials needed for seeding and/or weed control and recommending appropriate vendors and/or contractors.

5.1.5 Ensuring that revegetation and weed control supervisory personnel have sufficient experience and knowledge of the procedures to perform the work correctly.

5.1.6 Inspecting the revegetation and/or weed control work both during and after the work is performed to verify that correct procedures have been followed and determine the effectiveness of the revegetation and/or weed control measures.

5.2 The RST is responsible for:

5.2.1 Identifying areas that may require revegetation and/or weed control during security and environmental inspections of the property and notifying the RSO of the location and size of the affected areas.

5.2.2 Adhering to the soil sampling and shipping procedures.

5.3 The Plant Manager is responsible for:

5.3.1 Determining whether the revegetation and/or weed control activities will be performed by plant personnel or an outside contractor.

5.4 The General Mill Foreman is responsible for:

5.4.1 Assigning the revegetation and/or weed control work to the Mill Foreman, ordering the materials specified by the RSO, and obtaining any specialized equipment needed to perform the work when the work is to be done by plant personnel.

5.4.2 Providing the Mill Purchasing Agent with the information needed to obtain bids from qualified contractors and overseeing on-site activities by the successful bidder when the work is to be done by an outside contractor. Oversight may be designated to other Mill personnel at the discretion of the General Mill Foreman.

5.5 The Mill Foreman is responsible for:

5.5.1 Verifying that all materials needed to perform the work are available in the warehouse and have been properly stored.

5.5.2 Verifying that the equipment needed to perform the work is available for use.

5.5.3 Verifying that plant personnel assigned to the work have sufficient experience and knowledge of the procedures to perform the work correctly.

5.5.4 Directly supervising plant personnel in performing the work.

5.5.5 Reporting work progress to the General Mill Foreman and documenting work performed including materials used. Seed tags and other documentary materials requested by the RSO will be saved and provided to the RST or RSO.

6.0 PREREQUISITE INFORMATION

6.1 *SAFETY*

6.1.1 See Piñon Ridge Mill Health and Safety Plan.

6.1.2 Standard site PPE includes identity and safety badges, hard hat, safety glasses and steel-toe boots.

6.1.3 Rubber gloves and other PPE (e.g., rubber suit, dust mask) as recommended by the manufacturer will be used in mixing pesticides.

6.2 *FREQUENCY*

6.2.1 Revegetation will be performed as needed but only from September through November.

6.2.2 Weed control will be performed as needed on a biannual basis (spring and fall).

7.0 PROCEDURES

7.1 *INDENTIFYING AREAS REQUIRING REVEGETATION*

7.1.1 Areas that may require vegetation include: (1) areas disturbed by construction, (2) eroded areas, (3) areas with accumulated sediment, (4) new soil and topsoil stockpiles, (5) tailings cell closure covers, and (6) areas with sparse vegetation.

7.1.2 The RST will identify areas that may require vegetation on a suitable map prior to the fall planting season. As discussed in Appendix A, Revegetation Methods, areas seeded during previous years may require several years before the vegetation cover is adequate.

7.2 *SOIL SAMPLING PROCEDURE*

7.2.1 The soil samples will be collected with a clean, stainless steel garden trowel or equivalent from the surface and near surface of the area to be revegetated. Soil stockpile sampling may require sampling at different depth intervals if the stockpile originated from multiple sources on site. The number of samples required will depend on the size of the area to be revegetated and the uniformity of the soil within this area. Small, homogeneous areas may require only one sample while larger areas with various soil types may require multiple samples. Soil types may be determined based on texture, color, slope, degree of erosion, and drainage characteristics.

7.2.2 The soil samples will be placed in a ziplock plastic bag and labeled with a

unique identifier. The sample location and depth will be recorded for each sample.

7.2.3 The samples will be shipped to the Soil, Water, and Plant Testing Laboratory at Colorado State University or an equivalent soil laboratory. The samples will be shipped in a sturdy container with a completed laboratory chain-of-custody form.

7.2.4 Requested analyses will include pH, electrical conductivity, organic matter, nitrate-nitrogen, phosphorus, potassium, zinc, iron, manganese, copper, lime and texture estimates, and fertilizer suggestions for reclamation purposes.

7.3 *SELECTING REVEGETATION MATERIALS*

7.3.1 Seeding of the tailings cell cover, areas within 200 feet of the tailings cell cover, and soil stockpiles will be done using the seed mixture and rates specified in Table 1 of Appendix A, Revegetation Methods. Seeding of all other areas will done using the seed mixture and rates specified in Table 2 of Appendix A. If one or more species of seed is not available, a qualified person or organization will be consulted to determine suitable replacement specie(s). Care will be taken to avoid planting deep-rooted species within the tailings cover areas.

7.3.2 The need for soil amendments or fertilizer will be determined by the RSO based on the soil laboratory results and the laboratory's recommendations.

7.3.3 Straw or hay mulch will be inspected for weeds prior to purchase. Only weed-free mulch will be applied on site.

7.4 *EARTHWORK*

7.4.1 Areas to be seeded will be recontoured, where necessary, to be free draining and to tie in with surrounding areas.

7.4.2 Any compacted areas will be ripped.

7.4.3 Where topsoil is not already present, salvaged topsoil from a topsoil stockpile will be spread over the area to be seeded in a four to six-inch loose lift.

7.5 *SEEDBED PREPARATION*

7.5.1 The seedbed will be scarified to a minimum depth of six inches. The seedbed surface should be relatively rough to promote infiltration and seed propagation.

7.5.2 Soil amendments and fertilizer, if specified, will be worked into the upper six inches of soil by disking along the contour. This can be done in conjunction with scarification.

7.6 *SEEDING AND MULCHING*

7.6.1 Seeding will be performed using a drill seeder or using broadcast methods. Generally, larger and flatter areas will be drill seeded while broadcast

methods will be used for smaller, steeper areas and rocky areas. When using broadcast methods, the seed will be applied at twice the specified rate and will be worked into the top ¼-inch of soil by dragging a light chain, hand raking, or similar methods approved by the RSO. Hydroseeding is generally not recommended for semiarid areas such as the mill site; however, it may be used in special cases (e.g., steep, inaccessible areas). Refer to Appendix A for detailed seeding procedures.

7.6.2 Straw or hay mulch will be crimped into the seeded areas at an application rate of two tons per acre using a crimping device, dozer tracks or other method approved by the RSO.

7.7 *EROSION CONTROL AND FENCING*

7.7.1 Large revegetation projects and revegetation in steep or easily eroded areas may require the placement of erosion controls such as mulching, straw wattles, straw bale barriers, silt fences, erosion control blankets, berms, catch basins, check dams, and erosion control logs. The project's Stormwater Management Plan provides additional details on how to select and install erosion controls.

7.7.2 Fencing (i.e., barbed wire, electric fence) may be installed temporarily to exclude livestock from revegetated areas to promote complete revegetation.

7.8 *IDENTIFYING NOXIOUS WEEDS*

7.8.1 The RSO will arrange for on-site weed identification training for one or more RSTs. The training will be provided by a commercial herbicide applicator, the county extension office, or other qualified person.

7.8.2 The website for the Noxious Weed Management Program of the Colorado Department of Agriculture may be consulted for photographs of Colorado noxious weeds.

7.9 *CONTROLLING NOXIOUS WEEDS*

7.9.1 The RSO will coordinate with the General Mill Foreman on conducting biannual (i.e., spring and fall) weed control at the site. Weed control will consist of applying an appropriate pesticide to those areas infested with noxious weeds (see Appendix B, Weed Control Methods).

7.9.2 Pesticides will be applied by only those licensed by the Colorado Department of Agriculture to perform this work. A commercial applicator must be licensed as such. Energy Fuels personnel performing weed control activities are required to have, at a minimum, a private applicator license.

7.9.3 Pesticides will be applied using a truck or trailer-mounted system or manually using a portable tank and spray system. Larger weed infestations outside of the Restricted Area will typically be contracted to a commercial applicator using a truck or trailer-mounted system. Small weed infestations

and weeds within the Restricted Area will typically be sprayed by Energy Fuels employees using manual spray methods.

Revegetation and Weed Control Procedure MP-050

Appendix A

Revegetation Methods

MP-050 – APPENDIX A
REVEGETATION METHODS
PIÑON RIDGE PROJECT

1.0 Introduction

These revegetation seeding and vegetation maintenance procedures were developed to provide mill personnel with standard methods for revegetating disturbed areas on site and maintaining or improving the quality of the existing vegetation.

2.0 Scope

The procedures described in this appendix apply to revegetation of areas disturbed by construction, revegetation associated with general site maintenance, and revegetation conducted as part of decommissioning of facilities.

3.0 Recontouring

During construction, the surface areas will be graded to meet the lines and grades specified in the construction drawings. General site maintenance will include recontouring wherever it is necessary to create a free draining surface that ties in with the surrounding areas. Reclaimed facilities will be recontoured as illustrated in the *Tailing Cell Cover and Site Closure Grading Plan* (Kleinfelder, 2009) to match approximate original (pre-construction) contours over much of the site.

4.0 Scarification/Compaction Mitigation

After recontouring and prior to topsoil placement, compacted areas will be appropriately scarified, by ripping, chisel plowing, or discing. Compaction mitigation will promote infiltration, reduce runoff and enhance revegetation efforts.

5.0 Topsoil Replacement

Salvaged topsoil from the topsoil stockpile will be spread on reclaimed areas. Topsoil will primarily be redistributed on those reclaimed areas where the topsoil was originally salvaged. Topsoil will be redistributed in 4- to 6-inch loose lifts.

If available, topsoil may also be redistributed on other areas of the site that will be revegetated. Placement of topsoil in these areas will be determined based on the conditions and properties (physical and chemical) of the in-place soil. Energy Fuels will conduct soil and fertilizer analyses within soil stockpiles and areas to be revegetated to determine if topsoil redistribution would facilitate revegetation efforts, or if the “in-place” soil in these areas is suitable as a growth medium for revegetation. The analyses will also provide guidance on whether fertilizer or other soil amendments may be needed to enhance revegetation success.

6.0 Seedbed Preparation and Fertilization

Prior to seeding, the seedbed will be prepared by cultivating the soil to a minimum depth of six inches. The seedbed will be prepared to facilitate the seeding method to be used. A rough seedbed

is acceptable and encouraged to minimize runoff and erosion and to facilitate infiltration. Where drill seeding is to be accomplished, the roughened conditions need to accommodate the type of drill to be utilized. For example, rangeland drills are manufactured to accommodate very rough or rocky seedbed conditions, which are not appropriate for grain drills that need a smoother seedbed to successfully accomplish seeding and also do not accommodate rocky soil conditions. If hydroseeding is used the seedbed should be rough enough to facilitate lodging and germination of seed.

The addition of fertilizer and soil amendments will be determined by soil analyses that will be conducted by Energy Fuels prior to scheduled revegetation efforts. If the soil analyses indicate the use of a fertilizer or amendments, the recommended application rate will be worked into the upper six inches of soil by disking along the contour to the extent practical. The application will not precede seeding by more than one day, where feasible. If fertilizers or amendments are to be applied, the cultivation for seedbed preparation and incorporation of the applied fertilizer can be combined into one operation.

7.0 Seeding Timing

Seeding will be performed only in the autumn months from September through November. However, as noted in Section 8.0 for Seed Mixture 2, shrub species (sagebrush and Winterfat) may be seeded separately in the winter on snow.

8.0 Seed Mixture Specifications and Planting Locations

There are two similar seed mixtures that have been developed to revegetate disturbed areas associated with the Piñon Ridge Project. These seed mixtures are composed of native species that are adapted to the project area soils and climatic conditions and do not require supplemental irrigation for germination and establishment.

Seeding rates are based on Pure Live Seed (PLS) and for drill seeding methods. If broadcast or hydroseeding is used, the seeding rate should be doubled. All seed will be fresh or new crop seed and will be tested for purity, germination, and for weeds. The seed will be free of noxious weeds, and the quantity of total weed seed will be low or within the limits allowed by Colorado seed laws and labeling. All seed will be used within one year from testing date. Seed species will be from genetically appropriate seed sources/seed zones to the project area (i.e., collected from ecological conditions approximating those of the project location). Seed will be furnished in original bags showing seed testing analysis including percentage of PLS, year of production, net weight, date, origin and location of packaging. Seed that has become moldy or otherwise damaged in transit or storage will not be accepted. Modification of seed mixtures, if necessary for any reason, will be done in consultation with a qualified vegetation specialist.

Seed Mixture 1. Seed Mixture 1 (Shallow Rooted), which is presented on the next page, will be used to revegetate the closure cover on the tailing cells (Cell A1, Cell A2, Cell B, and Cell C) and the surrounding areas within 200 feet of the toes of the reclaimed embankments. Seed Mixture 1 will also be used to revegetate topsoil and subsoil stockpiles since these soils will be used in large part for building the closure covers over the tailings cells.

Table 1
Seed Mixture 1 – Shallow Rooted

Common name (Scientific Name)	Variety [1]	Seeding Rate (LBS/Acre – PLS)[2]
Needle and Thread *(Stipa comate)*		1.8
Indian Ricegrass *(Oryzopsis hymenoides)*		1.8
Thickspike Wheatgrass *(Elymus lanceolatus)*	Critana	1.8
Slender Wheatgrass (*Elymus trachycaulus*)	Pryor	0.5
Sandberg Bluegrass *(Poa Secunda)*	Sandberg	0.9
Bottlebrush Squirreltail *(Elymus elmoides)*		0.9
Blue Grama *(Bouteloua graceilis)*	Alma	0.9
Galleta *(Hilaria jamesii)*	Viva	0.9
Forbs		
Blue Flax (*Linum lewisii)*	Appar	0.5
Utah Sweetvetch (*Hedysarum boreale*)	Timp or native	1.0
Palmer Penstemon (*Penstemon palmerii)*		1.0
Total		**12.0 lbs/Ac**

[1] Where variety is not specified, use native seed genetically appropriate seed source/seed zone for all species to be planted.
[2] Double rate if broadcast seeded.

Seed Mixture 2. Seed Mixture 2, which is presented on the next page, will be utilized to revegetate areas disturbed during initial construction, during facility operation, and during closure operations. This seed mix will be used for all areas of the site except for the tailing cells and soil stockpiles. Seed Mixture 2 will be used on, but not limited to, the following areas: mill facility area, evaporation ponds, stormwater diversion ditches including the water quality swale, and reclaimed roads and former stockpile areas. This seed mixture may also be used for interim stabilization purposes. Seed Mixture 2 is similar to Seed Mixture 1 but includes five additional deeper-rooted shrub species to improve habitat quality.

Table 2
Seed Mixture 2 – Deep Rooted

Common name (Scientific Name)	Variety [1]	Seeding Rate (LBS/Acre – PLS)[2]
Needle and Thread *(Stipa comate)*		1.8
Indian Ricegrass *(Oryzopsis hymenoides)*		1.8
Thickspike Wheatgrass *(Elymus lanceolatus)*	Critana	1.8
Sandberg Bluegrass *(Poa Secunda)*	Sandberg	0.9
Bottlebrush Squirreltail *(Elymus elmoides)*		0.9
Blue Grama *(Bouteloua graceilis)*	Alma	0.9
Galleta *(Hilaria jamesii)*	Viva	0.9
Forbs		
Blue Flax (*Linum lewisii)*	Appar	0.5
Palmer Penstemon (*Penstemon palmerii)*		1.0
Scarlet globemallow (*Sphaeralcea coccinea*)		1.0
Utah Sweetvetch (Hedysarum boreale)	Timp or native	1.0
Shrubs		
Fourwing saltbush (*Atriplex canescens*)		2.0
Gardner's saltbush *(Atriplex gardneri)*		2.0
Wyoming sage (*Artemisia tridentate spp wyomingensis*) [3]		0.25
Black Sage (*Artemisia nova*) [3]		0.25
Winterfat *(Krascheninnikovia lanata)*[4]		0.5
Total		**17.5. lbs/Ac**

[1] Where variety is not specified, use native seed genetically appropriate seed source/seed zone for all species to be planted.
[2] Double rate if broadcast seeded.
[3] Sagebrush if drill seed should be seeded through a separate drill box to permit very shallow seeding (i.e., < 1/8 inch) and proper seed placement for plant establishment (Lambert, 2005, and USDA http://plants.usda.gov/java/profile?symbol=ARTRW8). Best seeding results comes from surface broadcast seeding that is pressed into the soil to provide for a good soil-seed contact. Sagebrush seed can also be broadcasted directly onto snow or broadcast seeding followed by a cultipacker or drag chain (USDA, http://plants.usda.gov/java/profile?symbol=ARTRW8).
[4] Seeding rate in mixture is recommended as 0.5 lbs/acre if drilled and 1.0 if broadcasted. When drill seeded seed at depths < ¼ inch. Winterfat may also be broadcast on snow http://plants.usda.gov/plantguide/pdf/pg_krla2.pdf

9.0 Seeding Methods

Seeding will be conducted by drill seeding the specified seed mixture at the specified application rates along the contours or opposite the direction of the prevailing wind when possible. Although drill seeding is the preferred seeding method, broadcast seeding may be utilized, especially for smaller projects, provided that the application rate is equal to twice the rate specified for drill seeding. Drill seeding equipment will have multiple seed boxes to accommodate seeding specific species at different depths. Seed will be planted to a depth between 1/4 to 1/2 inches. However, sagebrush species, which should be planted at very shallow depths, will be seeded in a separate seed box to accommodate seeding depths of approximately 1/16 inch (Lambert, 2005 and USDA[1]). Drill seeding will use a roller or packer wheels attachment or its equivalent attached to ensure proper soil/seed contact and inhibit movement of the sown seeds. Rice hulls will also be added to the seed mixture, as necessary, to prevent seed separation and to ensure a more even seed coverage. The drill seeder will be properly calibrated so that seed is distributed according to the rates specified for each seed mixture. No seeding will be performed in areas in excess of that which can be mulched the same day. Where drill seeding occurs, as noted for sagebrush and Winterfat in Seed Mixture 2, seed may also be broadcasted separately in the winter on snow.

If broadcast seeding methods are used, the seed will be lightly covered by dragging with a chain, rolled with a cultipacker, hand raking, or other appropriate methods.

Seeding will not be performed immediately following a heavy rain, during windy periods, or when the ground is too dry (particularly if broadcast seeding is considered).

10.0 Mulch

Mulch will be applied to all seeded areas at an application rate of two tons per acre. Mulch will be crimped into the surface utilizing a crimper designed for this purpose or other equipment that achieves satisfactory results. Mulch will be small-grain straw or hay in a dry condition and will be inspected and certified weed free and free of foreign matter detrimental to plant life. The purpose of the mulch is to minimize wind and water erosion potential and to enhance revegetation success.

11.0 Supplemental Irrigation

No supplemental irrigation is proposed for the Piñon Ridge Project facilities. Seed Mixtures 1 and 2 are composed of native species adapted to the area's soils and arid climate and do not require irrigation for germination and establishment. This includes the Water Quality Swale that will be revegetated using Seed Mixture 2.

12.0 Erosion Control

Erosion protection during facility closure is outlined in Section 11.0 of the Specifications for Reclamation of Mill Facilities (Golder, 2009a). For operation of the Piñon Ridge Project, erosion control measures are outlined in the Stormwater Management Plan (SWMP) (Golder Associates,

[1] http://plants.usda.gov/java/profile?symbol=ARTRW8

2009b). Erosion control measures were developed for the initial and ultimate build-out of the mill facilities area as described in the SWMP, which outlines the measures that will be implemented to address the surface disturbance and the effect that the mill facilities will have on site stormwater discharges. Generally, during operations disturbed areas will be revegetated with a native seed mix (Seed Mixtures 1 or 2) and mulched to stabilize the surfaces when no further construction activities are planned in the near future. Temporary erosion control measures will be implemented and maintained in the disturbed areas until permanent vegetation is established. Temporary erosion controls may include, but are not limited to, mulching, straw wattles, straw bale barriers, silt fences, erosion control blankets, temporary vegetation, rough-cut grading and sediment traps.

To stabilize the topsoil and subsoil (structural fill) stockpiles, the stockpiles will be seeded and mulched, and a berm will be constructed around the stockpiles to capture any potential eroded materials inside the stockpile berms. These measures are intended to prevent the loss of this material and to prevent potential offsite sedimentation. Additionally, during construction of the stockpiles, the stockpile slopes will be ripped on the contour prior to seeding. Roughening of the surface in this fashion will reduce runoff, encourage infiltration, and promote vegetation establishment by increasing soil moisture on the stockpiles.

All unarmored stormwater diversion channels, ditches, berms, and the water quality swale, which are designed to divert run-on around the facilities and to treat stormwater, will be stabilized by reseeding and mulching. As noted in Appendix A of the SWMP (Golder Associates, 2009b), most of the diversion channels and collection channels are designed with armored linings (dumped riprap, geomembrane, or grouted riprap) except for the Water Quality Swale and Diversion D2 which is located on the south edge of the evaporation ponds. At the time of reseeding, these unarmored stormwater facilitates will be evaluated by Energy Fuels' personnel to determine if other appropriate erosion control BMPs such as straw bale barriers, silt fences, erosion control fabric, check dams, wattles, or erosion control logs are required to stabilize them. Typical drawings of these BMPs are depicted in Appendix B of the SWMP.

13.0 Fencing

As indicated in Section 13.0 of the Specifications for Reclamation of Mill Facilities (Golder, 2009a), Energy Fuels will exclude livestock from revegetated and rehabilitated areas to promote complete revegetation. Exclusion will continue until the vegetation in the reclaimed area is established and self-sustaining.

14.0 Maintenance

During mill operations, inspection and monitoring of the facility will be conducted according to the procedures outlined in Section 8.0 of the SWMP (Golder Associates, 2009b). Different types of inspections and monitoring of the stormwater facilities will be performed on a monthly, quarterly, and semi-annual basis. Inspections will be conducted by site personnel that have been specifically trained to conduct the inspections. The contents and requirements of these inspections

are described in the SWMP (Section 8) and a blank inspection form for a comprehensive site compliance evaluation is included in Appendix C. Based on the results of these inspections, appropriate corrective actions will be implemented and the date when these corrective actions were implemented will be reported in the inspection forms. During these inspections, various site conditions will be monitored or assessed and corrected, as necessary. Inspections will document, among other conditions, that the site is free of trash and litter; BMPs are functioning, effective and in good condition; if erosion, such as rills on slopes, is present; the degree of vegetation cover; and if collection ditches are free of litter and potential pollutants.

During facility operations, Energy Fuels will inspect the water quality swale semi-annually during the first few years to ensure that vegetative cover is establishing and after major storm events. Annual inspections will occur after the second year, but inspections after major storm events will still be required. The vegetation along the swale bottom and side slopes will be inspected for erosion and formation of rills or gullies and repaired (reseeded), as necessary. Trash and other debris will be removed. The swale will also be inspected for sediment buildup. Sediment buildup will be removed when approximately 25 percent of the water quality volume or channel capacity has been exceeded. If sediment removal is required, reseeding efforts will be conducted in the excavated areas. Reseeding of an alternate seed mixture may be conducted if inspections indicate poor vegetative cover.

Sediment removed from drainages, the water quality swale, culverts, and other stormwater control features will be placed in separate stockpiles within the restricted area and outside of the restricted area. Sediment removed from stormwater controls within the restricted area may contain contaminants from processing operations and will be placed in a restricted-area stockpile for later testing and use during reclamation. Sediment from stormwater controls located outside of the restricted area may contain elevated levels of radium from erosion of the mineralized Morrison Formation located above the site. Baseline testing has shown that some of the soils within the drainages exhibit radiation levels more than 10 times greater than those soils located in the non-drainage areas. Mixing of these soils with other soils may create a false positive for radiation testing during reclamation. Accordingly, these sediments should be stockpiled separately outside of the restricted area and tested for radium content prior to any future use.

During operation, closure, and post-closure periods, Energy Fuels will conduct weed control monitoring and implement weed control measures, as necessary, on a biannual basis (spring and fall) to limit the occurrence of noxious weeds on the property. The program will start prior to construction and continue until the Department of Energy takes over responsibility for post-closure maintenance and monitoring. Records will be kept of the weed surveys and herbicide applications or treatments (i.e., mechanical or hand treatments).

Revegetation success of reseeded areas will be monitored and evaluated during operations and final reclamation of the Piñon Ridge Project. Additionally, planted areas that are damaged during execution of site work will be reseeded to ensure stabilization of these areas. Because of the arid

climate of the project area, the success of revegetation efforts will be assessed over two to three growing seasons, depending on seasonal climatic conditions. Revegetation success will be determined based on desirable vegetation having similar cover and density when compared to undisturbed adjacent areas. Desirable vegetation species include those species in the seed mix or native or naturalized species common to adjacent areas. As noted by Lambert (2005) on arid sites, a seeding is often considered successful if at least 0.5 plants per square foot are established. Revegetation success will be assessed annually in the summer at the end of the growing season. Condition of revegetation, including species present, estimates of percent ground cover, and vegetation condition and vigor will be recorded on standard field inspection forms, which will be developed as part of the Decommissioning Plan. During facility operations, vegetation monitoring reports will be included in the SWMP. It should be noted that vegetation of the tailings cells is expected to be sparser than surrounding areas due to the rock mulch incorporated into the top six inches of the soil cover.

As noted by (Sheley et.al., 2008), successful results for a seeding project may take 3 to 5 years because perennial grass and forb seed often lie dormant in the soil until climate conditions are appropriate for germination. If revegetation monitoring assessments determine reseeding efforts are necessary, the procedures outlined in this appendix will be utilized. These procedures may also be reassessed and modified should revegetation results be poor.

In the event that deep-rooted plants, such as greasewood, occupy the tailing cells, increased maintenance may be required to remove these deep-rooted plants so they do not root into the radon barrier and provide pathways for water to infiltrate into this barrier.

15.0 References

Elzinga, C. L.; Salzer, D. W.; Willoughby, J. W. 1998. Measuring and monitoring plant populations. Tech. Ref. 1730-1. Denver, CO: U.S. Department of the Interior, Bureau of Land Management. 492 p.

Golder Associates. 2009a. Specifications for Reclamation of Mill Facilities. Piñon Ridge Project, Montrose County, Colorado. Specifications for Reclamation of Mill Facilities. October.

Golder Associates. 2009b. Stormwater Management Plan. Piñon Ridge Project, Montrose County, Colorado. October.

Kleinfelder. 2009. Tailing Cell Cover and Site Closure Grading Plans. Energy Fuels Corporation Piñon Ridge Project. Montrose County, Colorado. February 2009.

Lambert, Scott. 2005. Seeding Considerations in Restoring Big Sagebrush Habitat. USDA Forest Service Proceedings RMRS-P-38.

Sheley, R., J. Mangold, K. Goodwin, and J. Marks. 2008. Revegetation Guidelines for the Great Basin: Considering Invasive Weeds. U.S. Department of Agriculture. Agricultural Research Service ARS-168. October.

Stevens Richard and Stephens B. Monson. 2004. Forbs for Seeding Range and Wildlife Habitats. USDA Forest Service Gen. Tech. Rep. RMRS-GTR-136. 2004.

USDA. (Accessed 9/17/10). Big Sagebrush. Plant Guide. Natural Resource Conservation Service. (http://plants.usda.gov/java/profile?symbol=ARTRW8)

Revegetation and Weed Control Procedure MP-050

Appendix B

Weed Control Methods

MP-050 – APPENDIX B
WEED CONTROL METHODS
PIÑON RIDGE PROJECT

1.0 Introduction

The weed control methods provided herein were developed to provide mill personnel with guidance for treating noxious weeds at and around the Piñon Ridge Mill site. These measures are designed to minimize the occurrence and spread of noxious weed species. The weed control program for the site includes conducting biannual weed surveys and spraying identified noxious weeds with approved herbicides. The surveys and treatments are to continue until the perennial cover and production of the site meet regulatory requirements and the reclamation bond is released.

2.0 Scope

During operation, closure, and post-closure periods, Energy Fuels will conduct weed control monitoring and implement weed control measures, as necessary, on a biannual basis (i.e., spring and fall) to limit the occurrence of noxious weeds on the property. The methods described in this program apply to areas associated with the site, which have been disturbed by construction, have been revegetated, or are undisturbed. The program will start prior to construction and continue until the Department of Energy takes over responsibility for post-closure maintenance and monitoring. Records will be kept of the weed surveys and herbicide applications or treatments (i.e., mechanical or hand treatments).

3.0 Surveys

Weed surveys and weed control measures will be implemented over the entire Project site, including along access roads and on all other disturbed, undisturbed, and reclaimed areas. Each year, properly trained personnel will conduct these surveys in the spring (April or May) and fall (September or October).

4.0 Treatment

All noxious weeds identified during the weed surveys will be sprayed using a truck or trailer-mounted system or manually using a portable tank and spray system. A commercial contractor, licensed by the Colorado Department of Agriculture, will spray large infestations located outside the Restricted Area using a truck or trailer-mounted system. Mill personnel will spray smaller weed occurrences and weeds within the Restricted Area using manual spray methods. Energy Fuels personnel performing weed control activities are required to have, at a minimum, a private applicator license. Only approved herbicides may be used.

Energy Fuels will consult with Montrose County regarding any identified weed infestation areas and appropriate control measures will be agreed upon prior to treatment. This program does not contemplate complete weed removal in reclaimed areas of the property. Experience demonstrates that some initial weed cover in the first year following topsoil placement promotes reclamation success at dry sites. Weeds tend to provide shade for new grasses, hold snow on the seedbed longer, and protect new grasses from wind and water erosion during establishment.

5.0 Noxious Weeds

During the environmental baseline studies conducted on the site, the most commonly observed weed was downy brome (a.k.a. cheatgrass) (*Bromus tectorum*), which was found throughout the property. Downy brome is listed as a State “C” List weed. Red-stemmed filaree (*Erodium*

cicutarium) was observed in the mixed grassland, and is a State "B" List weed (CWMA 2007). Other non-native species that may be present within the mixed grasslands include burning bush [*Bassia scoparia (Kochia scoparia)*], Kentucky bluegrass (*Poa pratensis*), tumblemustard (*Sisymbrium altissimum*), and yellow salsify (*Tragopogon dubius*).

6.0 Herbicide Use Guidelines (from the Colorado Department of Agriculture, Division of Plant Industry)

6.1 Herbicide Documentation

Herbicide labels should be included with any herbicide purchased. Labels include information about the chemical, including: active ingredient(s), protective equipment required, hazards, directions for use, storage, mixing and application, species controlled by the product and more. Additional information about most chemicals is available in the form of a Material Safety Data Sheet (MSDS). Both of these publications are also available from the manufacturer, as well as via the Internet.

6.2 Pre-Spraying Considerations

Restricted Use Chemicals: Some herbicides are restricted-use-only chemicals. These chemicals are for sale to and use only by Certified Applicators or persons under their direct supervision and only for those uses covered by the Certified Applicator's certification. For information on becoming a state certified pesticide applicator, contact the Colorado Department of Agriculture.

Herbicide Selection: Determine which products are labeled for use on your particular weed species. If the product is a restricted use chemical and you are not certified to use such chemicals, you will need to hire a professional applicator. Other factors to consider when choosing an herbicide include proximity of the weed infestation to water, nearby trees or shrubs, soil composition, and propensity of the chemical to contaminate water supplies.

Herbicide labels: Prior to handling and use, read the product labels for any herbicides that you plan to use. It is a violation of Federal law to use any herbicide in a way that is inconsistent with its labeling.

Timing: Consider the growth stage of both target and non-target species. Plan spraying for a time (of day and of year) when it is likely to have the greatest effect on target species.

Complement spraying with mechanical control methods in a logical sequence. The effectiveness of an herbicide can be enhanced by spraying a weed patch, which has been mowed earlier in the season. The mowing depletes the plant's energy reserves and makes it more susceptible to the effects of the herbicide. Time herbicide application to minimize effects to any desirable species in the area. This might mean waiting until desired plants have gone dormant before spraying weeds.

Weather: Rain can affect the function of an herbicide. It may be required for activity, or it may have the opposite effect, inactivating it or washing it away. Wind may result in unacceptable drift to non-target areas on or off the property. Drought

conditions may preclude the use of certain chemicals. Pay close attention to weather conditions and follow directions on labels. If rain is predicted and a label says 24 hours of dry weather must follow herbicide application, do NOT spray. Wait until weather conditions are suitable. The alternative is wasted chemical, wasted labor costs, and possible environmental contamination and unintended damage to non-target vegetation.

Revegetation plans: Determine how soon after herbicide application revegetation can and should occur. This will vary tremendously depending upon which chemical is used. If revegetation occurs too soon, residual pesticide in the soil may kill or damage new plants and seedlings. Revegetation too late can result in the colonization of new weeds or the reestablishment of existing weed seeds in the absence of any competition. Prepare a revegetation plan and be ready to plant at the right time.

6.3 Herbicide Application Methods

Wick/Swiper: Provides very selective application of herbicides with no drift or drip, and uses a sponge wiping mechanism to wipe herbicide from sponge onto weeds. For use in sensitive areas and areas where weeds are mixed with desired vegetation.

Backpack/hand sprayer: Useful for accessing remote or sensitive areas where motorized vehicle use is not practical or advisable. Can be used in conjunction with pack animals as well. Allows for moderately selective application of herbicides. Some herbicide drift will occur when this method is used. It is important that sprayers are calibrated accurately, because the volume of spray delivered to a given area will be dependent on proper calibration.

Broadcast sprayers: Includes truck, ATV and lawn tractor mounted or tow-behind boom sprayers. Also includes aerial applications. For use in more easily accessible, less sensitive areas, along right of ways, and in areas where weeds outnumber desired vegetation. This is not a selective application method. All plants in a treated area will be sprayed, including non-target species, so special care must be taken to select an appropriate herbicide and in timing applications to minimize damage to non-target species. It is important that sprayers are calibrated accurately, because the volume of spray delivered to a given area will be dependent on proper calibration.

6.4 Understanding the Herbicide Application Rates

It is important to distinguish between concentrated herbicide and the diluted spray that is actually applied to vegetation. Often, the label will state the maximum rate of concentrated product that should be applied to an acre of treated land per year. For example, the 1999 label for Tordon 22K states that for non-cropland areas, the total use of Tordon 22K, including retreatments or spot treatments, must not exceed 2 quarts per acre per annual growing season. The 2 quarts per acre refers to concentrated herbicide. Sometimes, the maximum application rate is converted to pounds of active ingredient (a.i.) per treated acre per year. The label will then include the maximum application rate in that form as well.

The herbicide concentrate must be diluted in a solvent (carrier) prior to application. It is important to read the labels thoroughly to get an idea of what the total final volume of the spray should be. The actual spray will include the herbicide mixed in a carrier, usually water, oil or a mix of oil and water and any adjuvants (see below) that have been added.

Returning to the Tordon 22K example, the label says that for ground broadcast applications, a spray volume of 10 or more gallons per acre should be used. This spray volume refers to the diluted spray that actually gets applied to vegetation. The total volume used will vary depending on a variety of factors, including the density of vegetation to be sprayed, the height of the vegetation, the type of weeds and the type of equipment used. As mentioned above, broadcast sprayers must be calibrated properly to ensure that proper application rates are maintained.

Remember not to exceed the maximum application rate of any herbicide (in this case, 2 quarts/acre is the absolute maximum).

It is important to look for any special directions that may be present in herbicide labels for hand spraying and cut surface tree treatments, since these techniques will likely be used commonly in natural areas. Unfortunately, this information is not always easy to find, and most directions given are for use with broadcast sprayers. In many cases, it is necessary to use manufacturers' directions for broadcast spraying and come up with a reasonable conversion in terms of amount of acreage that will be covered by a hand sprayer. Ideally, the area of the patch that will be sprayed should be measured and a calibrated hand sprayer used. This will ensure that the maximum application rate is not exceeded. Remember, no matter what method of herbicide application is used, there will always be a maximum rate of active ingredient that should be applied to a treated acre in a given amount of time. Never exceed the maximum rate stated in the label.

6.5 Herbicide Adjuvants

Adjuvants are substances added to a formulation to increase the effectiveness of the active ingredient. These substances may be labeled for use with certain herbicides and will be added during the mixing stage to the final dilute spray. Consult labels to ensure products are compatible.

Surfactants: Chemicals that break down the waxy layer found on most plant surfaces. When the layer is broken down, herbicides can be absorbed faster by the plant. This more efficient use of herbicides results in lower costs and reduced environmental impacts because less herbicide can be applied.

Dyes: Coloring agents added to herbicides. These dyes make it possible to see exactly what has been sprayed. Use of such dyes results in lower costs and reduced environmental impacts, because unintentional re-spraying of already sprayed areas is minimized. Care must be taken to avoid using incompatible dyes and herbicides. **Some dyes are listed as not compatible with certain herbicides. Read the labels**.

6.6 Personal Protection Equipment and Safety

- Specific safety information is provided on each herbicide label. Protect the health of applicators and the environment by following all instructions for use of the chemical being used. ***The label is the law***.
- Make a safety and contamination kit to be stored where herbicides are mixed and taken with applicators when they go to the field. This kit should contain eyewash solution, hand cleaner, a change of clothes, towels, a dust mask, safety glasses, and anything else that is recommended by the herbicide label.
- Applicators and handlers should always wear a long-sleeved shirt, long pants, waterproof gloves, shoes plus socks, and protective eyewear. Always wash clothes thoroughly after they are used and dispose of clothes that become drenched or heavily saturated with herbicides. Wash these items separate from other laundry.
- Remove clothing as soon as possible after application. Wash the outside of gloves before removing and rinse out the inside. As soon as possible, wash thoroughly and change into clean clothing.
- Wash hands before eating, drinking, chewing gum, using tobacco or using the toilet.

6.7 Mixing Herbicides

- Establish a site that will be used exclusively for storage and mixing of herbicides. Keep the area and equipment clean. Make sure that the area and equipment are not accessible to children or animals.
- Do not mix herbicides within 50 feet of any well, sinkhole, or any open water source.
- Use color-coded jugs for mixing herbicides and filling up tanks. Do not use these jugs for holding washing or drinking water.
- Avoid spilling herbicides, and wear safety glasses and gloves when handling herbicides or equipment.
- Rinse mixing cups and always triple rinse all containers and bottles.
- If herbicide is spilled, either dilute it with water, or shovel the exposed soil into a plastic bag and dispose of it properly.

According to Colorado's **Agricultural Chemicals and Groundwater Protection Act**, special rules and regulations relating to the storage, containment, mixing and loading of herbicides apply to the following:

(a) All operating bulk pesticide storage facilities, commercial or private; and

(b) All mixing and loading areas, commercial or private, where any of the following are handled in any one-year period:

(1) five hundred (500) gallons or more, in the aggregate, of formulated product or combination of formulated products of liquid pesticides;

(2) three thousand (3,000) pounds or more, in the aggregate, of formulated product or combination of formulated products of dry pesticides: or

(3) one thousand five hundred (1,500) pounds or more, in the aggregate, of active ingredients of pesticides.

6.8 Herbicide Disposal

- Triple rinse and puncture empty containers before disposing.
- Rinse the backpacks with water and pump some clean water through the nozzle.
- If herbicide is spilled on clothing, either dispose of the clothing or soak it in a bucket of soapy water and rinse a few times before laundering.
- Unused herbicide constitutes hazardous waste and should not be disposed of in a municipal landfill. Call your county health or environment department to find out if a hazardous waste disposal program exists in your city or county. If you have no access to a hazardous waste disposal site, use up the remaining product in accordance with directions on its label, or give it to someone who will use it properly.
- **Colorado Waste Agricultural Pesticide Collection Program- Colorado ChemSweep:** This program, organized by MSE Environmental, Inc., will dispose of unwanted, unused, or banned/outdated pesticides. The program services any agri-business or green industry business including farmers, ranchers, commercial applicators, golf courses, greenhouses or nurseries that apply or store pesticides in Colorado. Call 1-888-242-4362 for more information.

7.0 Becoming a State Licensed Herbicide Applicator

For information and to see the "Rules and Regulations Pertaining to the Administration and Enforcement of the Pesticide Applicator's Act", contact the Colorado Department of Agriculture, Division of Plant Industry.

8.0 Restricted Use Pesticides

Restricted use pesticides are for retail sale to and use only by certified applicators or persons under their direct supervision and only for those uses covered by the certified applicator's certification. The official list of Federally Restricted Use Pesticides is constantly revised as new products are developed and others are removed from production. Contact the nearest EPA office for current lists.

9.0 Reporting

Energy Fuels will submit an annual report to the Colorado Department of Public Health and Environment (CDPHE) providing weed survey results along with measures and practices employed for weed control.

10.0 References

Colorado Department of Agriculture, Division of Plant Industry. http://www.ag.state.co.us/DPI/home.html

CWMA. 2007. S. Anthony, T. D'Amato, A. Doran, S. Elzinga, J. Powell, I. Schonle, and K. Uhing. Noxious Weeds of Colorado, Ninth Edition. Colorado Weed Management Association, Centennial.