Portneuf Valley

Revegetation Guide

Also known as the Pocatello Re-Vegetation Guide
Version 1.1 (Technical Revisions of 7/2012)

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StreetWise
RiverWise

Guidelines for Developers & Property Owners

Contents

Thank you to the US Department of Agriculture's Natural Resources Conservation Service (NRCS)'s Plant Materials Center staff as well as located retired restoration and forestry experts for their contributions to this guide.

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1.1 Performance Requirement

This document outlines the steps required to successfully meet the final stabilization requirements of your Construction General Permit (CGP) with the EPA, or your Erosion and Sediment Control permit with the City of Pocatello, City of Chubbuck, or Bannock County. All surfaces that are not stabilized using non vegetative practices (such as a thick layer of mulch or rip rap) must have a perennial vegetative cover at a density of 70% of background vegetation within two (2) years.

Following the guidance in this manual will help you overcome major obstacles (e.g. weeds, dry soils & climate, soil profile disturbance) to successful revegetation in southeast Idaho.

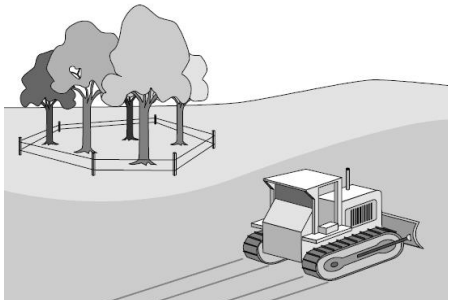
For suppliers, see the document (available on the City of Pocatello's stormwater website):

Local Sources: Soil, Compost, Seeds/Plants, Storm Water Management, Erosion Control, etc.

1.2 Pre-Construction

Preserve Existing Soils and Vegetation

Fence off areas that do not NEED to be disturbed in order to preserve existing soils and vegetation. This will minimize the amount of area to be re-vegetated.



Weed Prevention

Assess your site for presence of weeds. On sites infested with weeds, reduce future weed growth (and interference with successful revegetation of your site) by removing existing plant material (seed head and roots) from site.

If seeding is to occur more than 14 days after construction has finished, the use of tackifiers for soil stabilization will prevent future weed infestation.

Topsoil Stockpiling

4-6" of topsoil shall be stockpiled prior to land disturbance. Biological activity in this topsoil cycles soil nutrients, increases nutrient availability, aerates the soil, maintains soil structure, and increases soil water-holding capacity. Reapplication of healthy topsoil enhances revegetation and promotes establishment of vegetative cover.

- Remove the upper 4 to 6 inches of topsoil of the construction area and stockpile it in a separate area from other cut or fill material.
- Clearly sign the topsoil pile with a weatherproof sign, so that it is only used for revegetation purposes.
- Keep topsoil stockpiles as shallow and wide as possible to preserve the microbe life of the soil.
- Topsoil shall be stabilized with a waterproof membrane, tackifer, vegetation or other erosion control measure.

Do not permit weeds to grow or set seed into the stored stockpile. Any weeds shall be removed (including roots and seed heads) and disposed of off-site.

Topsoil that is damaged or unfit, for instance containing invasive weeds, should not be salvaged. It should instead be removed and replaced with weed-free topsoil.

1.3 Soil Preparation

This work provides increased infiltration, slows runoff and incorporates soil amendments.

Decompact Soil

Use in flat areas (3:1 slope and flatter) where soils are highly compacted and require tilling to restore infiltration and water holding capacity. High compaction is generally evident in staging areas and haul routes. Loosen compact soils using a winged subsoiler or grappling rake.

Weed Prevention

Till soil to loosen surface to encourage gemination of weed seeds. Once weeds have emerged mow annual weeds and apply a non-selective herbicide (e.g. glycophosphate) to kill perennial weeds. *Contact the Bannock County Weed Abatement District for for herbicide recommendations and rates*. If herbicide is applied, wait 1 month before amending soil, seeding and mulching.

Roughen soil (slope tracking).

Shall be done on all revegetation projects. This will hold soil in place, trap seeds, and reduce run-off velocity. Tread-track the slopes and and down slopes (perpendicular to contour lines). Small areas can be hand raked.

Amend Soil with Stockpiled Topsoil

Shall be done all revegetation projects. Topsoil shall be keyed into the underlying soil surface using a tracked excavator, tractor drawn disc, or rototiller. Depth of incorporation varies by slope gradient (ranging from 2- 12 inches of tilling)- steeper slopes involve lesser incorporation depths. Prior to placement of topsoil on slopes, all slopes shall be tracked to assist in achoring the topsoil.

Topsoil shall be mixed at a rate of 2-6" of applied material, depending on slope. If stockpiled topsoil is not available or sufficient, amend soil with compost.

Tilling in soil amendment

Tracking in soil amendment

Amend Soil with Fertilizer (optional)

Rarely is nitrogen needed for native species, which evolved in low nutrient environments. In these dryland sites, the addition of non-essential nitrogen can reduce important soil mycorrhizal activity and encourage heavy weed growth. However, fertilizers may be necessary in wetter areas where rapid grwoth and maximum production is desired.

- Nitrogen fertilizers shall only be used when soil tests show a gross deficiency.
- Shall be done prior to seeding.

Seedbed Preparation.

Prepare a friable but firm and weed free seedbed that is not compacted by prior construction work. Appropriate firmness can be estimated when a person leaves about a ¼ inch deep footprint.

- Areas to be drill-seeded shall be cultivated to a minimum depth of three (3) inches. The soil shall be worked to obtain a surface that shall permit proper operation of drill seeding equipment.
- Areas to be broadcast seeded shall be cultivated immediately prior to seeding at a minimum depth of two (2) inches and shall be left in a rough condition, similar to that obtained by walking a cleated-crawler tractor up and down the slopes. Where slopes are benched or serrated, no additional preparation shall be required.
- Remove rocks, twigs, concrete, foreign material and clods over two (2) inches that can't be broken down.
- Soil moisture content shall be at least 30% soil capacity. Do not seed into undesirable moisture conditions (e.g. "dust" or "mud").

1.4 Seeding

Seed shall be applied **after** amending the soil with topsoil and fertilizer (if applicable), and **prior to** the application of mulch and tackifier. This helps ensure that the fertilizer does not negatively impact the quality of the seed, and that the seed has good contact with the soil, which is important for strong germination rates.

Time of Seeding:

Spring seeding: Seed in the spring after the frost leaves the ground and temperatures are consistent (February 15 - May 15). If seeding is done after May 15th then provision shall be made for supplementary irrigation until the grass seedlings have 4-6 leaves. Grasses do best when seeded in the spring

Fall seeding: Dormant seeding will be accomplished soon after the first frost in the fall (October 15 - November 15). Seed shall not be applied on top of snow. Most shrubs and forbs are best seeded in the fall because they may require winter cold to germinate.

Seed Quality

- Obtain seed from a seed provider that holds an Idaho Seed Dealer's License.
- Seed shall be used within 1- year of the test date that appears on the label.
- The bags of seed shall be clearly labeled indicating test date, weed percentage or % Pure Live Seed (PLS), viability or germination percentage, and inert material.
- Live seed shall be stored in temperature and moisture conditions appropriate to maintain seed vigor.
- Seed containing prohibited noxious-weed seed is not acceptable. All seed shall contain less than 1% by weight restricted noxious-weed seed and less than 3% of cheat or downy brome and other weed and crop seed.
- Seed shall be delivered to the project site unopened, in original and individually packaged bags or containers (one species per bag) as specified.

For projects on City of Pocatello land, the seed shall have a seed analysis report issued from the Idaho Department of Agriculture, Bureau of Seed Analysis & Control or an Association of Official Seed Analysts (AOSA) state seed laboratory verifying the pure live seed percentage statements of the seed label including the name of the certifying state issuing the report. The seed analysis report shall show the seed has been tested within the last six (6) months and the test results shall indicate seed germination rate and purity, and that the seed is free of Idaho noxious weeds. All seed bags shall have analysis (certification) attached. The AOSA laboratory report shall be submitted at least thirty (30) working days prior to delivery of the seed and planting.

Seed Purity & Germination

High quality seed should run from 80-99% pure seed. The purity of seed listed tells what proportion of that seed is sound as opposed to chaff, stems, and other inert matter. Unprocessed seed may be only 50% sound seed and the other 50% chaff, hulls, and bits of stem and leaf which have not been separated from the seed.

Additionally, not every seed produced on a plant is live and able to grow. Storage and age further decrease the number of viable seeds which can produce a new plant. The germination test printed on the label tells what % of the pure seed was capable of growing on the date of the test.

To obtain the Pure Live Seed (PLS) rating follow the formula below:

$$\frac{(\text{Purity \%}) \times (\text{Germination \%})}{100}$$

Minimum allowable rates for seed material:

All grass seed	80% PLS
All legume seed	78.5% PLS
All native wildflower and forb seed	76.5% PLS

Approved Seed Mixes for Revegetation

The following seed mixes are preferred. They have been selected for their ability to quickly achieve 70% vegetation cover. This will minimize the establishment of weed species, and erosion. Alternatives may be reviewed for approval from the local jurisdiction.

All of these seed mixes should receive irrigation until they are at least 2- 4" tall. This can generally be accomplished without using irrigation lines through seeding in late fall or early spring to take advantage of moisture from snow melt and spring rains.

Upland Revegetation Mixes		**Rate (lbs PLS/Acre)**
Mix 1: Native non-irrigated erosion control mix for City Creek and subdivision revegetation in the Portneuf Valley		
'Anatone' Bluebunch wheatgrass	*Agropyron spicatum*	14
'High plains' Sandberg bluegrass	*Poa sandbergii*	3
'Bannock' Thickspike wheatgrass	*Agropyron dasytachyum*	8
'Magnar' Basin wildrye	*Elymus cinereus*	8
'Nezpurs' Idaho fescue	*Festuca idahoensis*	6
TOTAL GRASSES APPLICATION RATE		**39**
Forb mix to add (optional)		
Western Yarrow	*Achillea millefolium var. occidentalis*	2
Sulphur-Flower Buckwheat	*Eriogonum umbellatum*	0.5
Arrowleaf Balsam Root	*Balsamorhiza sagittata*	1
Monroe's Globemallow	*Sphaeralcea munroana*	3
Mix 2: Native non-irrigated erosion control mix for roadside, subdivision, and detention basin revegetation in the Portneuf Valley.		
'Bannock' Thickspike wheatgrass	*Agropyron dasytachyum*	8
'Anatone' Bluebunch wheatgrass	*Agropyron spicatum*	8
'High plains' Sandberg bluegrass	*Poa sandbergii*	3
'Sodar' Streambank wheatgrass	*Agropyron riparium*	7
'Pryor' Slender Wheatgrass	*Agropyron trachycaulum*	7
'Toe Jam Creek' or 'Fish Creek' Squirreltail bottlebrush	*Elymus elymoides*	6
TOTAL GRASSES APPLICATION RATE		**39**
Forb mix to add (optional)		
Prairie (white) sage	*Artemisia ludoviciana*	4
Western Yarrow	*Achillea millefolium var. occidentalis*	2
Sulphur-Flower Buckwheat	*Eriogonum umbellatum*	0.5
Palmer's Penstemon	*Penstemon palmeri*	4
Sandy Soils *Use one of the above mixes and supplement with:*		
'Nezpar' Indian ricegrass	*Achnatherum hymenoides*	8

Forbs (flowers), shrubs & trees. In areas with weed problems, it is recommended that forbs, shrubs and trees be added after the 1st season of growth. This allows for easier weed control during the first year of growth.

In small or linear sites with nearby populations of sagebrush and rabbitbrush, these shrubs will quickly colonize the new planting, elimating a need to purchase this seed (which has a limited viability timeframe).

Native forbs and shrubs that grow well in revegetation projects in the Portneuf Valley and require no irrigation (once established) include:

Forbs		Shrubs
Lewis' Flax	Palmer's Penstemon	Wyoming Big Sagebrush
Prairie (white) Sage	Rocky Mtn Penstemon	Silver Sagebrush
Western Yarrow	Arrowleaf Balsamroot	Winterfat
Little Larkspur	Sulpherflower Buckwheat	Grey and Green Rabbitbrush
Silky Lupine	Sticky Geranium	Bitterbrush
Scarlet Gilia	Monroe's Globemallow	Common Snowberry
		Skunkbush Sumac

See the Idaho Plant Materials Technical Note #24 for additional information regarding seeding rates and creating your own seed mix.

Wyoming big sagebrush, bluebunch wheatgrass and forbs

Bluebunch wheatgrass, Idaho fescue and forbs

Lawn/Pasture Revegetation Mixes		Rate (lbs PLS/Acre)
Mix 3: Hay/pasture seed mix (to receive supplemental irrigation during the summer)		
Smooth bromegrass		6
Timothy		2
Western Wheatgrass		8
TOTAL APPLICATION RATE		**16**
Mix 4: Low Water Lawn seed mix (to receive some supplemental irrigation and may be mowed regularly).		
Blue gramma		0.25 lbs/1000 sq ft
Red fescue		2.0 lbs/1000 sq ft
Tall fescue		6.0 lbs/1000 sq ft
Sideoats gramma		0.5 lbs/1000 sq ft
TOTAL APPLICATION RATE		**8.75 lbs/1000 sq ft**
Mix 5: Low Water Lawn seed mix (to receive some supplemental irrigation and may be mowed regularly).		
'Covar' sheep fescue	*Sheep fescue*	4 lbs/1000 sq ft
Lewis' flax	*Linum lewisii*	a few ounces
TOTAL APPLICATION RATE		**4 lbs/1000 sf**

Bio-infiltration Swale Seed Mixes **Rate (lbs PLS/Acre)**

For additional criteria on plant density and use of mulches and rocks within bio-infiltration swales, consult the Portneuf Valley Storm Water Quality Design Manual.

Mix 6: Bio-infiltration swale mix about 1' in height

'Nezpurs' Idaho Fescue	*Festuca idahoensis*	2
'Toe Jam Creek' or 'Fish Creek' Squirreltail Bottlebrush	*Elymus elymoides*	3
'High plains' Sandberg bluegrass	*Poa sandbergii*	2
Western wheatgrass	*Pascopyrum smithii*	3
TOTAL GRASSES APPLICATION RATE		**10**

Forb mix to add (optional)

Sticky Geranium	*Geranium viscossimum*	2
Lewis' flax	*Linum lewisii*	*3*
Firecracker penstemon	*Penstemon eatonii 'Richfield'*	0.5
Rocky Mountain Penstemon	*Penstemon strictus*	4

Mix 7: Bio-infiltration swale mix under 4' in height

'Anatone' Bluebunch wheatgrass	*Agropyron spicatum*	6
'Nezpurs' Idaho Fescue	*Festuca idahoensis*	2
Alkali sacaton	*Sporobolus airoides*	2
TOTAL GRASSES APPLICATION RATE		**10**

Forb mix to add (optional)

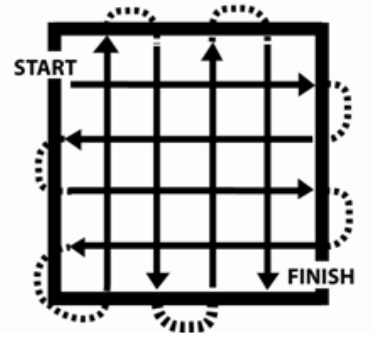
Prairie (white) sage	*Artemisia ludoviciana*	2
Lewis' flax	*Linum lewisii*	*3*
Blanket flower	*Gaillardia aristata*	0.5
Palmer's Penstemon	*Penstemon palmeri*	4

Those wishing to enhance their bio-infiltration swales with other forbs, grasses, trees and shrubs should refer to the following guides for plants appropriate to our area and use in swales:

- Suggested plants for bio-infiltration swales in Northern Nevada www.unce.unr.edu/publications/files/nr/2009/fs0928.pdf
- Pocatello Tree Guide

Seeding Methods:

All seeding methods will be subject to the standard of 70% required vegetated cover within the 2 year warranty period.



Whether hand broadcasting, using a spreader, or drill seeding - apply one-half of the seed from each direction and cover the area twice for even distribution.

Drill

This is the preferred method. It is appropriate for slopes 3:1 or flatter. The drill should be set to a depth of ¼ to ½ inch for the selected grass and forb species chosen. The seed should be drilled making passes at right angles (see above diagram).

Use a weed free mulch to enhance plant establishment and control erosion.

Broadcast

On slopes 2:1 and steeper, seed may be broadcast using a push-type or hand spreader. Broadcast seeding rates are usually double that of the drill rate. Once broadcast, lightly hand-rake the soil over the seed .

Blown in with Compost Blanket/Eco Blanket Mix seeds with compost blanket and tackifier. Blow on together.

Hydroseed. Shall only be done on slopes over 3:1 (V:H) where drill seeding is not acceptable, or for fall seeding in areas with significant snowpack. Leave the soil surface in a slightly roughened condition. *See discussion of hydromulching.*

To reduce damage to the seed, fertilizer shall be incorporated prior to seeding. After seeding apply tackifier and mulch with the hydromulcher. A small amount of green dye and hydromulch (100-200 lbs/acre) may be included in the seed slurry to provide a tracer to judge seed distribution. When seed is applied with tackifier and/or hydromulch there is poor contact between the seed and the soil in our arid climate, resulting in poor germination rates.

1.5 Soil Stabilization and Seed Protection: Mulch, Erosion Control Fabrics/Blankets & Tackifiers

Purpose

In revegetation projects, installing erosion control fabric or placing mulch, anchored mechanically or with a tackifier, are methods to protect erodible earthen material. Mulch and erosion control fabrics mitigate soil temperatures and provides nutrients to the soil as it decomposes. They provide the first line of defense against soil erosion by physically buffering the soil from disturbance, intercepting raindrop energy, slowing surface runoff, and capturing sediment.

Products for Flat Areas

- Compost Blanket/Eco Blanket **This is the preferred mulch**
- Wood Shreds - shall have a shredded or stringy texture
- Chipped Site Vegetation - shall be reasonably free of strips and splinters
- Straw -not recommended for windy areas. Shall be certified noxious weed-free
- Hydromulch - shall form a blotter-like ground cover when applied.

Products for Steeply Sloped Areas (3:1)

- Excelsior Erosion Control Blankets **This is the preferred mulch**
- Erosion Control Netting
- Jute Matting
- Hydromulch (some types)

Conditions of Use

All revegetation projects shall use a mulch and tackifer, and/or an erosion control fabric/blanket. This is typically the last step in an erosion control or revegetation project, occurring immediately after seeding and/or planting.

- Tackifier is typically mixed in with the mulch and sprayed onto the site.
- Where an erosion control blanket is used tackifier is not necessary.
- All fabrics/blankets/netting/hydromulches shall be applied per manufacturer's instructions and specifications.

Design and Installation Specifications

Mulch

- Mulch shall generally be applied 2" thick.
  - As a general rule, 2 cubic yards of mulch will cover about 325 square feet of ground at a depth of 2 inches.
  - Thicknesses may be increased for disturbed areas in or near sensitive areas or other areas highly susceptible to erosion.
- Mulch used within the ordinary high-water mark of surface waters should be selected to minimize potential flotation of organic matter.

Erosion Control Fabrics

- Shall be applied on all slopes over 3:1 (V:H).

Tackifier

- Shall be used in conjunction with all hydroseeding/mulching applications.
- Shall be used when compost is blown onto steep slopes.
- Shall be a non-toxic, non-corrosive, all organic material which forms a firm resilient, re-wettable membrane.

Maintenance Standards

- The thickness of the cover must be maintained
- Any areas that experience erosion shall be re-mulched and/or protected with a net or blanket. If the erosion problem is drainage related, then the problem shall be fixed and the eroded area re-mulched.

For suppliers, see the document (available on the City of Pocatello's stormwater website): Local Sources: Soil, Compost, Seeds/Plants, Storm Water Management, Erosion Control, etc.

Mulches & Erosion Control Fabrics/Blankets

Compost Blanket (Composted mulch/Eco Blanket)

What is this: Mulch-like blanket of medium-coarse stable and mature compost, typically 2" thick. Note that compost blanket is a coarse woody product, not the fine, screened compost product typically used as a soil amendment. It shall have a a sieve size of greater than 1/2" and less than 3" in length.

When to Use: **This is highly recommended for most sites.** Typically used on slopes 1.5:1 and flatter. On slopes of 2:1 or steeper, it should be applied with a pneumatic blower and may require netting to hold it in place.

Quality: No visible water or dust during handling. Must be purchased from supplier with Solid Waste Handling Permit (unless exempt).

Application Rates: 2" thick, depending on slope; approximately 108 tons/acre or 135 cubic yards of material at 800 lbs/cubic yard.

Application Method:

- Most projects use a pneumatic blower truck. Compost can be blown on a site together with seed in a single-step, cost effective erosion control treatment. Compost can also be blown in place together with a tackifier to help hold the material in place on steeper slopes.
- Can use a dumptruck and bulldozer to apply

Benefits: Reduced storm water runoff volume and velocity. Improved infiltration rate. Conserves soil moisture. Improved activity by bacteria, mycorrhizal fungi, nematodes, protozoa, microarthropod and earthworms. Improved soil nutrient levels and nutrient cycling. Improved potential for vigorous long term vegetation coverage.

Limitations: Shall not be used in drainageways or concentrated flow areas (ditches, streams, channels, etc).

Wood Based Mulch

What is this: This material is often called "hog or hogged fuel." It may include tree bark, wood chips, coarse woody grindings, pine needles, and shredded bark. It may come from material chipped on site.

When to Use: Typically used on slopes 2:1 and flatter.

Quality: No visible water or dust during handling. Must be purchased from a supplier with a Solid Waste Handling Permit or one exempt from solid waste regulations.

Application Rates: 2- 3" thick (270-400 cubic yards/acre).

Application Methods: Easy application by pneumatic blower trucks or bulldozers (in flat areas).

Benefits: Improved protection from raindrop splash erosion. Reduced competition from weed species. Reduced storm water runoff volume and velocity. Improved infiltration rate. Conserves soil moisture. Improved potential for vigorous long term vegetation coverage.

Limitations: Special caution is advised regarding the source and composition of wood-based mulches. Its preparation typically does not provide any weed seed control, so evidence of residual vegetation in its composition or known inclusion of weed plants or seeds should be monitored and prevented (or minimized). Caution related to juniper needles and bark applies.

Erosion Control Blankets

What is this: A rolled Erosion Control Blanket is a composite blanket typically consisting of a core composed of coconut, coconut and straw, or excelsior, surrounded by two non-synthetic nets for shear strength.

When to Use: Depending on the specifications of the fabric selected, it generally can be used on slopes between 2:1 and 1:1 (V:H)

Quality:

Application Rates: Overlap material per manufacturer's directions.

Application Method:

- Seeding shall occur prior to placing blanket.
- Blankets shall be laid evenly and smoothly. When the blanket is unrolled, the netting shall be on top and the fiber side should be in contact with the soil.
- Follow manufacturer's instructions regarding material installation, including placement of 'U' staples to secure the fabric. Installation will vary depending on material and slope.

Benefits: Provides immediate protection from surface erosion. Helps retain soil moisture improving seed germination and vegetation establishment. Longevity of 12 months.

Limitations: Rocks and debris may lift blankets above the soil surface, allowing erosion to occur between the blanket and the soil surface. Surface treatment only - unlikely to improve compacted, nutrient depleted, or poorly draining soils as necessary to ensure vigorous long term vegetative cover.

Erosion Control Netting

What is this: Erosion Control Netting is a net produced from 100% coconut (coir) fiber available in different weights. The size of the openings varies between the different weights.

When to Use: Generally can be used on slopes between 2:1 and 1:1 (V:H), can be used on slopes up to 3:1, depending on the material.

Quality:

Application Rates: Overlap material per manufacturer's directions.

Application Method:

- Seeding shall occur prior to placing blanket.
- Follow manufacturer's instructions regarding material installation, including placement of 'U' staples to secure the fabric. Installation will vary depending on material and slope.
- The area to receive netting shall have first been prepared, seeded, fertilized and mulched according to the specifications. The mulch shall not be crimped in.

Benefits: Provides immediate protection from surface erosion. Helps retain soil moisture improving seed germination and vegetation establishment. Longevity of 3 years.

Limitations: Rocks and debris may lift blankets above the soil surface, allowing erosion to occur between the blanket and the soil surface. Surface treatment only - unlikely to improve compacted, nutrient depleted, or poorly draining soils as necessary to ensure vigorous long term vegetative cover.

Punched Straw

What is this: Straw that is incorporated in the top six inches of the soil surface.

When to Use: Use on large, wind-free sites where mulches with long-term benefits are unavailable. Straw is generally not recommended as a mulch in the Portneuf Valley.

Quality: Air-dried, cleaned and weed free.

Application Rates: 2"-3" thick; 5 bales/1000 sf or 2-3 tons/acre.

Application Notes:

- Before applying straw, seed shall be applied to the slope, followed by fiber and tackifier using a hydroseed rig.
- A strawblower is used to blow straw on the slope. Hand-application generally requires greater thickness than blown straw. Following application of straw, a "sheepsfoot-roller" shall punch (crimp) straw into the slope, using a serrated disc (or crimper). In windy areas (most of the Portneuf Valley), additional tackifer or netting must be applied to hold the crimped straw in place.
- Optionally a second application of straw is blown (but not punched) onto the slope. This shall be followed by a second application of fiber and tackifier to glue the second straw application in place. Blown straw always has to be held in place with a tackifier as even light winds will blow it away.

Benefits: Cost-effective protection when applied with adequate thickness. Immediate protection from surface erosion due to raindrop impact. Helps conserve soil moisture. Conforms closely to soil surface which may result in less erosion from surface rilling.

Limitations: Will easily blow away with moderate winds. It often introduces and/or encourages the propagation of weed species (may have up to 15 pounds of weed seeds/ton).

Hydromulch

What is this: A wood or wood/paper fiber blanket bonded by a polymer tackifier

When to Use: Depending on the specifications of the product used, can be used on slopes that are flat to 4:1 (V:H). Use on sites where application of a compost blanket is impractical.

Quality:

- Shall be degradable and free of chemical printing ink, germination inhibitors, herbicide residue, chlorine bleach, rock, metal, plastic, and other materials detrimental to plant life. May have up to 5 percent by weight photodegradable material. All dyes shall be non-toxic to plants, animals, and aquatic life and shall not stain concrete or painted surfaces. Shall be furnished with a Material Safety Data Sheet (MSDS) that demonstrates that the product is not harmful to plants, animals, and aquatic life.
- Shall be suitable for spreading with a hydroseeder, and manufactured in such a manner that when agitated in slurry tanks with water, the fibers will become uniformly suspended, without clumping, to form a homogeneous slurry.
- May be any one or combination of : wood, paper, straw, hay, cotton, coconut, jute, or hemp and may contain poly fibers. Any hay, cotton, or straw must be treated to kill seeds.

Application Rates: Apply product according to manufacturer's specifications.

Application Notes:

- **Seed should be applied prior to hydromulch and tackifer.** This ensures strong contact of the seed with the soil for better germination. Fertilizer shall be incorporated prior to seeding.
- Shall be applied with a hydromulcher, following manufacturer's directions.

Benefits: Immediate protection from surface erosion due to raindrop impact. Helps conserve soil moisture. Low initial cost compared to other treatments. Conforms closely to the soil surface which may result in less erosion due to surface rilling.

Limitations: Higher application rates required for steeper slopes may inhibit germination of seed and establishment of long-term vegetation. Provides surface treatment only - unlikely to improve compacted, nutrient depleted, or poorly draining soils as necessary to ensure vigorous long term vegetative cover. Limited longevity.

Jute Matting

What is this: Jute is a natural fiber that is made into a yarn that is loosely woven into a biodegradable mesh. It has longevity of approximately 1 year.

When to Use: Generally can be used on slopes between 2:1 and 4:1 (V:H), where a mulch or blanket with long-term soil health benefits are not needed.

Quality:

Application Rates: Overlap material per manufacturer's directions.

Application Method:

- Seeding and additional vegetation protection shall occur prior to placing matting. Jute matting shall always be used in conjunction with additional vegetation protection, such as that provided by hydromulching, a compost blanket, or a wood based mulch.
- Follow manufacturer's instructions regarding material installation, including placement of 'U' staples to secure the fabric. Installation will vary depending on material and slope.

Benefits: Provides immediate protection from surface erosion. Helps retain soil moisture improving seed germination and vegetation establishment.

Limitations: Rocks and debris may lift blankets above the soil surface, allowing erosion to occur between the blanket and the soil surface. Surface treatment only - unlikely to improve compacted, nutrient depleted, or poorly draining soils as necessary to ensure vigorous long term vegetative cover.

1.6 Preservation of Seeded Areas:

Irrigation

- Consider the use of irrigation for one growing season to assist with the establishment of plantings. Use of irrigation on native species plantings will significantly improve the likelihood of a successful planting.
  - Keeping the seedbed moist during germination will prevent soil crusting and ensure greater seedling success.
  - Regular irrigation until the grass reaches the 4-5 leaf stage (2-4" high) will also improve the likelihood of a successful planting.

Weeds

- Weed growth must be addressed immediately.
- After desired grasses have reached the 4-6 leaf stage) manage weeds through mowing of annual weeds (including off-site disposal of seed heads) and/or herbicidal application for perennial weeds. *Contact the Bannock County Weed Abatement District for for herbicide recommendations and rates.*

Soil Compaction

- Limit vehicle traffic and other forms of compaction in areas that are seeded.

Inspections

- Inspect weekly during the growing season until vegetation is densely established.
- Inspect within 24 hours after every precipitation event that produces 0.5 inch of rain or more during a 24-hour period to check for excessive runoff and erosion problems.
- Inspect all planted areas for failures and make necessary repairs, replacements, reseedings, and re-mulching within the planting season.

Repair & Re-seeding

- Repair and reseed areas that have erosion damage as necessary.
- If a stand has less than 70% ground cover after two years, re-evaluate the choice of plant materials, methods and available light and moisture. Re-establish the stand with modifications based on the evaluation.

1.7 References:

Best Management Practices Manual Idaho Transportation Department.
http://itd.idaho.gov/enviro/storm%20water/SW_Mgmt_Plan/default.htm

Erosion Control Toolbox California Department of Transportation
http://www.dot.ca.gov/hq/LandArch/ec/index.htm

Grass, Grass-Like, Forb, Legume, and Woody Species for the Intermountain West Idaho Plant Materials Technical Note No. 24. USDA - NRCS.
http://www.plant-materials.nrcs.usda.gov/pubs/idpmstn10091.pdf

Local Sources: Soil, Compost, Seeds/Plants, Storm Water Management, Erosion Control, etc.

Native Plants for Idaho Roadside Restoration and Revegetation Programs. Idaho Transportation Department.
http://itd.idaho.gov/manuals/Online_Manuals/Current_Manuals/Roadside_Revegetation/Roadside_Revegetation.pdf

Plants Database USDA NRCS http://plants.usda.gov/java/

Revegetation Guidelines for Western Montana: Considering Invasive Weeds. Missoula County Weed District.
http://msuextension.org/publications/AgandNaturalResources/EB0170.pdf

Standard Specifications for Highway Contruction. Idaho Transportation Department.
http://www.itd.idaho.gov/manuals/Online_Manuals/Spec_04/Spec_04.htm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