Preliminary Reclamation Plan

RUBY PIPELINE LLC

FERC Docket No. CP09-___-000

January 2009

Table of Contents

LIST OF FIGURES

1 INTRODUCTION

The Ruby Pipeline Project (Project), proposed by Ruby Pipeline, LLC (Ruby), is comprised of approximately 675.2 miles of 42-inch diameter natural gas pipeline, along with associated compression and measurement facilities, located between Opal, Wyoming and Malin, Oregon (see Figure 1). An approximate 2.6-mile lateral would also be constructed south from the Malin Hub in Klamath County, Oregon. The Project right-of-way (ROW) would traverse four states: Wyoming, Utah, Nevada, and Oregon. Four new compressor stations would also be installed as part of the Project. Ruby would utilize a 115-foot-wide nominal construction ROW for installation of both the mainline and the lateral.

Ruby has prepared this Preliminary Reclamation Plan (Reclamation Plan) to outline goals and objectives, proposed seed mixes for each state, reclamation process, and monitoring and maintenance efforts. Ruby proposes to develop a technical team to provide input on the Reclamation Plans that would be developed for each state. Ruby would be seeking input from the Bureau of Land Management (BLM), the U.S. Forest Service (USFS), U.S. Fish and Wildlife Service (USFWS), and state wildlife agencies to develop the technical team that would participate in the development of each State Reclamation Plan.

Ruby has contacted two rangeland ecologists who are currently researching reclamation techniques. Ruby would seek to use both of them to assist with reclamation efforts by being on the technical team that would be developed for each state.

Professor Val Jo Anderson, with the Plant and Animal Sciences Department at Brigham Young University, is studying cheatgrass invasion in salt desert shrublands and the benefits of postfire reclamation. Professor Anderson has expressed an interested in assisting Ruby with reclamation efforts on the portion of the route that traverses salt-desert shrub, as well as for the entire route.

Dr. Tom Monaco, with the Forage and Range Research Lab at Utah State University, is researching strategies for improving plant materials to change wildfire frequency and rebuild critical soil functions. Dr. Monaco has also expressed interest in assisting Ruby with reclamation efforts along portions of the route that traverse salt-desert shrub as well as for the entire route.

The Reclamation Plan utilizes reclamation methods developed for other large-diameter pipeline projects that were approved by the Federal Energy Regulatory Commission (FERC) (Dames and Moore 1990; Ecology & Environment, Inc. 2007). Ruby has adapted and updated the Reclamation Plan by incorporating recent technical standards and published long-term restoration monitoring information associated with similar habitats (Ecology and Environment, Inc. 2007). The Reclamation Plan also incorporates Ruby's Upland Erosion Control, Revegetation, and Maintenance Plan, and the *Noxious Weed and Invasive Control Plan*.

The Plan of Development (POD) would include additional reclamation measures for visually sensitive areas and off-highway vehicle (OHV) control, as identified by the BLM and USFS during their review of this Reclamation Plan. Also, any additional landowner or other land management agency requirements as well as any special conditions or recommendations of the FERC staff as it completes its environmental review and the Final Environmental Impact Statement would be incorporated into this Reclamation Plan. Restoration of wetlands and riparian areas along the Project route are addressed in Ruby's Wetland Mitigation Plan.

2 PURPOSE

The Reclamation Plan describes the reclamation process that Ruby would implement to mitigate temporary habitat impacts within the construction ROW crossed by the Project. It also presents a discussion of possible alternatives to mitigate impacts to areas temporarily disturbed; such impacts may include disturbance of habitat during construction of the Project, along access roads and at staging areas, and at areas of temporary work space (TWS).

3 PLAN GOALS AND OBJECTIVES

The short-term goals for reclamation are to minimize the erosion and sedimentation potential on land impacted by the Project. Properly executed construction practices, optimum scheduling, and timely construction can mitigate short-term impacts. Long-term reclamation goals include protection of water resources, soil stabilization through successful establishment of stable vegetation cover, minimization of impacts to the viewshed, and a return to preexisting land uses, with emphasis on greater sage-grouse and big game habitat restoration. Monitoring during the construction and operational phases would ensure the achievement of these goals.

Ruby's reclamation efforts would meet short- and long-term reclamation goals by:

- Using proper soil management techniques, including stripping, stockpiling, and reapplying topsoil material to restore soil horizons and establish surface conditions that would enhance development of diverse, stable, self-generating plant communities. Where the terrain is relatively flat and topsoil exists, typically the ditch line and spoil side would be topsoiled.
- Full ROW topsoiling would be implemented in dry wetlands, areas requiring extensive grading, at landowner request and areas of high density noxious weeds based upon survey data.
- Ruby would discuss its topsoil segregation methods with each landowner or land management agency. If a landowner or land management agency requires the full ROW topsoil method, a wider construction ROW (10 - 20 feet) would be necessary to provide space to store the segregated topsoil. In these cases, Ruby would file for the necessary site-specific variance for the extra work space to perform the full ROW topsoil method.
- Establishing stable soil surface and drainage conditions which would minimize surface erosion and sedimentation.
- Revegetating disturbed areas with plant species adapted to site conditions in order to establish long-term, productive plant communities compatible with existing land uses; and concurrently minimize the chances for noxious and invasive weeds to establish. Species would be native to the area, including species utilized by tribes for food and medicine.
- Re-establishing topography compatible with the surrounding landscape.
- Monitoring (minimum of 5 years) during the construction and operational phases to ensure the achievement of both short-term and long-term reclamation goals.
- Minimizing temporary construction impacts along the route by limiting the temporary construction ROW width to avoid impacts to native soil and vegetation, where practical and safe.
- And finally, where longer term impacts occur to certain sensitive environments and habitats, in order to off set those impacts, Ruby would work with the BLM, the USFWS and other appropriate agencies to develop a plan for off site mitigation.

Insert Figure 1 Route Map

4 RECLAMATION SCHEDULE

Construction of the Project is scheduled to begin as early as February 2010 and to continue through March 2011. The Project is planned to be placed into service in March of 2011. This schedule includes cleanup, finishing of grading, installation of permanent erosion control structures, and seeding and planting. Some reclamation efforts may be required after March 2011 depending on weather and Project cleanup activities. Reclamation efforts would occur, where possible, during late fall to early winter to facilitate seed establishment when snow and rainfall are more likely to occur (Monson 1999). In areas with frozen ground, final reclamation may be completed in spring/summer of 2011.

5 RECLAMATION PROCESS

The reclamation process outlined below includes the necessary and appropriate steps for Ruby to fulfill the short- and long-term goals described above.

5.1 Reclamation Treatments

The Reclamation Plan address restoration of the pipeline ROW in Wyoming, Utah, Nevada, and Oregon. The Reclamation Plan includes topsoil and subsoil stocking piling, backfilling, recontouring, imprinting, seeding plant establishment by seedings or transplants, and erosion control. Location specific seed mixes to be applied in the ROW would use seed from local plant communities.

5.1.1 Clearing, Grading, and Topsoil Removal

Ruby's initial construction activities would include surveying and staking the temporary construction ROW, clearing vegetation, surface-soil stripping and stockpiling, and grading the ROW for safe construction passage.

The survey and staking of the temporary construction ROW would identify the width of the excavation and blade-work along the ROW, including cut and fill locations. Vehicle travel and equipment operation would be kept within the surveyed work areas. Vegetation, such as large shrubs, would be cleared from the staked ROW and stockpiled within the ROW for later use as soil mulch, OHV controls, and/or wildlife shelters.

Surface soil thickness varies throughout the ROW depending on soil type. Soil scientists or Environmental Inspectors in the field, would identify surface soil thickness for removal and stockpiling, where applicable. Surface soil containing the seed reservoir would be stripped (up to 12 inches) within the trench and spoil storage locations and any areas involving cut and fill. Ruby would segregate the entire surface soil layer, taking care not to mix it with the underlying sub-soil horizons, and stockpile it separately from all trench spoil material. Erosion control blankets or straw bales would be used as appropriate to limit erosion. Surface soil and sub-surface soils would be replaced in the proper order during backfilling and final grading operations as quickly as possible after construction has ceased.

Surface rocks, where present and where useful for reclamation, would be windrowed adjacent to the topsoil stockpile. In non-agricultural lands, after backfilling, the rock would be separated from the topsoil and then placed on the construction ROW or TWS in a manner that visually blends with the adjacent undisturbed area, for use as an erosion control, or for OHV control, if requested by the landowners or land management agencies. Rock remaining on the surface in active agricultural lands after final cleanup would be removed and disposed of at an approved location.

During construction of the pipeline, all vehicle travel would be within the identified construction ROW, or on approved access roads. Cross-country vehicle travel outside the construction ROW or within non-approved, existing access roads would not be allowed.

5.1.2 Right-of-Way Restoration

Restoration of the construction ROW involves backfilling the excavated trenchline, replacing stockpiled subsoil and surface soil, restoring pre-existing contours, installing permanent erosion control structures (i.e., water bars/slope breakers), and establishing native vegetation.

Backfilling

The excavated trench material (subsoil) would be used to backfill the trenchline followed by return of topsoil. Following backfilling, Ruby would feather or blend any excess ditch spoil across the construction corridor, creating a rough surface to help retain precipitation and capture windblown seed from adjacent vegetation.

Decompaction

Compacted soils are typically associated with the ROW travel lane and laydown locations. Decompaction would occur in certain areas and on a case-by-case basis after consultation with the landowner or land management agency. Each identified location would be decompacted to a minimum depth of 16 inches prior to surface soil replacement using a chisel plow (Institute for Land Rehabilitation 1978; Monson 2005). "Soil ripping" would be done along contours to minimize soil erosion and facilitate soil-water retention to aid revegetation. The surface soil would then be prepared for seeding as describe in section 5.1.3.1.

Recontouring

All temporarily disturbed lands within the ROW and TWS would be recontoured to blend with the surrounding landscape. Recontouring would emphasize restoration of the existing drainage patterns and landform to pre-construction condition, to the extent practicable.

Mulch

Any surface rock or cleared vegetation that is separated for use as natural mulch in specified areas would be spread over the contoured topsoil surface. Straw may be crimpt into the soil surface to conserve soil-water, reduce surface temperatures, and create conditions to aid seedling establishment.

Water Bars (Slope Breakers)

Water bars are earthen-berms that reduce and direct the flow of surface water (University of Minnesota Extension 1998). Water bars would be installed to provide erosion control in areas per Ruby's Upland Erosion Control, Revegetation and Maintenance Plan (Plan). Water bars would also be installed on other soils types as specified in Ruby's Plan and/or by land management agencies, with spacing determined by the appropriate agencies. Water bars usually consist of a one-foot high berm with an upslope swale. Water bars would be reseeded. Water bars are gently angled downslope to divert stormwater runoff to a stable upland discharge point or to a "j" hook created at the outfall point.

The purposes of water bars are:

- To decrease overland water velocities through disturbed lands by reducing slope lengths;
- To remove water from the disturbed area in a controlled manner and at frequent intervals to reduce its erosive power;
- To direct water into a stabilized location to minimize surface scour;
- To maximize water infiltration along the pipeline ROW; and,
- To slow water flow across the ROW to help maintain soil moisture for restoration efforts.

Wildlife Shelters

Large shrubs and trees that are removed during ROW clearing operations and stockpiled may be reused to construct wildlife habitat (shelter) structures. These shelters, constructed after seed and container-grown plant placement, would be placed within the reclaimed ROW as a wildlife habitat enhancement measure. In addition to augmenting habitat, shelter development would supplement other erosion controls, provide a trap for seed recruitment from adjacent vegetation, and minimize soil temperatures, allowing for increased water retention to improve seedling establishment.

Biological Soils and Playas

Ruby has identified areas of biological crust soils along the Project via literature review and agency contact; however, limited data are available. To the extent that damaging or destroying the biological crusts can not be avoided, steps would be taken to restore the crusts to the disturbed areas. Ruby would segregate the various types of soil during the trenching activity and would replace them in reverse order. In areas of identified biological crust soils and at the land management agencies request, the top two to five inches of topsoil, inclusive of the biological crust soils, could be carefully stripped and stockpiled separately from all other soil materials. Organic matter and debris could be retained in the piles to help sustain biological activity and increase the effectiveness of respreading the crust material after construction. Storage piles would be shallow and steep and would be kept dry to preserve microorganisms and seeds (Bainbridge 2007).

The majority of the construction would occur in the early summer to late fall timeframe, which should help minimize the chance of crossing playas when significant water is present. Any playas that are disturbed would be returned to their preconstruction condition, to the extent practicable, through the use of clay or bentonite patches to the subsurface to ensure that the preconstruction soil infiltration rates and drainage rates were maintained.

5.1.3 Revegetation

Vegetation types within the Project area vary according to soil types, topography, climatic conditions, and land management practices. The seeding mix would be adapted as needed for specific situations.

Experimental plots would be established at specific locations such as the "Sage" Sage-Grouse Core Breeding Area, Wyoming; Terrace Basin, Utah; Sheldon area, Nevada, to evaluate seeding mixes, invasive weed control, and the use of fertilizers. These studies would provide guidance to the revegetation of sagebrush-steppe and salt-desert shrub habitats.

The proposed seed mixtures were designed to be compatible with the dominant vegetation currently found along the proposed ROW. All disturbed areas would be seeded using the specific species and seeding rates for the various vegetation types found along the Project ROW.

The criteria used for selecting the seed mix are based on the following:

- Restoration performance of species within a similar habitat type based on past pipeline reclamation projects in similar habitats (Ecology and Environment, Inc. 2007);
- Erosion-control capability;
- Existing plant dominance;
- Availability of seed;
- Sage-grouse and big game habitat value;
- Livestock management; and
- Restoration of traditional food and medicine gathered by Native Americans.

Seeds would be tested for purity, percent live seed, and certified as weed free prior to use to ensure compliance with local, state, and federal seed requirements (Monsen 1999).

5.1.3.1 Seedbed Preparation

Seedbed preparation would consist of decompacting, recontouring, and surface soil replacement, as described in Section 5.1.2, above. The ground surface would be manipulated by equipment to create pockets to enhance soil water infiltration and seedling establishment by providing “safe sites” for seed germination (Monson 1999, 2005). The seedbed would be firm but not compacted, nor would it have a crusted surface. Ruby would use a proven reclamation and restoration procedure such as the spreading of corn stalks and manure, disking the mixture into the top five to six inches and then seeding with the appropriate seed mix. These areas would be identified during the development of the final Reclamation Plans.

Wyoming

The recommended seed mixtures and rates by community type traversed that are applicable to the Wyoming portion of the Project are as follows:

Desert Scrub

The desert scrub community is composed primarily of low, widely spaced shrubs such as shadescale, four-wing saltbush, winterfat, hopsage, horsebrush, rabbitbursh, and greasewood with associated bunchgrasses and forbs. The selected species and rates are designed to provide erosion control, sage-grouse and pronghorn habitat, and livestock forage The proposed seed mix would be used at the specified rate per acre (table 5.1-1). The seed mix would be approved by BLM and/or NRCS.

Table 5.1-1 Wyoming Recommended Native Seed Mixtures for Desert Scrub[c]

Species [b]	**Cultivar** [d]	**% Seed Mix Comp.**	**Lbs PLS for full seeding** [e]	**Seeds/LB PLS of seed**	**Seeding rate (seeds/ sqft)**	**PLS seeding rate** [a] **(lbs/acre)**
Slender wheatgrass	Pryor or Copperhead	30%	12	140,000	11.6	3.60
Thickspike wheatgrass	Critana	20%	12	145,000	8.0	2.40
Indian ricegrass	Nezpar	25%	12	235,000	16.2	3.00
Lewis flax	Appar	10%	6	286,690	3.9	0.60
Palmer penstemon		10%	4	586,088	5.4	0.40
Four-wing saltbush	Wytana	15%	10	49,000	1.7	1.50
Winterfat	Open Range	10%	2	210,000	1.0	0.20
Totals:		**120%**			**48**	**11.7**

Notes:

[a] The seeding rate is based on drill seeding. If broadcast or hydroseeding were used, the rate per acre would be doubled.

[b] Alternate grasses may include bottlebrush squirrel tail (rate dependent on species being replaced), and Sandberg bluegrass (rate dependant on species being replaced). In visually sensitive areas, to be determined after coordination with appropriate agency, shrubs would be transplanted including greasewood and big sagebrush.

[c] Mixtures have been recommended by the NRCS, Pinedale, Wyoming.

[d] When available, the cultivars listed above are recommended because of known quality and adaptability to the area.

[e] Rates are based on the full seeding rate for the seeding method noted above multiplied by the % seed mix composition.

5.1.3.1.2 Sagebrush Steppe

Wyoming sagebrush is the predominant species in this community and is interspersed with grasses, forbs and other shrubs such as serviceberry. The following seed mix would be used at the specified rate per acre. The seed mix would be approved by BLM and/or NRCS.

Table 5.1-2 Wyoming Recommended Native Seed Mixtures for Sagebrush Scrub[b]

Species	Cultivar [c]	% Seed Mix Comp.	Lbs PLS for full seeding [d]	Seeds/LB PLS of seed	Seeding rate (seeds/ sqft)	PLS seeding rate [a] (lbs/acre)
Slender wheatgrass	Pryor or Copperhead	30%	12	140,000	11.6	3.60
Thickspike wheatgrass	Critana	25%	12	145,000	10.0	3.00
Indian ricegrass	Nezpar	25%	12	235,000	16.2	3.00
Bottlebrush squirreltail		20%	10	192,000	8.8	2.00
Wyoming big sagebrush		10%	2	2,400,000	11.0	0.20
Serviceberry		10%	10	82,000	1.9	1.00
TOTALS:		**120%**			**59**	**12.8**

Notes:
[a] The seeding rate is based on drill seeding. If broadcast or hydroseeding were used, the rate per acre would be doubled.
[b] Mixtures have been recommended by the NRCS, Pinedale, Wyoming.
[c] When available, the cultivars listed above are recommended because of known quality and adaptability to the area.
[d] Rates are based on the full seeding rate for the seeding method noted above multiplied by the % seed mix composition.

Utah and Nevada

Table 5.1-3 Utah and Nevada Recommended Native Seed Mixtures[c]

Community type, Mixture	Variety	Seed Application Rate (pounds/acre/PLS)[a]
Utah [a]		
Sagebrush Scrub and Pinyon-Juniper Woodland, Mixture UT-1	Intermediate wheatgrass – Oahe	3
	Lewis flax – Apar	2
	Alfalfa	2
	Big sagebrush	2
	Indian ryegrass	5
	Fourwing saltbush	2
Desert Scrub, Mixture UT-2	Basin wildrye	2
	Indian ricegrass - Nezpar	5
	Globemallow	3
	Fourwing saltbush	2
	Penstemon	3
	Low sagebrush	2
	Winterfat	1
Grassland, Mixture UT-3 [d]	Forage kochia	1
	Indian rice grass	2
	Galleta grass	2
	Winterfat	2
	Alfalfa – dryland	1
Nevada [b]		
Sagebrush Scrub and Pinyon-Juniper Woodland, Mixture NV-1	Intermediate wheatgrass – Oahe	3
	Lewis flax – Apar	2
	Alfalfa	2
	Big sagebrush	2
	Indian ryegrass	5
	Fourwing saltbush	2
Desert Scrub, Mixture NV-2	Basin wildrye	2
	Indian ricegrass - Nezpar	5
	Globemallow	3
	Fourwing saltbush	2
	Penstemon	3
	Low sagebrush	2
	Winterfat	1

General Notes :

- Exact mix to be used may differ from the proposed mixture, depending on seed availability.
- Seeding mixtures have been compiled based on the ecotones that would be crossed as well as success of other large-diameter pipeline projects in similar habitats.
- Ruby would work with relevant agencies to develop and further refine appropriate seed mixes across sensitive management areas.

Notes:

a Seeding rate is listed as pounds per acre of pure live seed (PLS). Seeding rate is doubled if hydroseeded or broadcast. The seed mix may be modified based on site-specific conditions, identification of additional useful species for rapid site stabilization, species success in past revegetation efforts, and seed availability and cost. An alternative seeding rate may be applied in areas deemed appropriate by BLM, USFS, or the landowner.

b Yellow sweetclover may be substituted or added to the mixture.

c NRCS coordination pending.

Key:

NV = Nevada
OR = Oregon
PLS = Pure Live Seed
UT = Utah

Oregon

The recommended seed mixtures and rates by community type traversed that are applicable to the Oregon portion of the Project are presented below. Ruby would work with the USFS to develop the appropriate seed mix across the Fremont-Winema National Forest.

Table 5.1-4 Oregon Recommended Native Seed Mixtures [c]

Community type, Mixture	Variety	Seed Application Rate (pounds/acre/PLS)[a]
Oregon [a]		
Sagebrush Scrub and Pinyon-Juniper Woodland, Mixture OR-1	Intermediate wheatgrass – Oahe	3
	Lewis flax – Apar	2
	Alfalfa	2
	Big sagebrush	2
	Indian ryegrass	5
	Fourwing saltbush	2
Desert Scrub, Mixture OR-2	Basin wildrye	2
	Indian ricegrass - Nezpar	5
	Globemallow	3
	Fourwing saltbush	2
	Penstemon	3
	Low sagebrush	2
	Winterfat	1

[a] Seeding rate is listed as pounds per acre of pure live seed (PLS). Seeding rate is doubled if hydroseeded or broadcast. The seed mix may be modified based on site-specific conditions, identification of additional useful species for rapid site stabilization, species success in past revegetation efforts, and seed availability and cost. An alternative seeding rate may be applied in areas deemed appropriate by BLM, USFS, or the landowner.

Table 5.1-5 Oregon Seed Mixture Recommendations for Livestock Forage Production – Rangeland and Pastureland with Effective Precipitation 9-12 Inches

Common name	Mixtures Alternatives (lbs/acre)						
	A	**B**	**C**	**D**	**E**	**F**	**G**
Crested wheatgrass (I)	5						
Siberian wheatgrass (I)		4					
Beardless wheatgrass(N)			5		3		
Big bluegrass (N)				3			1
Sheep fescue (I)						2	
Bluebunch wheatgrass (N)				1		3	
Alfalfa (I)	1	1	1	1			1
Thickspike wheatgrass (N)		1					3
Seeds/sq ft/mixture	27	30	31	71	30	37	36

Notes:
N – Native plant, also may use any native plant listed in the NRCS ecological site description.
I – Introduced, non-native plant
Table adapted from NRCS (2000).

Table 5.1-6 Oregon Seed Mixture Recommendations for Livestock Forage Production – Rangeland and Pastureland with Effective Precipitation 12-15 Inches

Common name	Mixtures Alternatives (lbs/acre)						
	A	**B**	**C**	**D**	**E**	**F**	**G**
Big bluegrass (N)[1]	2		1				
Thickspike wheatgrass (N)		4	1				0.5
Beardless wheatgrass(N)				4		2	
Pubescent wheatgrass (I)			4		7		
Intermediate wheatgrass (I)[4]						7	
Alfalfa (I)[2]	1	2	2	2	2	2	2
Sheep fescue (I)3		1		1			
Bluebunch wheatgrass (N)	3				2		5
Seeds/sq ft/mixture	56	38	42	36	30	30	35
Alternative Native species:							

Notes:
N – Native plant, also may use any native plant listed in the NRCS ecological site description.
I – Introduced, non-native plant
1– Earliest spring forage
2– Add alfalfa at 1-2 lbs/acre for grazing and 3-4 lbs/acre for hay.
3– Add sheep fescue at 2 lbs/acre for weed and erosion control. Canby bluegrass (N) may be substitute/alternative for sheep fescue.
4– Intermediate wheatgrass may not be effective in areas with less than 15 inches annual precipitation.
NRCS has recommended the use of a number of alternative species (all native), including Idaho fescue, Thurber's needlegrass, Sandberg bluegrass, and bottlebrush squirreltail. Mixture rates to be determined, if used.
Table adapted from NRCS (2000).

Table 5.1-7 Oregon Seed Mixture Recommendations for Livestock Forage Production – Rangeland and Pastureland with Effective Precipitation 15-18 Inches

Common name	Mixtures (lbs/acre)						
	A	B	C	D	E	F	G
Big bluegrass(N) [1]	2						
Thickspike wheatgrass(N)		6					
Beardless wheatgrass(N)			7				
Tall wheatgrass(I)				10[2]		8	
Intermediate wheatgrass(I)					7		
Alfalfa(I)	2	2	2		4	4	2
Bluebunch wheatgrass(N)	3						
Idaho fescue(N)							6
Seeds/sq ft/mixture	61	31	31	18	36	35	70

Notes:
N – Native plant, also may use any native plant listed in the NRCS ecological site description.
I – Introduced, non-native plant
[1] – Earliest spring forage
[2] – Sodic soil tolerance, pure stands only
Table adapted from NRCS (2000).

Table 5.1-8 Oregon Seed Mixture Recommendations for Livestock Forage Production – Grazable Woodland with Effective Precipitation 15-18 Inches (Pine-Grassland)

Common name	Mixtures (lbs/acre)				
	A[1]	B	C	D	E
Slender wheatgrass(N)		6		3	5
Intermediate wheatgrass(I)	6				
Big bluegrass(N)	1				1
Alfalfa(I)	2				
Hard fescue(I)		1			
Orchardgrass(I)			4		
White dutch clover (I) - or native clovers		1	1	1	
Idaho fescue(N)				2	2
Seeds/sq ft/mixture	45	52	66	49	

Notes:
N – Native plant, also may use any native plant listed in the NRCS ecological site description.
I – Introduced, non-native plant.
[1] – Do not plant mixture in over 15% woodland canopy\
Table adapted from NRCS (2000).

Table 5.1-9 Oregon Seed Mixture Recommendations for Livestock Forage Production – Irrigated Pasture with Alkali Soils, Poor Drainage

Common name	Single sp. Rate (lbs/ac)
Beardless wildrye(N)	10
Tall fescue(I)	8
Tall wheatgrass(I)[1]	10
Strawberry clover(I)[2]	2
Alsike clover(I)	3
Cereal barley (annual)(I)	20
Slender wheatgrass(N)	7

Notes:
N – Native plant, also may use any native plant listed in the NRCS ecological site description.
I – Introduced, non-native plant
[1] – Do not plant mixture in over 15% woodland canopy
Table adapted from NRCS (2000).

Table 5.1-10 Oregon Seed Mixture Recommendations for Sagebrush Rangeland Sites

Common Name	Scientific Name	Seeding rate alone (lbs. / ac.)	% in mix	Seeding rate in mix (lbs. / ac.)
Great Basin Wildrye	*Elymus cinereus*	9	10%	0.9
Bluebunch wheatgrass	*Pseudoroegnaria spicata*	8	10%	0.8
Bottlebrush squirreltail	*Elymus elymoides*	10	10%	1
Western wheatgrass	*Psascopyrum smithii*	10	15%	1.5
Thickspike Wheatgrass	*Elymus lanceolatus*	8	15%	1.2
Thurber's Needlegrass	*Stipa thuberiana*	8	10%	0.8
Idaho Fescue	*Festuca idahoensis*	8	10%	0.8
Sandberg Bluegrass	*Poa Sandbergii (secunda)*	3	15%	0.45
Lewis Blue Flax	*Linum lewisii*	6	5%	0.3
		Total	100%	7.75

Source: BLM Lakeview Resource Area

5.1.3.2 Seeding Methods

The main purpose of all seeding methods are to place the seed in direct contact with the soil at average depths of approximately 0.5 inch to cover the seed with soil, and to firm the soil around the seed in order to eliminate air pockets. Some methods of seeding are more effective at seed placement than others. The type of terrain has an impact on the type of seeding method that is practicable; therefore, the exact method of seeding would have to be flexible. Seeding would be used in all areas that have replaced topsoil or surface fines, which would include all disturbed areas except exposed rock faces.

Broadcast seeding may be accomplished with a hand-operated, cyclone-type seeder; a mechanical broadcast seeder attached to the imprinting device; or a specially designed blower. Broadcast distributes the seed on top of the surface without mulch. The seeds must be covered by raking or dragging a chain or harrow over the seedbed. Imprinting with straw punch treatment also may be used to place seed in the soil. The cyclone-type seeder can be used on any slope that can be reached by foot; however, the blow seeder is limited by equipment access. Drill seeding places seed into the soil at a uniform depth, but can be used only on flat surfaces to moderate slopes. While drill seeding is the best method for seed placement, broadcast seeding followed by imprinting or straw punching also would provide effective seed placement where slope does not permit drill seeding only.

Hydromulching uses water with a slurry of seed, mulch, and tackifier (if required by land management agencies), which is sprayed over the restored topsoil surface. Hydroseeding alone sprays only the seed on the soil surface. Both methods often do not allow for good soil-to-seed contact, leave seed exposed to desiccating wind and temperatures, increase seed loss by rodent and avian foraging, and are limited by equipment access. Hydromulching is effective for applying both seed and fiber mulches.

Except for steep/erodible soils crossing areas, where additional methods would be used, the seed either would be broadcast to the surface before the imprinting or dragging process or would be drill seeded. On slopes that cannot be crimpt with straw, but that can be reached with a hydromulcher (used in isolated areas), seed would be applied to the slope in a slurry with fertilizer and mulch. Tackifier would be added to the hydromulch application if slopes are in excess of 25 degrees. Slopes that cannot be straw punched or hydroseeded/hydromulched may be broadcast seeded and hand-raked, or chain harrowed.

5.1.3.3 Soil Amendments/Fertilizer/Weed Control

Soil amendments consist of fertilizers, wood or straw mulches, tackifying agents, or soil stabilizing emulsions. Based on the recent restoration efforts on other projects involving large-diameter-pipelines that have met established success criteria, Ruby is not currently proposing the application of fertilizers as part of its post-construction restoration activities. Ruby may use pre-emergent herbicide, such as Oust® or Plateau®, to minimize annual germination of weeds such as cheatgrass, hologeton, and annual mustards, which would allow time for the perennial herbaceous species to become established (Shaw and Monson 1999). Appropriate application rates would be determined by the land management agency.

5.2 Reclamation Treatment for Steep Slopes and Erodible Soils

Erodible soil types would require additional restorative inputs to minimize the wind and water erosion potential and to offset any poor reclamation potential. The primary objective of any reclamation treatment is to rapidly stabilize the soil resource through the establishment of wind and water control measures and a suitable vegetative cover that emulates the existing landscape conditions.

Erosion control measures would be implemented to prevent adverse impacts to erodible soils due to increased runoff, particularly in areas where protective vegetation would be removed. Erosion control measures would implemented in accordance with Ruby's Plan and Procedures, other federal, state, and local agency requirements and landowners, as applicable.

6 POST-CONSTRUCTION MONITORING AND MAINTENANCE

The purpose of post-rehabilitation monitoring is to evaluate the long-term soil stability, vegetative cover and density, habitat quality, and levels of noxious and invasive weeds in the ROW. Post-construction monitoring for the Ruby route would include both qualitative and quantitative analysis.

The primary goals and objectives of monitoring are:

- Assess the effectiveness of temporary and permanent erosion-control structures (e.g., water bars) to ensure the stability of the ROW and TWS and to ensure that runoff is naturally controlled in place, with no accelerated erosion or wash-outs. The first year monitoring would focus on qualitative analysis of the ROW reclamation efforts. Locations where additional remedial work may be required should be apparent and would be identified by milepost (MP). The monitoring of the ROW for significant and/or new erosion or third-party damage is an element of Ruby's routine aerial surveillance that would be conducted throughout the life of the pipeline. It is anticipated that any active erosion would be apparent during the first two years following reclamation or after the first runoff event.

- Monitor and assess, through quantitative analysis, the success of the reseeding efforts during the second growing season, with subsequent follow-up surveys in the third and fifth growing seasons. Line-intercept transects would be used to measure plant densities and cover, bare ground, vegetation litter, and rock for comparison with adjacent undisturbed areas (Elzinga et al. 1998; Herrick et al. 2003, 2005).
- Monitor the survival of special plantings for visual restoration, if applicable, and the extent to which the restored ROW blends in with the adjacent undisturbed areas.
- Monitor and assess targeted noxious weeds and invasive plants in accordance with Ruby's Noxious and Invasive Weed Control Plan. The plan includes measures to control the spread of noxious and invasive weeds.
- Monitor and identify other disturbances that may hinder reclamation success, such as excessive livestock and wildlife grazing or unauthorized OHV use. Determine ways to take corrective actions.
- Identify places where other vegetation control may be needed. Note that with the exception of noxious weed control, vegetation maintenance, including mowing of non-agricultural lands or tree removal, is not anticipated.
- Ruby would selectively remove large brush from the permanent Project ROW to facilitate aerial surveillance and inspection.

6.1 Revegetation Performance Criteria

Upland reclamation of non-agriculture land would be considered successful when vegetation within the reclaimed ROW supports non-noxious plants that are similar in density and cover to those growing on adjacent undisturbed lands. A quantitative vegetative monitoring program would document the reclamation progress along the Ruby route. Monitoring plots would be established within the ROW and control plots on adjacent undisturbed lands. The monitoring and control plots would be similar in aspect, slope, and soils and approximately one acre in size. The control plots would have similar dimensions as the ROW monitoring plots and be established in undisturbed vegetation adjacent to the ROW approximately. Monitoring plots would be established approximately every 10 miles along the ROW. A line-intercept method would be used to assess species relative density and cover in the monitoring and control plots (Brower and Zar 1977, Elzinga et al. 1998). Ten, 50-m transects would be randomly placed in the monitoring and control plots to measure plant-canopy intercepts along transects. A one-tailed independent-sample t test would compare total grass, forb, and woody plant relative density and cover between the monitoring and control plots.

As stated above, Ruby would quantitatively document reclamation success within the ROW, using the line intercept method of vegetation analysis (Elinger et al. 1998, Herrick et al. 2003, 2005). Parameters typically include a species list and estimates of species density and percentage of plant cover, vegetation litter, rock, and bare ground. Observations of soil disturbance, occurrence of native and invasive species, plant growth stages, animal use, and grazing impacts would be documented. Qualitative analysis methods would be incorporated at established monitoring locations to provide digital-photo documentation of all quantitative data.

6.2 Remedial Action and Maintenance

Ruby would address identified erosion problems as soon as practical based on evaluation of conditions outside the permanent ROW against the original erosion control work. Additional erosion control work would be performed by applying the same basic reclamation techniques identified in this Plan, based on site-specific conditions. It is also noted that temporary erosion control structures, such as straw bale or sediment barriers, would be removed when sites are deemed stable and reclamation is determined to be successful.

Reseeding or replanting efforts, including supplemental mulching if necessary, would occur, with the agreement of the landowner or land management agency in any area where monitoring during the second growing season identifies a reclamation failure, particularly where accompanied by observed increases in water or wind erosion or excessive OHV use.

Noxious weed control also would be included in maintenance and would be performed in accordance with the noxious weed control plan and as approved by appropriate agencies.

6.3 Reporting

Ruby would document its observations of reclamation success following the field inspections and provide summary reports to the BLM, USFS, and FERC. The summary reports would be provided to agencies in September of each year. Areas that need remedial action would also be identified by MP and would include a description of additional erosion controls or reclamation work anticipated. Reports including a summary of corrective actions proposed would be submitted within three months of identifying these conditions. Areas where control applications for noxious weeds are needed would also be reported.

7 OFF-HIGHWAY VEHICLE (OHV) CONTROL

7.1 Reclamation Treatments for Off-Highway Vehicle Access

The BLM, USFS, and private landowners are concerned that the reclaimed ROW would be used for unauthorized OHV travel, which could thwart reclamation efforts and promote erosion. To discourage OHV use of the ROW, Ruby would use the following deterrents, in consultation with appropriate agencies:

- Leave the ROW in a roughened condition;
- Place signage in key areas;
- Install exclusion fencing;
- Install rock barriers, earthen berms, or other barricades at existing OHV routes that cross the ROW; and
- Work closely with the BLM, USFS, private landowners, grazing lessees, local law enforcement personnel, and adjacent landowners to monitor and eliminate unauthorized access to the ROW by installing exclusion fencing.

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