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Subject:
Pages: *3 + COVER*

Comments: *Seed mix 1/3 LETTER*

RECEIVED
OCT 18 2004
DIVISION OF OIL AND GAS ADMINISTRATION

From the desk of...
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Price, Utah 84501

Table 8.4.2.4-1A
Seed Mix used in 1991

Species	Seeds/lb	% Mix	(PLS) Drill Rate	(PLS) Broadcast Rate
Grasses				
Agropyron riparium*	156,000	0.3	0.1	0.2
Agropyron smithii	110,000	7.1	2.9	5.8
Agropyron spicatum	117,000	7.8	3.0	6.0
Agropyron trachycaulum*	159,000	0.4	0.1	0.2
Elymus salinus	379,500	16.1	1.9	3.8
Elymus giganteus*	100,000	0.7	0.3	0.6
Oryzopsis hymenoides	235,000	7.9	1.5	3.0
Sitanion hystrix	192,000	8.6	2.0	4.0
Sporobolus cryptandrus	5,298,000	11.8	0.1	0.2
Subtotal		60.6	11.9	23.8
Legumes				
Mellilotus officinalis	260,000	5.8	1.0	2.0
Medicago sativa	210,000	4.7	1.0	2.0
Astragalus cicer	145,000	4.8	1.5	3.0
Subtotal		15.3	3.5	7.0
Forbs				
Sphaeralcea ambigua	500,000	1.1	0.1	0.2
Penstemon palmeri	610,000	1.4	0.1	0.2
Linum lewisii	285,000	1.3	0.2	0.4
Sanguisorba minor*	55,000	0.1	0.1	0.2
Subtotal		3.9	0.5	1.0
Shrubs				
Artemisia tridentata				
tridentata	2,576,000	5.7	0.1	0.2
Artemisia nova	907,200	4.0	0.2	0.4
Atriplex canescens	52,000	2.3	2.0	4.0
Chrysothamnus nauseosus				
albicaulis	400,000	2.7	0.3	0.6
Ceratoides lanata	56,700	2.5	2.0	4.0
Cowania mexicana	64,600	2.9	2.0	4.0
Subtotal		20.2	6.6	13.2
TOTAL PER ACRE	4,485,490	100.0	22.5	45.0
<p>Note: An additional 15 bags of seed were purchased to provide sufficient seed for the mining phase of the project. Interium seed mix species indicated with an asterisk in the above table were eliminated and Elymus salinus was replaced with Elymus cinereus at 3.0 PLS drill rate due to availability.</p>				

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The vegetative cover data from both the Operator and the Division is summarized below.

	<u>Reclaimed</u>		<u>Reference</u>	
	Average Cover	Median Cover	Average Cover	Median Cover
Operator	51%	52%	37%	36%
Division	28%	27%	26%	17%

Both the Division's and the Operator's data indicate that vegetation establishment cover requirements for Phase II bond release have been met. The vegetation of the reclaimed area is at least equal to the reference area. No statistical tests are required if the reclaimed is greater than the reference area. However, a t-test, Mann-Whitney test, and Kolmogorov-Smirnov test were run on various parameters of the cover data and all tests found either no difference or that the reclaimed has greater vegetative cover than the reference.

The discrepancy between the Division's data and the Operator's data can probably be accounted for in sampling dormant vegetation. 1996 was very dry in the spring and summer, most all grass growth was dormant at the time of sampling. The season was so dry that very little seed was produced from the shrubs or grasses. The Operator counted all current year production as living cover even if it was dead at the time of sampling. (This is an accepted method for sampling vegetation.) The Division could not assume that the current years production was still living and that the dormant vegetation was still living. Only vegetative growth with some green was counted by the Division as living. This often allowed only a basal cover count on the grasses.

Shrub density is not a requirement for Phase II Bond Release. Shrub density was reported in 1996 for the reclaimed area by the Operator at 4773 shrubs per acre. The success standard for Phase III Bond Release is 3000 shrubs per acre.

There are several potential problems for Phase III Bond Release. These problems could be considered permit problems and not problems associated with the revegetation. They are identified below:

- - The permit commits to meeting a community similarity index. The Phase II Bond Application states the current similarity is 9 and the permit commits to a similarity index of 90.
- - The permit commits to several diversity standards. The standard of one tree or shrub, one forb, and two cool season grasses with a relative cover of greater than 5 percent has not been met.

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→ - Production was not measured and may not be required by the regulations. The permit may possibly be changed to delete this requirement.

Erosion

Pages II-34 and II-35 of the proposed permit changes refer to early reclamation erosion problems and an erosion identification program instigated in 1993. The program was to identify, monitor and if needed correct erosion problems. This program was documented and then submitted annually to the Division in the annual report. The erosion monitoring program concludes "that as the vegetation and the reclaimed surface matured, the erosion potential decreased." Pictures submitted with the report and on the ground observations indicate that no erosion problems exist.

Vegetation Findings for Phase II Bond Release

Information provided in the bond release application meets the minimum regulatory and permit requirements for Phase II bond release.

HYDROLOGY

A surface evaluation was conducted on July 28, 1999. During the oversight, the areas designated for reclamation, in accordance with the reclamation timetable, were observed and discussed. The applicant plans to remove the culvert on the reclaimed refuse pile. A trackhoe or backhoe will be used to excavate the culvert then recontour and stabilize the channel. This channel will drain into Horse Canyon Creek.

The applicant will also reclaim the #1 Sedimentation Pond. The spillways will be removed and the embankments will be pulled back to fill in the pond. The riprap channel which currently drains into the pond will remain. The pond area will be recontoured with a low area through the center to direct any flow to the west into the undisturbed drainage. Temporary silt fences may be placed on the reclaimed pond area as need dictates. The drop from the sedimentation pond discharge to the undisturbed drainage is riprapped and may not need to be reconstructed.

The applicant submitted a summary report of the erosion monitoring program conducted at the Horse Canyon Mine from 1993 to 1998. Thirteen representative sites were selected across the mine site to monitor development of erosion features. The report shows that the sites incurred some erosion in the past, but has been greatly reduced as vegetation has flourished in response to two years of above normal precipitation. Vegetation growth is a major factor in controlling erosion both by stabilizing the soil with root growth and reducing energy impacts from rain and runoff.

The applicant submitted maps depicting 13 acres of excluded area (not included in Phase I or II Bond release). Drainage controls are shown in Drawings III 1A-III through III 1G. The drainage controls that currently exist in the excluded area will continue to be used. They include a system of berms, ditches and silt fences. Berms and ditches will route flows through and around the South Portal and the large pad