

Appendix 2-9

Mountain Coal Company

**Application
for
Phase II Bond Release**

Gordon Creek No. 2/7/8 Mines

C/007/016

December 2005

Mine # C/007/0016
File According #0008
Doc. Date 12.09.05
Recd. Date 12.12.05

Public Notice

****PUBLIC NOTICE****

Application for Phase II Bond Release

**Gordon Creek No. 2/7/8 Mines
Permit #ACT/007/016**

**Mountain Coal Company, L.L.C.
P.O. Box 591
Somerset, Colorado 81434**

Mountain Coal Company, P. O. Box 591, Somerset, Colorado, 81434, a wholly owned subsidiary of Arch Western Resources, L.L.C., has filed with the Division of Oil, Gas & Mining an application for partial release of the reclamation performance bond for it's Gordon Creek No. 2/7/8 Mines.

The company has completed Phase II of the approved reclamation plan for the Gordon Creek No. 2/7/8 Mines. This is based upon the establishment of revegetation and sediment control in accordance with the approved plan. There were approximately 34.88 acres of disturbed area associated with this operation. Of this, approximately 1.63 acres were associated with the new sediment ponds (to be reclaimed at a later time) and 0.73 acres were associated with the Sweet's Canyon Pond, which has been released. Phase II Bond Release is requested on all reclaimed area, exclusive of the above pond areas, or 32.52 acres.

The present bond posted for this site is \$256,578.00. Mountain Coal Company is applying for release of an additional \$146,578.00.

The Gordon Creek No. 2/7/8 Mines are located in Bryner Canyon, approximately 20 road miles northwest of Price, Utah. The permit area is described as follows:

Township 13 South, Range 8 East, SLBM, Utah

Sec. 17: SE ¼ SW ¼ SW ¼

**Sec. 18: N½SE¼, N½SW¼SE¼, S½NE¼SW¼,
SE¼SW¼, SE¼SW¼SW¼**

The permit area is located on the Jump Creek, Utah, U. S. Geological Survey 7.5 minute quadrangle map.

Federal Coal Leases were #U-53159 and #U-8319.

The Gordon Creek No. 2/7/8 Mines have been operated and reclaimed under permit ACT/007/016. The existing permit was renewed and approved on August 28, 2004.

The Gordon Creek No. 2/7/8 Mines were closed in November, 1990. Site demolition was completed in 1991. Backfilling and grading started in 1995 and finished in August 1997. Additional regrading was completed in July, 1999. Phase I Bond Release was approved in October 2003.

This notice is being published to comply with the Surface Mining Control and Reclamation Act of 1997 and State and Federal regulations promulgated pursuant to said act.

A request for public hearings or informal conferences concerning this proposal may be made to: State of Utah Department of Natural Resources, Division of Oil, Gas & Mining, 1594 West North Temple, Suite 1210, Box 145801, Salt Lake City, Utah 84114-5801.

Landowner / Agency Notifications

United States of America
Bureau of Land Management
Moab District Office
Price River Resource Area
P.O. Box AB
Price, Utah 84501

Re: Application for Partial Bond Release
Gordon Creek No. 2/7/8 Mines
ACT/007/016
Carbon County, Utah

Gentlemen:

Mountain Coal Company has completed Phase II of the approved reclamation plan for the Gordon Creek No. 2/7/8 Mines. This is based upon the establishment of revegetation and sediment control in accordance with the approved reclamation plan.

In accordance with the provisions of R645-301-880 of the Utah Mining Reclamation Act, this letter will serve as notification that Mountain Coal Company intends to file an application with the Utah Division of Oil, Gas & Mining for partial release of the performance bond.

The present bond posted for this site is \$256,578.00. Mountain Coal Company is applying for release of an additional \$146,578.00. This Phase II Bond Release is requested for approximately 32.52 acres of the reclaimed (bonded) area, excluding the 2/7/8 Sediment Pond Area and the Sweet's Pond Area. The Sweet's Pond Area has been released from the bond. The 2/7/8 Sediment Pond will be removed and reclaimed upon approval of this application.

If you have any questions, or need any further information, please contact Ms. Pamela Grubaugh-Littig of the Utah Division of Oil, Gas & Mining, 1594 W. No. Temple, Suite 1210, Box 145801, Salt Lake City, Utah 84114-5801.

Respectfully,

Chris Hansen
Project Manager

cc: Phil Schmidt
Dan Guy
File

Mr. Robert Davis
Price River Distribution System
45 West 500 South
Price, Utah 84501

Re: Application for Partial Bond Release
Gordon Creek No. 2/7/8 Mines
ACT/007/016
Carbon County, Utah

Gentlemen:

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Respectfully,

Chris Hansen
Project Manager

cc: Phil Schmidt
Dan Guy
File

Division of Wildlife Resources
455 West Railroad Avenue
Price, Utah 84501

Re: Application for Partial Bond Release
Gordon Creek No. 2/7/8 Mines
ACT/007/016
Carbon County, Utah

Gentlemen:

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Respectfully,

Chris Hansen
Project Manager

cc: Phil Schmidt
Dan Guy
File

Carbon County Commission
Courthouse Building
Price, Utah 84501

Re: Application for Partial Bond Release
Gordon Creek No. 2/7/8 Mines
ACT/007/016
Carbon County, Utah

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Respectfully,

Chris Hansen
Project Manager

cc: Phil Schmidt
Dan Guy
File

Calvin K. Jacob & Sons
Partnership
754 S. Cherry Drive
Orem, Utah 84057

Re: Application for Partial Bond Release
Gordon Creek No. 2/7/8 Mines
ACT/007/016
Carbon County, Utah

Gentlemen:

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Respectfully,

Chris Hansen
Project Manager

cc: Phil Schmidt
Dan Guy
File

Mrs. Agnes Peirce
Rt. 1 Box 143
Price, Utah 84501

Re: Application for Partial Bond Release
Gordon Creek No. 2/7/8 Mines
ACT/007/016
Carbon County, Utah

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Respectfully,

Chris Hansen
Project Manager

cc: Phil Schmidt
Dan Guy
File

Helper Associates
178 South Main Street
Helper, Utah 84526

Re: Application for Partial Bond Release
Gordon Creek No. 2/7/8 Mines
ACT/007/016
Carbon County, Utah

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Respectfully,

Chris Hansen
Project Manager

cc: Phil Schmidt
Dan Guy
File

Wasatch Coal Company
c/o George N. Cannon Co.
Mtg. Rep.
1322 Chandler Drive
Salt Lake City, Utah 84103

Re: Application for Partial Bond Release
Gordon Creek No. 2/7/8 Mines
ACT/007/016
Carbon County, Utah

Gentlemen:

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Respectfully,

Chris Hansen
Project Manager

cc: Phil Schmidt
Dan Guy
File

Mr. Robert Jewkes
2651 Hiawatha Circle
Salt Lake City, Utah 84108

Re: Application for Partial Bond Release
Gordon Creek No. 2/7/8 Mines
ACT/007/016
Carbon County, Utah

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Respectfully,

Chris Hansen
Project Manager

cc: Phil Schmidt
Dan Guy
File

G. Pete & Betty Frandsen
9267 Tortellini Drive
Sandy, Utah 84070

Re: Application for Partial Bond Release
Gordon Creek No. 2/7/8 Mines
ACT/007/016
Carbon County, Utah

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Respectfully,

Chris Hansen
Project Manager

cc: Phil Schmidt
Dan Guy
File

Helen Marakis
165 East 1st South
Price, Utah 84501

Re: Application for Partial Bond Release
Gordon Creek No. 2/7/8 Mines
ACT/007/016
Carbon County, Utah

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Respectfully,

Chris Hansen
Project Manager

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Dan Guy
File

***Vegetation Monitoring
for
Phase II Bond Release
at the
Gordon Creek 2/7/8 Mines***

2003

**VEGETATION MONITORING
FOR PHASE II BOND RELEASE
AT THE
GORDON CREEK 2/7/8 MINES
2003**

**RECLAIMED AREAS
&
THE MOUNTAIN BRUSH/ GRASS
REFERENCE AREA**



Prepared by

MT. NEBO SCIENTIFIC, INC.
330 East 400 South, Suite 6
Springville, Utah 84663
(801) 489-6937

Patrick D. Collins, Ph.D.

for

CANYON FUEL COMPANY
HC 35 Box 380
Helper, Utah 84526

June 2004



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**VEGETATION MONITORING
FOR PHASE II BOND RELEASE
AT THE
GORDON CREEK 2/7/8 MINES
2003**

INTRODUCTION

Gordon Creek 2/7/8 is an area where coal mining has been conducted for many years. Recently, the area has been reclaimed or restored to a condition that is closer to what it was prior to disturbances made by mining activities. After sealing the portals, performing earthwork to bring the area back to approximate original contours and reclaiming all right-of-ways, final seeding was accomplished using seeds of native and approved introduced plant species (see Fig. 1). Final seeding for most of the area occurred in October 1998 with follow-up seeding on the regraded roads in October 1999.

The following report has been prepared to monitor the current condition of the vegetation in the restored or *Reclaimed Areas* at Gordon Creek 2/7/8 Mines. The Reclaimed Areas will be compared to a *Reference Area* that was chosen and approved as a standard for final revegetation success. This report was prepared to accompany an application by Canyon Fuel Company to the State of Utah, Division of Oil, Gas & Mining (DOG M) for **Phase II Bond Release**.

The Gordon Creek 2/7/8 mine site is located in the Bryner Canyon and Beaver Creek area at about 8,000 ft elevation in Carbon County, Utah. General plant communities surrounding the area include Mountain Brush/Grass, Oak Shrubland, Sagebrush/Grass, Aspen, and Douglas Fir.

SHRUBS	
Bitterbrush	(<i>Purshia tridentata</i>)
Mtn. Mahogany	(<i>Cercocarpus ledifolius</i>)
Rubber rabbitbrush	(<i>Chrysothamnus nauseosus</i>)
Blue elderberry	(<i>Sambucus caerulea</i>)
Snowberry	(<i>Symphoricarpos albus</i>)
Sagebrush	(<i>Artemisia tridentata</i> ssp. <i>vaseyana</i>)
FORBS	
Northern sweetvetch	(<i>Hedysarum boreale</i>)
Cicer milkvetch	(<i>Astragalus cicer</i>)
Purple daisy fleabane	(<i>Erigeron corymbosus</i>)
Little sunflower	(<i>Helianthella uniflora</i>)
Rocky Mt. penstemon	(<i>Penstemon strictus</i>)
Yellow sweet clover	(<i>Melilotus officinalis</i>)
Alfalfa (Ladak)	(<i>Medicago sativa</i>)
Pacific Aster	(<i>Aster chilensis</i>)
GRASSES	
Thickspike wheatgrass	(<i>Elymus lanceolatus</i>)
Bluebunch wheatgrass	(<i>Elymus spicatus</i>)
Slender wheatgrass	(<i>Elymus trachycaulus</i>)
Indian ricegrass	(<i>Stipa hymenoides</i>)
Gt. Basin wildrye	(<i>Elymus cinereus</i>)

Fig. 1: Final Seed Mixture for the Gordon Creek 2/7/8 Mine Site

METHODS

Methodologies used herein were performed in accordance with the guidelines supplied by DOGM. Quantitative and qualitative data were taken on the vegetation of the Reclaimed Areas and the Mountain Brush/Grass Reference Area. Field work and sampling was conducted in early to mid-September 2003.

Transect and Quadrat Placement

Transect lines for sampling were placed randomly throughout the Reclaimed and Reference Areas. Random/regular placement of sampling quadrats were designed to record data without preconceived bias. This was accomplished in the Reclaimed Areas by establishing several long, random transect lines, each running diagonally along the entire length of the area. At frequent and regular intervals along the transect lines, random numbers were generated and used to measure distances at right angles from the line to determine sample locations. Whether these random numbers were odd or even determined which side of the transect lines (north or south) a given quadrat was measured for placement. The random numbers selected could be high enough to place quadrats to the lateral limits of the Reclaimed Areas as well as all areas in-between. This insured that the sample quadrats were placed randomly over the entire study area in an attempt to adequately represent the site as a whole.

In the Reference Area four separate transect lines were placed randomly for the length of the site. To adequately sample the entire area, random numbers were taken from these transect lines using the same methods as described above for the Reclaimed Areas.

Cover and Composition

Cover estimates were made using ocular methods with meter square quadrats. Species composition and relative frequencies were also assessed from the quadrats. Additional information recorded on the raw data sheets were: estimated precipitation, slope, exposure, grazing use, animal disturbance and other appropriate notes. Plant nomenclature follows "A Utah Flora" (Welsh et al., 1993).

Woody Species Density

Density of woody plant species of the Reclaimed Areas was estimated using belt transects that were 5 ft by 50 ft (250 ft²) in size. The belt transects were placed randomly over the entire length of the Reclaimed Areas. Total number of individuals by species were counted in each of the belt transects. The average number per transect was then used to calculate the number of individuals per acre.

Because the woody species density numbers were visually so much different in the Reference Area when compared to the Reclaimed Areas, different sampling methods were warranted. For the Reference Area, the point quarter method was employed by random methods. Sample locations were chosen using similar methods as those described above to record cover. In this method, the random points were placed on the sample sites and measured into four quarters. The distances to the nearest woody plant species were then recorded in each quarter. The average point-to-individual distance was equal to the square root of the mean area per individual. Again, the number of individuals per acre was the end results of the calculations.

Diversity

Three diversity indices have been reported in this document for the Reclaimed and Reference Areas. MacArthur's Diversity Index is an effective diversity measurement and is computed using the following equation:

$$1/\sum p_i^2$$

where,

p_i is the proportion of sum frequency contributed by the i th species in the sample area of concern.

The proportional contribution of each species is then squared and the values for all species in the sample areas are summed. This index integrates the number of species and the degree to which frequency of occurrence was equitably distributed among those species.

Another diversity measurement was provided that shows the average number of species encountered at each quadrat – or a measure of species diversity. Finally, a third measure of diversity or “richness” is simply the total number of species encountered in the quadrats.

Photographs

Color photographs of the sample areas were taken at the time of sampling and have been submitted with this report.

Raw Data

The raw data for total cover, cover by species, composition, and frequency have been summarized on spreadsheets and have been included in this report.

RESULTS

Reclaimed Areas

The mean total living cover for the Reclaimed Areas was estimated at 64.20% (Table 1-A). The living cover was comprised of 57.21% forbs, 40.52% grasses and 2.26% shrubs (Table 1-B). Woody species density was estimated at 266 plants per acre (Table 1-C).

Three diversity indices have been reported in Table 1-D. The average number of species per meter square was 3.720. Total Diversity using MacArthur's Index was 10.752. Finally, the total number of species encountered in the sample quadrats was 30.

By far, the dominant plant species in the sample quadrats by cover and frequency was alfalfa (*Medicago sativa*), followed by thickspike wheatgrass (*Elymus lanceolatus*), then Cicer milkvetch (*Astragalus cicer*). For a list of species by cover and frequency, refer to Table 2.

Reference Area

The Mountain Brush/Grass Reference Area had a total living cover (overstory plus understory) of 51.88% (Table 3-A), most of which was understory (51.00%). Of the total understory cover, 53.13% were grasses, 43.47% were shrubs and 3.40% were forbs (Table 3-B). The sampling results revealed that the woody species density was 2,225 individuals per acre (Table 3-C).

The three diversity indices for the Reference Area are shown in Table 3-D. The average number of species per meter square was 2.750. Total Diversity using MacArthur's Index was 5.495 whereas, the total number of species encountered in the sample quadrats was 15.0.

The dominant plant species for the Reference Area was the grass, Salina wildrye (*Elymus salinus*). It was present in all of the sample quadrats (Table 4). The next most common species were the shrubs antelope bitterbrush (*Purshia tridentata*) and alder-leaf mountain mahogany (*Cercocarpus montanus*).

Statistical Analyses and Other Comparisons

Several comparisons have been made between the Reclaimed Areas and Reference Area at the Gordon Creek 2/7/8 mine site. First, a Student's t-test was employed to compare the total living cover of the two areas. The Reclaimed Areas had more cover than the Reference Area, the difference was statistically significant (Fig. 2).

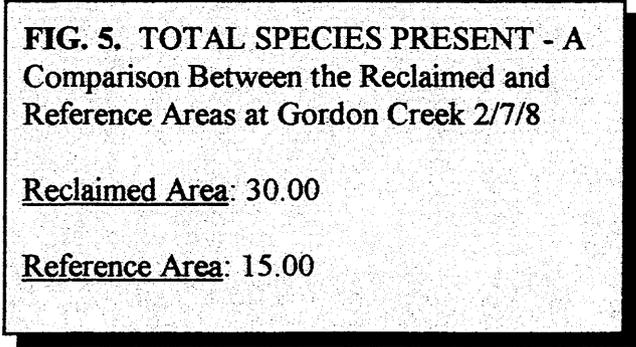
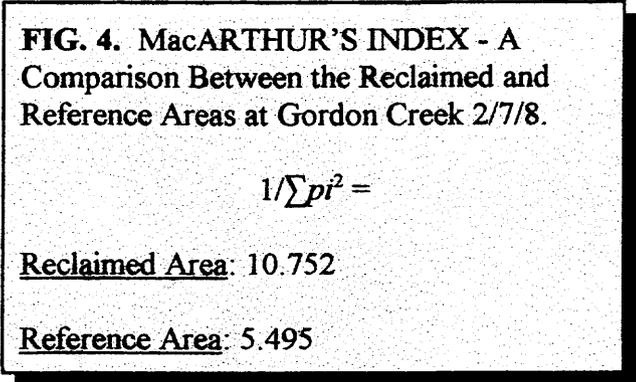
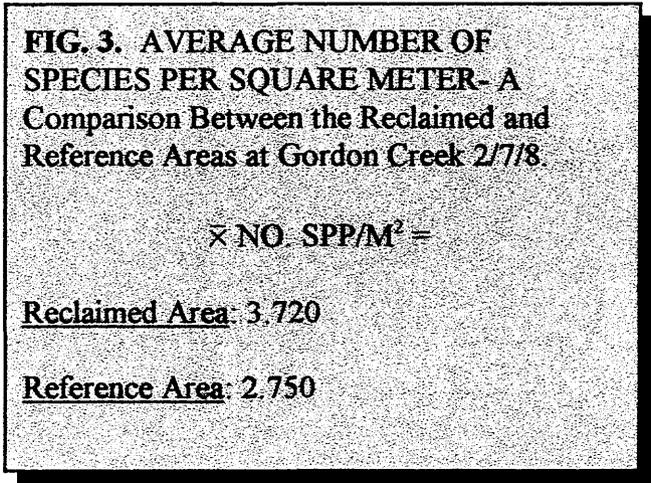
FIG. 2. STUDENT'S T TEST - A
Comparison of Total Living Cover Between
the Reclaimed and Reference Areas at
Gordon Creek 2/7/8.

Reclaimed Area: \bar{x} =64.20; s=10.43; n=75

Reference Area: \bar{x} =51.88; s=15.44; n=40

Next, the average number of species present in the sample quadrats was compared. In this comparison the Reclaimed Areas had a greater average number of species (Fig. 3). The next comparison was a diversity index for each community. MacArthur's Diversity Index for the Reclaimed Area was also greater than the Reference Area (Fig. 4), suggesting great total

diversity. Finally, another diversity-type computation, the total number of species encountered in the sample quadrats, were compared. Again, the Reclaimed Areas value was greater when compared to the Reference Area (Fig. 5).



DISCUSSION

Approval by the State of Utah for the Phase II Bond Release is dependent on several factors. One of the most important conditions is probably whether or not the reclaimed site is controlling erosional sediments, or as stated by the State Rules (R645-301-830): "*No part of the bond or deposit will be released under this paragraph so long as the lands to which the release would be applicable are contributing suspended solids to streamflow or runoff outside the permit area in excess of the requirements set by UCA 40-10-17(j) of the Act and by R645-301-751*". When comparisons of an undisturbed plant community (in this case the Reference Area) were made between those communities that have been disturbed and later revegetated, it has been shown in the RESULTS section that the total cover values, paramount to erosion control, of the Reclaimed Area was statistically greater than the Reference Area.

The State of Utah also encourages the collection of quantitative data that can indicate which plant species are growing on the Reclaimed Areas and how much (quantity) of each of these species are becoming established. Reporting cover by species and frequency enables one to portray this information as well as calculate community diversity, and species diversity. Total living cover has been shown to be significantly greater in the Reclaimed Area when compared to its standard of revegetation success (Reference Area). Three diversity indices suggested that the Reclaimed Area also had greater diversity than the Reference Area. These data and analyses suggests that revegetation at Gordon Creek 2/7/8 is progressing well for living cover, composition, frequency and diversity. Therefore, Phase II bond release through the State of Utah may be warranted.

TABLE 1: Summary of total cover (A), composition (B), woody species density C), and diversity (D) for the Reclaimed Areas of Gordon Creek 2/7/8 Mines (2003).

A.			
TOTAL COVER	% MEAN COVER	STANDARD DEVIATION	SAMPLE SIZE
Total Living	64.20	10.43	75
Litter	8.25	4.29	75
Bareground	16.21	7.81	75
Rock	11.33	6.66	75

B.			
UNDERSTORY COMPOSITION	PERCENT	STANDARD DEVIATION	SAMPLE SIZE
Shrubs	2.26	8.53	75
Forbs	57.21	28.46	75
Grasses	40.52	27.37	75

C.	
WOODY SPECIES DENSITY	NUMBER/ACRE
<i>Artemisia tridentata</i>	126.720
<i>Chrysothamnus nauseosus</i>	79.200
<i>Gutierrezia sarothrae</i>	3.168
<i>Purshia tridentata</i>	25.344
<i>Salix exigua</i>	9.504
<i>Symphoricarpos oreophilus</i>	15.840
<i>Rosa woodsii</i>	3.168
<i>Sambucus caerulea</i>	<u>3.168</u>
TOTAL	<u>266.112</u>

D.	
DIVERSITY	
Mean No. Species Per Square Meter	3.720
Total Diversity (MacArthur's Index)	10.752
Total Species Present (Richness)	30.000

TABLE 2: Summary of living cover and frequency by species for the Reclaimed Areas of Gordon Creek 2/7/8 Mines (2003).

UNDERSTORY COVER
BY SPECIES

	MEAN COVER	STANDARD DEVIATION	RELATIVE FREQUENCY	SAMPLE SIZE
<u>Trees & Shrubs</u>				
<i>Artemisia tridentata</i>	0.41	2.03	5.33	75
<i>Chrysothamnus nauseosus</i>	0.93	5.40	4.00	75
<i>Gutierrezia sarothrae</i>	0.07	0.57	1.33	75
<i>Symphoricarpos oreophilus</i>	0.11	0.92	1.33	75
<u>Forbs</u>				
<i>Achillea millefolium</i>	0.20	1.28	2.67	75
<i>Artemisia dracunculus</i>	0.07	0.57	1.33	75
<i>Astragalus cicer</i>	6.36	10.99	40.00	75
<i>Cirsium</i> sp.	0.04	0.34	1.33	75
<i>Cynoglossum officinale</i>	0.20	1.28	2.67	75
<i>Equisetum arvense</i>	0.13	1.15	1.33	75
<i>Lepidium montanum</i>	0.07	0.57	1.33	75
<i>Linum lewisii</i>	1.59	3.62	20.00	75
<i>Machaeranthera canescens</i>	0.43	1.67	6.67	75
<i>Medicago sativa</i>	25.57	22.05	70.67	75
<i>Melilotus officinalis</i>	0.07	0.57	1.33	75
<i>Penstemon palmeri</i>	0.27	1.61	2.67	75
<i>Penstemon strictus</i>	1.75	4.54	20.00	75
<i>Viguiera multiflora</i>	0.13	0.81	2.67	75
<u>Grasses</u>				
<i>Agropyron cristatum</i>	1.07	4.62	8.00	75
<i>Bromus carinatus</i>	1.27	3.57	13.33	75
<i>Bromus tectorum</i>	0.13	0.81	2.67	75
<i>Dactylis glomeratus</i>	0.20	1.72	1.33	75
<i>Elymus cinereus</i>	4.49	8.51	33.33	75
<i>Elymus hispidus</i>	1.76	7.20	10.67	75
<i>Elymus junceus</i>	0.07	0.57	1.33	75
<i>Elymus lanceolatus</i>	9.16	12.45	52.00	75
<i>Elymus smithii</i>	2.04	5.33	20.00	75
<i>Elymus spicatus</i>	2.03	5.83	18.67	75
<i>Elymus trachycaulus</i>	0.40	1.96	4.00	75
<i>Poa pratensis</i>	3.20	8.31	20.00	75

TABLE 3: Summary of total cover (A), composition (B), woody species density C), and diversity (D) for the Mountain Brush/Grass Reference Area of Gordon Creek 2/7/8 Mines (2003).

A.			
TOTAL COVER	% MEAN COVER	STANDARD DEVIATION	SAMPLE SIZE
Overstory Living (o)	0.88	3.85	40
Understory living (u)	51.00	15.05	40
Litter	13.75	6.87	40
Bareground	16.00	9.43	40
Rock	19.25	10.10	40
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Total Living (o+u)	51.88	15.44	40
B.			
UNDERSTORY COMPOSITION	PERCENT	STANDARD DEVIATION	SAMPLE SIZE
Shrubs	43.47	22.48	40
Forbs	3.40	6.80	40
Grasses	53.13	22.50	40
C.			
WOODY SPECIES DENSITY	NUMBER/ACRE		
<i>Amelanchier utahensis</i>	264.27		
<i>Artemisia tridentata</i>	27.82		
<i>Artemisia frigida</i>	27.82		
<i>Chrysothamnus viscidiflorus</i>	125.18		
<i>Cercocarpus montanus</i>	542.46		
<i>Eriogonum corymbosum</i>	194.73		
<i>Gutierrezia sarothrae</i>	542.46		
<i>Purshia tridentata</i>	445.09		
<i>Symphoricarpos oreophilus</i>	<u>55.64</u>		
TOTAL	<u>2225.47</u>		
D.			
DIVERSITY			
Mean No. Species Per Square Meter	2.750		
Total Diversity (MacArthur's Index)	5.495		
Total Species Present (Richness)	15.000		

TABLE 4: Summary of living cover and frequency by species for the Mountain/Grass Brush Reference Area of Gordon Creek 2/7/8 Mines (2003).

OVERSTORY COVER
BY SPECIES

	MEAN COVER	STANDARD DEVIATION	RELATIVE FREQUENCY	SAMPLE SIZE
<i>Cercocarpus montanus</i>	0.88	3.85	5.00	40

UNDERSTORY COVER

Trees & Shrubs

<i>Amelanchier utahensis</i>	2.95	5.60	25.00	40
<i>Artemisia frigida</i>	0.13	0.78	2.50	40
<i>Artemisia tridentata</i>	0.18	1.09	2.50	40
<i>Cercocarpus montanus</i>	6.63	13.94	25.00	40
<i>Chrysothamnus viscidiflorus</i>	0.13	0.78	2.50	40
<i>Eriogonum corymbosum</i>	2.63	7.24	15.00	40
<i>Gutierrezia sarothrae</i>	2.23	4.05	30.00	40
<i>Purshia tridentata</i>	7.05	13.07	30.00	40
<i>Symphoricarpos oreophilus</i>	0.13	0.78	2.00	40

Forbs

<i>Eriogonum jamesii</i>	1.33	5.05	10.00	40
<i>Hymenoxys acaulis</i>	0.13	0.78	2.50	40
<i>Machaeranthera grindelioides</i>	0.38	1.73	5.00	40
<i>Stanleya pinnata</i>	1.00	2.29	17.50	40

Grasses

<i>Elymus salinus</i>	26.15	13.07	100.00	40
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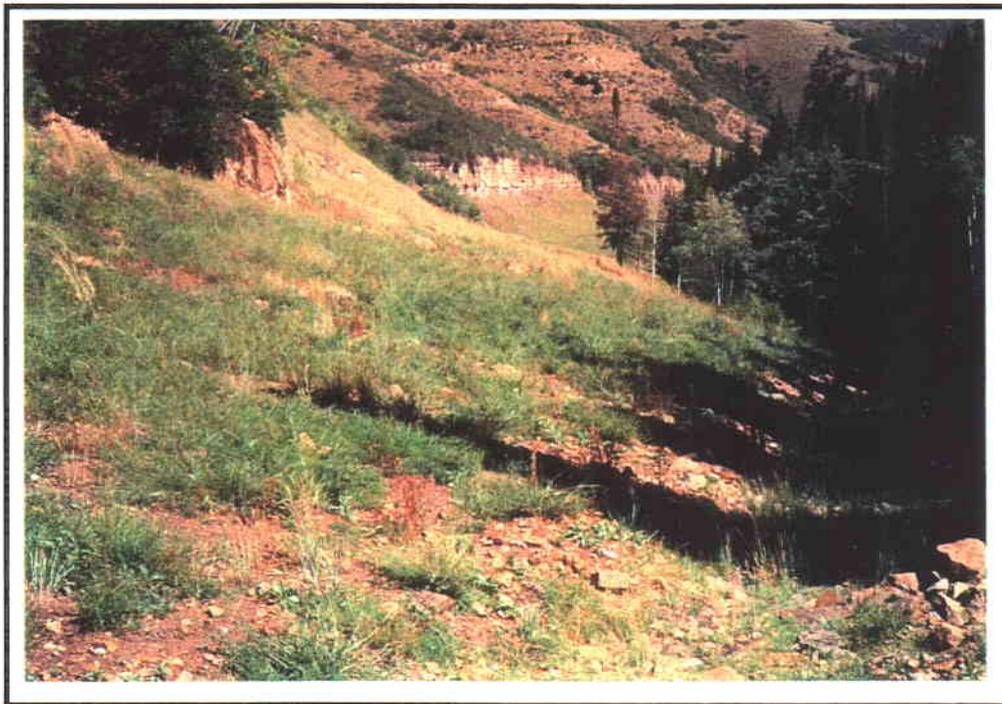
COLOR PHOTOGRAPHS

Reclaimed Areas

(beginning at upper and working to lower elevations)



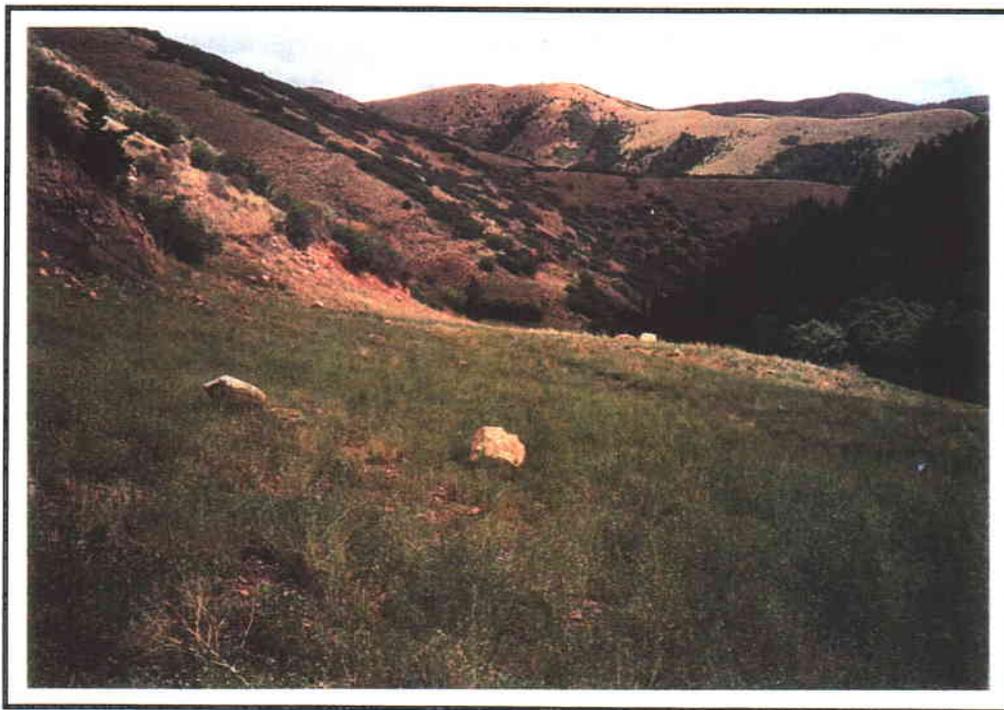
Reclaimed Area (1 of 6)



Reclaimed Area (2 of 6)



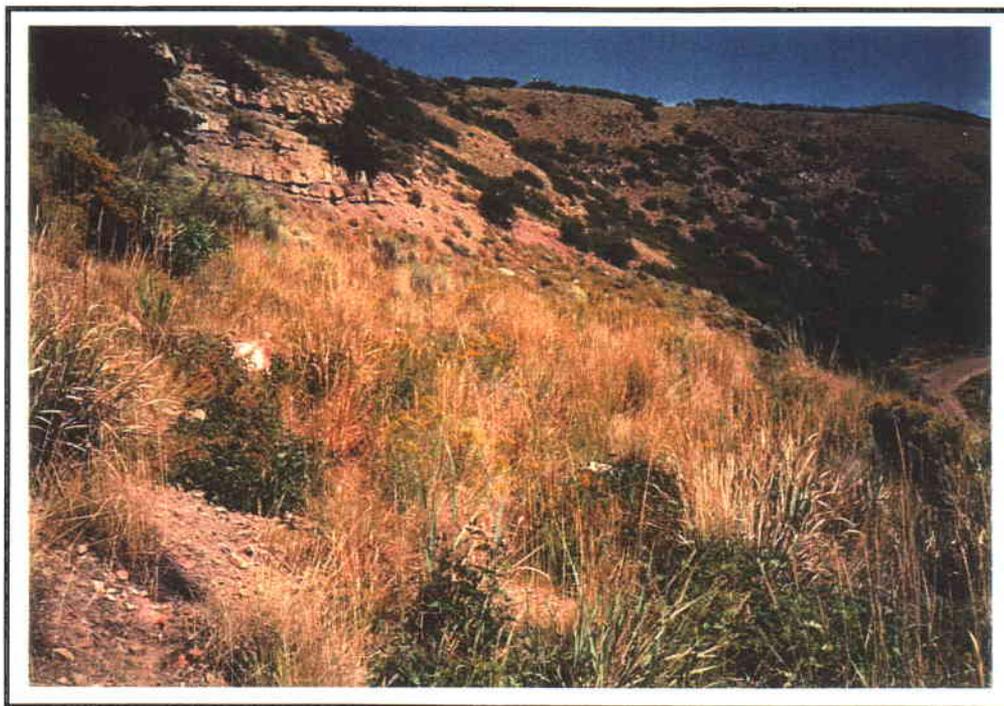
Reclaimed Area (3 of 6)



Reclaimed Area (4 of 6)



Reclaimed Area (5 of 6)

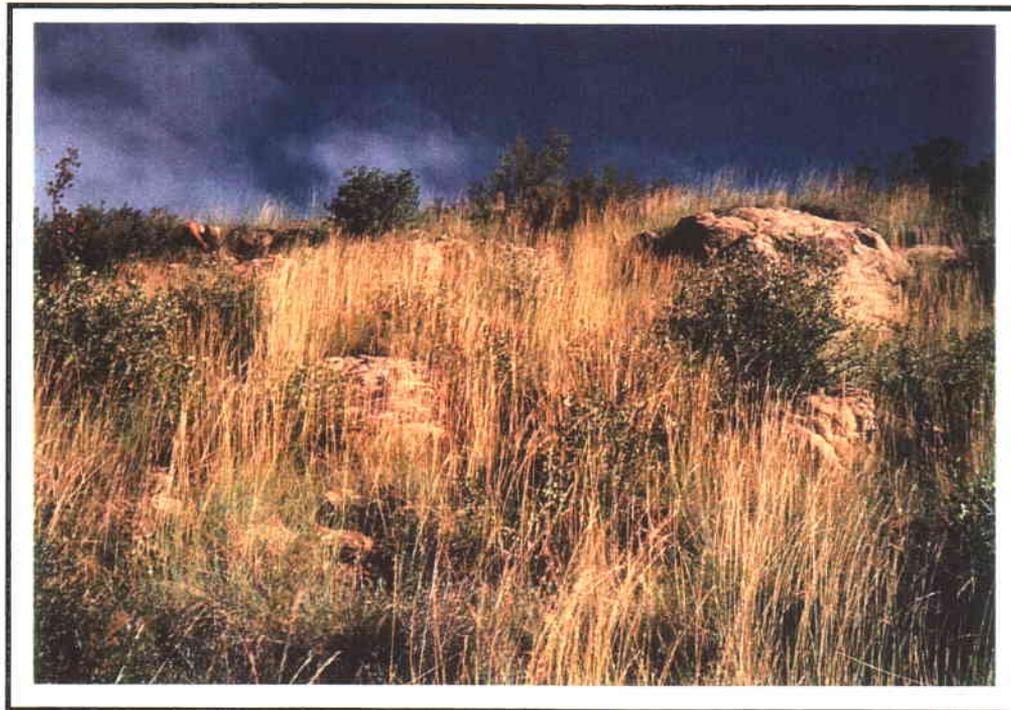


Reclaimed Area - Old Portal Area (6 of 6)

Reference Area



Reference Area (1 of 2)



Reference Area (2 of 2)

APPENDIX
(Raw Data)

CANYON FUELS
 Gordon Creek 2, 7 & 8
 Reclaimed Areas

Exposure: Var
 Slope: Var

From East to West

Sample Date: 10 Sept 03

	1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00
TREES & SHRUBS								
<i>Artemisia tridentata</i>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<i>Chrysothamnus nauseosus</i>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<i>Gutierrezia sarothrae</i>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<i>Symphoricarpos oreophilus</i>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FORBS								
<i>Achillea millefolium</i>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<i>Artemisia dracunculus</i>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<i>Astragalus cicer</i>	0.00	10.00	0.00	0.00	45.00	5.00	15.00	15.00
<i>Cirsium sp.</i>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<i>Cynoglossum officinale</i>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<i>Equisetum arvense</i>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<i>Lepidium montanum</i>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<i>Linum lewisii</i>	5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<i>Machaeranthera canescens</i>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<i>Medicago sativa</i>	40.00	40.00	45.00	45.00	5.00	0.00	0.00	45.00
<i>Mellilotus officinalis</i>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<i>Penstemon palmeri</i>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<i>Penstemon sp.</i>	10.00	5.00	10.00	0.00	5.00	0.00	0.00	0.00
<i>Viguiera multiflora</i>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
GRASSES								
<i>Agropyron cristatum</i>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<i>Bromus carinatus</i>	5.00	10.00	15.00	15.00	0.00	5.00	15.00	5.00
<i>Bromus tectorum</i>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<i>Dactylis glomeratus</i>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<i>Elymus cinereus</i>	0.00	0.00	0.00	0.00	0.00	5.00	5.00	5.00
<i>Elymus hispidus</i>	0.00	10.00	0.00	0.00	10.00	55.00	0.00	0.00
<i>Elymus junceus</i>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<i>Elymus lanceolatus</i>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<i>Elymus smithii</i>	5.00	0.00	0.00	0.00	0.00	0.00	35.00	0.00
<i>Elymus spicatus</i>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<i>Elymus trachycaulis</i>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<i>Poa pratensis</i>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
COVER								
Total Living Cover	65.00	75.00	70.00	60.00	65.00	70.00	70.00	70.00
Litter	5.00	5.00	5.00	10.00	5.00	5.00	5.00	5.00
Bareground	15.00	15.00	20.00	20.00	20.00	15.00	15.00	10.00
Rock	15.00	5.00	5.00	10.00	10.00	10.00	10.00	15.00
% COMPOSITION								
Shrubs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Forbs	84.62	73.33	78.57	75.00	84.62	7.14	21.43	85.71
Grasses	15.38	26.67	21.43	25.00	15.38	92.86	78.57	14.29

9.00	10.00	11.00	12.00	13.00	14.00	15.00	16.00	17.00	18.00	19.00
0.00	0.00	0.00	0.00	0.00	0.00	5.00	0.00	0.00	0.00	3.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	10.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15.00	10.00	0.00	15.00	0.00	0.00	0.00	15.00	10.00	10.00	10.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	5.00	0.00	0.00	0.00	0.00	0.00
25.00	60.00	65.00	45.00	65.00	0.00	10.00	30.00	0.00	0.00	45.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	5.00	5.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	10.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10.00	0.00	0.00	5.00	0.00	0.00	5.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25.00	0.00	10.00	0.00	0.00	50.00	30.00	5.00	30.00	40.00	10.00
0.00	0.00	0.00	0.00	0.00	0.00	5.00	0.00	0.00	10.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.00	10.00	0.00	0.00
75.00	80.00	75.00	70.00	65.00	60.00	70.00	60.00	55.00	60.00	70.00
15.00	5.00	10.00	5.00	10.00	5.00	5.00	5.00	5.00	5.00	5.00
9.00	10.00	1.00	20.00	5.00	20.00	20.00	20.00	25.00	20.00	20.00
1.00	5.00	14.00	5.00	20.00	15.00	5.00	15.00	15.00	15.00	5.00
0.00	0.00	0.00	0.00	0.00	0.00	7.14	0.00	0.00	0.00	4.29
53.33	87.50	86.67	92.86	100.00	16.67	35.71	75.00	27.27	16.67	78.57
46.67	12.50	13.33	7.14	0.00	83.33	57.14	25.00	72.73	83.33	17.14

20.00	21.00	22.00	23.00	24.00	25.00	26.00	27.00	28.00	29.00	30.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	10.00	0.00	5.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	20.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
50.00	10.00	40.00	50.00	20.00	40.00	45.00	40.00	25.00	45.00	55.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	35.00	0.00	0.00	7.00	0.00	10.00	0.00	8.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	10.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20.00	0.00	5.00	30.00	0.00	30.00	0.00	0.00	0.00	5.00	0.00
0.00	0.00	0.00	0.00	8.00	0.00	0.00	15.00	5.00	0.00	0.00
0.00	0.00	5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	5.00	0.00	0.00	0.00	0.00	0.00	0.00	10.00	10.00
70.00	65.00	60.00	80.00	35.00	70.00	75.00	55.00	50.00	70.00	75.00
5.00	10.00	15.00	10.00	5.00	10.00	5.00	10.00	5.00	5.00	20.00
20.00	15.00	20.00	5.00	25.00	10.00	10.00	20.00	20.00	15.00	2.00
5.00	10.00	5.00	5.00	35.00	10.00	10.00	15.00	25.00	10.00	3.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
71.43	46.15	75.00	62.50	57.14	57.14	73.33	72.73	60.00	78.57	73.33
28.57	53.85	25.00	37.50	42.86	42.86	26.67	27.27	40.00	21.43	26.67

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64.00	65.00	66.00	67.00	68.00	69.00	70.00	71.00	72.00	73.00	74.00
0.00	0.00	0.00	0.00	0.00	0.00	8.00	15.00	0.00	0.00	0.00
40.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00
0.00	0.00	0.00	0.00	8.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15.00	35.00	35.00	5.00	0.00	10.00	7.00	10.00	15.00	40.00	5.00
0.00	0.00	0.00	0.00	0.00	0.00	3.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	7.00	0.00	10.00	0.00	10.00	5.00
0.00	0.00	5.00	0.00	7.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	10.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	10.00	10.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	5.00	0.00	0.00	0.00	8.00	0.00	0.00	0.00	0.00	30.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	5.00	0.00	0.00	0.00	5.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	10.00	35.00	15.00	0.00	0.00	5.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10.00	0.00	0.00	35.00	0.00	0.00	12.00	20.00	10.00	10.00	5.00
0.00	5.00	15.00	0.00	0.00	0.00	10.00	0.00	0.00	0.00	5.00
0.00	0.00	0.00	0.00	30.00	0.00	10.00	0.00	35.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.00	0.00	0.00	0.00
65.00	55.00	65.00	40.00	60.00	70.00	65.00	65.00	65.00	65.00	55.00
5.00	10.00	10.00	10.00	15.00	5.00	20.00	25.00	10.00	5.00	5.00
25.00	25.00	20.00	30.00	15.00	20.00	10.00	5.00	15.00	25.00	30.00
5.00	10.00	5.00	20.00	10.00	5.00	5.00	5.00	10.00	5.00	10.00
61.54	0.00	0.00	0.00	13.33	0.00	12.31	23.08	0.00	0.00	9.09
23.08	90.91	76.92	12.50	11.67	50.00	15.38	30.77	23.08	76.92	72.73
15.38	9.09	23.08	87.50	75.00	50.00	72.31	46.15	76.92	23.08	18.18

CANYON FUELS

Gordon Creek 2, 7 & 8

Reclaimed Areas

Exposure: Var

Slope: Var

Sample Date: 10 Sept 03

75.00	Mean	SDev	Freq	
TREES & SHRUBS				
0.00	0.41	2.03	5.33	<i>Artemisia tridentata</i>
0.00	0.93	5.40	4.00	<i>Chrysothamnus nauseosus</i>
0.00	0.07	0.57	1.33	<i>Gutierrezia sarothrae</i>
0.00	0.11	0.92	1.33	<i>Symphoricarpos oreophilus</i>
FORBS				
0.00	0.20	1.28	2.67	<i>Achillea millefolium</i>
0.00	0.07	0.57	1.33	<i>Artemisia dracunculus</i>
10.00	6.36	10.99	40.00	<i>Astragalus cicer</i>
0.00	0.04	0.34	1.33	<i>Cirsium sp.</i>
0.00	0.20	1.28	2.67	<i>Cynoglossum officinale</i>
0.00	0.13	1.15	1.33	<i>Equisetum arvense</i>
0.00	0.07	0.57	1.33	<i>Lepidium montanum</i>
0.00	1.59	3.62	20.00	<i>Linum lewisii</i>
10.00	0.43	1.67	6.67	<i>Machaeranthera canescens</i>
0.00	25.57	22.05	70.67	<i>Medicago sativa</i>
0.00	0.07	0.57	1.33	<i>Melilotus officinalis</i>
0.00	0.27	1.61	2.67	<i>Penstemon palmeri</i>
0.00	1.75	4.54	20.00	<i>Penstemon sp.</i>
0.00	0.13	0.81	2.67	<i>Viguiera multiflora</i>
GRASSES				
0.00	1.07	4.62	8.00	<i>Agropyron cristatum</i>
0.00	1.27	3.57	13.33	<i>Bromus carinatus</i>
0.00	0.13	0.81	2.67	<i>Bromus tectorum</i>
0.00	0.20	1.72	1.33	<i>Dactylis glomeratus</i>
0.00	4.49	8.51	33.33	<i>Elymus cinereus</i>
0.00	1.76	7.20	10.67	<i>Elymus hispidus</i>
0.00	0.07	0.57	1.33	<i>Elymus junceus</i>
30.00	9.16	12.45	52.00	<i>Elymus lanceolatus</i>
15.00	2.04	5.33	20.00	<i>Elymus smithii</i>
0.00	2.03	5.83	18.67	<i>Elymus spicatus</i>
0.00	0.40	1.96	4.00	<i>Elymus trachycaulis</i>
0.00	3.20	8.31	20.00	<i>Poa pratensis</i>
COVER				
65.00	64.20	10.43		Total Living Cover
15.00	8.25	4.29		Litter
10.00	16.21	7.81		Bareground
10.00	11.33	6.66		Rock
% COMPOSITION				
0.00	2.26	8.53		Shrubs
30.77	57.21	28.46		Forbs
69.23	40.52	27.37		Grasses

CANYON FUELS

Gordon Creek 2, 7 & 8

Reference Area

Exposure: SSE

Slope: 33 deg.

Sample Date: 11 Sept 03

	1.00	2.00	3.00	4.00	5.00	6.00	7.00
<hr/>							
OVERSTORY							
<i>Cercocarpus montanus</i>	0.00	0.00	0.00	0.00	0.00	0.00	0.00
UNDERSTORY							
SHRUBS							
<i>Amalanchier utahensis</i>	20.00	0.00	15.00	0.00	0.00	0.00	0.00
<i>Artemisia frigida</i>	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<i>Artemisia tridentata</i>	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<i>Cercocarpus montanus</i>	0.00	0.00	0.00	15.00	0.00	0.00	0.00
<i>Chrysothamnus viscidiflorus</i>	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<i>Eriogonum corymbosum</i>	0.00	0.00	0.00	5.00	25.00	25.00	0.00
<i>Gutierrezia sarothrae</i>	0.00	0.00	5.00	0.00	0.00	0.00	0.00
<i>Purshia tridentata</i>	25.00	20.00	0.00	0.00	0.00	0.00	0.00
<i>Symphoricarpos oreophilus</i>	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FORBS							
<i>Eriogonum jamesii</i>	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<i>Hymenoxys acaulis</i>	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<i>Machaeranthera grindelioides</i>	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<i>Stanleya pinnata</i>	0.00	0.00	0.00	0.00	0.00	0.00	0.00
GRASSES							
<i>Elymus salinus</i>	25.00	20.00	20.00	20.00	20.00	40.00	25.00
<hr/>							
COVER							
Overstory	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Understory	70.00	40.00	40.00	40.00	45.00	65.00	25.00
Litter	5.00	10.00	10.00	10.00	20.00	10.00	25.00
Bareground	20.00	20.00	20.00	40.00	20.00	15.00	35.00
Rock	5.00	30.00	30.00	10.00	15.00	10.00	15.00
<hr/>							
% COMPOSITION							
Shrubs	64.29	50.00	50.00	50.00	55.56	38.46	0.00
Forbs	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grasses	35.71	50.00	50.00	50.00	44.44	61.54	100.00
<hr/>							
Overstory + Understory	70.00	40.00	40.00	40.00	45.00	65.00	25.00
<hr/>							

8.00	9.00	10.00	11.00	12.00	13.00	14.00	15.00	16.00	17.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	25.00	0.00	20.00	20.00	10.00	35.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	15.00	0.00	0.00	0.00	35.00	0.00	0.00	0.00	0.00
0.00	0.00	5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5.00	0.00	0.00	0.00	5.00	0.00	0.00	0.00	0.00	0.00
35.00	50.00	60.00	25.00	20.00	20.00	15.00	30.00	30.00	62.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
40.00	65.00	65.00	50.00	25.00	75.00	35.00	40.00	65.00	70.00
25.00	15.00	5.00	15.00	25.00	10.00	10.00	25.00	10.00	10.00
20.00	10.00	15.00	5.00	30.00	10.00	30.00	15.00	15.00	10.00
15.00	10.00	15.00	30.00	20.00	5.00	25.00	20.00	10.00	10.00
0.00	23.08	7.69	50.00	0.00	73.33	57.14	25.00	53.85	11.43
12.50	0.00	0.00	0.00	20.00	0.00	0.00	0.00	0.00	0.00
87.50	76.92	92.31	50.00	80.00	26.67	42.86	75.00	46.15	88.57
40.00	65.00	65.00	50.00	25.00	75.00	35.00	40.00	65.00	70.00

18.00	19.00	20.00	21.00	22.00	23.00	24.00	25.00	26.00	27.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7.00	0.00	0.00	15.00	15.00	0.00	0.00	0.00	10.00	8.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.00	0.00	0.00
0.00	65.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	10.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	15.00	0.00	10.00	0.00	0.00	0.00	5.00
0.00	0.00	0.00	0.00	0.00	25.00	0.00	50.00	0.00	7.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	30.00	0.00	10.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	5.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.00	0.00
0.00	0.00	0.00	0.00	0.00	5.00	5.00	0.00	0.00	10.00
23.00	10.00	35.00	20.00	45.00	20.00	10.00	13.00	15.00	35.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30.00	75.00	50.00	50.00	60.00	60.00	50.00	70.00	45.00	65.00
15.00	5.00	10.00	5.00	5.00	10.00	5.00	5.00	15.00	15.00
10.00	10.00	25.00	5.00	5.00	15.00	25.00	5.00	10.00	5.00
45.00	10.00	15.00	40.00	30.00	15.00	20.00	20.00	30.00	15.00
23.33	86.67	30.00	60.00	25.00	58.33	0.00	81.43	22.22	30.77
0.00	0.00	0.00	0.00	0.00	8.33	80.00	0.00	44.44	15.38
76.67	13.33	70.00	40.00	75.00	33.33	20.00	18.57	33.33	53.85
30.00	75.00	50.00	50.00	60.00	60.00	50.00	70.00	45.00	65.00

28.00	29.00	30.00	31.00	32.00	33.00	34.00	35.00	36.00	37.00
0.00	15.00	0.00	20.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	15.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	25.00	40.00	10.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	30.00
0.00	5.00	0.00	0.00	0.00	10.00	15.00	7.00	5.00	2.00
25.00	5.00	0.00	0.00	0.00	0.00	0.00	40.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	5.00	8.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	5.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00
20.00	25.00	40.00	20.00	25.00	10.00	10.00	15.00	15.00	13.00
0.00	15.00	0.00	20.00	0.00	0.00	0.00	0.00	0.00	0.00
45.00	35.00	65.00	60.00	35.00	25.00	30.00	70.00	35.00	50.00
10.00	10.00	25.00	30.00	20.00	20.00	25.00	10.00	15.00	10.00
30.00	35.00	5.00	5.00	20.00	20.00	20.00	10.00	15.00	15.00
15.00	20.00	5.00	5.00	25.00	35.00	25.00	10.00	35.00	25.00
55.56	28.57	38.46	66.67	28.57	40.00	50.00	67.14	57.14	64.00
0.00	0.00	0.00	0.00	0.00	20.00	16.67	11.43	0.00	10.00
44.44	71.43	61.54	33.33	71.43	40.00	33.33	21.43	42.86	26.00
45.00	50.00	65.00	80.00	35.00	25.00	30.00	70.00	35.00	50.00

CANYON FUELS
 Gordon Creek 2, 7 & 8
 Reference Area
 Exposure: SSE
 Slope: 33 deg.
 Sample Date: 11 Sept 03

38.00	39.00	40.00	Mean	SDev	Freq	
<hr/>						OVERSTORY
0.00	0.00	0.00	0.88	3.85	5.00	<i>Cercocarpus montanus</i>
<hr/>						UNDERSTORY
<hr/>						SHRUBS
5.00	0.00	0.00	2.95	5.60	25.00	<i>Amalanchier utahensis</i>
0.00	5.00	0.00	0.13	0.78	2.50	<i>Artemisia frigida</i>
0.00	0.00	0.00	0.18	1.09	2.50	<i>Artemisia tridentata</i>
0.00	0.00	0.00	6.63	13.94	25.00	<i>Cercocarpus montanus</i>
0.00	0.00	0.00	0.13	0.78	2.50	<i>Chrysothamnus viscidiflorus</i>
10.00	0.00	0.00	2.63	7.24	15.00	<i>Eriogonum corymbosum</i>
5.00	0.00	5.00	2.23	4.05	30.00	<i>Gutierrezia sarothrae</i>
0.00	5.00	30.00	7.05	13.07	30.00	<i>Purshia tridentata</i>
0.00	0.00	0.00	0.13	0.78	2.50	<i>Symphoricarpos oreophilus</i>
<hr/>						FORBS
0.00	0.00	0.00	1.33	5.05	10.00	<i>Eriogonum jamesii</i>
0.00	0.00	0.00	0.13	0.78	2.50	<i>Hymenoxys acaulis</i>
0.00	0.00	0.00	0.38	1.73	5.00	<i>Machaeranthera grindelioides</i>
0.00	0.00	5.00	1.00	2.29	17.50	<i>Stanleya pinnata</i>
<hr/>						GRASSES
45.00	40.00	25.00	26.15	13.07	100.00	<i>Elymus salinus</i>
<hr/>						COVER
0.00	0.00	0.00	0.88	3.85		Overstory
65.00	50.00	65.00	51.00	15.05		Understory
15.00	15.00	15.00	13.75	6.87		Litter
10.00	5.00	5.00	16.00	9.43		Bareground
10.00	30.00	15.00	19.25	10.10		Rock
<hr/>						% COMPOSITION
30.77	20.00	53.85	40.71	22.81		Shrubs
0.00	0.00	7.69	6.16	14.74		Forbs
69.23	80.00	38.46	53.13	22.50		Grasses
<hr/>						Overstory + Understory
65.00	50.00	65.00	51.88	15.44		