

APPENDIX D-8 PREMINING VEGETATION ASSESSMENT

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APPENDIX D-8 PREMINING VEGETATION ASSESSMENT

D8.1 INTRODUCTION

This study was implemented to document the plant community types located within the CROELL Redi-Mix Roger's Pit proposed quarry area surveyed in 2008. The extended reference area concept will be applied to this study area and will include at a minimum, all lands within 200 meters of the areas to be affected. Jim Orpet and Russell Tait of Intermountain Resources completed the vegetation survey, data analysis and report preparation for this proposed quarry area.

D8.2 STUDY AREA LOCATION

The permit and study area includes about 600.0 acres located in Crook County, Wyoming. The site is located approximately seven miles east of Sundance, Wyoming. The permit area is specifically located in portions of Sections 25, 26 and 35, T52N R62W. The access to this permit area is by way of the frontage road along I90, east of Sundance, to the Riflepit road.

D8.3 METHODS

Field surveys of the area were conducted from April through July of 2008. These surveys were designed to map plant community types, prepare a plant species list, identify noxious weeds, search for threatened or endangered species (T&E) and sample cover on selected plant community types. Cover data was collected in late June and early July of 2008 for the Upland Grassland and Rocky Grassland plant community types on the Roger's Pit permit area as agreed upon with the LQD. Field surveys were designed to comply with WDEQ-LQD recommendations for this permit area as outlined in discussions between Intermountain Resources and LQD personnel.



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Plant community types were determined through identification of major plant species, approximate coverage of these species, dominant ground cover classes, and percentage of bare ground.

Vegetation and ground cover class data was collected from 50 meter long transects with a pin drop at one meter intervals for 50 points per transect. The first hit of the pin was recorded for plant species and cover class evaluations. Second hits for vegetation cover were recorded for this study but only first hits were used for data analysis.

Wyoming Department of Environmental Quality - Land Quality Division (WDEQ-LQD) Guideline No. 2 and other WDEQ memoranda provide lists of plant species which are of special concern either due to rarity or because they are noxious weeds. Field work included observations for any species which were listed in these categories.

D8.4 RESULTS

Information gathered during the 2008 field investigations is included in this section. Plant species lists are provided in Addendum D8A, photographs of the study area are presented in Addendum D8B and computer generated data sheets from the 2008 sampling are included in Addendum D8C.

D8.4.1 Mapping

In all, five vegetation/land use map units were delineated within the study area. These map units are outlined on the attached map and Table D8-1 provides a tabulation of the number of total acres each unit comprises within the study area. The map units observed within the study area include Rocky Grassland, Upland Grassland, Hayland, Barren and Disturbed Land.

D8.4.2 Plant Community Type Descriptions



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The plant community types identified on the study area are described in this section. Cover data from the 2008 study is presented in Table D8-2. Sampling data and maps are also included.



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Table D8-1. Plant Community Type and Map Unit Acreage on the CROELL Redi-Mix Roger's Pit Surveyed in 2008.

Plant Community Type/ Map Unit	Study Area Acres	Percent of Area
Rocky Grassland (R)	205.7	34.3
Upland Grassland (U)	203.2	33.9
Hayland (H)	162.5	27.1
Barren (B)	6.6	1.1
Disturbed Land (D)	22.0	3.6
Total	600.0	100.0



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Table D8-2. Absolute and Relative Percent Cover Data for Plant Community Types Sampled on the Roger's Pit in 2008.*

Life Form / Species	Plant Community Type			
	Upland Grassland		Rocky Grassland	
	Absolute	Relative	Absolute	Relative
Perennial Grass				
<i>Agropyron cristatum</i>	0.5	0.7	-	-
<i>Agropyron dasystachyum</i>	0.3	0.4	-	-
<i>Agropyron intermedium</i>	1.5	2.2	-	-
<i>Agropyron smithii</i>	10.3	14.8	0.3	1.2
<i>Agropyron spicatum</i>	3.2	4.6	4.7	17.4
<i>Aristida purpurea</i>	-	-	0.3	1.2
<i>Bouteloua gracilis</i>	3.4	4.9	-	-
<i>Bromus inermis</i>	2.3	3.3	-	-
<i>Calamovilfa longifolia</i>	0.4	0.6	0.4	1.6
<i>Koeleria macrantha</i>	2.2	3.2	0.5	1.9
<i>Poa secunda</i>	0.8	1.2	1.4	5.3
<i>Schizachyrium scoparium</i>	1.3	1.9	2.4	8.8
<i>Stipa comata</i>	16.5	23.8	2.1	7.7
<i>Stipa viridula</i>	<u>3.0</u>	<u>4.3</u>	<u>0.1</u>	<u>0.2</u>
Subtotal	45.7	65.9	12.2	45.3
Grass-like				
<i>Carex filifolia</i>	7.9	11.4	1.4	5.1
Perennial Forb				
<i>Antennaria dimorpha</i>	0.1	0.1	-	-
<i>Antennaria rosea</i>	0.2	0.3	-	-
<i>Aster sp.</i>	0.1	0.1	-	-
<i>Besseyia wyomingensis</i>	0.2	0.3	-	-
<i>Campanula rotundifolia</i>	-	-	0.1	0.5
<i>Castilleja sessiliflora</i>	-	-	0.2	0.7
<i>Cerastium arvense</i>	0.1	0.1	-	-
<i>Comandra umbellatum</i>	-	-	0.2	0.7
<i>Dodecatheon conjugens</i>	-	-	0.1	0.5
<i>Erigeron pumilus</i>	-	-	0.1	0.5
<i>Gaura coccinea</i>	0.3	0.4	0.1	0.2
<i>Geum triflorum</i>	0.1	0.1	-	-
<i>Grindelia squarrosa</i>	0.1	0.1	0.3	0.9
<i>Helianthella quinquenervis</i>	0.4	0.6	-	-
<i>Heterotheca villosa</i>	0.2	0.3	3.8	14.0

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Table D8-2. Absolute and Relative Percent Cover Data (Continued).

Life Form / Species	Plant Community Type			
	Upland Grassland		Rocky Grassland	
	Absolute	Relative	Absolute	Relative
<u>Perennial Forb (Cont.)</u>				
<i>Hymenoxys acaulis</i>	-	-	0.9	3.5
<i>Linum lewisii</i>	0.1	0.1	-	-
<i>Liatris punctata</i>	0.1	0.1	-	-
<i>Lygodesmia juncea</i>	0.3	0.4	-	-
<i>Machaeranthera grindelioides</i>	-	-	0.1	0.2
<i>Mellilotus officinalis</i>	0.3	0.4	-	-
<i>Medicago sativa</i>	0.1	0.1	-	-
<i>Paronychia depressa</i>	0.3	0.4	1.2	4.4
<i>Penstemon</i> sp.	-	-	0.1	0.2
<i>Phlox hoodii</i>	0.7	1.0	0.1	0.5
<i>aPhlox multiflora</i>	0.5	0.7	0.2	0.7
<i>Psoralea argophylla</i>	0.5	0.7	-	-
<i>Ratibida columnifera</i>	0.1	0.1	-	-
<i>Sedum lanceolatum</i>	-	-	0.1	0.2
<i>Senecio canus</i>	-	-	0.3	1.2
<i>Sphaeralcea coccinea</i>	0.5	0.7	0.1	0.2
<i>Taraxacum officinale</i>	0.2	0.3	0.1	0.2
<i>Tragopogon dubius</i>	0.1	0.1	-	-
<i>Vicia americana</i>	0.1	0.1	-	-
Unknown Perennial Forb	-	-	0.1	0.2
Subtotal	5.7	8.2	7.9	29.5
<u>Subshrub</u>				
<i>Artemisia frigida</i>	1.6	2.3	1.6	6.0
<i>Artemisia ludoviciana</i>	0.1	0.1	-	-
<i>Eriogonum pauciflorum</i>	-	-	0.9	3.3
<i>Gutierrezia sarothrae</i>	0.2	0.3	1.8	6.5
Subtotal	1.9	2.7	4.3	15.8
<u>Shrub</u>				
<i>Juniperus horizontalis</i>	-	-	0.2	0.7
<i>Rosa woodsii</i>	0.7	1.0	-	-
Subtotal	0.7	1.0	0.2	0.7
Total Perennials	61.9	89.2	25.9	96.5



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Table D8-2. Absolute and Relative Percent Cover Data (Continued).

Life Form / Species	Plant Community Type			
	Upland Grassland		Rocky Grassland	
	Absolute	Relative	Absolute	Relative
<u>Annual Grass</u>				
<i>Bromus japonicus</i>	4.6	6.6	0.5	1.9
<i>Bromus tectorum</i>	<u>1.8</u>	<u>2.6</u>	<u>0.2</u>	<u>0.7</u>
Subtotal	6.4	9.2	0.7	2.6
<u>Annual Forb</u>				
<i>Alyssum alyssoides</i>	1.0	1.4	0.3	0.9
<i>Camelina microcarpa</i>	<u>0.1</u>	<u>0.1</u>	-	-
Subtotal	1.1	1.6	0.3	0.9
Total Annuals	<u>7.5</u>	<u>10.8</u>	<u>0.9</u>	<u>3.5</u>
Total Vegetation Cover	69.4	100.0	26.9	100.0
Lichens	0.1	-	0.1	-
Litter	21.2	-	8.9	-
Rock	0.2	-	7.4	-
Total Ground Cover	90.9	-	43.3	-
Bare Ground	9.1	-	56.7	-

* Additions may not always equal totals due to computer rounding.

Absolute = Absolute Percent Cover Value

Relative = Relative Percent Cover Value



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Rocky Grassland (R)

The Rocky Grassland plant community type is the most common type mapped on the Roger's Pit permit area. This type makes up approximately 205.7 acres or about 34.3 percent of the permit area. Total vegetation cover and total ground cover were relatively low on this map unit due to the lack of topsoil. This type was dominated by perennial grass species with approximately 45.3 percent of the relative cover. Bluebunch wheatgrass (*Agropyron spicatum*) was the single most dominant species encountered on this type as shown in Table D8-2. Other common plant species recorded on this vegetation type were hairy goldenaster (*Heterotheca villosa*), little bluestem (*Schizachyrium scoparium*), needleandthread (*Stipa comata*) and fringed sagewort (*Artemisia frigida*). Perennial plant species made up approximately 96.5 percent of the total relative vegetation cover while annual grass and forb species made up approximately 3.5 percent of the relative vegetation cover. Shrub density was not required or collected on this area in 2008 but few shrubs were present. Statistical analysis for this plant community type are shown in Table D8-3 and indicates that both the total vegetation and the total ground cover parameters met sample adequacy.

Upland Grassland (U)

The Upland Grassland plant community type was the second most common type on the permit area, comprising approximately 33.9 percent of the surface area with 203.2 acres. Total vegetation cover and total ground cover were relatively good on this area due to the abundant suitable topsoil. Vegetation sampling on this type shows that perennial grasses make up approximately 65.9 percent of the total relative vegetative cover as shown in Table D8-2. Needleandthread was the most common species recorded on this plant community type followed by western wheatgrass (*Agropyron smithii*), threadleaf sedge (*Carex filifolia*), Japanese chess

(*Bromus*



Table D8-3. Statistical Evaluations for the Cover Data Collected on the CROELL Redi-Mix Roger's Pit in 2008.

Plant community type	<u>Parameters</u>			
	\bar{X}	S	N	NS
<u>Rocky Grassland</u>				
Total Vegetation Cover (%)	26.9	7.9	32	29
Total Ground Cover (%)	43.3	13.1	32	30
<u>Upland Grassland</u>				
Total Vegetation Cover (%)	69.4	6.5	20	3
Total Ground Cover (%)	90.9	3.3	20	1

\bar{X} = Mean
 S = Sample Standard Deviation
 N = Number of Samples Taken
 NS = Number of Samples Required to Meet Sample Adequacy
 (%) = Percent

japonicus) and blue grama (*Bouteloua gracilis*). Perennial species made up 89.2 percent of the total relative vegetation cover on this vegetation type while annual species made up about 10.2 percent of the total relative vegetation cover. Shrub density was not required or collected on this type in 2008 but few shrubs were observed. Sample adequacy was met for both total vegetation cover and total ground cover on this vegetation type in 2008. Table D8-3 displays statistical evaluations of cover data for the samples collected in 2008 on this permit area.

Hayland (H)

Seven areas seeded to hayland are located within the permit area. These hayland areas varied in size and attributed to 27.1 percent of the permit area or about 162.5 acres. These haylands were dominated by either smooth brome (*Bromus inermis*), intermediate



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wheatgrass (*Agropyron intermedium*) or a combination of both species. A minor amount of alfalfa (*Medicago sativa*) is also present. Vegetation cover samples were not collected on this type in 2008 as agreed upon with LQD. Hay from these lands is generally harvested every year.

Barren (B)

The Barren land map unit, which was scattered throughout the permit area, occupied approximately 6.6 acres or 1.1 percent of the permit area. Vegetation was either absent or very sparse. Vegetation which is present on this type included hairy goldenaster, nailwort (*Paronychia depressa*), fringed sagewort, broom snakeweed (*Gutierrezia sarothrae*) and bluebunch wheatgrass. Cover samples were not collected on this type in 2008 as agreed upon with LQD due to the lack of vegetation.

Disturbed Land (D)

The Disturbed Land map unit occupied approximately 22.0 acres or 3.6 percent of the permit area. This type is primarily right-of-way and borrow pit disturbance from the construction of Interstate 90. The dominant species found occurring on this type were seeded and includes crested wheatgrass (*Agropyron cristatum*) and smooth brome. Vegetation cover samples were not collected on this type in 2008 as agreed upon with LQD since this area will not be disturbed.

D8.4.3 Plant Species List

A plant species list developed for this permit area is included in Addendum D8A. This list includes species observed during field surveys of the area from April through July of 2008.

D8.5 SPECIES OF SPECIAL CONCERN AND NOXIOUS WEEDS

Plant species of special concern, as listed in Guideline No. 2 or other WDEQ or state memorandum were not encountered on the area to be affected. Threatened or Endangered (T&E) plant species were not found on the area and habitat is not present to support T&E



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species. Numerous noxious weed species were found within this permit area. These species included Canada thistle (*Cirsium arvense*), Scotch thistle (*Onopordum acanthium*), field bindweed (*Convolvulus arvensis*) and houndstongue (*Cynoglossum officinale*).

Cheatgrass brome (*Bromus tectorum*), an annual grass, is not designated as a noxious weed in WDEQ-LQD Guideline No. 2 but is considered a noxious weed in much of Wyoming. Annual grasses comprised from 2.6 to 9.2 percent of the total relative vegetative cover on the 2008 study areas with Japanese brome being the most common species encountered.

Selenium indicator species were not observed on the study area in 2008.

D8.6 CONCLUSION

The plant community type and map unit data presented in this report presents the pre-mine baseline data for the Roger's Pit permit area as required and will provide goals for bond release following mining. Adjacent areas which will not be affected by mining will be used for future bond release studies under the extended reference area concept. No T&E species were found within the permit area and habitat is not present on site to support currently listed T&E species. State listed noxious weeds are present on the site but selenium indicator plants were not observed.



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D8.7 REFERENCES

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ADDENDUM D8A
PLANT SPECIES LIST

D8A



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List of Plant Species Recorded on the Roger's Quarry Permit Area for CROELL Redi-Mix.

Code	Scientific Name	Common Name
<u>Perennial Grass</u>		
AGCR	<i>Agropyron cristatum</i>	Crested wheatgrass
AGDA	<i>Agropyron dasystachyum</i> (<i>Elymus lanceolatus</i>)	Thickspike wheatgrass
AGEL	<i>Agropyron elongatum</i> (<i>Elytrigia elongata</i>)	Tall wheatgrass
AGIN	<i>Agropyron intermedium</i> (<i>Elymus hispidus</i>)	Intermediate wheatgrass
AGSM	<i>Agropyron smithii</i> (<i>Elymus smithii</i>)	Western wheatgrass
AGSP	<i>Agropyron spicatum</i> (<i>Elymus spicatum</i>)	Bluebunch wheatgrass
ARPU	<i>Aristida purpurea</i>	Threeawn
BOGR	<i>Bouteloua gracilis</i>	Blue grama
BRIN	<i>Bromus inermis</i>	Smooth brome
CALO	<i>Calamovilfa longifolia</i>	Prairie sandreed
DAUN	<i>Danthonia unispicata</i>	Onespike danthonia
ELJU	<i>Elymus junceus</i>	Russian wildrye
HOJU	<i>Hordeum jubatum</i>	Foxtail barley
KOMA	<i>Koeleria macrantha</i>	Prairie junegrass
ORHY	<i>Oryzopsis hymenoides</i>	Indian ricegrass
POAM	<i>Poa ampla</i>	Big bluegrass
POPR	<i>Poa pratensis</i>	Kentucky bluegrass
POSE	<i>Poa secunda</i>	Sandberg bluegrass
SCSC	<i>Schizachyrium scoparium</i>	Little bluestem
SCPA	<i>Schedonnardus paniculatus</i>	Tumblegrass
SIHY	<i>Sitanion hystrix</i>	Bottlebrush squirreltail
STCO	<i>Stipa comata</i>	Needleandthread
STVI	<i>Stipa viridula</i>	Green needlegrass
<u>Grass-like</u>		
CAFI	<i>Carex filifolia</i>	Threadleaf sedge
<u>Perennial Forb</u>		
ACMI	<i>Achillea millefolium</i>	Western yarrow
AGGL	<i>Agoseris glauca</i>	Pale agoseris
ALTE	<i>Allium textile</i>	Prairie onion
ANDI	<i>Antennaria dimorpha</i>	Low pussytoes
ANMI	<i>Antennaria microphylla</i>	Littleleaf pussytoes



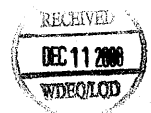
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Code	Scientific Name	Common Name
<u>Perennial Forb (Continued)</u>		
ANRO	<i>Antennaria rosea</i>	Rose pussytoes
ARHO	<i>Arenaria hookeri</i>	Hooker sandwort
ARFU	<i>Arnica fulgens</i>	Orange arnica
AST	<i>Astragalus</i> sp.	Milkvetch
BEWY	<i>Besseyia wyomingensis</i>	Wyoming kittentails
CANU	<i>Calochortus nuttallii</i>	Mariposa lily
CARO	<i>Campanula rotundifolia</i>	Bluebell
CAFL	<i>Castilleja flava</i>	Yellow Indian paintbrush
CASE	<i>Castilleja sessiliflora</i>	Indian paintbrush
CEAR	<i>Cerastium arvense</i>	Field cerastium
CIAR	<i>Cirsium arvense</i>	Canada thistle
CIUN	<i>Cirsium undulatum</i>	Wavyleaf thistle
COUM	<i>Comandra umbellata</i>	Bastard toadflax
COAR	<i>Convolvulus arvensis</i>	Field bindweed
CRCE	<i>Cryptantha celosioides</i>	Northern cryptantha
CRAC	<i>Crepis acuminata</i>	Tapertip hawksbeard
CRBR	<i>Cryptantha bradburiana</i>	Miner's candle
DACA	<i>Dalea candida</i>	White prairieclover
DAPU	<i>Dalea purpurea</i>	Purple prairie clover
DEBI	<i>Delphinium bicolor</i>	Little larkspur
DOCO	<i>Dodecatheon conjugens</i>	Sailorscaps shootingstar
EROC	<i>Erigeron ochroleucus</i>	Buff fleabane
ERPU	<i>Erigeron pumilus</i>	Daisy fleabane
ERUM	<i>Eriogonum umbellatum</i>	Sulfur wildbuckwheat
ERAS	<i>Erysimum asperum</i>	Plains wallflower
GABO	<i>Galium boreale</i>	Northern bedstraw
GACO	<i>Gaura coccinea</i>	Scarlet Gaura
GETR	<i>Geum triflorum</i>	Prairie smoke
GLLE	<i>Glycyrrhiza lepidota</i>	American licorice
GRSQ	<i>Grindelia squarrosa</i>	Curlycup gumweed
HASP	<i>Haplopappus spinulosus</i>	Ironplant goldenweed
HEQU	<i>Helianthella quinquenervis</i>	Fivenerve helianthella
HEVI	<i>Heterotheca villosa</i>	Hairy goldenaster
HYFI	<i>Hymenopappus filifolius</i>	Fineleaf hymenopappus
HYAC	<i>Hymenoxys acaulis</i>	Stemless actinea
LELU	<i>Lesquerella ludoviciana</i>	Foothill bladderpod
LEMO	<i>Leucocrinum montanum</i>	Common starlily



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Code	Scientific Name	Common Name
<u>Perennial Forb (Continued)</u>		
LIPU	<i>Liatris punctata</i>	Dotted gayfeather
LILE	<i>Linium lewisii</i>	Lewis flax
LYJU	<i>Lygodesmia juncea</i>	Skeleton plant
MAGR	<i>Machaeranthera grindelioides</i>	Spiny aster
MESA	<i>Medicago sativa</i>	Alfalfa
MELA	<i>Mertensia lanceolata</i>	Bluebell
MEOF	<i>Melilotus officinalis</i>	Yellow sweetclover
OECO	<i>Oenothera coronopifolia</i>	Crownleaf eveningprimrose
OECA	<i>Oenothera caespitosa</i>	Tufted eveningprimrose
ONAC	<i>Onopordum acanthium</i>	Scotch thistle
ORFA	<i>Orobanche fasciculata</i>	Cancer root
OXSE	<i>Oxytropis sericea</i>	Silky loco
PADE	<i>Paronychia depressa</i>	Nailwort
PEN	<i>Penstemon</i> sp.	Penstemon
PEER	<i>Penstemon eriantherus</i>	Fuzzytongue penstemon
PHHO	<i>Phlox hoodii</i>	Hoods phlox
PHMU	<i>Phlox multiflora</i>	Flowery phlox
PIOP	<i>Picradeniopsis oppositifolia</i>	Picradeniopsis
POAN	<i>Potentilla anserina</i>	Silverweed cinquefoil
POT	<i>Potentilla</i> sp.	Cinquefoil
PSAR	<i>Psoralea argophylla</i>	Silverleaf scurfpea
PSTE	<i>Psoralea tenuiflora</i>	Slimflower scurfpea
RACO	<i>Ratibida columifera</i>	Prairie coneflower
SELA	<i>Sedum lanceolatum</i>	Stonecrop
SECA	<i>Senecio canus</i>	Woolly groundsel
SEIN	<i>Senecio integerrimus</i>	Lambstongue groundsel
SOMI	<i>Solidago missouriensis</i>	Missouri goldenrod
SPCO	<i>Sphaeralcea coccinea</i>	Scarlet globemallow
TAOF	<i>Taraxacum officinale</i>	Dandelion
THRH	<i>Thermopsis rhombifolia</i>	Prairie thermopsis
TROC	<i>Tradescantia occidentalis</i>	Spiderwort
TRDU	<i>Tragopogon dubius</i>	Yellow salsify
TRI	<i>Trifolium</i> sp.	Clover
VIAM	<i>Vicia americana</i>	American vetch
ZIVE	<i>Zigadenus venenosus</i>	Meadow deathcamus



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Code	Scientific Name	Common Name
<u>Subshrub</u>		
ARFR	<i>Artemisia frigida</i>	Fringed sagewort
ARLU	<i>Artemisia ludoviciana</i>	Louisiana sagewort
ERPA	<i>Eriogonum pauciflorum</i>	Wildbuckwheat
GUSA	<i>Gutierrezia sarothrae</i>	Broom snakeweed
YUGL	<i>Yucca glauca</i>	Yucca
<u>Shrub</u>		
JUHO	<i>Juniperus horizontalis</i>	Creeping juniper
PRVI	<i>Prunus virginiana</i>	Chokecherry
RIB	<i>Ribes</i> sp.	Current
ROWO	<i>Rosa woodsii</i>	Woods rose
SYOC	<i>Symphoricarpos occidentalis</i>	Western snowberry
<u>Succulent</u>		
OPPO	<i>Opuntia polyacantha</i>	Prickly pear
PESO	<i>Pediocactus simpsonii</i>	Barrel cactus
<u>Annual Grass</u>		
BRCO	<i>Bromus commutatus</i>	Hairy brome
BRJA	<i>Bromus japonicus</i>	Japanese chess
BRTE	<i>Bromus tectorum</i>	Cheatgrass
VUOC	<i>Vulpia octoflora</i>	Sixweeksgrass
<u>Annual Forb</u>		
ALAL	<i>Alyssum alyssoides</i>	Pale alyssum
ARHOL	<i>Arabis holboellii</i>	Holboell rockcress
CAMI	<i>Camelina microcarpa</i>	Smallseed falseflax
CHAL	<i>Chenopodium album</i>	Lambsquarter goosefoot
CHTE	<i>Chorispora tenella</i>	Little blue mustard
COLI	<i>Collomia linearis</i>	Collomia
CYOF	<i>Cynoglossum officinale</i>	Western houndstongue
DEPI	<i>Descurainia pinnata</i>	Pinnate tansymustard
DESO	<i>Descurainia sophia</i>	Flixweed tansymustard
EUGL	<i>Euphorbia glyptosperma</i>	Ridgeseed spurge
EUSP	<i>Euphorbia spathulata</i>	Warty spurge
FIAR	<i>Filago arvensis</i>	Filago
HEAN	<i>Helianthus annuus</i>	Annual sunflower
KOSC	<i>Kochia scoparia</i>	Summer cypress



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Code	Scientific Name	Common Name
<u>Annual Forb (Continued)</u>		
LARE	<i>Lappula redowskii</i>	Bluebur stickseed
LEDE	<i>Lepidium densiflorum</i>	Prairie pepperweed
LEPE	<i>Lepidium perfoliatum</i>	Clasping pepperweed
PLPA	<i>Plantago patagonica</i>	Wooly plantain
POAV	<i>Polygonum aviculare</i>	Prostrate knotweed
PSES	<i>Psoralea esculentum</i>	Scurfpea
SAKA	<i>Salsola kali</i>	Russian thistle
SIAL	<i>Sisymbrium altissimum</i>	Tumbling hedge mustard
THAR	<i>Thlaspi arvense</i>	Field pennycress
XAST	<i>Xanthium strumarium</i>	Cocklebur
<u>Moss/Lichen</u>		
SEDE	<i>Selaginella densa</i>	Spikemoss



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ADDENDUM D8B
PHOTOGRAPHS

D8B



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Photo 1. Rocky Grassland Type on the Roger's Pit area in July of 2008.



Photo 2. Upland Grassland Type on the Roger's Pit area in July of 2008.

D8B-1



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Photo 3. Hayland Type on the Roger's Pit area in July of 2008.



Photo 4. Barren Type on the Roger's Pit area in July of 2008.

D8B-2



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Photo 5. Disturbed Land Type on the Roger's Pit area in July of 2008



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ADDENDUM D8C
DATA SHEETS

D8C



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CROELL Redi-Mix - Roger's Pit
 Rocky Grassland
 Cover Data (6/30-7/1/2008)

Life Form / Species	Transect														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Perennial Grass															
<i>Agropyron smithii</i>	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
<i>Agropyron spicatum</i>	4	1	1	4	2	1	5	4	3	0	1	3	1	1	8
<i>Aristida purpurea</i>	0	0	0	0	0	0	0	1	0	4	0	0	0	0	0
<i>Calamovilfa longifolia</i>	1	0	1	0	1	0	0	0	0	1	0	0	0	0	0
<i>Koeleria macrantha</i>	0	0	0	0	2	0	0	0	1	0	0	0	0	1	0
<i>Poa secunda</i>	0	1	1	1	1	1	0	0	3	0	2	0	1	1	0
<i>Schizachyrium scoparium</i>	7	0	0	3	0	0	0	1	0	1	0	5	0	0	2
<i>Stipa comata</i>	0	0	0	0	1	4	0	0	3	0	3	0	0	5	0
<i>Stipa viridula</i>	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
Grasslike															
<i>Carex filifolia</i>	1	0	1	0	0	0	2	0	0	1	0	0	1	2	0
Perennial Forb															
<i>Campanula rotundifolia</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<i>Castilleja sessiliflora</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
<i>Comandra umbellatum</i>	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
<i>Dodecatheon conjugens</i>	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0
<i>Erigeron pumilus</i>	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
<i>Gaura coccinea</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<i>Grindelia squarrosa</i>	0	1	0	1	0	0	0	0	0	1	0	1	0	0	0
<i>Heterotheca villosa</i>	1	5	4	2	1	3	2	1	1	2	2	1	4	2	0
<i>Hymenoxys acaulis</i>	5	0	0	0	0	0	0	0	0	1	0	0	0	0	0
<i>Machaeranthera grindelioides</i>	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
<i>Paronychia depressa</i>	0	1	0	0	1	0	0	1	1	0	1	1	0	0	0
<i>Penstemon sp.</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<i>Phlox hoodii</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<i>Phlox multiflora</i>	2	0	0	0	0	0	0	1	0	0	0	0	0	0	0
<i>Sedum lanceolatum</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<i>Senecio canus</i>	1	0	0	0	0	0	0	1	0	0	0	0	0	0	1
<i>Sphaeralcea coccinea</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<i>Taraxacum officinale</i>	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
Unknown Perennial Forb	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
Annual Grass															
<i>Bromus japonicus</i>	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0
<i>Bromus tectorum</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Annual Forb															
<i>Alyssum alyssoides</i>	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0
Subshrub															
<i>Artemisia frigida</i>	0	0	0	0	0	0	1	0	2	2	1	0	3	3	0
<i>Eriogonum pauciflorum</i>	0	0	1	0	0	2	1	0	1	4	0	0	0	0	0
<i>Gutierrezia sarothrae</i>	0	0	0	1	2	4	0	2	1	0	1	0	0	3	1
Shrub															
<i>Juniperus horizontalis</i>	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0
Total Veg Cover	23	10	10	12	11	16	11	13	22	18	12	15	10	19	13
Lichens	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Litter	9	4	4	4	6	4	6	0	4	3	2	8	3	7	2
Rock	5	0	0	3	2	2	1	16	0	2	7	11	0	0	9
Bare Ground	13	35	36	31	31	28	32	21	24	27	29	16	37	24	26
Total Ground Cover	37	15	14	19	19	22	18	29	26	23	21	34	13	26	24



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CROELL Redi-Mix - Roger's Pit
Rocky Grassland
Cover Data (6/30-7/1/2008)

Life Form / Species	Transect														
	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Perennial Grass															
<i>Agropyron smithii</i>	0	0	0	1	0	0	1	1	0	0	0	0	0	0	0
<i>Agropyron spicatum</i>	4	1	3	3	2	0	5	3	4	1	1	2	3	0	2
<i>Aristida purpurea</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<i>Calamovilfa longifolia</i>	0	0	0	0	0	0	1	0	0	1	0	0	0	1	0
<i>Koeleria macrantha</i>	0	0	0	0	2	0	0	0	0	0	0	1	1	0	0
<i>Poa secunda</i>	1	0	0	0	0	2	1	0	2	3	0	0	1	0	1
<i>Schizachyrium scoparium</i>	0	0	0	4	2	0	1	3	0	0	1	0	3	0	0
<i>Stipa comata</i>	2	0	2	0	1	6	1	0	0	0	0	0	1	3	1
<i>Stipa viridula</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grasslike															
<i>Carex filifolia</i>	1	0	1	3	1	0	3	0	1	1	0	1	0	0	0
Perennial Forb															
<i>Campanula rotundifolia</i>	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
<i>Castilleja sessiliflora</i>	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0
<i>Comandra umbellatum</i>	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0
<i>Dodecatheon conjugens</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<i>Erigeron pumilus</i>	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
<i>Gaura coccinea</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<i>Grindelia squarrosa</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<i>Heterotheca villosa</i>	1	2	2	0	0	7	2	0	0	3	0	1	1	4	3
<i>Hymenoxys acaulis</i>	0	1	0	0	2	0	0	1	0	0	2	0	0	0	0
<i>Machaeranthera grindelioides</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<i>Paronychia depressa</i>	0	2	0	1	2	0	0	0	1	1	2	0	1	0	0
<i>Penstemon sp.</i>	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
<i>Phlox hoodii</i>	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0
<i>Phlox multiflora</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<i>Sedum lanceolatum</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<i>Senecio canus</i>	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0
<i>Sphaeralcea coccinea</i>	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
<i>Taraxacum officinale</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Unknown Perennial Forb	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Annual Grass															
<i>Bromus japonicus</i>	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0
<i>Bromus tectorum</i>	0	0	0	0	0	0	0	1	0	0	0	2	0	0	0
Annual Forb															
<i>Alyssum alyssoides</i>	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0
Subshrub															
<i>Artemisia frigida</i>	1	0	0	0	0	3	0	0	1	2	0	2	0	1	2
<i>Eriogonum pauciflorum</i>	0	2	0	0	0	0	0	0	0	1	0	0	0	1	0
<i>Gutierrezia sarothrae</i>	1	0	0	3	1	0	0	1	0	0	1	0	2	1	1
Shrub															
<i>Juniperus horizontalis</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Veg Cover	11	8	8	17	14	20	18	12	10	13	11	9	16	11	10
Lichens	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Litter	3	4	5	8	4	7	9	7	3	5	4	3	1	5	2
Rock	0	5	0	3	10	0	0	8	1	0	9	1	11	2	0
Bare Ground	36	33	37	22	22	23	23	23	36	32	26	37	22	32	38
Total Ground Cover	14	17	13	28	28	27	27	27	14	18	24	13	28	18	12



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CROELL Redi-Mix - Roger's Pit
Rocky Grassland
Cover Data (6/30-7/1/2008)

Life Form / Species	sect		Total	Mean	Abs. Cover	Relative Cover				
	31	32								
Perennial Grass										
<i>Agropyron smithii</i>	0	0	5	0.2	0.3	1.2				
<i>Agropyron spicatum</i>	1	1	75	2.3	4.7	17.4				
<i>Aristida purpurea</i>	0	0	5	0.2	0.3	1.2				
<i>Calamovilfa longifolia</i>	0	0	7	0.2	0.4	1.6				
<i>Koeleria macrantha</i>	0	0	8	0.3	0.5	1.9				
<i>Poa secunda</i>	0	0	23	0.7	1.4	5.3				
<i>Schizachyrium scoparium</i>	4	1	38	1.2	2.4	8.8				
<i>Stipa comata</i>	0	0	33	1.0	2.1	7.7				
<i>Stipa viridula</i>	0	0	1	0.0	0.1	0.2				
Grasslike										
<i>Carex filifolia</i>	2	0	22	0.7	1.4	5.1				
Perennial Forb										
<i>Campanula rotundifolia</i>	1	0	2	0.1	0.1	0.5				
<i>Castilleja sessiliflora</i>	0	0	3	0.1	0.2	0.7				
<i>Comandra umbellatum</i>	0	0	3	0.1	0.2	0.7				
<i>Dodecatheon conjugens</i>	0	0	2	0.1	0.1	0.5				
<i>Erigeron pumilus</i>	0	0	2	0.1	0.1	0.5				
<i>Gaura coccinea</i>	0	1	1	0.0	0.1	0.2				
<i>Grindelia squarrosa</i>	0	0	4	0.1	0.3	0.9				
<i>Heterotheca villosa</i>	0	3	60	1.9	3.8	14.0				
<i>Hymenoxys acaulis</i>	2	1	15	0.5	0.9	3.5				
<i>Machaeranthera grindelioides</i>	0	0	1	0.0	0.1	0.2				
<i>Paronychia depressa</i>	1	2	19	0.6	1.2	4.4				
<i>Penstemon sp.</i>	0	0	1	0.0	0.1	0.2				
<i>Phlox hoodii</i>	0	0	2	0.1	0.1	0.5				
<i>Phlox multiflora</i>	0	0	3	0.1	0.2	0.7				
<i>Sedum lanceolatum</i>	0	1	1	0.0	0.1	0.2				
<i>Senecio canus</i>	0	0	5	0.2	0.3	1.2				
<i>Sphaeralcea coccinea</i>	0	0	1	0.0	0.1	0.2				
<i>Taraxacum officinale</i>	0	0	1	0.0	0.1	0.2				
Unknown Perennial Forb	0	0	1	0.0	0.1	0.2				
Annual Grass										
<i>Bromus japonicus</i>	0	0	8	0.3	0.5	1.9				
<i>Bromus tectorum</i>	0	0	3	0.1	0.2	0.7				
Annual Forb										
<i>Alyssum alyssoides</i>	0	0	4	0.1	0.3	0.9				
Subshrub										
<i>Artemisia frigida</i>	0	2	26	0.8	1.6	6.0				
<i>Eriogonum pauciflorum</i>	0	1	14	0.4	0.9	3.3				
<i>Gutierrezia sarothrae</i>	1	1	28	0.9	1.8	6.5				
Shrub										
<i>Juniperus horizontalis</i>	1	0	3	0.1	0.2	0.7				
Total Veg Cover	13	14	430	13.4	26.9	<table border="1"> <tr> <td>S-1</td> <td>Nmin</td> </tr> <tr> <td>3.95</td> <td>29</td> </tr> </table>	S-1	Nmin	3.95	29
S-1	Nmin									
3.95	29									
Lichens	0	0	1	0.0	0.1					
Litter	6	1	143	4.5	8.9					
Rock	6	5	119	3.7	7.4					
Bare Ground	25	30	907	28.3	56.7					
Total Ground Cover	25	20	693	21.7	43.3	<table border="1"> <tr> <td>S-1</td> <td>Nmin</td> </tr> <tr> <td>6.54</td> <td>30</td> </tr> </table>	S-1	Nmin	6.54	30
S-1	Nmin									
6.54	30									



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CROELL Redi-Mix - Roger's Pit
Upland Grassland
Cover Data (6/30-7/1/2008)

Life Form / Species	Transect																	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Perennial Grass																		
<i>Agropyron cristatum</i>	0	0	0	0	0	0	0	0	0	1	0	0	0	4	0	0	0	0
<i>Agropyron dasystachyum</i>	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
<i>Agropyron intermedium</i>	0	2	0	0	0	1	0	3	0	2	0	0	3	4	0	0	0	0
<i>Agropyron smithii</i>	4	3	6	5	6	4	1	4	10	7	0	7	7	6	13	7	3	5
<i>Agropyron spicatum</i>	0	0	0	6	0	0	1	0	0	0	11	0	1	0	0	0	2	0
<i>Bouteloua gracilis</i>	6	0	2	0	1	0	0	3	2	5	6	0	2	0	0	2	3	0
<i>Bromus inermis</i>	0	2	3	0	0	10	0	3	0	1	0	0	0	4	0	0	0	0
<i>Calamovilfa longifolia</i>	0	0	0	2	0	0	0	0	2	0	0	0	0	0	0	0	0	0
<i>Koeleria macrantha</i>	2	1	0	2	1	0	0	1	1	0	3	2	0	0	0	3	0	3
<i>Poa secunda</i>	0	0	0	0	0	1	0	0	0	0	1	1	0	0	0	1	3	1
<i>Schizachyrium scoparium</i>	0	0	5	0	2	0	0	0	0	0	1	2	0	0	0	0	0	0
<i>Stipa comata</i>	12	10	3	9	3	6	15	13	6	10	4	5	4	9	13	6	14	15
<i>Stipa viridula</i>	2	4	3	1	0	5	0	2	0	2	0	3	0	1	0	6	0	1
Grasslike																		
<i>Carex filifolia</i>	3	5	3	0	4	1	11	1	6	2	0	7	2	4	4	3	6	3
Perennial Forb																		
<i>Antennaria dimorpha</i>	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<i>Antennaria rosea</i>	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
<i>Aster sp.</i>	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<i>Besseyia wyomingensis</i>	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
<i>Cerastium arvense</i>	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
<i>Gaura coccinea</i>	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0
<i>Geum triflorum</i>	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<i>Grindelia squarrosa</i>	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<i>Helianthella quinquenervis</i>	0	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
<i>Heterotheca villosa</i>	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
<i>Linum lewisii</i>	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
<i>Liatris punctata</i>	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
<i>Lygodesmia juncea</i>	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	1	0
<i>Melilotus officinalis</i>	0	0	0	0	0	0	0	0	0	1	0	0	2	0	0	0	0	0
<i>Medicago sativa</i>	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
<i>Paronychia depressa</i>	0	0	0	0	2	0	0	0	0	0	1	0	0	0	0	0	0	0
<i>Phlox hoodii</i>	0	0	1	0	1	0	0	0	0	0	1	0	0	0	0	0	0	1
<i>Phlox multiflora</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
<i>Psoralea agrophylla</i>	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0
<i>Ratibida columnifera</i>	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
<i>Sphaeralcea coccinea</i>	1	1	0	1	0	0	1	0	0	0	0	0	0	1	0	0	0	0
<i>Taraxacum officinale</i>	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
<i>Tragopogon dubius</i>	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
<i>Vicia americana</i>	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Annual Grass																		
<i>Bromus japonicus</i>	3	4	1	3	7	0	0	3	6	0	0	3	0	2	8	4	0	2
<i>Bromus tectorum</i>	0	0	0	0	0	5	0	0	0	4	0	0	5	4	0	0	0	0
Annual Forb																		
<i>Alyssum alyssoides</i>	0	0	0	0	0	0	0	0	0	0	0	3	0	0	1	0	3	0
<i>Camelina microcarpa</i>	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
Subshrub																		
<i>Artemisia frigida</i>	0	1	1	0	4	0	1	0	0	0	0	2	0	0	0	0	2	3
<i>Artemisia ludoviciana</i>	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
<i>Gutierrezia sarothrae</i>	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
Shrub																		
<i>Rosa woodsii</i>	0	0	0	0	0	0	0	0	2	0	0	0	0	0	1	2	1	1
Total Veg Cover	35	37	35	31	36	34	33	33	36	35	29	34	31	39	40	38	36	40
Lichens	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Litter	9	8	9	15	10	14	12	13	11	9	14	11	12	8	8	8	10	7
Rock	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
Bare Ground	5	5	6	4	4	2	4	4	3	6	7	5	7	3	2	4	4	3
Total Ground Cover	45	45	44	46	46	48	46	46	47	44	43	45	43	47	48	46	46	47



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CROELL Redi-Mix - Roger's Pit
Upland Grassland
Cover Data (6/30-7/1/2008)

Life Form / Species	Transect		Total	Mean	Abs. Cover	Relative Cover
	19	20				
Perennial Grass						
<i>Agropyron cristatum</i>	0	0	5	0.3	0.5	0.7
<i>Agropyron dasystachyum</i>	0	0	3	0.2	0.3	0.4
<i>Agropyron intermedium</i>	0	0	15	0.8	1.5	2.2
<i>Agropyron smithii</i>	4	1	103	5.2	10.3	14.8
<i>Agropyron spicatum</i>	6	5	32	1.6	3.2	4.6
<i>Boutelua gracilis</i>	1	1	34	1.7	3.4	4.9
<i>Bromus inermis</i>	0	0	23	1.2	2.3	3.3
<i>Calamovilfa longifolia</i>	0	0	4	0.2	0.4	0.6
<i>Koeleria macrantha</i>	2	1	22	1.1	2.2	3.2
<i>Poa secunda</i>	0	0	8	0.4	0.8	1.2
<i>Schizachyrium scoparium</i>	0	3	13	0.7	1.3	1.9
<i>Stipa comata</i>	2	6	165	8.3	16.5	23.8
<i>Stipa viridula</i>	0	0	30	1.5	3.0	4.3
Grasslike						
<i>Carex filifolia</i>	2	12	79	4.0	7.9	11.4
Perennial Forb						
<i>Antennaria dimorpha</i>	0	0	1	0.1	0.1	0.1
<i>Antennaria rosea</i>	0	1	2	0.1	0.2	0.3
<i>Aster sp.</i>	0	0	1	0.1	0.1	0.1
<i>Besseyia wyomingensis</i>	1	0	2	0.1	0.2	0.3
<i>Cerastium arvense</i>	0	0	1	0.1	0.1	0.1
<i>Gaura coccinea</i>	0	0	3	0.2	0.3	0.4
<i>Geum triflorum</i>	0	0	1	0.1	0.1	0.1
<i>Grindelia squarrosa</i>	0	0	1	0.1	0.1	0.1
<i>Helianthella quinquenervis</i>	1	0	4	0.2	0.4	0.6
<i>Heterotheca villosa</i>	0	0	2	0.1	0.2	0.3
<i>Linum lewisii</i>	0	0	1	0.1	0.1	0.1
<i>Liatris punctata</i>	0	0	1	0.1	0.1	0.1
<i>Lygodesmia juncea</i>	0	0	3	0.2	0.3	0.4
<i>Melilotus officinalis</i>	0	0	3	0.2	0.3	0.4
<i>Medicago sativa</i>	0	0	1	0.1	0.1	0.1
<i>Paronychia depressa</i>	0	0	3	0.2	0.3	0.4
<i>Phlox hoodii</i>	2	1	7	0.4	0.7	1.0
<i>Phlox multiflora</i>	3	1	5	0.3	0.5	0.7
<i>Psoralea agrophylla</i>	1	0	5	0.3	0.5	0.7
<i>Ratibida columnifera</i>	0	0	1	0.1	0.1	0.1
<i>Sphaeralcea coccinea</i>	0	0	5	0.3	0.5	0.7
<i>Taraxacum officinale</i>	0	0	2	0.1	0.2	0.3
<i>Tragopogon dubius</i>	0	0	1	0.1	0.1	0.1
<i>Vicia americana</i>	0	0	1	0.1	0.1	0.1
Annual Grass						
<i>Bromus japonicus</i>	0	0	46	2.3	4.6	6.6
<i>Bromus tectorum</i>	0	0	18	0.9	1.8	2.6
Annual Forb						
<i>Alyssum alyssoides</i>	2	1	10	0.5	1.0	1.4
<i>Camelina microcarpa</i>	0	0	1	0.1	0.1	0.1
Subshrub						
<i>Artemisia frigida</i>	2	0	16	0.8	1.6	2.3
<i>Artemisia ludoviciana</i>	0	0	1	0.1	0.1	0.1
<i>Gutierrezia sarothrae</i>	0	0	2	0.1	0.2	0.3
Shrub						
<i>Rosa woodsii</i>	0	0	7	0.4	0.7	1.0
Total Veg Cover	29	33	694	34.7	69.4	
						S-1 Nmin
						3.23 3
Lichens	1	0	1	0.1	0.1	
Litter	12	12	212	10.6	21.2	
Rock	0	0	2	0.1	0.2	
Bare Ground	8	5	91	4.6	9.1	
Total Ground Cover	42	45	909	45.5	90.9	
						S-1 Nmin
						1.64 1



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