

J. E. STOVER & ASSOCIATES, INC.

**2352 NORTH 7TH STREET, UNIT B
GRAND JUNCTION, COLORADO 81501
PHONE: (970) 245-4101, FAX: (970) 242-7908**

**MINE ENGINEERING
MINE RECLAMATION**

**CIVIL ENGINEERING
CONST. MANAGEMENT**

January 13, 2020

Zach Trujillo
Division of Reclamation, Mining and Safety
1313 Sherman St., Room 215
Denver, CO 80203

Re: C. B. Minerals Company, LLC
2019 Annual Reclamation Report
Permit No. C-1984-065

Dear Mr. Trujillo:

On behalf of C.B. Minerals Company LLC, attached is its 2019 Annual Reclamation Report for its Coal Ridge No. 1 Mine as required by Rule 2.04.13.

- a) Name and address of the permittee and permit number:
C. B. Minerals Company, LLC
2352 N 7th Street, Unit B
Grand Junction, CO 81501
Permit C-1981-025
- b) Location and number of acres disturbed during the year:
No land disturbed during the year.
- c) Location and number of acres backfilled and graded during the year:
No land backfilled and graded during the year.
- d) Location and number of acres topsoiled during the year.
No land topsoiled during the year.
- e) Located and number of acres seeded during the year:
No land seeded during the year.

f) Location, number of acres and date of planting for all previously revegetated areas.
See attached map.

g) Noxious weed control was not performed during the year.

The second year (Year 10) of a two-year phase III bond release vegetation evaluation was performed during the year and that report is attached.

Please call if you have any questions.

Sincerely,

J. E. Stover

J. E. Stover, P.E.
Consulting Engineer

Colorado Division of Reclamation, Mining and Safety

Annual Reclamation Report for Calendar Year – _____

Mine Name	Permit Number	Permittee
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Address

This report, required by Rule 2.04.13, is due by February 15 of each year, or other date, as agreed upon by the Division. It should include text, discussion, and maps, at a minimum, in addition to any other reclamation monitoring data as required by the approved permit. The location of the acreage reported under each land status category and year of seeding (if applicable) should be clearly identified on a map included with the report.

Land Category	Last Year's Cumulative Total (from last year's ARR)	This Calendar Year			Cumulative Total
		Acres Added (+)	Acres Subtracted (-)		
Acreage in Active Mining Areas ¹				=	

Land Category	Last Year's Cumulative Total (from last year's ARR)	This Calendar Year			Cumulative Total
		Acres Added (+)	Acres Subtracted (-)		
Acres Disturbed ²				=	
Acres Backfilled and Graded				=	
Acres Topsoiled				=	

Acreage in Long-term Facilities ³	Last Year's Cumulative Total (from last year's ARR)	This Calendar Year			Cumulative Total
		Acres Added (+)	Acres Subtracted (-)		
Non-Permanent Facilities				=	
Permanent Facilities (permitted)				=	
Totals				=	

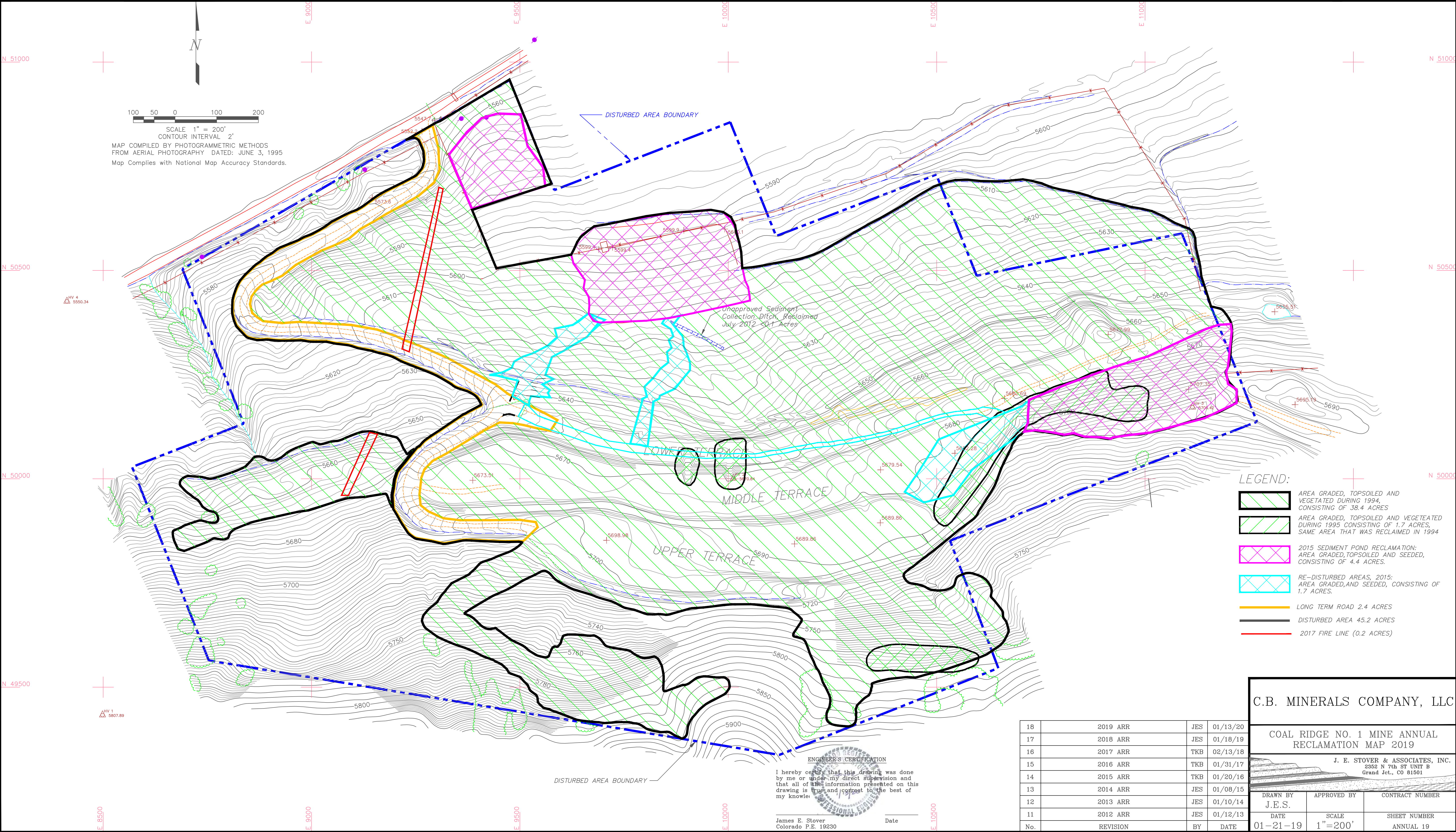
Acres Seeded (permanent)	Last Year's Cumulative Total (from last year's ARR)	This Calendar Year			Cumulative Total
		Acres Added (+)	Acres Subtracted (-)		
9 Years and Less				=	
10 Years and Greater				=	
Totals				=	

Bond Release	Last Year's Cumulative Total (from last year's ARR)	This Calendar Year			Cumulative Total
		Acres Added (+)	Acres Subtracted (-)		
Phase I Released				=	
Phase II Released				=	
Phase III Released				=	

¹Includes pits, topsoil stripped areas in advance of pits, and spoil not backfilled and graded

²Surface Mine Acres Disturbed = B&G + Long-Term Facilities + Active Mining Areas; Underground Mine Acres Disturbed = B&G + Long-Term Facilities; Separately-permitted Loadouts = B&G + Long-Term Facilities

³Includes haul, access and light-use roads, temporary dams and impoundments; permanent dams and impoundments; diversion and collector ditches, water and air monitoring sites; topsoil stockpiles; overburden stockpiles; repair, storage and construction areas; office area, repair shops, and parking; coal stockpiles, loading, and processing areas; railroads; coal conveyors; refuse piles and coal mine waste impoundments; head-of-hollow fills; valley fills; ventilation shafts and entryways; and non-coal waste disposal area (garbage dumps and coal combustion by-products disposal areas).



LEGEND:

- AREA GRADED, TOPSOILED AND VEGETATED DURING 1994, CONSISTING OF 38.4 ACRES
- AREA GRADED, TOPSOILED AND VEGETATED DURING 1995 CONSISTING OF 1.7 ACRES, SAME AREA THAT WAS RECLAIMED IN 1994
- 2015 SEDIMENT POND RECLAMATION: AREA GRADED, TOPSOILED AND SEEDED, CONSISTING OF 4.4 ACRES.
- RE-DISTURBED AREAS, 2015: AREA GRADED, AND SEEDED, CONSISTING OF 1.7 ACRES.
- LONG TERM ROAD 2.4 ACRES
- DISTURBED AREA 45.2 ACRES
- 2017 FIRE LINE (0.2 ACRES)

C.B. MINERALS COMPANY, LLC

COAL RIDGE NO. 1 MINE ANNUAL RECLAMATION MAP 2019

J. E. STOVER & ASSOCIATES, INC.
2352 N 7th ST UNIT B
Grand Jct., CO 81501

DRAWN BY J.E.S.	APPROVED BY	CONTRACT NUMBER
DATE	SCALE	SHEET NUMBER
01-21-19	1"=200'	ANNUAL 19

18	2019 ARR	JES	01/13/20
17	2018 ARR	JES	01/18/19
16	2017 ARR	TKB	02/13/18
15	2016 ARR	TKB	01/31/17
14	2015 ARR	TKB	01/20/16
13	2014 ARR	JES	01/08/15
12	2013 ARR	JES	01/10/14
11	2012 ARR	JES	01/12/13
No.	REVISION	BY	DATE

ENGINEER'S CERTIFICATION

I hereby certify that this drawing was done by me or under my direct supervision and that all of the information presented on this drawing is true and correct to the best of my knowledge.

James E. Stover
Colorado P.E. 19230
Date

C. B. Minerals, LLC.

COAL RIDGE NO. 1 MINE

Phase III Bond Release
Revegetation Evaluation Report
2018 & 2019
Years 1 & 2

NOVEMBER, 2019



EXECUTIVE SUMMARY

Cedar Creek Associates, Inc. was contracted in 2018 and 2019 by C. B. Minerals Company, LLC to evaluate several revegetated areas at the Coal Ridge No. 1 Mine for both years of a two-year Phase III Bond Release effort. First- and second-year field studies to evaluate revegetation efforts, conducted May 30 through June 2, 2018 and June 16 through 18, 2019, have shown that the target reclaimed plant communities meet Phase III Bond Release success criteria (Table 1). Ground cover and production of perennial plants within the reclaimed areas is comparable to adjacent undisturbed native communities and plant succession is progressing in a positive direction, indicating that plants are self-sustaining.

Table 1 Coal Ridge #1 - 2019							
Revegetation Success Criteria Comparison - 2018 & 2019							
		2018			2019		
		Success Criterion	Sagebrush Revegetation	Dryland Pasture Revegetation	Success Criterion	Sagebrush Revegetation	Dryland Pasture Revegetation
Plant Cover (% average cover)	Perennial Lifeforms (90% of Extended Ref. Area Value)	$\geq 24.3\%$	50.1%	51.5%	$\geq 25.0\%$	49.2%	43.0%
			Pass	Pass		Pass	Pass
Production (pounds per acre)	Total Perennial Herbaceous (90% of Extended Ref. Area Value)	≥ 287	737	702	≥ 283	655	656
			Pass	Pass		Pass	Pass
Diversity (Sagebrush Only)	Number of Perennial Species (between 3% & 60% Relative Cover)	≥ 4	5 Pass	Not Applicable	≥ 4	5 Pass	Not Applicable
	Number of Cool-Season Perennial Grasses (between 3% & 60% Relative Cover)	≥ 3	3 Pass		≥ 3	3 Pass	

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C. B. MINERALS COMPANY, LLC

Coal Ridge No. 1 Mine

PHASE III BOND RELEASE REVEGETATION EVALUATION REPORT 2018 & 2019

YEARS 1 & 2

1.0 INTRODUCTION

1.1 General

Cedar Creek Associates, Inc. (Cedar Creek) was contracted in 2018 and 2019 by C. B. Minerals Company, LLC. (Applicant) to evaluate several revegetated areas within the Coal Ridge No. 1 Mine (Coal Ridge, Permit No. C1984065) for both years of a two-year Phase III Bond Release effort. Data collection was performed in the interest of ascertaining progress toward revegetation success in accordance with Rule 3.03, Release of Performance Bonds and the approved technical revision, TR-21. The Dryland Pasture and Sagebrush Revegetation areas evaluated in 2018 and 2019 consisted of approximately 19 and 23 acres of revegetation, respectively (Map 1). In addition, the Extended Reference Area (approximately 23 acres) was evaluated to provide cover and production values to facilitate a comparison of success for the reclaimed areas. Field sampling for ground cover and production was systematically conducted within the reclaimed areas as well as within the reference area on May 30th through June 2nd in 2018 and June 16th through 18th in 2019. Sampling was conducted by or under the direct supervision of Cedar Creek's Senior Plant Ecologist, Mr. Erik Mohr. In addition to the sampling effort, current conditions existing at the time of field work were documented by photos of all areas to provide a visual demonstration of site-conditions. Nomenclature for plant taxa followed Weber and Whitman (1996) and lifeform classification regarding sub-shrubs followed Wyoming DEQ (1999). Raw data tables and photo plates are presented in Appendix A.



Map 1 Coal Ridge #1 Mine - 2018 & 2019

Phase III Bond Release Evaluation

Revegetation Units and Extended Reference Area Locations

-  Dryland Pasture Revegetation
-  Sagebrush Revegetation
-  Extended Reference Area



1 inch = 300 feet



1.2 Precipitation

Table P1 and the associated charts on the following page exhibit the monthly precipitation that has occurred near Coal Ridge over the past 14 years. The weather station at Glenwood Springs, Colorado is sufficiently near the site (approximately 8 miles east) to provide a good comparison of long-term trends of the precipitation for the area. The overall average annual precipitation (Jan-Dec) for the past 31 years is 16.5 inches while monthly averages range from 0.9 in June to 1.7 inches in September (Table P1). Average summer precipitation was 3.2 inches while fall, winter, and spring average 4.5, 3.4, and 4.2 inches, respectively (Charts P1 and P2). Review of the precipitation charts further reveals that growing season (spring) precipitation in the past 14 years has been variable ranging from 1.2 inches in 2010 to 6.6 inches in 2019. This variation in conditions ranging from drought to well above-average seasonal precipitation has contributed significantly to the current expression of ecological communities across the study area.

Chart P2 indicates that total precipitation in the 12 months preceding the 2018 sampling effort was below-average at 11.1 inches (73% of average). The 2017 summer and fall precipitation were 35% and 72% of average (1.1 and 3.2 inches), respectively. The 2018 pre-sampling seasonal precipitation was below-average for winter (69% of average, 2.3 inches) and average for spring (107% of average, 4.5 inches). Total precipitation in the 12 months preceding the 2019 sampling effort was above-average at 17.6 inches (107% of average). The 2018 summer and fall precipitation were 58% and 110% of average (1.9 and 4.9 inches), respectively. The 2019 pre-sampling seasonal precipitation was above-average for winter (124% of average, 4.2 inches) and average for spring (156% of average, 6.6 inches).

Table P1 - Annual Precipitation at Glenwood Springs, CO 2006-2019

	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Total
2006	0.93	0.11	3.11	1.59	0.81	0.34	1.16	2.85	1.46	3.82	0.92	0.30	17.40
2007	0.51	0.67	0.70	0.38	0.24	0.93	0.00	1.29	2.88	0.70	1.22	0.28	9.79
2008	1.75	1.61	1.11	0.92	1.52	0.32	0.49	0.75	1.49	0.19	1.00	1.38	12.47
2009	1.66	0.93	0.43	0.89	3.00	1.85	0.66	0.77	1.15	1.02	0.70	1.32	14.38
2010	0.69	0.98	0.00	0.78	0.38	0.85	1.08	1.57	0.81	1.66	0.83	1.35	10.98
2011	1.26	1.07	1.11	1.50	1.63	0.93	1.00	1.29	1.71	1.58	1.22	1.06	15.22
2012	1.26	1.07	1.11	1.50	1.63	0.93	2.07	1.22	1.00	0.72	0.68	1.19	14.23
2013	0.94	0.02	1.11	1.50	1.43	0.93	1.00	1.45	2.63	2.87	1.22	1.06	16.04
2014	1.38	1.34	0.66	0.64	1.75	0.10	1.51	3.68	2.09	1.19	1.03	1.19	16.56
2015	0.43	0.49	0.91	0.84	4.71	0.76	1.71	1.32	1.07	1.12	1.49	0.61	15.46
2016	0.58	0.86	0.46	1.50	1.41	0.73	1.15	1.06	1.46	0.69	1.50	2.12	13.52
2017	2.52	1.22	0.62	2.15	0.85	0.13	0.76	0.24	1.10	2.12	0.00	0.17	11.88
2018	0.94	1.21	1.12	3.00	0.33	0.57	0.07	1.22	0.24	3.33	1.37	1.06	14.46
2019	1.51	1.64	2.62	1.68	2.32	2.07	1.21	0.20	0.38	-	-	-	13.63
31 Year Avg.	1.26	1.07	1.11	1.50	1.63	0.93	1.00	1.29	1.71	1.58	1.22	1.06	16.48

Values in red are missing data and replaced with the 31 year average value.

Chart P1
Seasonal Precipitation for the 12 months Prior to Evaluation (June - May)
for Glenwood Springs, CO 2006 - 2019

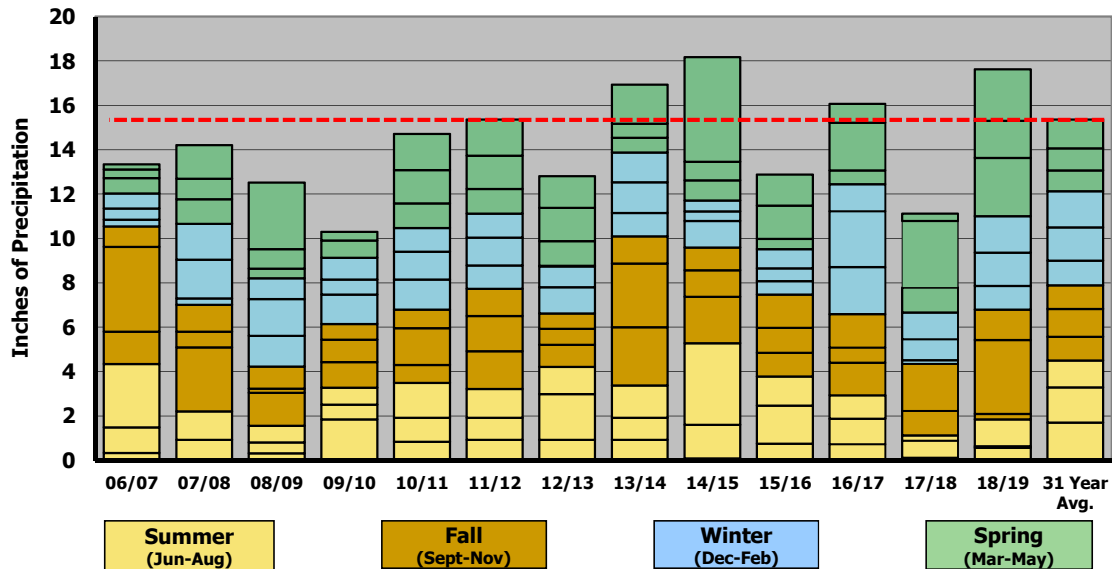
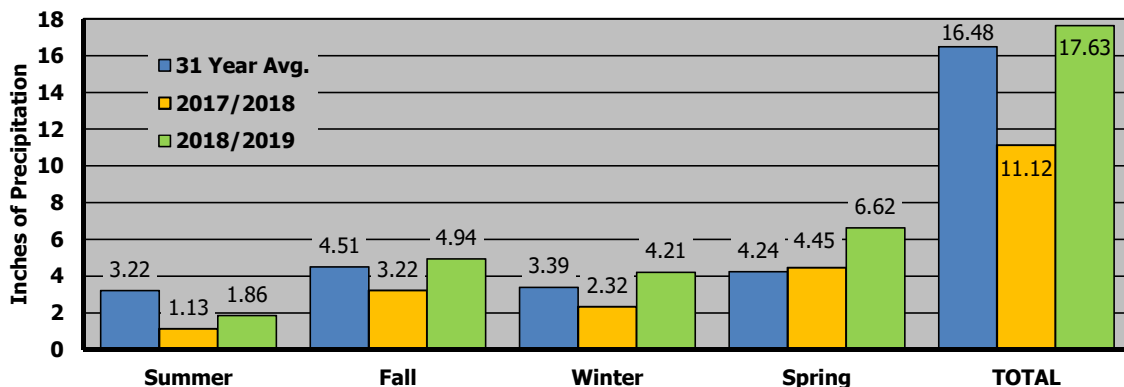


Chart P2
Seasonal Precipitation for the 12 Months Prior to Evaluation
Glenwood Springs, CO 2017/2018 & 2018/2019 vs. 31-Year Average



1.3 Background and Standards for Success

The original permit for Coal Ridge describes the sampling procedures and success standards for the original planned reclamation (Irrigated Hayland and Sagebrush Revegetation) and Sagebrush Reference Area. Two on-the-ground conditions have rendered the original permit inapplicable and necessitated the issuance of TR-21. First, the Applicant's water source (irrigation ditch) has failed and the hayland area has not been irrigated in recent years. Therefore, the standards for Irrigated Hayland were rendered null and new sampling procedures and success standards were established for Dryland Pasture. Second, extensive grazing in the original Sagebrush Reference Area necessitated the establishment of an Extended Reference Area not subject to livestock grazing outside the Applicant's control. According to permit and recent technical revision documents, the current success criteria and standards are as follows:

- **Perennial Cover** (Dryland Pasture and Sagebrush units) – greater than or equal to 90% of the average perennial cover of the Extended Reference Area. Noxious weeds excluded and 90% statistical confidence level.
- **Perennial Herbaceous Production** (Dryland Pasture and Sagebrush units) – greater than or equal to 90% of the perennial, herbaceous production of the Extended Reference Area. Noxious weeds excluded and 90% statistical confidence level.
- **Diversity** (Sagebrush Revegetation only) - Reclaimed area will have at least four perennial species with greater than or equal to 3% relative cover, of which at least three of those must be cool-season grasses. No individual species representing greater than 60% relative cover can be counted towards the diversity standard.

After a review from the Colorado Division of Parks and Wildlife (formerly Division of Wildlife), it was decided there will be no woody plant density requirement for revegetation at Coal Ridge.

2.0 SAMPLING METHODS

2.1 Sample Site Selection / Location

A systematic procedure for sample location in the revegetated and reference units occurred in the following stepwise manner. First, a fixed point of reference was selected for the unit to facilitate location of the systematic grid in the field. Second, a systematic grid of appropriate dimensions was selected to provide a reasonable number of coordinate intersections (e.g., 45) that could then be used for the set of sample sites. Third, a scaled representation of the grid was overlain on a computer-generated map of the target unit extending along north/south and east/west lines. Fourth, the initial placement of this grid was implemented by selection of two random numbers (an X and Y distance) used for locating the first coordinate from the fixed point of reference, thereby making the effort unbiased. Fifth, the sample points were located in the field utilizing a handheld GPS unit.

Once a selected grid point was located in the field, ground cover sampling transects were always oriented in the direction of the next site to be physically sampled to further limit any potential bias while facilitating sampling efficiency. This orientation protocol is indicated on Figure 1. Depending on logistics, timing, and access points to the target sampling area, the field crew would occasionally layout a set of points along coordinates in one direction and then sample them in reverse order. However, orientation protocol was always maintained (i.e., in the direction of the next point to be physically sampled). If the boundary of an area was encountered before reaching the full length of a transect, the orientation of the transect was turned 90° in the appropriate direction so the transect could be completed. In this manner, boundary transects were retained entirely within the target unit by “bouncing” off the boundaries. Production quadrats were always oriented 90° to the right (clockwise) of the ground cover transect and placed one meter from the starting point so as to avoid any trampled vegetation.

2.2 Determination of Ground Cover

Ground cover at each sample point was evaluated in accordance with Rule 4.15.11 (1) (a) (i) utilizing the point-intercept methodology as illustrated on Figure 1. As indicated on this figure, Cedar Creek utilizes state-of-the-art instrumentation it has pioneered to facilitate much more rapid and accurate collection of data. A transect of 10 meters length was extended in the direction of the next sampling location from the flagged center of each systematically located sample point. At each one-meter interval along the transect, a “laser point bar” was situated parallel to, and approximately 4.5 to 5.0 feet vertically above the ground surface. A set of 10 readings was taken specifically to record hits on vegetation (by species), litter, (including standing dead), rock (>2mm), or bare soil. Hits were determined at each meter interval by activating a battery of 10 low-energy specialized lasers situated along the bar at 10 centimeter intervals

and recording the variable intercepted by each of the narrowly focused (0.02") beams (Exhibit 1). In this manner, a total of 100 intercepts per transect were recorded resulting in 1 percent cover per intercept. This methodology and instrumentation facilitates the collection of the most unbiased, repeatable, and precise ground cover data possible. To facilitate diversity calculations, second hits were recorded when an overstory shrub stratum was present. However, these second hits were not included in the determination of ground cover.

2.3 Determination of Current Annual Production

At all sample sites in the reference and reclamation areas, current annual herbaceous production was collected from a 0.5 m² quadrat frame placed one meter and 90° to the right (clockwise) of the ground cover transect to facilitate avoidance of vegetation trampled by investigators during sample site location (Figure 1). From within each quadrat, all above ground current annual vegetation within the vertical boundaries of the frame was clipped and bagged separately by lifeform as follows:

Perennial Grasses
Sub-Shrubs
Noxious Weeds - Grass

Perennial Forbs
Annual & Biennial Forbs
Noxious Weeds – Other

All production samples were returned to the lab for drying and weighing. Drying occurred at 105° C until a stable weight was achieved (24 hours). Samples were then weighed to the nearest 0.1 gram. Total weights for each sample were compiled and converted to pounds per acre prior to success determination.

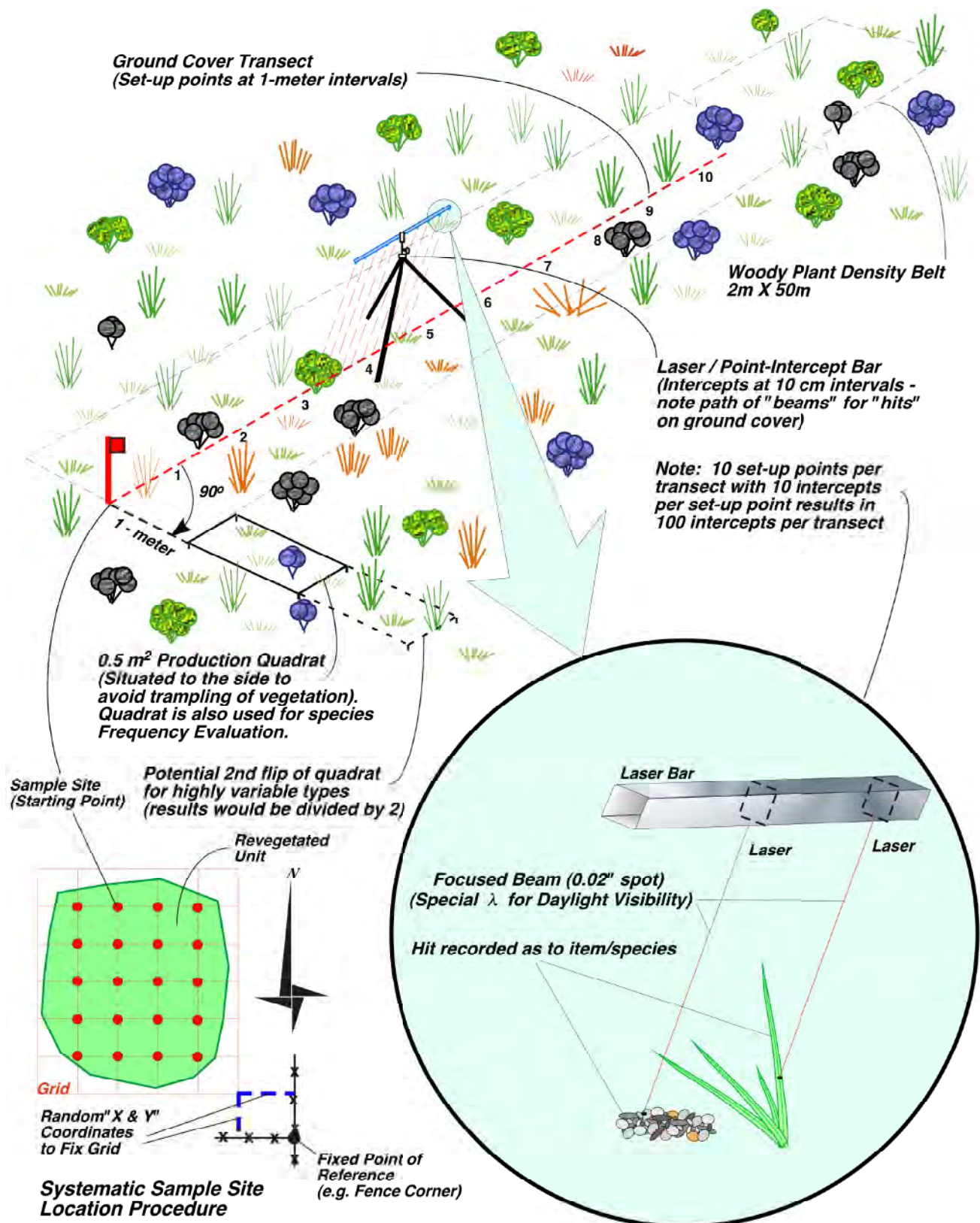


Figure 1
Sampling Procedure at a Systematic Sample Site Location

2.4 Sample Adequacy Determination

Cover and production sampling within each unit was conducted using 45 co-located points. From these preliminary efforts, sample means and standard deviations for total non-overlapping vegetation ground cover and total production were calculated. The Cochran formula (below) for determining sample adequacy was used to calculate $n_{\min}$, whereby the population is estimated to within 10% of the true mean (μ) with 90% confidence.

When the inequality ($n_{\min} \leq n$) is true, sampling is deemed adequate; and $n_{\min}$ is determined as follows:

$$n_{\min} = (t^2 s^2) / (0.1 \bar{X})^2$$

Where:

- n = the number of actual samples collected (initial size = 30 or 45)
- t = the value from the one-tailed t distribution for 90% confidence with $n-1$ degrees of freedom;
- s^2 = the variance of the estimate as calculated from the initial samples;
- $\bar{X}$ = the mean of the estimate as calculated from the initial samples.

If the initial samples do not provide a suitable estimate of the mean (i.e., the inequality is false), a reverse null success evaluation which does not require adequacy would be employed (Rule 4.15.11 (2)(c)). Sample adequacy results are presented on Table 2 and all raw data tables.

3.0 RESULTS

Tables 1 through 3 and Charts 1 through 11 provide a summary of the sampling efforts described above. Tabular compilations of raw data and summaries presented in Appendix A on Tables 4 through 17. Photographs of the evaluated areas in 2018 and 2019 are also presented in Appendix A. It should be noted that a large herd of elk was observed by the land managers in the revegetation and reference area in the weeks prior to the evaluation in 2018. Scattered light grazing of vegetation was observed with heavy grazing on the alfalfa (*Medicago sativa*) noted in the Dryland Pasture at the time of the evaluation.

3.1 Dryland Pasture

2018

A total of 29 plant species were observed within the Dryland Pasture in 2018 (Table 5). Ground cover within the unit (Table 2 and Chart 1) consisted of 63.7% live vegetation, 0.5% rock, 30.0% litter, and bare ground exposure of 5.8%. Desirable perennial cover averaged 51.5% and annual and biennial cover averaged 1.6% cover. Noxious weed cover averaged 10.7% and consisted primarily of bulbous bluegrass (*Poa bulbosa*) which is a List C noxious weed in Colorado. The dominant taxa were smooth brome (*Bromus inermis*), western wheatgrass (*Pascopyron smithii*), bulbous bluegrass, and thickspike wheatgrass (*Elymus lanceolatus*) with 26.5%, 10.7%, 8.1%, and 6.7% average cover, respectively. Herbaceous production averaged 736 pounds per acre across the Dryland Pasture (Table 3 and Chart 3). Desirable perennial production averaged 702 pounds per acre.

2019

A total of 26 plant species were observed within the Dryland Pasture in 2019 (Table 5). Ground cover within the unit (Table 2 and Chart 1) consisted of 78.9% live vegetation, 0.6% rock, 17.8% litter, and bare ground exposure of 2.8%. Desirable perennial cover averaged 43.0% and annual and biennial cover averaged 2.2% cover. Noxious weed cover averaged 33.7% and consisted primarily of bulbous bluegrass. The dominant taxa were bulbous bluegrass, smooth brome, western wheatgrass, thickspike wheatgrass, and crested wheatgrass (*Agropyron cristatum*) with 27.3%, 17.6%, 7.7%, 6.7%, and 6.3% average cover, respectively. Herbaceous production averaged 1,055 pounds per acre across the Dryland Pasture (Table 3 and Chart 3). Desirable perennial production averaged 655 pounds per acre.

3.2 Sagebrush Revegetation Area

2018

A total of 18 plant species were observed within the Sagebrush Revegetation evaluated during 2018 (Table 5). Ground cover within the unit (Table 2 and Chart 1) consisted of 58.6% live vegetation, 2.0%

rock, 32.3% litter, and bare ground exposure of 7.0%. Desirable perennial cover across the unit averaged 50.1% and annual and biennial cover averaged 0.1% cover. Noxious weed cover averaged 8.4% and consisted primarily of bulbous bluegrass. The dominant taxa were smooth brome, western wheatgrass, and thickspike wheatgrass with 19.9%, 11.5%, and 7.9% average cover, respectively. Minor species included bulbous bluegrass and Wyoming big sagebrush (*Seriphidium tridentatum wyomingensis*) with 7.6% and, 6.2% average cover, respectively. Herbaceous production averaged 764 pounds per acre across the unit (Table 3 and Chart 3). Desirable perennial production averaged 737 pounds per acre. A substantial amount of young Wyoming Big Sagebrush was observed emerging across the revegetated area.

2019

A total of 26 plant species were observed within the Sagebrush Revegetation evaluated during 2019 (Table 5). Ground cover within the unit (Table 2 and Chart 1) consisted of 69.6% live vegetation, 1.0% rock, 26.7% litter, and bare ground exposure of 2.7%. Desirable perennial cover across the unit averaged 49.2% and annual and biennial cover averaged 0.7% cover. Noxious weed cover averaged 19.7% and consisted primarily of bulbous bluegrass. The dominant taxa were bulbous bluegrass, western wheatgrass, smooth brome, and Wyoming big sagebrush with 17.6%, 15.1%, 13.7%, and 6.8% average cover, respectively. Herbaceous production averaged 731 pounds per acre across the unit (Table 3 and Chart 3). Desirable perennial production averaged 656 pounds per acre.

3.3 Extended Reference Area

2018

A total of 46 plant species were observed within the Extended Reference Area evaluated during 2018 (Table 5). Ground cover within the reference area (Table 2 and Chart 1) consisted of 46.9% live vegetation, 3.8% rock, 41.8% litter, and bare ground exposure of 7.5%. Desirable perennial cover across the unit averaged 27.0% and annual and biennial cover averaged 0.3% cover. Noxious weed cover averaged 18.6% and consisted primarily of bulbous bluegrass. The dominant taxa were bulbous bluegrass, Wyoming big sagebrush, and western wheatgrass with 17.9%, 14.9%, and 3.5% average cover, respectively. Herbaceous production averaged 351 pounds per acre across the reference area (Table 3 and Chart 3). Desirable perennial production averaged 319 pounds per acre.

2019

A total of 46 plant species were observed within the Extended Reference Area evaluated during 2019 (Table 5). Ground cover within the reference area (Table 2 and Chart 1) consisted of 58.6% live vegetation, 2.1% rock, 33.1% litter, and bare ground exposure of 6.1%. Desirable perennial cover across the unit averaged 27.7% and annual and biennial cover averaged 0.4% cover. Noxious weed cover averaged

30.5% and consisted primarily of bulbous bluegrass. The dominant taxa were bulbous bluegrass and Wyoming big sagebrush with 29.1% and 16.0% average cover, respectively. Herbaceous production averaged 365 pounds per acre across the reference area (Table 3 and Chart 3). Desirable perennial production averaged 314 pounds per acre.

Table 2 Coal Ridge #1 - Vegetation Cover - 2019								
Average Ground Cover Summary - 2018 & 2019								
Percent Ground Cover Based on Point-Intercept Sampling								
Area -->		Dryland Pasture Revegetation		Sagebrush Revegetation		Extended Reference Area		
		2018	2019	2018	2019	2018	2019	
Grasses and Grass-like								
N	P	<i>Achnatherum hymenoides</i>	Indian Ricegrass	-	-	-	-	0.07
I	P	<i>Agropyron cristatum</i>	Crested Wheatgrass	4.83	6.33	0.17	0.07	-
X	A	<i>Anisantha tectorum</i>	Cheatgrass	1.43	2.13	0.30	1.33	1.47
I	P	<i>Bromus inermis</i>	Smooth Brome	26.50	17.60	19.87	13.67	0.43
I	A	<i>Bromus japonicus</i>	Japanese Brome	-	0.10	-	-	1.07
I	P	<i>Dactylis glomerata</i>	Orchard Grass	0.27	-	-	-	-
N	P	<i>Elymus elymoides</i>	Bottlebrush Squirreltail	-	-	-	-	0.47
N	P	<i>Elymus lanceolatus</i>	Thickspike Wheatgrass	6.70	6.73	7.87	4.23	0.87
N	P	<i>Hesperostipa comata</i>	Neddle-and-thread	-	-	-	-	0.73
N	P	<i>Koeleria cristata</i>	Prairie Junegrass	-	-	0.17	-	0.03
N	P	<i>Leymus cinereus</i>	Great Basin Wildrye	-	-	1.00	1.93	-
N	P	<i>Pascopyron smithii</i>	Western Wheatgrass	10.67	7.70	11.53	15.10	3.50
X	P	<i>Poa bulbosa</i>	Bulbous Bluegrass	8.07	27.30	7.60	17.63	17.87
I	P	<i>Poa compressa</i>	Canada Bluegrass	-	-	-	-	0.03
N	P	<i>Poa fendleriana</i>	Muttongrass	-	-	-	-	0.10
I	P	<i>Poa pratensis</i>	Kentucky Bluegrass	-	-	-	-	0.07
N	P	<i>Poa secunda</i> / <i>canbyi</i>	Sandberg Bluegrass	-	0.03	-	-	0.57
N	P	<i>Pseudoroegneria spicata</i>	Bluebunch Wheatgrass	0.30	-	-	-	0.70
Forbs								
N	P	<i>Allium textile</i>	Prairie Onion	-	-	-	-	0.03
N	A	<i>Alyssum desertorum</i>	Desert Alyssum	0.03	0.07	0.07	0.07	0.27
N	P	<i>Artemisia ludoviciana</i>	Prairie Sagewort	-	-	-	-	0.07
N	P	<i>Aster ascendens</i>	Creeping Aster	-	-	-	0.20	0.07
I	P	<i>Astragalus cicer</i>	Cicer Milkvetch	-	-	-	0.23	-
N	P	<i>Astragalus convallarius</i>	Lesser Rushy Milkvetch	-	-	-	-	0.33
N	P	<i>Astragalus miser</i>	Timber Milkvetch	-	-	-	-	0.17
N	P	<i>Balsamorhiza sagittata</i>	Arrowleaf Balsamroot	-	-	-	-	0.33
N	A	<i>Camelina microcarpa</i>	Littlepod Falseflax	-	0.20	-	0.03	-
X	B	<i>Centaurea maculosa</i>	Spotted Knapweed	-	-	-	-	0.50
I	A	<i>Chenopodium album</i>	Lambsquarters	0.03	-	-	-	-
I	A	<i>Chorispora tenella</i>	Crossflower	0.30	0.03	-	-	-
N	P	<i>Cirsium undulatum</i>	Wavyleaf Thistle	-	-	-	-	0.10
N	A	<i>Collomia linearis</i>	Slenderleaf Collomia	-	-	-	-	0.23
X	P	<i>Convolvulus arvensis</i>	Field Bindweed	0.30	1.20	-	0.37	-
N	A	<i>Descurainia pinnata</i>	Western Tansymustard	0.83	1.07	0.03	0.10	-
X	A	<i>Erodium cicutarium</i>	Redstem Stork's Bill	0.87	3.03	0.50	0.37	-
N	P	<i>Eucephalus glaucus</i>	Glaucous Aster	-	-	-	-	0.03
N	P	<i>Galium triflorum</i>	Fragrant Bedstraw	-	-	-	-	0.03
N	B	<i>Grindelia squarrosa</i>	Curlycup Gumweed	0.03	-	-	-	0.07
N	P	<i>Heterotheca villosa</i>	Hairy Golden Aster	-	-	0.03	0.13	0.17
I	A	<i>Kochia scoparia</i>	Summer Cypress	0.33	-	-	0.27	-
I	B	<i>Lactuca serriola</i>	Prickly Lettuce	0.03	-	-	-	-
N	A	<i>Lappula redowskii</i>	Western Stickseed	-	0.03	-	-	-
I	A	<i>Lepidium perfoliatum</i>	Clasping Pepperweed	-	0.03	-	-	-
N	P	<i>Linum lewisii</i>	Lewis Flax	0.10	0.03	0.03	-	-
I	P	<i>Medicago sativa</i>	Alfalfa	1.03	3.80	1.30	4.93	-
N	P	<i>Packera multilobata</i>	Lobeleaf Groundsel	-	-	-	0.03	0.03
N	P	<i>Phlox longifolia</i>	Longleaf Phlox	-	-	-	-	0.17
I	A	<i>Sisymbrium altissimum</i>	Tumble Mustard	-	0.63	-	0.20	-
N	P	<i>Solidago missouriensis</i>	Missouri Goldenrod	0.33	-	-	-	0.13
N	P	<i>Sphaeralcea coccinea</i>	Scarlet Globemallow	-	0.13	-	0.20	1.10
I	P	<i>Taraxacum officinale</i>	Common Dandelion	0.03	-	-	-	0.03
I	B	<i>Tragopogon dubius</i>	False Salsify	-	-	0.03	-	-
N	P	<i>Zigadenus venenosus</i>	Meadow Death Camas	-	-	-	-	0.03
Sub-Shrubs								
N	P	<i>Gutierrezia sarothrae</i>	Snakeweed	-	-	-	-	0.10
N	P	<i>Krascheninnikovia lanata</i>	Winterfat	-	-	-	-	0.13
Shrubs & Trees								
N	P	<i>Amelanchier utahensis</i>	Utah Serviceberry	-	-	-	-	0.27
N	P	<i>Atriplex canescens</i>	Fourwing Saltbrush	-	0.13	-	-	0.30
N	P	<i>Cercocarpus montanus</i>	Mountain Mahogany	-	-	-	-	0.40
N	P	<i>Chrysothamnus nauseosus</i>	Rubber Rabbitbrush	0.67	0.50	1.97	1.63	0.17
N	P	<i>Chrysothamnus viscidiflorus</i>	Low Rabbitbrush	-	-	-	-	0.43
N	P	<i>Dasiphora fruticosa</i>	Shrubby Cinquefoil	-	-	-	-	0.07
N	P	<i>Eriogonum microthecum</i>	Slender Buckwheat	-	-	-	-	0.07
N	P	<i>Opuntia polyacantha</i>	Plains Prickly-pear	-	-	-	-	0.03
N	P	<i>Seriphidium tridentatum wyo.</i>	Wyoming Big Sagebrush	0.03	0.03	6.17	6.83	14.87
N	P	<i>Symphoricarpos rotundifolius</i>	Snowberry	-	-	-	-	0.87
Total Plant Cover		63.73	78.87	58.63	69.57	46.90	58.63	
	Rock	0.47	0.57	2.03	1.03	3.80	2.10	
	Litter	30.00	17.77	32.33	26.73	41.77	33.13	
	Bare ground	5.80	2.80	7.00	2.67	7.53	6.13	
Perennial Cover (excluding noxious weeds)		51.47	43.03	50.10	49.20	27.00	27.73	
Summary by Lifeform:								
Perennial Grasses		49.27	38.40	40.60	35.00	7.10	5.93	
	Annual Grasses	-	0.10	-	-	1.07	-	
Perennial Forbs		1.50	3.97	1.37	5.73	2.27	3.03	
	Annual and Biennial Forbs	1.60	2.07	0.13	0.67	0.27	0.37	
Noxious / Aggressive Weeds		10.67	33.67	8.40	19.70	18.57	30.53	
Sub-Shrubs		-	-	-	-	0.23	0.10	
Shrubs and Trees		0.70	0.67	8.13	8.47	17.40	18.67	
Sample Adequacy Calculations:								
Mean =		63.73	78.87	58.63	69.57	46.90	58.63	
Variance =		33.44	86.60	66.17	39.36	80.44	63.76	
n =		30	30	30	30	30	30	
n_{min} =		1.42	2.39	3.31	1.40	6.29	3.19	

N - Native, Nw - Warm Season, I - Introduced, X - Noxious

A - Annual, B - Biennial, P - Perennial

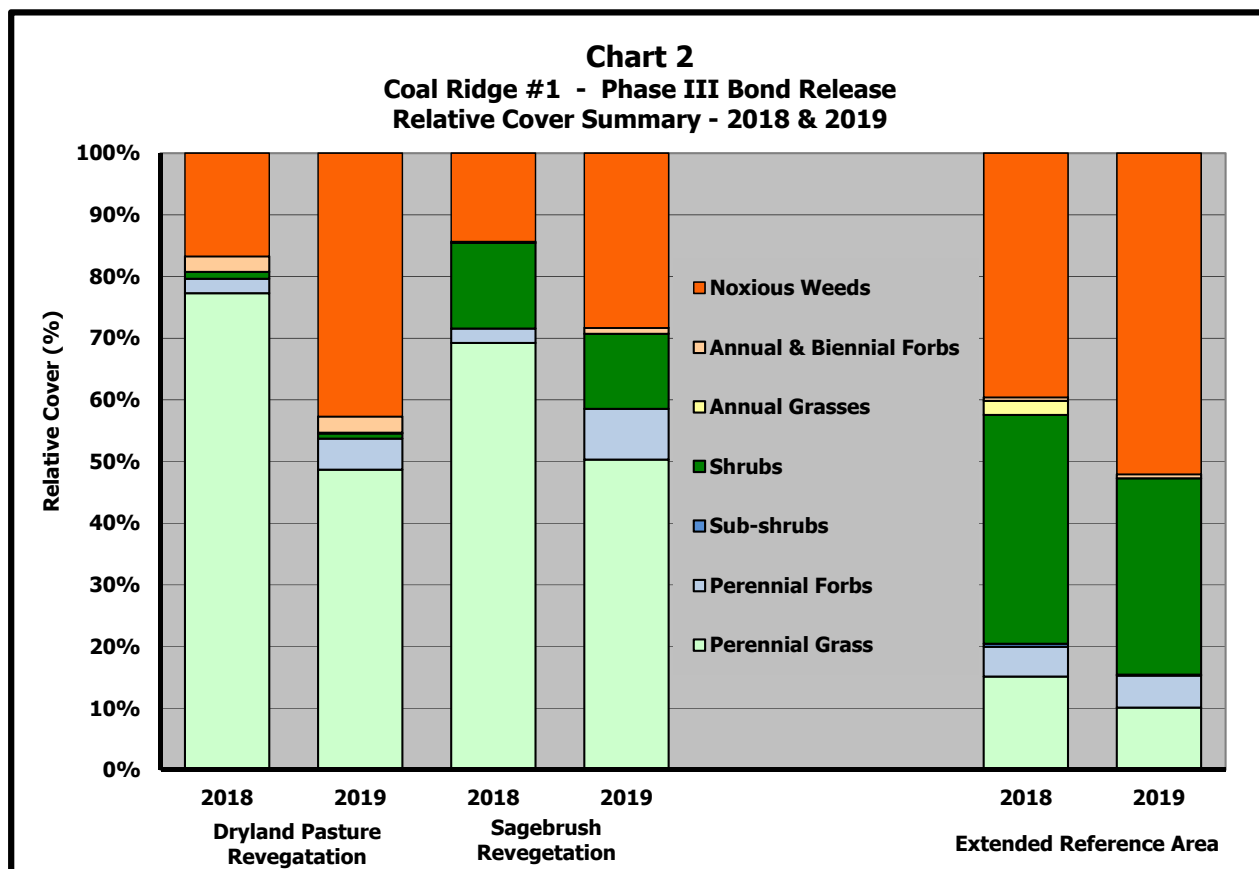
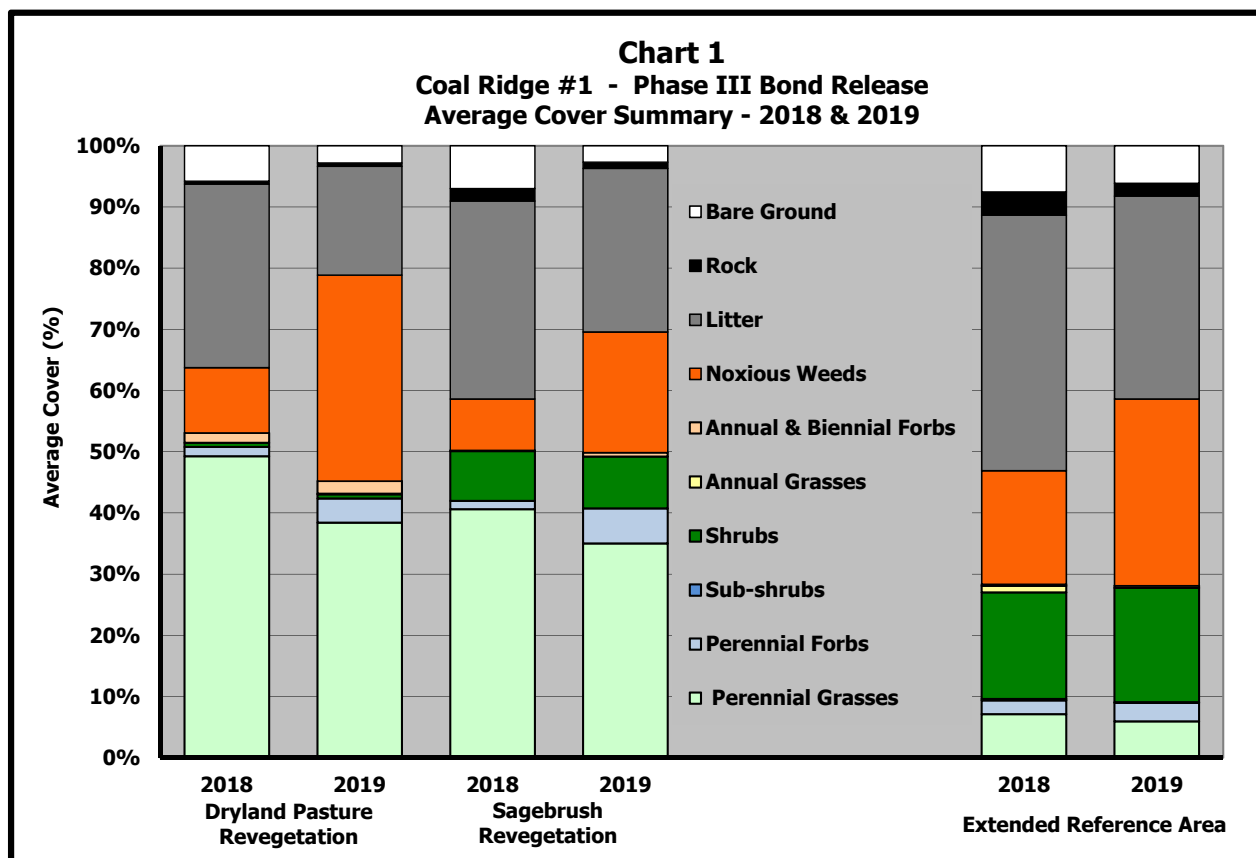
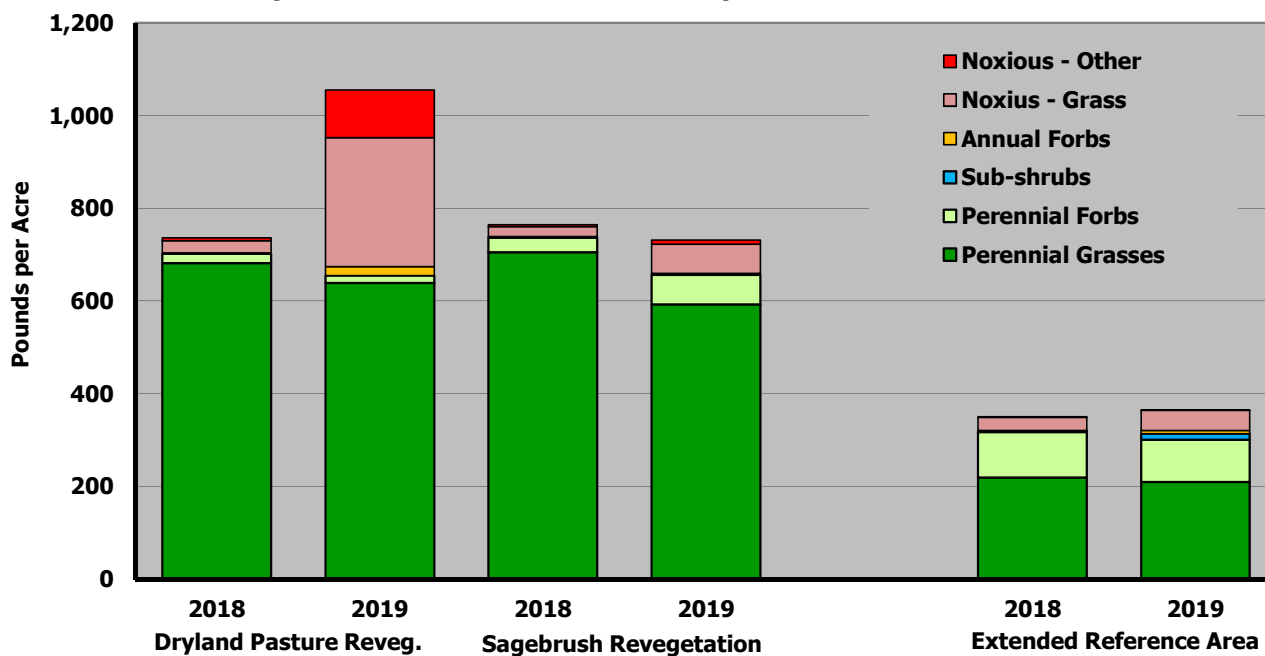


Table 3 Coal Ridge #1 - Vegetation Production - 2019**Summary of Bond Release & Reference Areas - 2018 & 2019**

Oven Dry Pounds (lbs) per Acre

Area	Year	Perennial Grasses	Perennial Forbs	Sub- shrubs	Annual / Biennial Forbs	Noxious Weeds		PERENNIAL	TOTAL
						Grass	Other		
Dryland Pasture Revegetation	2018	681.6	20.0	-	2.3	26.3	5.9	701.6	736.1
	2019	638.9	16.3	-	18.8	278.4	102.6	655.2	1,054.9
Sagebrush Revegetation	2018	705.0	31.5	-	2.5	21.6	3.8	736.5	764.3
	2019	592.5	63.8	-	3.4	62.5	8.9	656.3	731.1
Extended Reference Area	2018	219.0	98.3	1.3	2.3	28.4	1.5	318.6	350.7
	2019	209.4	91.6	12.9	6.5	44.0	0.4	313.9	364.8

Chart 3**Coal Ridge #1****Summary of Current Annual Production by Unit and Lifeform - 2018 & 2019**

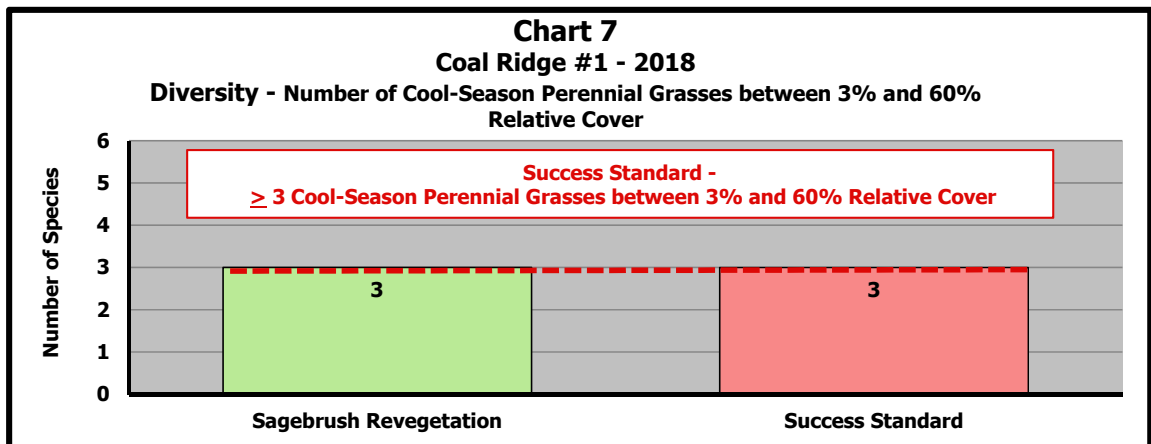
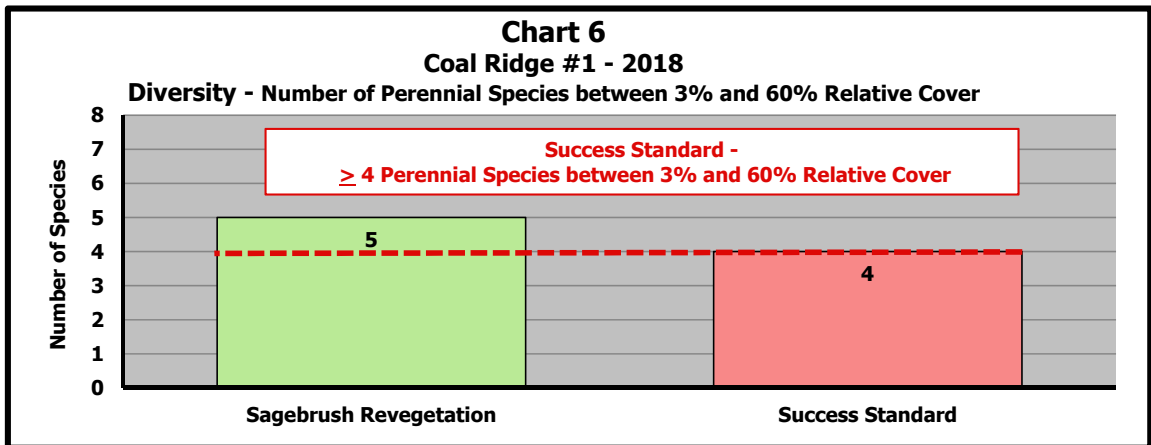
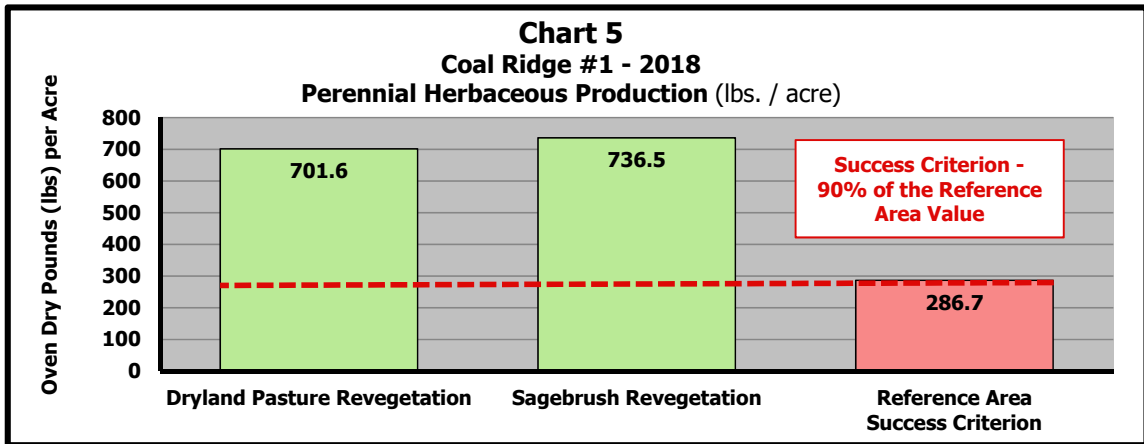
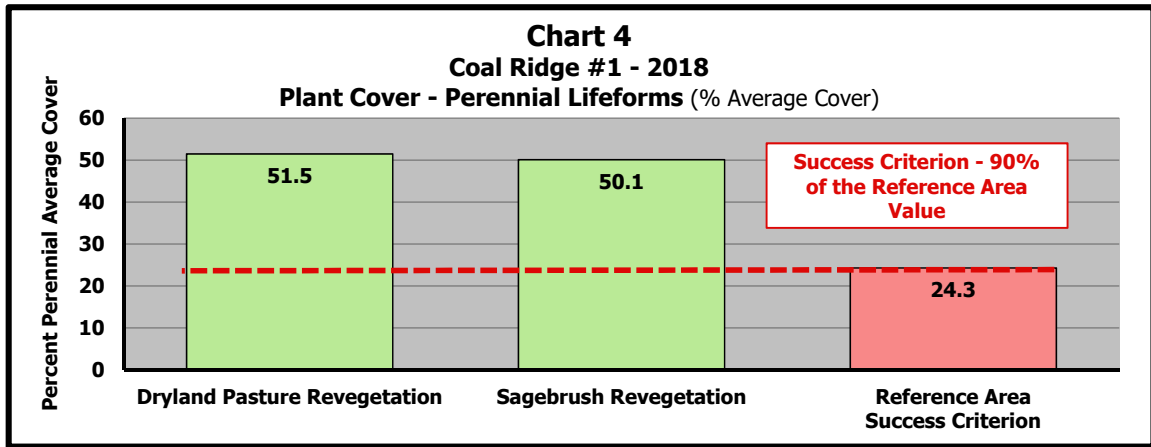
4.0 SUCCESS COMPARISON

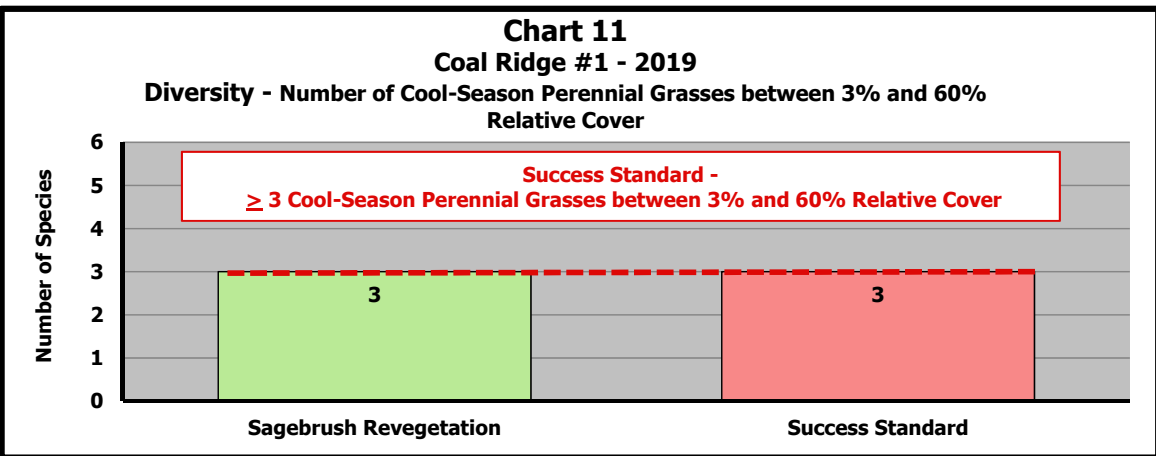
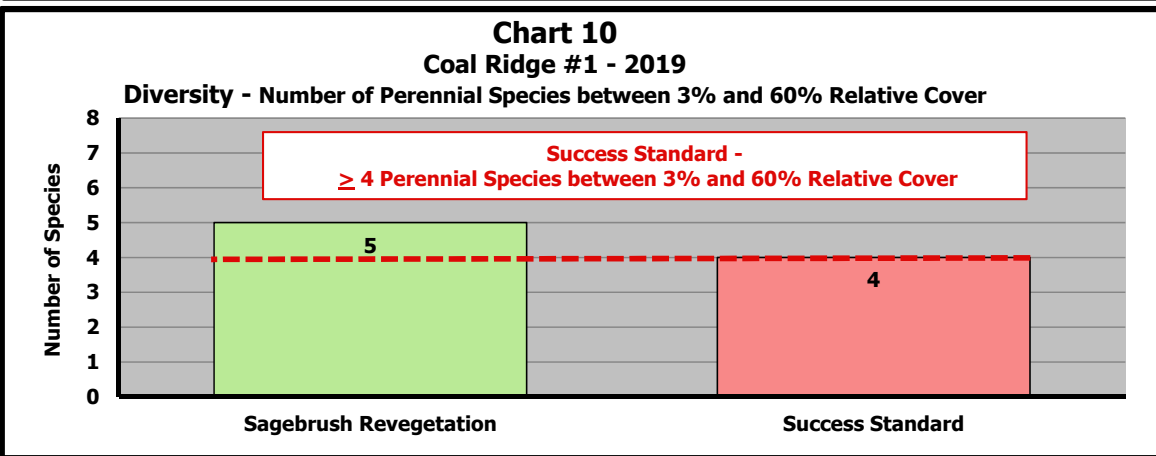
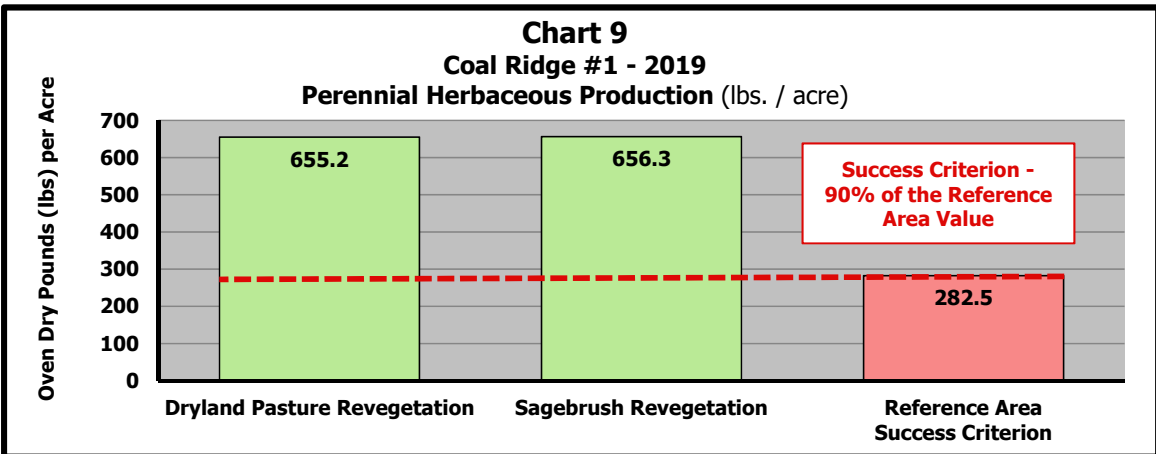
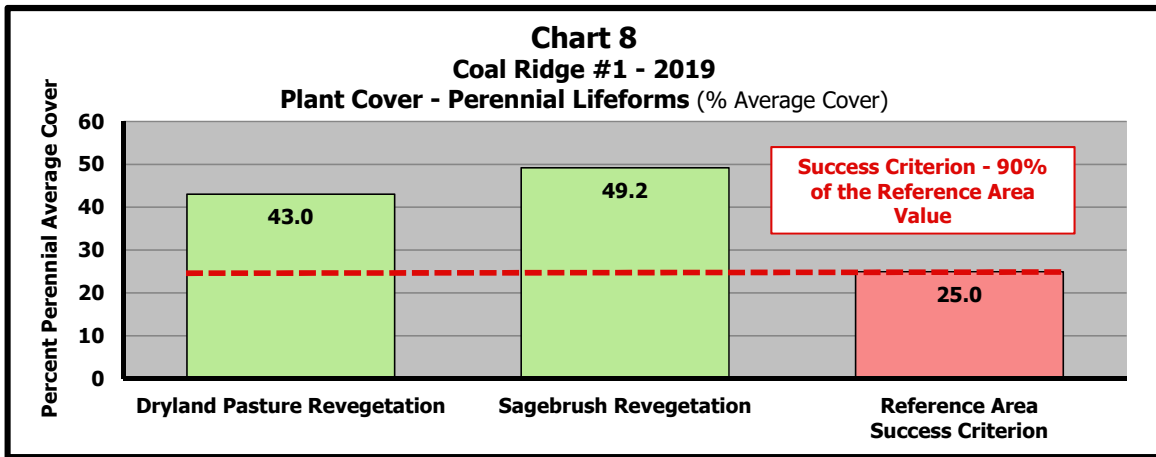
A summary of the success comparison for the reclamation units is provided on the following pages in Table 1 and Charts 4 through 11. Table 1 gives a quick indication of the overall success of the revegetation units compared with reference area data and/or standards. Charts 4 through 11 provide a visual display of the same comparisons.

The demonstration of adequacy and a minimum of 15 transects in each unit allow for a direct comparison for cover and production per Rule 4.15.11 (2)(a). With regard to perennial lifeform ground cover, both the Dryland Pasture and the Sagebrush Revegetation passed the 2018 cover success criterion of $\geq 24.3\%$ perennial cover (90% of the reference area value) with 51.5% and 50.1%, respectively, and passed the 2019 cover success criterion of $\geq 25.0\%$ perennial cover (90% of the reference area value) with 43.0% and 49.2%, respectively. An evaluation of the production variable also demonstrated that both the Dryland Pasture and the Sagebrush Revegetation passed the 2018 success criterion of ≥ 287 pounds per acre of perennial herbaceous production (90% of the reference area value) by producing 702 and 737 pounds per acre, respectively, and passed the 2019 success criterion of ≥ 283 pounds per acre of perennial herbaceous production (90% of the reference area value) by producing 656 and 655 pounds per acre, respectively. With regard to the diversity standard of four species between 3% and 60% relative cover (three of which must be cool-season perennial grasses), the Sagebrush Revegetation passed in both 2018 and 2019 by having five total perennial species and three cool-season perennial grass species in both years. The Dryland Pasture is not subject to the diversity standards.

Table 1 Coal Ridge #1 - 2019							
Revegetation Success Criteria Comparison - 2018 & 2019							
		2018			2019		
		Success Criterion	Sagebrush Revegetation	Dryland Pasture Revegetation	Success Criterion	Sagebrush Revegetation	Dryland Pasture Revegetation
Plant Cover (% average cover)	Perennial Lifeforms (90% of Extended Ref. Area Value)	$\geq 24.3\%$	50.1 % Pass	51.5 % Pass	$\geq 25.0\%$	49.2 % Pass	43.0 % Pass
Production (pounds per acre)	Total Perennial Herbaceous (90% of Extended Ref. Area Value)	≥ 287	737 Pass	702 Pass	≥ 283	655 Pass	656 Pass
Diversity (Sagebrush Only)	Number of Perennial Species (between 3% & 60% Relative Cover)	≥ 4	5 Pass	Not Applicable	≥ 4	5 Pass	Not Applicable
	Number of Cool-Season Perennial Grasses (between 3% & 60% Relative Cover)	≥ 3	3 Pass		≥ 3	3 Pass	

This review of collected data demonstrates the success and utility of the revegetated areas, especially given vegetative ground cover and favorable results with regard to diversity and production despite livestock and wildlife grazing. Inspection of Plates 1 through 4 in comparison to Plates 5 and 6 provides visual evidence of this utility in 2018 and 2019. Field studies have shown that the target reclaimed plant communities have met the Phase III Bond Release success criteria in both 2018 and 2019. Ground cover of perennial plants within the reclaimed areas is comparable to adjacent undisturbed native communities and plant succession is occurring and progressing in a positive direction, indicating that plants are self-sustaining.





5.0 LITERATURE CITED

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Appendix A

Raw Tables, Maps and Photographs

Appendix A

Raw Tables, Maps and Photographs

Table 4	Vegetation Cover - Relative Cover Summary – 2018 & 2019	A-1
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Table 4 Coal Ridge #1 - Vegetation Cover - 2019								
Relative Ground Cover Summary - 2018 & 2019								
Percent Ground Cover Based on Point-Intercept Sampling								
Area -->		Dryland Pasture Revegetation		Sagebrush Revegetation		Extended Reference Area		
		2018	2019	2018	2019	2018	2019	
Grasses and Grass-like								
N	P	<i>Achnatherum hymenoides</i>	Indian Ricegrass	-	-	-	-	0.11
I	P	<i>Agropyron cristatum</i>	Crested Wheatgrass	7.58	8.03	0.28	0.10	0.43
X	A	<i>Anisantha tectorum</i>	Cheatgrass	2.25	2.70	0.51	1.92	0.07
I	P	<i>Bromus inermis</i>	Smooth Brome	41.58	22.32	33.88	19.65	2.27
I	A	<i>Bromus japonicus</i>	Japanese Brome	-	0.13	-	-	-
I	P	<i>Dactylis glomerata</i>	Orchard Grass	0.42	-	-	-	-
N	P	<i>Elymus elymoides</i>	Bottlebrush Squirreltail	-	-	-	-	1.00
N	P	<i>Elymus lanceolatus</i>	Thickspike Wheatgrass	10.51	8.54	13.42	6.09	1.85
N	P	<i>Hesperostipa comata</i>	Nedde-and-thread	-	-	-	-	1.56
N	P	<i>Koeleria cristata</i>	Prairie Junegrass	-	-	0.28	-	0.07
N	P	<i>Leymus cinereus</i>	Great Basin Wildrye	-	-	1.71	2.78	-
N	P	<i>Pascopyron smithii</i>	Western Wheatgrass	16.74	9.76	19.67	21.71	7.46
X	P	<i>Poa bulbosa</i>	Bulbous Bluegrass	12.66	34.62	12.96	25.35	38.10
I	P	<i>Poa compressa</i>	Canada Bluegrass	-	-	-	-	0.07
N	P	<i>Poa fendleriana</i>	Muttongrass	-	-	-	-	0.21
I	P	<i>Poa pratensis</i>	Kentucky Bluegrass	-	-	-	-	0.14
N	P	<i>Poa secunda / canbyi</i>	Sandberg Bluegrass	-	0.04	-	-	1.21
N	P	<i>Pseudoroegneria spicata</i>	Bluebunch Wheatgrass	0.47	-	-	-	1.49
Forbs								
N	P	<i>Allium textile</i>	Prairie Onion	-	-	-	-	0.07
N	A	<i>Alyssum desertorum</i>	Desert Alyssum	0.05	0.08	0.11	0.10	0.57
N	P	<i>Artemisia ludoviciana</i>	Prairie Sagewort	-	-	-	-	0.14
N	P	<i>Aster ascendens</i>	Creeping Aster	-	-	-	0.29	-
I	P	<i>Astragalus cicer</i>	Cicer Milkvetch	-	-	-	0.34	-
N	P	<i>Astragalus convallarius</i>	Lesser Rushy Milkvetch	-	-	-	-	0.71
N	P	<i>Astragalus miser</i>	Timber Milkvetch	-	-	-	-	0.28
N	P	<i>Balsamorhiza sagittata</i>	Arrowleaf Balsamroot	-	-	-	-	0.71
N	A	<i>Camelina microcarpa</i>	Littlepod Falseflax	-	0.25	-	0.05	-
X	B	<i>Centaurea maculosa</i>	Spotted Knapweed	-	-	-	-	1.07
I	A	<i>Chenopodium album</i>	Lambsquarters	0.05	-	-	-	-
I	A	<i>Chorispora tenella</i>	Crossflower	0.47	0.04	-	-	-
N	P	<i>Cirsium undulatum</i>	Wavyleaf Thistle	-	-	-	-	0.21
N	A	<i>Collomia linearis</i>	Slenderleaf Collomia	-	-	-	-	0.40
X	P	<i>Convolvulus arvensis</i>	Field Bindweed	0.47	1.52	-	0.53	-
N	A	<i>Descurainia pinnata</i>	Western Tansymustard	1.31	1.35	0.06	0.14	-
X	A	<i>Erodium cicutarium</i>	Redstem Stork's Bill	1.36	3.85	0.85	0.53	-
N	P	<i>Eucephalus glaucus</i>	Glaucous Aster	-	-	-	-	0.07
N	P	<i>Galium triflorum</i>	Fragrant Bedstraw	-	-	-	-	0.07
N	B	<i>Grindelia squarrosa</i>	Curlycup Gumweed	0.05	-	-	-	-
N	P	<i>Heterotheca villosa</i>	Hairy Golden Aster	-	-	0.06	0.19	0.21
I	A	<i>Kochia scoparia</i>	Summer Cypress	0.52	-	-	0.38	-
I	B	<i>Lactuca serriola</i>	Prickly Lettuce	0.05	-	-	-	-
N	A	<i>Lappula redowskii</i>	Western Stickseed	-	0.04	-	-	-
I	A	<i>Lepidium perfoliatum</i>	Clasping Pepperweed	-	0.04	-	-	-
N	P	<i>Linum lewisii</i>	Lewis Flax	0.16	0.04	0.06	-	-
I	P	<i>Medicago sativa</i>	Alfalfa	1.62	4.82	2.22	7.09	-
N	P	<i>Packera multilobata</i>	Lobeleaf Groundsel	-	-	-	0.05	-
N	P	<i>Phlox longifolia</i>	Longleaf Phlox	-	-	-	-	0.36
I	A	<i>Sisymbrium altissimum</i>	Tumble Mustard	-	0.80	-	0.29	-
N	P	<i>Solidago missouriensis</i>	Missouri Goldenrod	0.52	-	-	-	0.28
N	P	<i>Sphaeralcea coccinea</i>	Scarlet Globemallow	-	0.17	-	0.29	1.92
I	P	<i>Taraxacum officinale</i>	Common Dandelion	0.05	-	-	-	0.06
I	B	<i>Tragopogon dubius</i>	False Salsify	-	-	0.06	-	-
N	P	<i>Zigadenus venenosus</i>	Meadow Death Camas	-	-	-	-	0.07
Sub-Shrubs								
N	P	<i>Gutierrezia sarothrae</i>	Snakeweed	-	-	-	-	0.21
N	P	<i>Krascheninnikovia lanata</i>	Winterfat	-	-	-	-	0.28
Shrubs & Trees								
N	P	<i>Amelanchier utahensis</i>	Utah Serviceberry	-	-	-	-	0.57
N	P	<i>Atriplex canescens</i>	Fourwing Saltbrush	-	0.17	-	-	0.64
N	P	<i>Cercocarpus montanus</i>	Mountain Mahogany	-	-	-	-	0.85
N	P	<i>Chrysothamnus nauseosus</i>	Rubber Rabbitbrush	1.05	0.63	3.35	2.35	0.36
N	P	<i>Chrysothamnus viscidiflorus</i>	Low Rabbitbrush	-	-	-	-	0.92
N	P	<i>Dasiphora fruticosa</i>	Shrubby Cinquefoil	-	-	-	-	0.14
N	P	<i>Eriogonum microthecum</i>	Slender Buckwheat	-	-	-	-	0.11
N	P	<i>Opuntia polyachantha</i>	Plains Prickly-pear	-	-	-	-	0.07
N	P	<i>Seriphidium tridentatum wyo.</i>	Wyoming Big Sagebrush	0.05	0.04	10.52	9.82	31.70
N	P	<i>Symphoricarpos rotundifolius</i>	Snowberry	-	-	-	-	1.85
Summary by Lifeform:								
Perennial Grasses		77.30	48.69	69.24	50.31	15.14	10.12	
Annual Grasses		-	0.13	-	-	2.27	-	
Perennial Forbs		2.35	5.03	2.33	8.24	4.83	5.17	
Annual and Biennial Forbs		2.51	2.62	0.23	0.96	0.57	0.63	
Noxious / Aggressive Weeds		16.74	42.69	14.33	28.32	39.59	52.08	
Sub-Shrubs		-	-	-	-	0.50	0.17	
Shrubs and Trees		1.10	0.85	13.87	12.17	37.10	31.84	
Species Diversity Categories (Number of Species between 3% and 60% Relative Cover)†								
Number of Perennial Species		4	5	5	5	2	2	
Number of Cool-Season Perennial Grasses		4	4	3	3	1	1	

N - Native, Nw - Warm Season, I - Introduced, X - Noxious

A - Annual, B - Biennial, P - Perennial

† Diversity standards exclude invasive and noxious weed species.

Table 5 Coal Ridge #1 - Vegetation Cover - 2019										
Species Observed - 2018 & 2019										
N - Native, Nw - Warm Season, I - Introduced, X - Noxious A - Annual, B - Biennial, P - Perennial				Dryland Pasture Revegetation		Sagebrush Revegetation		Extended Reference Area		
				2018	2019	2018	2019	2018	2019	
Grasses and Grass-likes										
N	P	<i>Achnatherum hymenoides</i>	Indian Ricegrass					X	X	
I	P	<i>Agropyron cristatum</i>	Crested Wheatgrass	X	X	X	X			
X	A	<i>Anisantha tectorum</i>	Cheatgrass	X	X	X	X	X	X	
I	P	<i>Bromus inermis</i>	Smooth Brome	X	X	X	X	X	X	
I	A	<i>Bromus japonicus</i>	Japanese Brome		X			X		
I	P	<i>Dactylis glomerata</i>	Orchard Grass	X						
N	P	<i>Elymus elymoides</i>	Bottlebrush Squirreltail					X	X	
N	P	<i>Elymus lanceolatus</i>	Thickspike Wheatgrass	X	X	X	X	X	X	
N	P	<i>Hesperostipa comata</i>	Nedde-and-thread					X	X	
N	P	<i>Koeleria cristata</i>	Prairie Junegrass						X	
N	P	<i>Leymus cinereus</i>	Great Basin Wildrye			X	X			
N	P	<i>Pascopyron smithii</i>	Western Wheatgrass	X	X	X	X	X	X	
X	P	<i>Poa bulbosa</i>	Bulbous Bluegrass	X	X	X	X	X	X	
I	P	<i>Poa compressa</i>	Canada Bluegrass					X		
N	P	<i>Poa fendleriana</i>	Muttongrass					X	X	
I	P	<i>Poa pratensis</i>	Kentucky Bluegrass					X		
N	P	<i>Poa secunda</i> / <i>canbyi</i>	Sandberg Bluegrass		X			X	X	
N	P	<i>Pseudoroegneria spicata</i>	Bluebunch Wheatgrass	X				X		
N	A	<i>Vulpia octoflora</i>	Six-weeks Fescue						X	
Forbs										
X	P	<i>Acroptilon repens</i>	Russian Knapweed		X					
N	P	<i>Allium textile</i>	Prairie Onion					X	X	
N	A	<i>Alyssum desertorum</i>	Desert Alyssum	X	X	X	X	X	X	
N	P	<i>Artemisia ludoviciana</i>	Prairie Sagewort					X		
N	P	<i>Aster ascendens</i>	Creeping Aster				X		X	
I	P	<i>Astragalus cicer</i>	Cicer Milkvetch				X			
N	P	<i>Astragalus convallarius</i>	Lesser Rushy Milkvetch					X	X	
N	P	<i>Astragalus miser</i>	Timber Milkvetch					X	X	
N	P	<i>Astragalus</i> sp.	Milkvetch	X					X	
N	P	<i>Balsamorhiza sagittata</i>	Arrowleaf Balsamroot					X	X	
N	P	<i>Calylophus serrulatus</i>	Shrubby Evening Primrose					X	X	
N	A	<i>Camelina microcarpa</i>	Littlepod Falseflax		X		X			
N	P	<i>Castilleja miniata</i>	Red Indian Paintbrush					X		
X	B	<i>Centaurea maculosa</i>	Spotted Knapweed	X			X	X	X	
I	A	<i>Chenopodium album</i>	Lambsquarters	X						
I	A	<i>Chorispora tenella</i>	Crossflower	X	X					
N	P	<i>Cirsium undulatum</i>	Wavyleaf Thistle					X	X	
N	A	<i>Collomia linearis</i>	Slenderleaf Collomia						X	
X	P	<i>Convolvulus arvensis</i>	Field Bindweed	X	X		X			
N	A	<i>Descurainia pinnata</i>	Western Tansymustard	X	X	X	X		X	
X	A	<i>Erodium cicutarium</i>	Redstem Stork's Bill	X	X	X	X			
N	P	<i>Eucephalus glaucus</i>	Glaucous Aster					X		
N	P	<i>Gallium triflorum</i>	Fragrant Bedstraw				X	X	X	
N	B	<i>Grindelia squarrosa</i>	Curlycup Gumweed	X			X			
N	P	<i>Heterotheca villosa</i>	Hairy Golden Aster			X	X	X	X	
I	A	<i>Kochia scoparia</i>	Summer Cypress	X		X	X			
I	B	<i>Lactuca serriola</i>	Prickly Lettuce	X						
N	A	<i>Lappula redowskii</i>	Western Stickseed		X					
I	A	<i>Lepidium perfoliatum</i>	Clasping Pepperweed		X					
N	P	<i>Linum lewisii</i>	Lewis Flax	X	X	X	X			
I	P	<i>Medicago sativa</i>	Alfalfa	X	X	X	X			
I	B	<i>Mellilotus officinalis</i>	Yellow Sweetclover		X					
X	P	<i>Onopordum acanthium</i>	Scotch Thistle	X	X				X	
N	P	<i>Packera multilobata</i>	Lobeleaf Groundsel						X	
N	P	<i>Phlox longifolia</i>	Longleaf Phlox					X	X	
I	A	<i>Sisymbrium altissimum</i>	Tumble Mustard		X		X		X	
N	P	<i>Solidago missouriensis</i>	Missouri Goldenrod	X				X		
N	P	<i>Sphaeralcea coccinea</i>	Scarlet Globemallow	X	X		X	X	X	
I	P	<i>Taraxacum officinale</i>	Common Dandelion	X					X	
I	B	<i>Tragopogon dubius</i>	False Salsify			X		X		
N	P	<i>Zigadenus venenosus</i>	Meadow Death Camas					X	X	
Sub-Shrubs										
N	P	<i>Gutierrezia sarothrae</i>	Snakeweed					X	X	
N	P	<i>Krascheninnikovia lanata</i>	Winterfat	X				X	X	
Shrubs & Trees										
N	P	<i>Amelanchier utahensis</i>	Utah Serviceberry					X	X	
N	P	<i>Atriplex canescens</i>	Fourwing Saltbrush	X	X			X	X	
N	P	<i>Cercocarpus montanus</i>	Mountain Mahogany					X	X	
N	P	<i>Chrysothamnus nauseosus</i>	Rubber Rabbitbrush	X	X	X	X	X	X	
N	P	<i>Chrysothamnus viscidiflorus</i>	Low Rabbitbrush					X	X	
N	P	<i>Dasiphora fruticosa</i>	Shrubby Cinquefoil					X	X	
N	P	<i>Eriogonum microthecum</i>	Slender Buckwheat					X	X	
N	P	<i>Opuntia polyacantha</i>	Plains Prickly-pear					X	X	
N	P	<i>Quercus gambelii</i>	Gambel Oak					X	X	
N	P	<i>Seriphidium tridentatum</i> wyo.	Wyoming Big Sagebrush	X	X	X	X	X	X	
I	P	<i>Ulmus pumila</i>	Siberian Elm			X	X			
N	P	<i>Symphoricarpos rotundifolius</i>	Snowberry					X	X	
Total Counts by Lifeform				Perennial Grasses	6	5	5	5	12	9
				Annual Grass	0	1	0	0	1	1
				Perennial Forbs	6	3	3	7	15	15
				Annual / Biennial Forbs	7	8	4	6	2	4
				Noxious Weeds	6	6	3	5	3	4
				Sub-shrubs	1	0	0	0	2	2
Total Counts by Origin				Shrubs & Trees	3	3	3	3	11	11
				Native	14	12	9	14	38	39
				Introduced	9	8	6	7	5	3
				Noxious Weeds	6	6	3	5	3	4
Total Species Encountered				29	26	18	26	46	46	

Table 6 Coal Ridge #1 - Vegetation Cover -- 2018

Raw Data		Percent Ground Cover Based on Point-Intercept Sampling																																																																						
Transect No. —>		1	2	4	5	7	8	10	11	13	14	16	17	19	20	22	23	25	26	28	29	31	32	34	35	37	38	40	41	43	44	Average Cover	Relative Cover	Freq.																																						
Grasses and Grass-like																																																																								
I	P	Crested Wheatgrass	7	11	2	23	29	2						8						4		25	1	4			14	16	4	6	4.83	7.58	43																																							
X	A	Cheatgrass	8	6	8	23	2	10	2	6	2											8	36	13	28	43	21	25	38	28	10	1.43	2.25	30																																						
I	P	Bromus inermis					44	39	49	23	25	41	33	35	32																	26.50	41.58	97																																						
I	P	Orchard Grass					1	3	2																							0.27	0.42	13																																						
N	P	Thickspike Wheatgrass	21	12	10	2	16	20	8	8	2	22	13	6	20	4			5	6			7	6							6.70	10.51	70																																							
N	P	Elymus lanceolatus	5	6	12	24	10	4	6					4	12	10	11		11	15	12	19	16	12	9	27	15	11	11	16	15	27	10.67	16.74	83																																					
X	P	Pascopyrum smithii																																																																						
X	P	Poa bulbosa	5	16	11	9	16	2	5					9	8	8	2		6	12	9	3	10	17	12	8	2	12	16	15	8	11	10	8.07	12.66	87																																				
X	P	Pseudoroegneria spicata	5	2																											0.30	0.47	10																																							
Forbs																																																																								
N	A	Desert Alyssum	1				1																									0.03	0.05	3																																						
I	A	Lamb's-quarters																														0.03	0.05	3																																						
I	A	Crossflower	7				2																									0.30	0.47	7																																						
X	P	Field Bindweed	1											1																		0.30	0.47	17																																						
N	A	Western Tansymustard	1	6				1	4	7	1																					0.83	1.31	30																																						
X	A	Redstem Stork's Bill																														0.87	1.36	30																																						
X	A	Erodium cicutarium																															0.87	1.36	30																																					
N	B	Curlycup Gumweed												2					1		4	5	4	2	3							0.03	0.05	3																																						
I	A	Summer Cypress	4					3	1	2																						0.33	0.52	13																																						
I	B	Prickly Lettuce																														0.33	0.52	13																																						
N	P	Linum lewisii	3																													0.10	0.16	3																																						
I	P	Alfalfa	1	1				2	1	1	7									2	1	2	2	3	4							1.03	1.62	47																																						
N	P	Missouri Goldenrod																														0.33	0.52	3																																						
I	P	Common Dandelion	1																													0.03	0.05	3																																						
Sub-Shrubs																																																																								
None																															0.00	0.00	0																																							
Shrubs & Trees																																																																								
N	P	Rubber Rabbitbrush	5	15																												0.67	1.05	7																																						
N	P	Wyco. Big Sagebrush																														0.03	0.05	3																																						
Total Plant Cover																																	52	69	47	71	65	66	74	69	67	61	63	60	63	67	57	65	66	64	67	60	67	65	64	55	69	62	67	67	56	Mean										
Rock																																	0	0	2	0	2	1	2	1	0	3	0	0	0	1	0	0	1	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0							
Litter																																	21	15	49	29	27	28	13	23	26	30	14	39	37	33	31	35	29	30	28	30	30	33	24	42	30	38	33	33	27	43	30.00									
Bare ground																																	27	16	2	0	8	4	12	6	6	9	20	1	0	11	0	5	6	4	10	3	2	11	3	1	0	0	0	1	0	0	1	5.80								
Perennial Cover (excl. noxious weeds)																																	44	45	40	49	53	56	55	48	52	54	48	51	53	65	57	53	52	55	60	50	45	48	54	53	54	46	48	56	54	46	51.47									
Sampling Adequacy Calculations																																	n = 30										f = 1.3111										Variance = 33.44										n_min = 1.42									
2nd Hits on Plants Below Shrub Layer (for Diversity)																																																																								
None																																																																								
N - Native, Nw - Warm Season, I - Introduced, X - Noxious																																																																								
A - Annual, B - Biennial, P - Perennial																																																																								

Dryland Pasture Revegetation																																			
Raw Data		Percent Ground Cover Based on Point-Intercept Sampling																																	
Transect No. —>		1	2	4	5	7	8	10	11	13	14	16	17	19	20	22	23	25	26	28	29	31	32	34	35	37	38	40	41	43	44	Average Cover	Relative Freq.		
Grasses and Grass-Likes																																			
I	P	Crested Wheatgrass	13	39	5	10	2	4	12	4	2	20	24	22	3	26	3					13	5								6.33	8.03	50		
X	A	Cheatgrass	46	7	13	32	1	10	12	12	4	15	15	13	9	20	12	1	11	16	2	4									2.13	2.70	30		
I	P	Smooth Bromel																				2	27								17.60	22.32	93		
I	A	Bromus japonicus																													0.10	0.13	3		
N	P	Elymus lanceolatus	5	40	P				12	4	4	20	13				3			26		21	20	21							6.73	8.54	50		
N	P	Thickspike Wheatgrass	4	12			22	1				11	2	3	14	3	15	4			4	4	22	10	25						7.70	9.76	77		
X	P	Western Wheatgrass	17	2	23	57	28	16	5	12	44	11	21	39	23	35	29	33	28	37	43	45	35	60	35	16	3	27	1	23	39	32	27.50	34.62	100
X	P	Bulbous Bluegrass																													0.03	0.04	3		
X	P	Sandberg Bluegrass																																	
Forbs																																			
N	A	Alyssum desertorum	2						1			2																			0.07	0.08	3		
N	A	Ceanothus microcarpa	3								1																				0.20	0.25	10		
I	A	Chorizanthe tenella																													0.03	0.04	3		
X	P	Convolvulus arvensis	2				3	2	2	4	6						1	1													1.20	1.52	40		
X	A	Descurainia pinnata	1	3	2	1	2	4	1	1		2					1	3	1			5									1.07	1.35	50		
X	A	Erodium cicutarium															9	5	4			6	7	2							3.03	3.85	57		
N	A	Lappula radowskii																													0.03	0.04	3		
I	A	Lepidium perfoliatum	1				1																								0.03	0.04	3		
I	N	Linum lewisii	1																												0.03	0.04	3		
I	P	Medicago sativa	5	1	2		5	34	10			13	2	2							2	5	6								3.80	4.82	57		
I	A	Symbrium altissimum									2	6											5								0.63	0.80	23		
I	P	Sphaeralcea coccinea	1	4																											0.13	0.17	3		
Sub-Shrubs																																			
N	P																																		

Sagebrush Revegetation

N - Native, Nw - Warm Season, I - Introduced, X - Noxious A - Annual, B - Biennial, P - Perennial

Table 9 Coal Ridge - Vegetation Cover -- 2019
Sagebrush Revegetation

[illegible]

Table 10 Coal Ridge #1 - Vegetation Cover -- 2018

Extended Reference Area

Raw Data		Percent Ground Cover Based on Point-Intercept Sampling																																											
Transect No. -->		1	2	4	5	7	8	10	11	13	14	16	17	19	20	22	23	25	26	28	29	31	32	34	35	37	38	40	41	43	44	Average Cover	Relative Cover	Freq.											
Grasses and Grass-Likes																																													
X	A	6																																											
A	Anisantha tectorum	Cheatgrass																																											
I	P	Smooth Brome																																											
I	A	Japanese Brome																																											
N	P	Bottlebrush Squirreltail																																											
N	P	Thickspike Wheatgrass																																											
N	P	Nedde-and-thread																																											
N	P	Prairie Junegrass																																											
N	P	Western Wheatgrass																																											
N	P	Bulbous Bluegrass																																											
X	P	Canada Bluegrass																																											
I	P	Muttongrass																																											
N	P	Kentucky Bluegrass																																											
I	P	Sandberg Bluegrass																																											
N	P	Bluebunch Wheatgrass																																											
Forbs																																													
N	P	1																																											
N	A	Prairie Onion																																											
N	P	Desert Alyssum																																											
N	P	Prairie Sagewort																																											
N	P	Lesser Rushy Milkvetch																																											
N	P	Arrowleaf Balsamroot																																											
X	B	Spotted Knapweed																																											
N	P	Wavyleaf Thistle																																											
N	P	Glaucous Aster																																											
N	P	Hairy Golden Aster																																											
N	P	Longleaf Phlox																																											
N	P	Missouri Goldenrod																																											
N	P	Scarlet Globemallow																																											
I	P	Trifolium sp.																																											
N	P	Meadow Death Camass																																											
Sub-Shrubs																																													
N	P	3																																											
N	P	Snakeweed																																											
N	P	Winterfat																																											
Shrubs & Trees																																													
N	P	2																																											
N	P	Utah Serviceberry																																											
N	P	Fourwing Saltbrush																																											
N	P	Mountain Mahogany																																											
N	P	Rubber Rabbitbrush																																											
N	P	Chrysothamnus nauseosus																																											
N	P	Chrysothamnus viscidiflorus																																											
N	P	Shrubby Cinquefoil																																											
N	P	Plains Prickly-pear																																											
N	P	Wyoming Big Sagebrush																																											
N	P	Symphoricarpos rotundifolius																																											
Total Plant Cover		56	43	53	54	38	50	39	57	61	48	63	53	48	65	46	50	36	36	30	55	38	40	47	41	54	47	37	38	46	38	Mean													
Rock		4	5	7	1	5	4	7	0	2	2	2	0	3	0	1	0	13	11	9	1	11	10	4	5	0	3	1	1	2	3.80														
Litter		34	48	37	42	43	42	50	42	31	48	33	43	43	34	47	28	30	44	53	43	33	34	48	39	44	47	49	46	40	58	41.77													
Bare ground		6	4	3	3	14	4	4	1	6	2	2	4	6	1	6	22	21	9	8	1	18	16	1	15	2	6	11	15	13	2	7.53													
Perennial Cover (excl. noxious weeds)		30	27	33	45	23	30	24	18	27	36	25	23	31	18	29	37	29	22	20	33	24	17	23	25	34	26	22	27	27	25	27.00													
Sampling Adequacy Calculations		n = 30		t = 1.311										Variance = 80.44										n_min = 6.29																					
2nd Hits on Plants Below Shrub Layer (for Diversity)																																													
None																																													
A - Native, Nw - Warm Season, I - Introduced, X - Noxious																																													
A - Annual, B - Biennial, P - Perennial																																													

Table 11 Coal Ridge - Vegetation Cover -- 2019

[illegible]

Table 12 Coal Ridge #1 - Vegetation Production - 2018

Dryland Pasture Revegetation								
Raw Data					Oven Dry Weight (grams per 1/2 square meter)			
Sample No.	Perennial Grasses	Perennial Forbs	Sub-shrubs	Annual / Biennial Forbs	Noxious Weeds		TOTAL	
					Grass	Other	g/0.5m ²	lbs / ac
1	31.7	1.0			0.9		33.6	598.6
2	47.8			3.6	7.0		58.4	1,040.3
3	64.9	5.7			2.2		72.8	1,296.9
4	22.7	1.2			7.7		31.6	562.9
5	45.8				3.3		49.1	874.7
6	37.9	0.4			2.0		40.3	717.9
7	52.1				1.4		53.5	953.0
8	17.3	2.6			0.7		20.6	367.0
9	55.0				3.0		58.0	1,033.2
10		8.7		0.1	1.1		9.9	176.4
11	67.1	5.2		0.7	0.4		73.4	1,307.5
12	45.4	4.3			0.3		50.0	890.7
13	46.5	4.6			0.5	0.1	51.7	921.0
14	82.3				1.0		83.3	1,483.9
15	47.9				0.8		48.7	867.5
16	72.2			0.9	2.2		75.3	1,341.4
17	87.7	3.1			0.2		91.0	1,621.1
18	39.4				3.3	0.2	42.9	764.2
19	58.2				0.4		58.6	1,043.9
20	58.6				0.2	0.7	59.5	1,059.9
21	30.2				0.2		30.4	541.5
22	24.1	3.0			0.7	1.1	28.9	514.8
23	28.9				1.0	4.4	34.3	611.0
24	27.9				0.1	0.2	28.2	502.4
25	31.0				0.1	1.8	32.9	586.1
26	36.6				3.4	2.6	42.6	758.9
27	30.1	2.4			1.2	0.3	34.0	605.7
28	21.0	1.5		0.2	0.7		23.4	416.8
29	32.6				0.9	2.0	35.5	632.4
30	20.3			0.1	0.8	0.4	21.6	384.8
31	9.0				1.2	0.2	10.4	185.3
32	23.1				1.8		24.9	443.6
33	15.8				0.5	0.2	16.5	293.9
34	23.6				0.5		24.1	429.3
35	32.0	5.4			1.1		38.5	685.8
36	13.7	0.1			0.3		14.1	251.2
37	27.1	0.2			2.2	0.1	29.6	527.3
38	26.5	0.1		0.2	0.3	0.5	27.6	491.7
39	60.3				3.1		63.4	1,129.4
40	43.6				0.4		44.0	783.8
41	57.8				2.8		60.6	1,079.5
42	30.1				1.9		32.0	570.0
43	31.6				0.9		32.5	579.0
44	28.1			0.1	1.4		29.6	527.3
45	36.2	1.1			0.3		37.6	669.8
Average	38.3	1.1	0.0	0.1	1.5	0.3	41.3	736.1
Sampling Adequacy: t = 1.301 var. = 372.380 n = 45 Mean = 41.32 n_{min} = 36.922								

Table 13 Coal Ridge #1 - Vegetation Production - 2019

Dryland Pasture Revegetation								
Raw Data					Oven Dry Weight (grams per 1/2 square meter)			
Sample No.	Perennial Grasses	Perennial Forbs	Sub-shrubs	Annual / Biennial Forbs	Noxious Weeds		TOTAL	
					Grass	Other	g/0.5m ²	lbs / ac
1	40.2				74.4	2.6	117.2	2,087.8
2	26.1			4.9	66.8	2.1	99.9	1,779.6
3	26.7			0.3	3.1	5.9	36.0	641.3
4	39.7				4.8	8.2	52.7	938.8
5	33.2				25.8	0.9	59.9	1,067.1
6	18.1				21.5	22.0	61.6	1,097.3
7	30.2			10.7	4.7		45.6	812.3
8	18.4	9.8		2.6	3.9	18.3	53.0	944.1
9	42.4			0.7	64.1	2.2	109.4	1,948.9
10	24.8	6.6		5.3	1.7		38.4	684.1
11	35.8	0.7		0.7	4.9	0.3	42.4	755.3
12	44.6	4.1			2.6	0.4	51.7	921.0
13	21.0				27.2	7.7	55.9	995.8
14	45.0				4.9	15.6	65.5	1,166.8
15	65.3			4.6	37.8		107.7	1,918.6
16	45.6			3.1	43.2	3.3	95.2	1,695.9
17	8.5				3.7	17.3	29.5	525.5
18	14.4				13.7	2.8	30.9	550.5
19	78.9				8.9	10.7	98.5	1,754.7
20	43.4				10.2	1.6	55.2	983.3
21	27.6	4.9			4.2		36.7	653.8
22	4.8			1.1	16.2	12.4	34.5	614.6
23	17.8				11.5		29.3	522.0
24	52.1				12.0	5.5	69.6	1,239.9
25	34.0				9.2		43.2	769.6
26	32.9				4.8	4.4	42.1	750.0
27	70.3	3.8			25.0	1.8	100.9	1,797.4
28	86.7			2.1	19.7	10.2	118.7	2,114.5
29	31.0				17.7	5.2	53.9	960.2
30	51.5			1.0	3.7	4.3	60.5	1,077.7
31	91.8	2.9			1.0	0.8	96.5	1,719.1
32	29.4				2.8	3.5	35.7	636.0
33	26.8				9.8	2.2	38.8	691.2
34	49.1				15.0	1.1	65.2	1,161.5
35	14.4				8.0	7.2	29.6	527.3
36	34.1			2.2	7.7	25.4	69.4	1,236.3
37	24.5				4.6	9.8	38.9	693.0
38	18.4	1.8			11.8	12.0	44.0	783.8
39	6.6	6.5			44.3	5.6	63.0	1,122.3
40	66.6			1.7	0.4		68.7	1,223.8
41	16.5			0.2	5.6	3.0	25.3	450.7
42	17.8			1.6	33.1	1.9	54.4	969.1
43	15.4			0.2	2.6	7.2	25.4	452.5
44	22.8			4.4	3.9	4.7	35.8	637.7
45	68.7				0.7	9.2	78.6	1,400.2
Average	35.9	0.9	0.0	1.1	15.6	5.8	59.2	1,054.9
Sampling Adequacy: t = 1.301 var. = 713.688 n = 45 Mean = 59.22 n_{min} = 34.450								

Table 14 Coal Ridge #1 - Vegetation Production - 2018

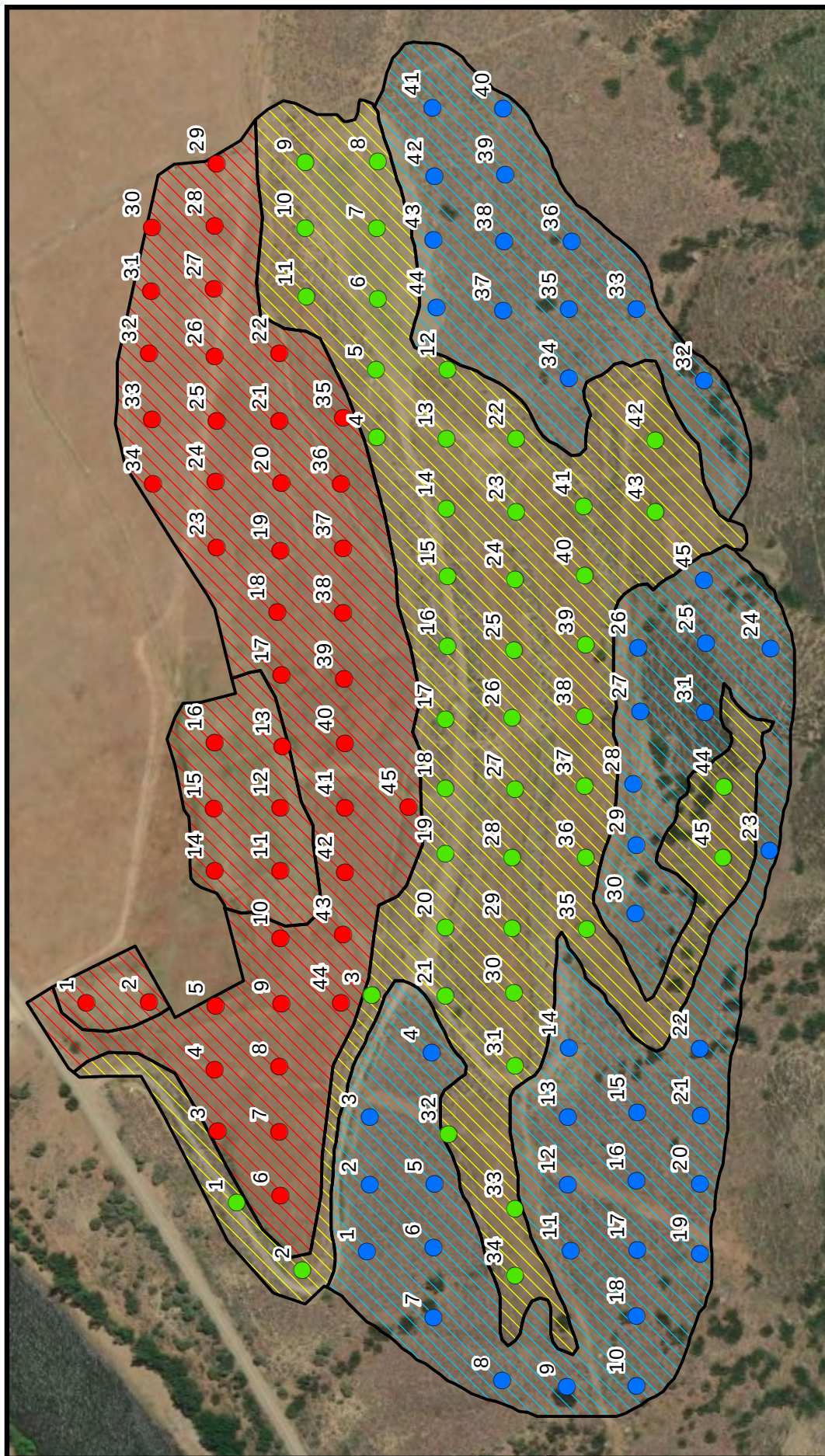
Sagebrush Revegetation								
Raw Data					Oven Dry Weight (grams per 1/2 square meter)			
Sample No.	Perennial Grasses	Perennial Forbs	Sub-shrubs	Annual / Biennial Forbs	Noxious Weeds		TOTAL	
					Grass	Other	g/0.5m ²	lbs / ac
1	39.0				0.5		39.5	703.7
2	49.6	0.1			0.2		49.9	888.9
3	38.3			0.1	0.4		38.8	691.2
4	33.2			0.1			33.3	593.2
5	35.4	3.5		0.1	0.5	0.7	40.2	716.1
6	16.2			0.1			16.3	290.4
7	44.2				0.3		44.5	792.7
8	46.8				1.9		48.7	867.5
9	56.7			0.1			56.8	1,011.8
10	23.2			1.9	0.1		25.2	448.9
11	27.0			0.1	0.2		27.3	486.3
12	23.1	22.6		0.1	0.2		46.0	819.4
13	49.4				1.7		51.1	910.3
14	25.9	1.2		0.1	0.4	1.5	29.1	518.4
15	32.3	1.8		0.1	0.3		34.5	614.6
16	32.0	4.2			0.9		37.1	660.9
17	36.9	5.1		0.2	0.4		42.6	758.9
18	63.7	0.8			0.6		65.1	1,159.7
19	44.7			2.1	0.1		46.9	835.5
20	28.2			0.1			28.3	504.1
21	38.3	1.3				0.5	40.1	714.3
22	58.1	1.0			1.3		60.4	1,076.0
23	34.7	1.7		0.1	0.6		37.1	660.9
24	57.2	1.1			4.0		62.3	1,109.8
25	30.1				1.2	3.2	34.5	614.6
26	37.1				0.2		37.3	664.5
27	24.4	1.6			1.0	0.9	27.9	497.0
28	52.6				4.3		56.9	1,013.6
29	53.8				0.8		54.6	972.6
30	36.1				2.2		38.3	682.3
31	30.4			0.1	0.7	2.7	33.9	603.9
32	28.8	3.2		0.1	2.0		34.1	607.5
33	64.7				0.6		65.3	1,163.3
34	44.9			0.1	0.5		45.5	810.5
35	52.5				4.4		56.9	1,013.6
36	27.1	4.6		0.1	3.1		34.9	621.7
37	16.4	1.9		0.1	0.9		19.3	343.8
38	38.7	1.8			4.4		44.9	799.8
39	54.4	2.4		0.1	2.1		59.0	1,051.0
40	52.2				1.0		53.2	947.7
41	36.9	7.1		0.2	0.5		44.7	796.1
42	47.8	8.0		0.1	3.9		59.8	1,065.3
43	33.9			0.1	0.7		34.7	618.1
44	29.4				0.5		29.9	532.6
45	54.6	4.5			4.9		64.0	1,140.1
Average	39.6	1.8	0.0	0.1	1.2	0.2	42.9	764.3
Sampling Adequacy: t = 1.301 var. = 158.922 n = 45 Mean = 42.90 n_{min} = 14.615								

Table 15 Coal Ridge #1 - Vegetation Production - 2019

Sagebrush Revegetation								
Raw Data					Oven Dry Weight (grams per 1/2 square meter)			
Sample No.	Perennial Grasses	Perennial Forbs	Sub-shrubs	Annual / Biennial Forbs	Noxious Weeds		TOTAL	
					Grass	Other	g/0.5m ²	lbs / ac
1	37.7				1.0		38.7	689.4
2	61.1			0.2	7.8		69.1	1,230.9
3	69.7				4.2		73.9	1,316.5
4	23.7	9.0			3.5	0.1	36.3	646.6
5	40.6	1.4			0.7		42.7	760.7
6	74.7				2.8		77.5	1,380.6
7	54.5			0.4	3.1		58.0	1,033.2
8	57.6			1.3	5.6		64.5	1,149.0
9	39.4				3.3		42.7	760.7
10	24.6	2.1		0.2	7.2		34.1	607.5
11	15.2				4.7		19.9	354.5
12	70.8				0.9	0.3	72.0	1,282.6
13	57.6	0.9		1.1	0.1		59.7	1,063.5
14	15.8	11.6			5.0		32.4	577.2
15	25.6	26.0			1.8	0.7	54.1	963.7
16	45.6				1.5	2.0	49.1	874.7
17	19.5	3.8		0.4	4.7	0.3	28.7	511.3
18	26.4				2.6	1.9	30.9	550.5
19	32.7				2.9		35.6	634.2
20	24.3			1.8	3.1		29.2	520.2
21	18.4			0.2	6.8		25.4	452.5
22	21.5	1.6			1.0		24.1	429.3
23	23.7	1.4			6.0		31.1	554.0
24	13.4				3.4	2.9	19.7	350.9
25	12.3	13.6			3.7	1.7	31.3	557.6
26	41.2				2.8		44.0	783.8
27	40.0				4.2		44.2	787.4
28	8.3	13.8			2.1	2.4	26.6	473.9
29	41.6			0.4	5.7		47.7	849.7
30	23.8	5.6		0.2	1.3	2.7	33.6	598.6
31	19.6				2.6		22.2	395.5
32	67.3			0.3	0.1		67.7	1,206.0
33	62.4				1.5	1.2	65.1	1,159.7
34	41.9				6.3	2.6	50.8	905.0
35	10.6	0.8			5.0		16.4	292.1
36	36.5			0.2	4.6		41.3	735.7
37	1.8	20.2			3.1		25.1	447.1
38	5.7	4.1		1.0	1.7	2.1	14.6	260.1
39	18.4	3.8			1.7	1.5	25.4	452.5
40	60.6	19.4			2.0		82.0	1,460.7
41	28.7	8.0			6.8		43.5	774.9
42	13.2				5.2		18.4	327.8
43	31.6	3.4			4.2		39.2	698.3
44	10.2	4.0			7.7		21.9	390.1
45	27.0	6.6		0.9	2.0		36.5	650.2
Average	33.3	3.6	0.0	0.2	3.5	0.5	41.0	731.1
Sampling Adequacy: t = 1.301 var. = 323.724 n = 45 Mean = 41.04 n_{min} = 32.533								

Table 16 Coal Ridge #1 - Vegetation Production - 2018								
Extended Reference Area								
Raw Data				Oven Dry Weight (grams per 1/2 square meter)				
Sample No.	Perennial Grasses	Perennial Forbs	Sub-shrubs	Annual / Biennial Forbs	Noxious Weeds		TOTAL	
					Grass	Other	g/0.5m ²	lbs / ac
1	8.0			0.1	0.4		8.5	151.4
2	20.7				1.3		22.0	391.9
3	16.3	4.0		0.1	0.9		21.3	379.4
4	12.9			0.2	0.6		13.7	244.1
5	10.5	0.5			0.5		11.5	204.9
6	5.2				0.7		5.9	105.1
7	2.3	6.9			0.6		9.8	174.6
8	16.5	4.3		0.1	0.4		21.3	379.4
9	2.0	9.6		0.2	2.0		13.8	245.8
10	32.7	2.4			2.1	0.3	37.5	668.0
11	17.1			0.5	1.9		19.5	347.4
12	34.5				3.4		37.9	675.2
13	0.5	14.1		0.1	2.9		17.6	313.5
14	33.2				2.3		35.5	632.4
15	1.3	9.1			2.2		12.6	224.5
16	6.0	15.4		0.2	1.5		23.1	411.5
17	7.0	15.6		2.0	3.7		28.3	504.1
18	6.0	9.2		0.2	2.0		17.4	310.0
19	33.8	2.0		0.2	2.0		38.0	676.9
20	9.6	8.4			1.3		19.3	343.8
21	6.0	4.6		0.1	0.8		11.5	204.9
22	17.8			0.2	0.6		18.6	331.3
23	1.7	16.7					18.4	327.8
24	10.3		3.4	0.2			13.9	247.6
25	0.2	4.0			0.7		4.9	87.3
26	1.6	5.6			0.3		7.5	133.6
27	3.9	4.4		0.1	0.1		8.5	151.4
28	24.1						24.1	429.3
29	15.7	3.6			1.9		21.2	377.7
30	1.8	25.0		0.1	1.9		28.8	513.0
31	11.4			0.3	0.1		11.8	210.2
32		20.3			1.1		21.4	381.2
33	10.1	8.5			10.5		29.1	518.4
34	27.0	0.3			0.6		27.9	497.0
35	3.1	17.7			0.2		21.0	374.1
36	29.0			0.3	0.4	0.1	29.8	530.9
37	28.3				4.2		32.5	579.0
38	2.3	2.6			4.0		8.9	158.5
39	2.8	11.7		0.1	2.1		16.7	297.5
40	23.5			0.2	0.6		24.3	432.9
41	12.0	2.7			0.2		14.9	265.4
42	5.1	11.0		0.2	2.0		18.3	326.0
43	14.1	3.6			3.4		21.1	375.9
44	12.9				2.1	3.3	18.3	326.0
45	12.3	4.5			1.2		18.0	320.7
Average	12.3	5.5	0.1	0.1	1.6	0.1	19.7	350.7
Sampling Adequacy: t = 1.301 var. = 75.213 n = 45 Mean = 19.69 n_{min} = 32.852								

Table 17 Coal Ridge #1 - Vegetation Production - 2019								
Extended Reference Area								
Raw Data					Oven Dry Weight (grams per 1/2 square meter)			
Sample No.	Perennial Grasses	Perennial Forbs	Sub-shrubs	Annual / Biennial Forbs	Noxious Weeds		TOTAL	
					Grass	Other	g/0.5m ²	lbs / ac
1	26.1				11.3		37.4	666.2
2	3.6	7.5	10.8		1.7		23.6	420.4
3	3.9	11.1		0.5	1.7		17.2	306.4
4	10.5	5.0		0.1	0.8		16.4	292.1
5	42.1	1.4		0.3	0.4		44.2	787.4
6	14.8	1.9			4.0		20.7	368.7
7	5.6	0.7		0.1	4.0		10.4	185.3
8	16.0	2.1		0.8	1.3		20.2	359.8
9	4.9	0.4	0.3		2.6		8.2	146.1
10	15.2			0.2	1.7		17.1	304.6
11		9.2		0.1	1.3		10.6	188.8
12	27.5	6.3			4.4		38.2	680.5
13	19.4			0.3	0.5		20.2	359.8
14	36.6			0.5	2.2		39.3	700.1
15	10.8			0.8	2.7	1.0	15.3	272.6
16	1.1	14.7		1.7	1.9		19.4	345.6
17	20.6	1.0			3.9		25.5	454.3
18	21.3		21.5	0.9	0.1		43.8	780.3
19	2.1	11.5		0.2	4.9		18.7	333.1
20	6.6	7.1		1.2	1.8		16.7	297.5
21	18.2	0.4		0.2	0.5		19.3	343.8
22		14.1		1.2	1.9		17.2	306.4
23	32.4				0.3		32.7	582.5
24	10.6	5.8		0.1	0.2		16.7	297.5
25	5.7			0.1	0.5		6.3	112.2
26	21.2	2.7		0.2	0.7		24.8	441.8
27	2.1	11.5		3.0	0.8		17.4	310.0
28	5.9			0.4	0.4		6.7	119.4
29	21.2				4.2		25.4	452.5
30	1.0	18.2		0.2	3.0		22.4	399.0
31	7.5	0.5			2.0		10.0	178.1
32	21.6			0.4	2.3		24.3	432.9
33	15.2	3.5		0.1	3.2		22.0	391.9
34	14.4				5.6		20.0	356.3
35	6.9	13.3		0.2	2.0		22.4	399.0
36		7.9		0.1	2.0		10.0	178.1
37	0.3	13.9		0.2	4.3		18.7	333.1
38	10.0	8.6		0.2	3.8		22.6	402.6
39	12.3	2.3		0.6	2.1		17.3	308.2
40	8.9	12.3		0.5	2.8		24.5	436.4
41		6.3		0.2	4.0		10.5	187.0
42	3.9	4.5			1.7		10.1	179.9
43	5.4	16.5		0.2	2.3		24.4	434.7
44	15.5	3.1		0.4	6.0		25.0	445.4
45		6.2		0.3	1.3		7.8	138.9
Average	11.8	5.1	0.7	0.4	2.5	0.0	20.5	364.8
Sampling Adequacy: t = 1.301 var. = 87.079 n = 45 Mean = 20.48 n_{min} = 35.146								



Map 2 Coal Ridge #1 Mine - 2018

Phase III Bond Release Evaluation

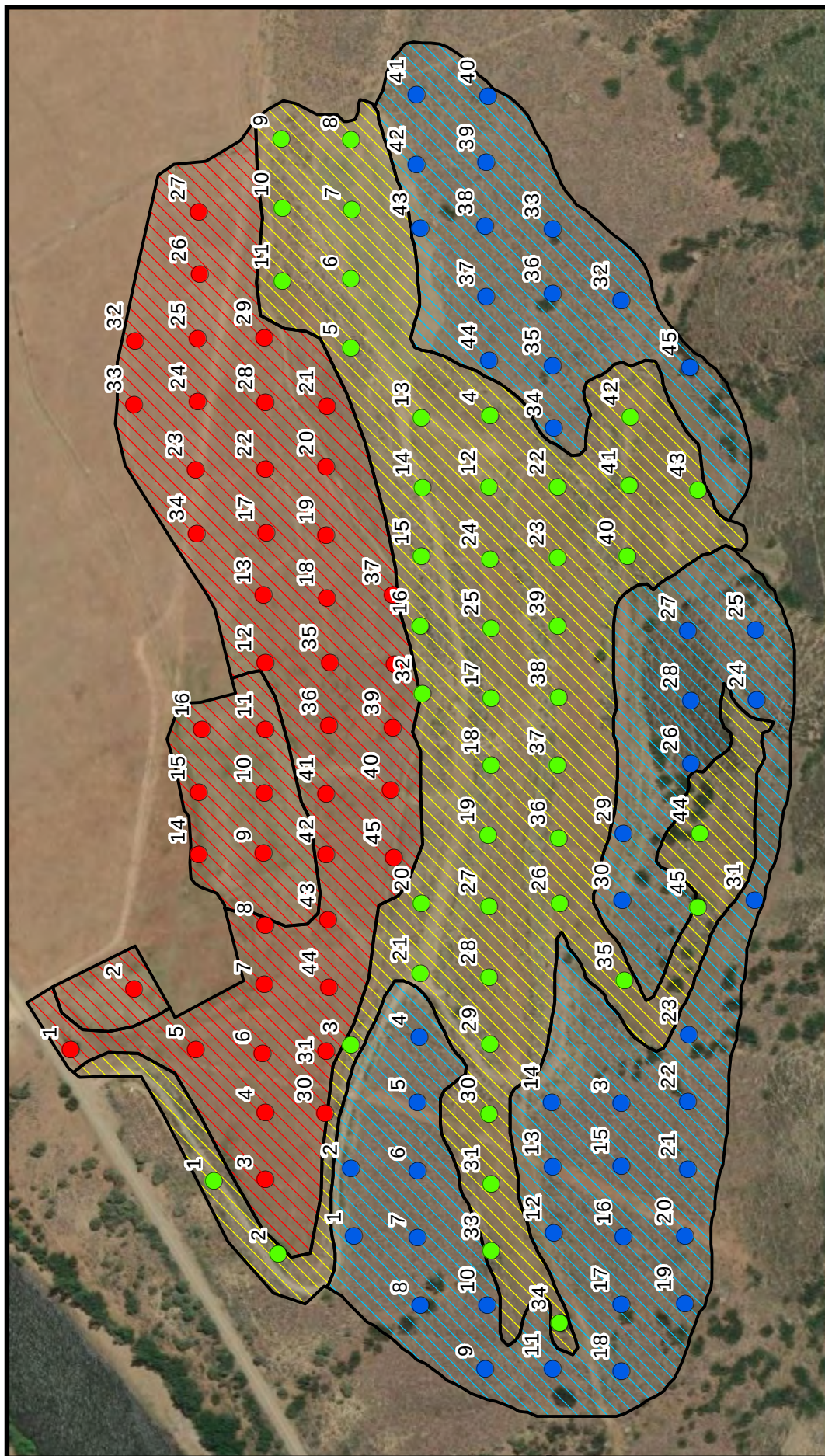
Sample Point Locations

- Dryland Pasture Revegetation Sample Point - 130' x 130' Grid
- Sagebrush Revegetation Sample Point - 140' x 140' Grid
- Extended Reference Area Sample Point - 135' x 135' Grid



1 inch = 300 feet





Map 3 Coal Ridge #1 Mine - 2019

Phase III Bond Release Evaluation

Sample Point Locations

- Dryland Pasture Revegetation Sample Point - 130' x 130' Grid
- Sagebrush Revegetation Sample Point - 140' x 140' Grid
- Extended Reference Area Sample Point - 135' x 135' Grid



1 inch = 300 feet





Photo 1: Dryland Pasture Revegetation – 2018



Photo 2: Dryland Pasture Revegetation - 2019



Photo 3: Sagebrush Revegetation - 2018



Photo 4: Sagebrush Revegetation - 2019



Photo 5: Extended Reference Area - 2018



Photo 6: Extended Reference Area - 2019