

**Stand Alone Report 6**  
**2012 Baseline Vegetation Assessment**  
**Upton Plant Site**



Rare Element Resources, Inc.  
2012 Baseline Vegetation Assessment  
Bear Lodge Project – Upton Plant Site

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## **D8-2.1 INTRODUCTION**

Rare Element Resources, Inc. (RER) proposes to mine and recover rare earth elements (REE) in the Bear Lodge Mountains of northeastern Wyoming. The proposed Bear Lodge Project consists of the Bull Hill Mine and Upton Plant Site. The proposed Bull Hill Mine, located approximately 12 miles north of Sundance, Wyoming, in central Crook County, will consist of an open-pit mining operation and Physical Upgrading (PUG) Plant for REE mineral pre-concentration. REE mineral pre-concentrate produced at the PUG plant will be transported to the proposed Upton Plant Site which will consist of a Hydrometallurgical Plant and Tailings Storage Pond. The proposed Upton Plant Site Permit Area is located approximately 40 miles south of the proposed Bull Hill Mine approximately two miles northwest of Upton, Wyoming, in north-central Weston County.

The Upton Plant Site Permit Area proposed by RER for the Wyoming Mine Permit Application includes approximately 831.85 acres of the initial 856.20 acre permit area (referenced within this report as the proposed Upton Plant Site Permit Area). Baseline vegetation assessments were completed prior to revision of the proposed permit area. As a result, the entire 856.20 acre permit area was evaluated during baseline vegetation assessments (referenced within this report as the Upton Plant Site Permit Area). Addendum D8-2-F contains a map of the Bear Lodge Project –Upton Plant Site Permit Area evaluated during baseline vegetation assessments.

The Upton Plant Site Permit Area are location in all or portions of:

- S ½ Section 28 T48N R65W
- SE ¼ Section 29 T48N R65W
- NE ¼ NE ¼ Section 32 T48N R65W
- Section 33 T48N R65W

This report presents baseline information on the vegetation communities occurring within the approximately 831.85 acre proposed Upton Plant Site Permit Area.

## **D8-2.2 METHODOLOGY**

All sampling procedures were designed according to the Wyoming Department of Environmental Quality – Land Quality Division (WDEQ) Rules and Regulations for Non-Coal Permitting, Guideline 2 (November 1997) and July 2012 consultation with the WDEQ. Baseline vegetation sampling methods for the Upton Plant Site Permit Area were derived by BKS Environmental Associates, Inc. (BKS), of Gillette, Wyoming, in July 2012. WDEQ approved the baseline vegetation sampling methodology derived by BKS on July 19, 2012.

BKS conducted the baseline vegetation assessment fieldwork July 30-August 2, 2012. All sampling procedures outlined in the approved WDEQ baseline vegetation sampling methodology were executed as approved.

### **D8-2.2.1 Vegetation Community Mapping**

Six vegetation communities were identified within the Upton Plant Site Permit Area: Big Sagebrush Shrubland, Greasewood Shrubland, Meadow Grassland, Mixed Shrubland, Reclaimed Grassland, and Upland Grassland. Vegetation communities were mapped using U.S. Department of Agriculture (USDA) National Agricultural Imagery Program (NAIP) true color ortho aerial imagery and verified through field surveys. Extent and number of vegetation communities throughout the Upton Plant Site Permit Area were agreed upon by WDEQ, RER, and BKS personnel during the July 17, 2012, site visit. Disturbed areas within the Upton Plant Site Permit Area were identified and mapped, based on the scale of the available mapping.

All areas within  $\frac{1}{2}$  mile of the Upton Plant Site Permit Area were mapped based on review of 2011 USDA NAIP true color ortho aerial imagery within the Upton Plant Site Permit Area. Field verification of the vegetation communities within the  $\frac{1}{2}$  mile buffer was not necessary, and vegetation sampling was not conducted within the  $\frac{1}{2}$  mile buffer.

### **D8-2.2.2 Selection of Sample Point Locations**

A computerized systematic grid (through ArcGIS) was used to randomly locate 50 sample points within each vegetation community occurring within the Upton Plant Site Permit Area. These computer generated random locations were uploaded to a hand-held Global Positioning System (GPS) unit for actual location in the field. Sample points were sampled in numerical order until the minimum sample size was attained and then, until either sample adequacy was met or the required maximum number of samples had been collected. Disturbed areas were excluded from quantitative vegetation sampling.

### **D8-2.2.3 Sample Intensity**

A total of 150 sample points were sampled within the Upton Plant Permit Area. Thirty-six sample points were sampled within the Big Sagebrush Shrubland vegetation community. Twenty-nine sample points were sampled within the Greasewood Shrubland vegetation community. Twenty-four sample points were sampled within the Meadow Grassland vegetation community. Twenty-two sample points were sampled within the Reclaimed Grassland vegetation community. Twenty sample points were sampled within the Mixed Shrubland vegetation community. Nineteen sample points were sampled within the Upland Grassland vegetation community.



#### **D8-2.2.4 Cover Sampling of Vegetation Communities**

Line-transect point-intercept methods were used to collect percent absolute cover data within the Big Sagebrush Shrubland, Greasewood Shrubland, Meadow Grassland, Mixed Shrubland, Reclaimed Grassland, and Upland Grassland vegetation communities. Percent cover measurements were taken from point-intercepts at 1-meter intervals along a 50-meter cover transect using a laser point device at each sample location. Each 50-meter cover transect began at its specified random origin point and extended in a random compass direction. Transects that exceed the boundaries of the vegetation community being sampled were redirected back into its vegetation community at a 90 degree angle from the original transect direction at the point of intercept. In instances where a 90 degree angle of reflection did not place the transect within the sampled vegetation community, a 45 degree angle of reflection was used.

Each 50-meter cover transect represented a single sample point within the given vegetation community. Each point-intercept represented 2% of the cover measurement. Percent cover measurements recorded “first-hit” point-intercepts by live foliar vegetation species, litter, rock, or bare ground. “Second-hits” on vegetation were recorded, but used only for the purpose of constructing a plant species list for each vegetation community.

Percent vegetation cover is the vertical projection of the general outline of plants to the ground surface. All “first-hit” point-intercepts of living vegetation and growth, produced during the current growing season, were counted toward total vegetation cover. Lichen and moss were not included in total vegetation cover. Total vegetation cover data was summarized by computing absolute (mean) cover, relative cover (% of total vegetation cover), frequency, and relative frequency (% of total plot occurrences for each plant species).

Total ground cover equals the sum of cover values for percent vegetation, percent litter, percent cryptograms, and percent rock. Litter included all non-living organic material that was recognizable. Rock fragments were recorded when equal to or greater than two centimeters in size (i.e., sheet flow, minimum non-erodible particle size). Total ground cover measurements were expressed in absolute percentages for each sample point.

#### **D8-2.2.5 Shrub and Tree Density**

Although shrub density sampling is not required for non-coal sites, this data was collected in conjunction with the cover sampling. Shrub density sampling was accomplished by counting each individual full, half-, and sub-shrub species within a 2-meter wide belt transect centered over the 50-meter cover

transect, yielding a 100-m<sup>2</sup> belt transect. The number of individual shrub occurrences was recorded by species. The number shrub density belt transects equaled the number of 50-meter cover transects within each vegetation community. Data was tabulated by computing the mean density per m<sup>2</sup> and mean density per acre. Sample adequacy was not calculated for shrub density transects. General approximations of shrub heights were recorded; however, shrub height measurements were not summarized for purposes of this report.

Trees occurring within the Upton Plant Site Permit Area were direct counted, by species, at the time of cover sampling.

#### **D8-2.2.6 Species Diversity and Composition**

Species diversity was assessed by recording all plant species observed within the same 100-m<sup>2</sup> belt transect used for determining shrub density. These observations provide a measurement of the total species diversity for each vegetation community. Species diversity data was reported as the average numbers of species per 100-m<sup>2</sup> belt transect and total number of species within each vegetation community, based on the comprehensive plant species list of sampled and observed plant species. Species diversity calculations did not include Species Lacking Credible Value (SLCV): halogeton (*Halogeton glomeratus*), Japanese brome (*Bromus japonicus*), cheatgrass (*Bromus tectorum*), summer cypress (*Bassia sieversiana*), and Russian thistle (*Salsola tragus*), State Designated Noxious Weeds or Weston County Declared Weeds. The number of species diversity belt transects equaled the number of 50-meter cover transects within each vegetation community.

Based on the cover transect data, the total number of plant species, by lifeform, and the total number of plant species with greater than 2% relative vegetation cover, by lifeform, was also determined for each vegetation community.

A comprehensive plant species list of all species encountered during 2012 baseline vegetation assessment was compiled. Plant species encountered during other site assessments conducted on May 30, June 28, July 30-31, August 1-2, and August 9 2012 were also included in the species list. Plant species were compiled by lifeform and vegetation community. Scientific nomenclature follows the Rocky Mountain Vascular Plants of Wyoming (Dorn 2001).

#### **D8-2.2.7 Sample Adequacy**

Sample adequacy for absolute total vegetation cover and total ground cover was tested for each of the sampled vegetation communities, using the following formula as outlined in WDEQ Guideline 2:

$$n_{\min} = \frac{2(sz)^2}{(dx)^2}$$

Where  $n_{\min}$  = the number of sample points needed in a given vegetation community

s = sample standard deviation

z = 1.28

d = 0.1

x = sample mean for absolute total vegetation cover or total ground cover

Confidence levels were determined as outlined in WDEQ Guideline 2.

#### **D8-2.2.8 Extended Reference Area**

For the purposes of this permit Extended Reference Area (EXREFA) means a native land unit which will be used to evaluate revegetation success for each of the same native vegetation communities which were affected by the proposed activities. All Big Sagebrush Shrubland, Greasewood Shrubland, Meadow Grassland, Mixed Shrubland, Reclaimed Grassland, and Upland Grassland vegetation communities unaffected by the proposed activities within the proposed Upton Plant Site Permit Area will serve as the EXREFA. The EXREFA will remain unaffected over the course of the project and will be as large as practical, at least two acres, considering land ownership patterns and land management history.

#### **D8-2.2.9 Cropland and Hayland Productivity**

No prime farmland or agricultural land of state wide importance occurs within the Upton Plant Site Permit Area or proposed Upton Plant Site Permit Area (NRCS 2013).

### **D8-2.3 RESULTS**

Tables are located in Addendum D8-2-A. Refer to Addendum D8-2-B for the comprehensive plant species list. Refer to Addendum D8-2-C for the cover raw data and cover summaries. Refer to Addendum D8-2-D for the shrub density summaries. Refer to Addendum D8-2-E for photographs. Refer to Addendum D8-2-F for maps illustrating the vegetation communities, sample locations, and weeds present within the proposed Upton Plant Site Permit Area.

#### **D8-2.3.1 Vegetation Community Mapping**

The Upton Plant Site Permit Area is approximately 831.85 acres (Table D8-2.1). Of these acres, the Big Sagebrush Shrubland vegetation community occupied approximately 138.78 acres (16.68%), the Greasewood Shrubland vegetation community occupied approximately 153.30 acres (18.43%), the Meadow

Grassland vegetation community occupied approximately 36.16 acres (4.35%), the Mixed Shrubland vegetation community occupied approximately 334.76 acres (40.24%), the Reclaimed Grassland vegetation community occupied approximately 45.80 acres (5.51%), and the Upland Grassland vegetation community occupied approximately 116.24 acres (13.97%). Disturbed areas, defined as lands disturbed by human activities, encompassed approximately 3.90 acres (0.47%), and water covered approximately 2.91 acres (0.35%).

### **D8-2.3.2 Big Sagebrush Shrubland**

This vegetation community comprised 138.78 of the 831.85 acre (16.68%) Upton Plant Site Permit Area and was characterized by greater than 20% big sagebrush (*Artemisia tridentata*) canopy cover. This vegetation community was found on deeper, fine-textured soils in the northwest, southwest, and southeast portions of the Upton Plant Site Permit Area. The topography of these sites captures snow during the winter months, creating persistent drifts resulting in different vegetation types than adjacent sites where snow blows free. Big sagebrush shrubland habitats often end along fence lines, indicating delineation based on different land use practices.

#### D8-2.3.2.1 Cover

Thirty-six, 50-meter cover transects were sampled within the Big Sagebrush Shrubland vegetation community. Absolute total vegetation cover was 48.22%. Absolute total ground cover was 96.66% (Table D8-2.2). Absolute bare soil and litter/rock percentages were 3.34% and 44.88%, respectively. Cryptograms provided 3.56% absolute cover (Table D8-2.5). Native cool season perennial grasses were the dominant lifeform with 43.31% relative vegetation cover, followed by native full shrubs with 25.58% relative vegetation cover (Table D8-2.4). Big sagebrush provided the highest relative vegetation cover at 25.13%, while western wheatgrass (*Elymus smithii*) provided the next highest relative vegetation cover at 22.11% (Addendum D8-2-C).

#### D8-2.3.2.2 Shrub and Tree Density

Shrub density was 0.81 shrubs/m<sup>2</sup> or 3,076.83 shrubs/acre (Table D8-2.2). Big sagebrush contributed 90.27% of the relative density with 0.73 shrubs/m<sup>2</sup> (Addendum D8-2-D). No trees were observed within the Big Sagebrush Shrubland vegetation community.

#### D8-2.3.2.3 Species Diversity and Composition

Excluding SLCV, 11 lifeforms and 37 plant species were sampled or observed within the Big Sagebrush Shrubland vegetation community (Addendum D8-2-B). The mean number of plant species sampled or observed per belt transect was 9.69 (Addendum D8-2-C). Native perennial forbs were the most common

lifeform encountered with nine plant species sampled or observed. Native cool season perennial grasses were the second most common lifeform with six plant species sampled or observed (Addendum D8-2-B). Based on all plant species sampled on the cover transects, native cool season perennial grass, native warm season perennial grass, introduced perennial grass, native grasslike, and native full shrub lifeforms all had at least one plant species with greater than 2% relative vegetation cover (Table D8-2.6).

### **D8-2.3.3 Greasewood Shrubland**

This vegetation community occupied 153.30 acres of the 831.85 acre (18.43%) Upton Plant Site Permit Area. This vegetation community was characterized by greater than 20% greasewood (*Sarcobatus vermiculatus*) canopy cover and occurred throughout the proposed Upton Plant Site Permit Area on breaks, as well as low-lying areas adjacent to the Meadow Grassland vegetation community on saline or alkaline floodplains.

#### D8-2.3.3.1 Cover

Twenty-nine, 50-meter cover transects were sampled within the Greasewood Shrubland vegetation community. Absolute total vegetation cover was 61.10%. Absolute total ground cover was 89.93% (Table D8-2.2). Absolute bare soil and litter/rock percentages were 10.07% and 28.42%, respectively. Cryptograms provided 0.41% absolute cover (Table D8-2-5). Introduced perennial grasses were the dominant lifeform with 45.16% relative vegetation cover, followed by native cool season perennial grasses with 28.45% relative vegetation cover (Table D8-2.4). Crested wheatgrass (*Agropyron cristatum*) provided the highest relative vegetation cover at 43.36%, while greasewood provided the next highest relative vegetation cover at 19.19% (Addendum D8-2-C).

#### D8-2.3.3.2 Shrub and Tree Density

Shrub density was 0.90 shrubs/m<sup>2</sup> or 3,639.47 shrubs/acre (Table D8-2.2). Greasewood contributed 71.36% of the relative density with 0.64 shrubs/m<sup>2</sup> (Addendum D8-2-D). No trees were observed within the Greasewood Shrubland vegetation community.

#### D8-2.3.3.3 Species Diversity and Composition

Excluding SLCV, 11 lifeforms and 37 plant species were sampled or observed within the Greasewood Shrubland vegetation community (Addendum D8-2-B). The mean number of plant species sampled or observed per belt transect was 7.41 (Addendum D8-2-C). Native cool season perennial grasses were the most common lifeform encountered with nine plant species sampled or observed. Native perennial forbs were the second most common lifeform with five plant species sampled or observed (Addendum D8-2-B). Based on all plant species

sampled on the cover transects, native cool season perennial grass, introduced perennial grass, and native full shrub lifeforms all had at least one plant species with greater than 2% relative vegetation cover (Table D8-2.6).

#### **D8-2.3.4 Meadow Grassland**

This vegetation community occupied approximately 36.16 acres of the 831.85 acre (4.35%) Upton Plant Site Permit Area. The Meadow Grassland vegetation community was found in shallow ephemeral drainages in the western portion of the Upton Plant Site Permit Area to deeper, more incised drainages along Coyote Creek in the eastern portion of the Upton Plant Site Permit Area, as well as surrounding reservoirs throughout the Upton Plant Site Permit Area and one seep/spring in the southwest portion of the Upton Plant Site Permit Area. Soils were generally deep, clayey or fine textured and not well developed.

##### D8-2.3.4.1 Cover

Twenty-four, 50-meter cover transects were sampled within the Meadow Grassland vegetation community. Absolute total vegetation cover was 60.60%. Absolute total ground cover was 94.44% (Table D8-2.2). Absolute bare soil and litter/rock percentages were 5.56% and 33.84%, respectively. Cryptograms were not observed within this vegetation community (Table D8-2.5). Native cool season perennial grasses were the dominant lifeform with 41.82% relative vegetation cover, followed by native warm season perennial grasses with 23.93% relative vegetation cover (Table D8-2.4). Western wheatgrass provided the highest relative vegetation cover at 34.39%, while prairie cordgrass (*Spartina pectinata*) provided the next highest relative vegetation cover at 19.93% (Addendum D8-2-C).

##### D8-2.3.4.2 Shrub and Tree Density

Shrub density was 0.01 shrubs/m<sup>2</sup> or 52.21 shrubs/acre (Table D8-2.2). Greasewood contributed 90.70% of the relative density at 0.01 shrubs/m<sup>2</sup> (Addendum D8-2-D). Two trees were observed within the Meadow Grassland vegetation community: one eastern cottonwood (*Populus deltoides*) in the central portion of the Upton Plant Site Permit Area and one peachleaf willow (*Salix amygdaloides*) in the southeast portion of the Upton Site Permit Area.

##### D8-2.3.4.3 Species Diversity and Composition

Excluding SLCV, 12 lifeforms and 48 plant species were sampled or observed within the Meadow Grassland vegetation community (Addendum D8-2-B). The mean number of plant species sampled or observed per belt transect was 6.80 (Addendum D8-2-C). Native perennial forbs were the most common lifeform encountered with 10 plant species sampled or observed. Native cool season

perennial grasses were the second most common lifeform with eight plant species sampled or observed (Addendum D8-2-B). Based on all plant species sampled on the cover transects, native cool season perennial grass, native warm season perennial grass, introduced perennial grass, and native grasslikes lifeforms all had at least one plant species with greater than 2% relative vegetation cover (Table D8-2.6).

### **D8-2.3.5 Mixed Shrubland**

This vegetation community occupied approximately 334.76 acres of the 831.85 acre (40.24%) Upton Plant Site Permit Area and was characterized by greater than 20% greasewood and big sagebrush canopy cover. Big sagebrush and yellow rabbitbrush (*Chrysothamnus viscidiflorus*) were the dominant shrub species present, with greasewood and broom snakeweed (*Gutierrezia sarothrae*) also accounting for high shrub cover. Generally, each shrub species was equally dominant across the vegetation community. The Mixed Shrubland vegetation community occurred throughout most of the central portion of the Upton Plant Site Permit Area on breaks, slopes, and low-lying areas on saline or alkaline floodplains.

#### D8-2.3.5.1 Cover

Twenty, 50-meter cover transects were sampled within the Mixed Shrubland vegetation community. Absolute total vegetation cover was 48.60%. Absolute total ground cover was 85.80% (Table D8-2.2). Absolute bare soil and litter/rock percentages were 14.20% and 34.60%, respectively. Cryptograms provided 2.60% absolute cover (Table D8-2.5). Native cool season perennial grasses were the dominant lifeform with 39.50% relative vegetation cover, followed by introduced perennial grasses with 25.92% relative vegetation cover (Table D8-2.4). Crested wheatgrass provided the highest relative vegetation cover at 24.69%, while big sagebrush provided the next highest relative vegetation cover at 15.43% (Addendum D8-2-C).

#### D8-2.3.5.2 Shrub and Tree Density

Shrub density was 1.26 shrubs/m<sup>2</sup> or 5,083.03 shrubs/acre (Table D8-2.2). Big sagebrush contributed 69.31% of the relative density at 0.87 shrubs/m<sup>2</sup>, and yellow rabbitbrush provided 11.54% of the relative density (Addendum D8-2-D). One Rocky Mountain juniper (*Juniperus scopulorum*) was observed in the northwest portion of the Upton Plant Site Permit Area within the Mixed Shrubland vegetation community.

#### D8-2.3.5.3 Species Diversity and Composition

Excluding SLCV, 11 lifeforms and 27 plant species were sampled or observed within the Mixed Shrubland vegetation community (Addendum D8-2-B). The

mean number of plant species sampled or observed per belt transect is 10.95 (Addendum D8-2-C). Native perennial forbs were the most common lifeform encountered with eight plant species sampled or observed. Native cool season perennial grasses and native full shrubs were the second most common lifeforms with four plant species sampled or observed within each lifeform (Addendum D8-2-B). Based on all plant species sampled on the cover transects, native cool season perennial grass, introduced perennial grass, and native full shrub lifeforms all had at least one plant species with greater than 2% relative vegetation cover (Table D8-2.6).

### **D8-2.3.6 Reclaimed Grassland**

This vegetation community occupied approximately 45.80 acres of the 831.85 acre (5.51%) Upton Plant Site Permit Area. The Reclaimed Grassland vegetation community was located in the northeastern portion of the Upton Plant Site Permit Area on a reclaimed bentonite mine. Due to the past disturbance and relatively recent seeding of this area, there was a high percentage of bare ground. Common species used in reclamation were observed, and included western wheatgrass and crested wheatgrass.

#### D8-2.3.6.1 Cover

Twenty-two, 50-meter cover transects were sampled within the Reclaimed Grassland vegetation community. Absolute total vegetation cover was 38.24%. Absolute total ground cover was 92.14% (Table D8-2.2). Absolute bare soil and litter/rock percentages were 7.86% and 53.90%, respectively. Cryptograms were not observed within this vegetation community (Table D8-2.5). Native cool season perennial grasses were the dominant lifeform with 71.08% relative vegetation cover, followed by introduced perennial grasses with 20.71% relative vegetation cover (Table D8-2.4). Western wheatgrass provided the highest relative vegetation cover at 59.41%, while crested wheatgrass provided the next highest relative vegetation cover at 19.98% (Addendum D8-2-C).

#### D8-2.3.6.2 Shrub and Tree Density

Shrub density was 0.14 shrubs/m<sup>2</sup> or 554.01 shrubs/acre (Table D8-2.2). Greasewood contributed 97.30% of the relative density at 0.13 shrubs/m<sup>2</sup> (Addendum D8-2-D). No trees were observed within the Reclaimed Grassland vegetation community.

#### D8-2.3.6.3 Species Diversity and Composition

Excluding SLCV, nine lifeforms and 29 plant species were sampled or observed within the Reclaimed Grassland vegetation community (Addendum D8-2-B). The mean number of plant species sampled or observed per belt transect was



4.96 (Addendum D8-2-C). Native cool season perennial grasses were the most common lifeform encountered with eight plant species sampled or observed. Native warm season perennial grasses were the second most common lifeform with four plant species sampled or observed (Addendum D8-2-B). Based on all plant species sampled on the cover transects, native cool season perennial grass and introduced perennial grass lifeforms all had at least one plant species with greater than 2% relative vegetation cover (Table D8-2.6).

### **D8-2.3.7 Upland Grassland**

This vegetation community occupied approximately 116.24 acres of the 831.85 acre (13.97%) Upton Plant Site Permit Area. The Upland Grassland vegetation community was generally located on rolling topography with shallow, moderately deep, to deep light-textured soils along gently sloping to moderately steep hillsides extending from ridge tops to ephemeral drainages throughout the Upton Plant Site Permit Area.

#### D8-2.3.7.1 Cover

Nineteen, 50-meter cover transects were sampled within the Upland Grassland vegetation community. Absolute total vegetation cover was 48.60%. Absolute total ground cover was 98.50% (Table D8-2.2). Absolute bare soil and litter/rock percentages were 1.50% and 49.26%, respectively. Cryptograms provided 0.64% absolute cover (Table D8-2.5). Introduced perennial grasses were the dominant lifeform with 79.30% relative vegetation cover, followed by native cool season perennial grasses with 13.50% relative vegetation cover (Table D8-2.4). Crested wheatgrass provided the highest relative vegetation cover at 78.64%, while Sandberg bluegrass (*Poa secunda*) provided the next highest relative vegetation cover at 6.30% (Addendum D8-2-C).

#### D8-2.3.7.2 Shrub and Tree Density

Shrub density was 0.08 shrubs/m<sup>2</sup> or 329.82 shrubs/acre (Table D8-2.2). Big sagebrush contributed 60.00% of the relative density at 0.05 shrubs/m<sup>2</sup>, and Woods' rose (*Rosa woodsii*) contributed 36.81% of the relative density at 0.03 shrubs/m<sup>2</sup> (Addendum D8-2-D). No trees were observed within the Upland Grassland vegetation community.

#### D8-2.3.7.3 Species Diversity and Composition

Excluding SLCV, eight lifeforms and 22 plant species were sampled or observed within the Upland Grassland vegetation community (Addendum D8-2-B). The mean number of plant species sampled or observed per belt transect was 4.80 (Addendum D8-2-C). Native cool season perennial grasses were the most common lifeform encountered with five plant species sampled or observed.

Native warm season perennial grasses and native full shrubs were the second most common lifeforms with four plant species sampled or observed within each lifeform (Addendum D8-2-B). Based on all plant species sampled on the cover transects, native cool season perennial grass, native warm season perennial grass, and introduced perennial grass lifeforms all had at least one plant species with greater than 2% relative vegetation cover (Table D8-2.6).

#### **D8-2.3.8 Sample Adequacy**

Thirty-six, 50-meter cover transects were sampled within the Big Sagebrush Shrubland vegetation community. Twenty-nine, 50-meter cover transects were sampled within the Greasewood Shrubland vegetation community. Twenty-four, 50-meter cover transects were sampled within the Meadow Grassland vegetation community. Twenty-two, 50-meter cover transects were sampled within the Reclaimed Grassland vegetation communities. Twenty, 50-meter cover transects were sampled within the in the Mixed Shrubland vegetation community. Nineteen, 50-meter cover transects were sampled within the Upland Grassland vegetation community. The sample adequacy formula, outlined in WDEQ Guideline 2, was utilized to determine the minimum required size of the sample population.

All sampled vegetation communities but the Reclaimed Grassland met sample adequacy (Table D8-2.3). The Reclaimed Grassland had a computed sample adequacy size of 22; an additional seven samples were collected above the maximum number required based on the WDEQ methodology. The confidence level achieved was 80.78%.

#### **D8-2.4 THREATENED AND ENDANGERED HABITAT AND SPECIES SURVEYS**

Refer to Table D8-2.7 for a tabular summary of potential occurrence determinations for Threatened and Endangered plant species within the proposed Upton Site Permit Area.

##### **D8-2.4.1 Ute ladies'-tresses (*Spiranthes diluvialis*)**

Habitat suitability for Ute ladies'-tresses (*Spiranthes diluvialis*), within the Upton Plant Site Permit Area, was evaluated based on the presence of the following characteristics: late season perennial water source, associated vegetation species, sandy or loamy textured soils, gradual transitions between uplands and water body or drainages, vegetation density between 75% and 90%, vegetation height less than 18 inches, and non-alkaline soils. Based on August field evaluations, late season perennial water sources were present within the Upton Plant Site Permit Area. However, where late season perennial water sources were present, associated vegetation species, appropriate soil

textures, gradual transitions, vegetation cover and density, and non-alkaline sandy or loamy textured soils were not present or not present in sufficient combination to provide suitable habitat. No individuals or populations of Ute ladies'-tresses were found during field surveys, and based on the lack of suitable habitat characteristics, local habitat was confirmed unsuitable for Ute ladies'-tresses.

#### **D8-2.4.2 Blowout penstemon (*Penstemon haydenii*)**

Habitat suitability for blowout penstemon (*Penstemon haydenii*), within the Upton Plant Site Permit Area, was evaluated based on the presence of the following characteristics: eolian sand deposits or sand deposits greater than three feet in depth, fine sandy textured soils absent of rocks and coarse fragments, wind or gravity erosion versus water erosion, slopes greater than 25%, slope elevation changes of 60 to 120 feet, vegetation cover of less than 40%, and associated plant species. Based on Natural Resource Conservation soil data and the 2012 baseline soil assessment, soils derived from eolian sources were not present within the Upton Plant Site Permit Area. Therefore, no blowout penstemon surveys were conducted in within the Upton Plant Site Permit Area.

#### **D8-2.5 OTHER SPECIAL STATUS PLANT SPECIES**

WYNDD reports no special status plant species within the Upton Plant Site Permit Area (WYNDD 2012).

#### **D8-2.6 SELENIUM INDICATORS**

One selenium indicator, two-grooved milkvetch (*Astragalus bisulcatus*), was observed within the Big Sagebrush Shrubland and Reclaimed Grassland vegetation communities. Selenium indicator plant species are known to accumulate selenium within plant tissue and cause sickness and death in livestock and wildlife (Beath 1982).

#### **D8-2.7 NOXIOUS WEEDS**

Surveys for Wyoming State Designated Noxious Weeds (Wyoming Weed and Pest Council 2012a) and Weston County Declared Weeds (Wyoming Weed and Pest Council 2012b) were conducted in conjunction with baseline vegetation mapping, sampling, and threatened and endangered plant species surveys. All State Designated Noxious Weeds and Weston County Declared Weeds observed during these surveys were GPS located and mapped. Refer to Addendum D8-2-F for a map illustrating weed location within the Upton Plant Site Permit Area.

One State Designated Noxious Weed, Canada thistle (*Cirsium arvense*), was observed. Canada thistle was observed within the Big Sagebrush Shrubland,

Meadow Grassland, and Mixed Shrubland vegetation communities either as scattered populations along stream channels and reservoirs or as small isolated populations scattered throughout the Upton Plant Site Permit Area.

Three Weston County Declared Weeds were encountered: wild licorice (*Glycyrrhiza lepidota*), broom snakeweed, and curly dock (*Rumex crispus*). Wild licorice was observed within the Meadow Grassland vegetation community along stream channels and edges of reservoirs. Broom snakeweed was observed within the Big Sagebrush Shrubland, Greasewood Shrubland, Mixed Shrubland, and Upland Grassland vegetation communities, either as small isolated populations or larger populations spreading throughout the community. Curly dock was observed within the Meadow Grassland vegetation community along stream channels and surrounding reservoirs.

## **D8-2.8 SUMMARY OF VEGETATION SURVEYS**

The approximately 831.85 acre Upton Plant Site Permit Area consisted of six vegetation communities: Big Sagebrush Shrubland, Greasewood Shrubland, Meadow Grassland, Mixed Shrubland, Reclaimed Grassland, and Upland Grassland. Shrubland vegetation communities covered approximately 75% of the Upton Plant Site Permit Area. Mixed Shrubland was the dominant shrubland vegetation community accounting for approximately 40% of the Upton Plant Site Permit Area. Big Sagebrush Shrubland and Greasewood Shrubland vegetation communities occurred on almost equal percentages of the Upton Plant Site Permit Area.

Total vegetation cover ranged from 38.24% to 61.10%. Total ground cover ranged from 85.80% to 98.50%. Excluding SLCV, species diversity ranged from 22 to 48 plant species sampled or observed, with a total of 83 plant species sampled or observed within the Upton Plant Site Permit Area. Big sagebrush and greasewood were the most abundant shrub species. Western wheatgrass, prairie sandreed, Sandberg bluegrass, crested wheatgrass, and smooth brome (*Bromus inermis*) were the dominant perennial grasses. The dominant perennial forb species were western yarrow (*Achillea millefolium*) and prairie thermopsis (*Thermopsis rhombifolia*).

No special status plant species or suitable habitats were encountered within the Upton Plant Site Permit Area. One State Designated Noxious Weed and three Weston County Declared Weeds were observed throughout the Upton Plant Site Permit Area.

**D8-2.9 REFERENCES**

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**ADDENDUM D8-2-A**

TABLES

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**Table D8-2.1: Acreage and Percent of Total Area for Each Vegetation Community with the Upton Plant Site Permit Area.**

<b>Vegetation Community</b>	<b>Upton Plant Site Proposed Permit Area</b>		<b>1/2 Mile Buffer</b>	
	<b>Acres</b>	<b>% of Area</b>	<b>Acres</b>	<b>% of Area</b>
Big Sagebrush Shrubland	138.78	16.68	376.30	16.95
Greasewood Shrubland	153.30	18.43	58.16	2.62
Meadow Grassland	36.16	4.35	55.08	2.48
Mixed Shrubland	334.76	40.24	988.44	44.52
Reclaimed Grassland	45.80	5.51	201.73	9.09
Upland Grassland	116.24	13.97	153.53	6.91
Disturbance	3.90	0.47	350.46	15.78
Water	2.91	0.35	36.62	1.65
Total	831.85	100.00	2,220.32	100.00

**Table D8-2.3: Summary of 2012 Major Vegetation Parameters for the Upton Plant Site Permit Area.**

<b>Vegetation Community</b>	<b>Total Vegetation Cover (Absolute %)</b>	<b>Total Ground Cover (Absolute %)</b>	<b>Shrub Density (#/m<sup>2</sup>)</b>
Big Sagebrush Shrubland	48.22	96.66	0.81
Greasewood Shrubland	61.10	89.93	0.90
Meadow Grassland	60.60	94.44	0.01
Mixed Shrubland	48.60	85.80	1.26
Reclaimed Grassland	38.24	92.14	0.14
Upland Grassland	48.60	98.50	0.08

**Table D8-2.3: Summary of 2012 Sample Adequacy Calculations for the Upton Plant Site Permit Area.**

<b>Vegetation Community</b>	<b>Mean</b>	<b>Standard Deviation</b>	<b>Computed Sample Adequacy Sample Size</b>	<b>Actual Sample #</b>	<b>Computed Z-Value</b>	<b>Confidence Level Achieved</b>
Big Sagebrush Shrubland						
Total Vegetation Cover	48.22	14.84	31	36	N/A	N/A
Total Ground Cover	96.66	3.96	1	36	N/A	N/A
Greasewood Shrubland						
Total Vegetation Cover	61.10	16.88	25	29	N/A	N/A
Total Ground Cover	89.93	11.08	5	29	N/A	N/A
Meadow Grassland						
Total Vegetation Cover	60.60	15.14	20	24	N/A	N/A
Total Ground Cover	94.44	12.38	6	24	N/A	N/A
Mixed Shrubland						
Total Vegetation Cover	48.60	8.68	11	20	N/A	N/A
Total Ground Cover	85.80	9.74	5	20	N/A	N/A
Reclaimed Grassland						
Total Vegetation Cover	38.24	10.26	24	22	0.87	87.90
Total Ground Cover	92.14	7.76	2	22	N/A	N/A
Upland Grassland						
Total Vegetation Cover	48.60	9.40	12	19	N/A	N/A
Total Ground Cover	98.50	4.46	1	19	N/A	N/A

**Table D8-2.4: Summary of 2012 Mean Vegetation Cover Data, by Lifeform, for the Upton Plant Site Permit Area.**

Lifeform	Big Sagebrush Shrubland		Greasewood Shrubland		Meadow Grassland	
	Absolute %	Relative % <sup>1</sup>	Absolute %	Relative % <sup>1</sup>	Absolute %	Relative % <sup>1</sup>
Native Annual Grasses	--	--	--	--	0.66	1.09
Introduced Annual Grasses	0.50	1.04	0.48	0.79	0.16	0.26
Native Cool Season Perennial Grasses	20.88	43.31	17.38	28.45	25.34	41.82
Native Warm Season Perennial Grasses	1.18	2.45	0.55	0.90	14.50	23.93
Introduced Perennial Grasses	7.40	15.35	27.59	45.16	8.76	14.46
Native Grasslike Species	2.34	4.85	0.14	0.23	8.16	13.47
Native Annual Forbs	--		--		0.76	1.25
Introduced Annual Forbs	--		0.21	0.34	--	--
Introduced Biennial Forbs	0.40	0.83	0.07	0.11	0.08	0.13
Native Perennial Forbs	1.66	3.44	0.34	0.56	0.42	0.69
Introduced Perennial Forbs	0.18	0.37	--		1.42	2.34
Native Full Shrubs	12.34	25.58	13.17	21.55	0.34	0.56
Native Half & Sub-Shrubs	0.68	1.41	0.14	0.23	--	--
Native Succulents	0.66	1.37	1.03	1.69	--	--

<sup>1</sup>Relative percentages within these communities do not appear to add to 100.00% based on the rounded values shown, non-rounded values equal 100.00%.

**Table D8-2.4 (Cont.): Summary of 2012 Mean Vegetation Cover Data, by Lifeform, for the Upton Plant Site Permit Area.**

<b>Lifeform</b>	<b>Mixed Shrubland</b>		<b>Reclaimed Grassland</b>		<b>Upland Grassland</b>	
	Absolute %	Relative %	Absolute %	Relative %	Absolute %	Relative %
Native Annual Grasses	--	--	--	--	--	--
Introduced Annual Grasses	--	--	0.28	0.73	0.10	0.21
Native Cool Season Perennial Grasses	19.2	39.50	27.18	71.08	6.56	13.50
Native Warm Season Perennial Grasses	0.8	1.64	1.02	2.67	1.60	3.29
Introduced Perennial Grasses	12.6	25.92	7.92	20.71	38.54	79.30
Native Grasslike Species	0.3	0.62	--	--	--	--
Native Annual Forbs	0.1	0.21	--	--	--	--
Introduced Annual Forbs	--	--	--	--	--	--
Introduced Biennial Forbs	0.5	1.03	0.36	0.94	0.42	0.86
Native Perennial Forbs	2.6	5.36	0.64	1.67	0.54	1.11
Introduced Perennial Forbs	--	--	--	--	0.10	0.21
Native Full Shrubs	10.8	22.22	0.84	2.20	0.42	0.86
Native Half & Sub-Shrubs	1.0	2.06	--	--	--	--
Native Succulents	0.7	1.44	--	--	0.32	0.66

<sup>1</sup>Relative percentages within these communities do not appear to add to 100.00% based on the rounded values shown, non-rounded values equal 100.00%.

**Table D8-2.5: Summary by 2012 Mean Vegetation Cover Data, by Species, for the Upton Plant Site Permit Area.**

Lifeform/Scientific Name	Common Name	Big Sagebrush Shrubland	Greasewood Shrubland	Meadow Grassland
		Absolute %	Absolute %	Absolute %
Native Annual Grasses				
<i>Beckmannia syzigachne</i>	American sloughgrass	--	--	0.66
Subtotal		--	--	0.66
Introduced Annual Grasses				
<i>Bromus japonicus</i>	Japanese brome	0.50	0.48	0.16
Subtotal		0.50	0.48	0.16
Native Cool Season Perennial Grasses				
<i>Achnatherum hymenoides</i>	Indian ricegrass	0.22	--	--
<i>Elymus cinereus</i>	Basin wildrye	--	--	--
<i>Elymus lanceolatus</i>	Thickspike wheatgrass	--	0.21	0.16
<i>Elymus smithii</i>	Western wheatgrass	10.66	10.21	20.84
<i>Elymus spicatus</i>	Bluebunch wheatgrass	--	0.07	0.50
<i>Hesperostipa comata</i>	Needleandthread	2.06	--	--
<i>Hordeum jubatum</i>	Foxtail barley	--	--	2.58
<i>Koeleria macrantha</i>	Prairie junegrass	2.00	0.76	--
<i>Muhlenbergia asperifolia</i>	Alkali muhly	--	--	0.26
<i>Nassella viridula</i>	Green needlegrass	2.66	1.10	--
<i>Poa secunda</i>	Sandberg bluegrass	3.28	5.03	0.16
<i>Puccinellia nuttalliana</i>	Alkaligrass	--	--	0.84
Subtotal		20.88	17.38	25.34

**Table D8-2.5 (Cont.): Summary by 2012 Mean Vegetation Cover Data, by Species, for the Upton Plant Site Permit Area.**

Lifeform/Scientific Name	Common Name	Big Sagebrush Shrubland	Greasewood Shrubland	Meadow Grassland
		Absolute %	Absolute %	Absolute %
Native Warm Season Perennial Grasses				
<i>Bouteloua gracilis</i>	Blue grama	1.06	--	--
<i>Calamovilfa longifolia</i>	Prairie sandreed	--	0.48	2.34
<i>Schizachyrium scoparium</i>	Little bluestem	--	--	--
<i>Spartina pectinata</i>	Prairie cordgrass	--	0.07	12.08
<i>Sporobolus airoides</i>	Alkali sacaton	0.12	--	0.08
<i>Sporobolus cryptandrus</i>	Sand dropseed	--	--	--
Subtotal		1.18	0.55	14.50
Introduced Perennial Grasses				
<i>Agropyron cristatum</i>	Crested wheatgrass	6.66	26.49	0.08
<i>Bromus inermis</i>	Smooth brome	0.34	0.55	0.08
<i>Elymus hispidus</i>	Intermediate wheatgrass	--	--	--
<i>Phleum pratense</i>	Timothy	0.06	0.07	0.34
<i>Poa pratensis</i>	Kentucky bluegrass	0.34	0.48	8.26
Subtotal		7.40	27.59	8.76
Native Grasslike Species				
<i>Carex filifolia</i>	Threadleaf sedge	2.34	0.14	--
<i>Carex nebrascensis</i>	Nebraska sedge	--	--	3.08
<i>Carex praegracilis</i>	Clustered field sedge	--	--	0.08
<i>Eleocharis palustris</i>	Common spikerush	--	--	4.58
<i>Juncus balticus</i>	Mountain rush	--	--	0.34
<i>Juncus interior</i>	Inland rush	--	--	0.08
Subtotal		2.34	0.14	8.16

**Table D8-2.5 (Cont.): Summary by 2012 Mean Vegetation Cover Data, by Species, for the Upton Plant Site Permit Area.**

Lifeform/Scientific Name	Common Name	Big Sagebrush Shrubland	Greasewood Shrubland	Meadow Grassland
		Absolute %	Absolute %	Absolute %
Native Annual Forbs				
<i>Chenopodium berlandieri</i>	Pitseed goosefoot	--	--	--
<i>Gnaphalium palustre</i>	Western marsh cudweed	--	--	--
<i>Xanthium strumarium</i>	Common cocklebur	--	--	0.76
Subtotal		--	--	0.76
Introduced Annual Forbs				
<i>Alyssum desertorum</i>	Desert alyssum	--	0.07	--
<i>Camelina microcarpa</i>	Littleseed falseflax	--	--	--
<i>Chenopodium glaucum</i>	Oakleaf goosefoot	--	--	--
<i>Descurainia sophia</i>	Flixweed	--	0.07	--
<i>Lepidium perfoliatum</i>	Shieldcress	--	0.07	--
<i>Polygonum aviculare</i>	Prostrate knotweed	--	--	--
<i>Thlaspi arvense</i>	Field pennycress	--	--	--
Subtotal		--	0.21	--
Introduced Biennial Forbs				
<i>Lactuca serriola</i>	Prickly lettuce	--	--	0.08
<i>Melilotus officinalis</i>	Sweetclover	0.28	0.07	--
<i>Tragopogon dubius</i>	Yellow salsify	0.12	--	--
Subtotal		0.40	0.07	0.08

**Table D8-2.5 (Cont.): Summary by 2012 Mean Vegetation Cover Data, by Species, for the Upton Plant Site Permit Area.**

Lifeform/Scientific Name	Common Name	Big Sagebrush Shrubland	Greasewood Shrubland	Meadow Grassland
		Absolute %	Absolute %	Absolute %
Native Perennial Forbs				
<i>Achillea millefolium</i>	Western yarrow	0.28	0.14	0.08
<i>Astragalus bisulcatus</i>	Two-grooved milkvetch	--	--	--
<i>Astragalus spatulatus</i>	Spoonleaf milkvetch	--	--	--
<i>Calochortus gunnisonii</i>	Gunnison mariposalily	--	--	0.08
<i>Dalea candida</i>	White prairie clover	--	--	--
<i>Gaura coccinea</i>	Scarlet gaura	--	--	--
<i>Glycyrrhiza lepidota</i>	Wild licorice	--	--	--
<i>Grindelia squarrosa</i>	Curlycup gumweed	--	0.14	--
<i>Phlox hoodii</i>	Hoods phlox	0.94	0.06	--
<i>Psoraleidium tenuiflorum</i>	Slimflower scurfpea	--	--	--
<i>Ratibida columnifera</i>	Upright prairie coneflower	0.22	--	--
<i>Sphaeralcea coccinea</i>	Scarlet globemallow	0.16	--	--
<i>Thermopsis rhombifolia</i>	Prairie thermopsis	--	--	--
<i>Typha latifolia</i>	Broadleaf cattail	--	--	0.26
<i>Vicia americana</i>	American vetch	0.06	--	--
Subtotal		1.66	0.34	0.42



**Table D8-2.5 (Cont.): Summary by 2012 Mean Vegetation Cover Data, by Species, for the Upton Plant Site Permit Area.**

Lifeform/Scientific Name	Common Name	Big Sagebrush Shrubland	Greasewood Shrubland	Meadow Grassland
		Absolute %	Absolute %	Absolute %
Introduced Perennial Forbs				
<i>Astragalus cicer</i>	Chickpea milkvetch	0.06	--	0.08
<i>Cirsium arvense</i>	Canada thistle	--	--	0.26
<i>Medicago sativa</i>	Alfalfa	--	--	--
<i>Rumex crispus</i>	Curly dock	--	--	0.92
<i>Taraxacum officinale</i>	Common dandelion	0.12	--	0.08
<i>Trifolium pratense</i>	Red clover	--	--	0.08
Subtotal		0.18	--	1.42
Native Full Shrubs				
<i>Artemisia cana</i>	Silver sagebrush	--	0.07	--
<i>Artemisia tridentata</i>	Big sagebrush	12.12	1.31	--
<i>Atriplex canescens</i>	Four-wing saltbush	--	--	--
<i>Chrysothamnus viscidiflorus</i>	Yellow rabbitbrush	0.06	0.07	--
<i>Rosa woodsii</i>	Woods' rose	--	--	--
<i>Sarcobatus vermiculatus</i>	Greasewood	0.16	11.72	0.34
Subtotal		12.34	13.17	0.34

**Table D8-2.5 (Cont.): Summary by 2012 Mean Vegetation Cover Data, by Species, for the Upton Plant Site Permit Area.**

Lifeform/Scientific Name	Common Name	Big Sagebrush Shrubland	Greasewood Shrubland	Meadow Grassland
		Absolute %	Absolute %	Absolute %
Native Half & Sub-Shrubs				
<i>Artemisia frigida</i>	Fringed sagewort	0.50	0.07	--
<i>Atriplex gardneri</i>	Gardner saltbush	--	--	--
<i>Gutierrezia sarothrae</i>	Broom snakeweed	0.06	0.07	--
<i>Krascheninnikovia lanata</i>	Winterfat	0.12	--	--
Subtotal		0.68	0.14	--
Native Succulents				
<i>Opuntia polyacantha</i>	Plains pricklypear	0.66	1.03	--
Subtotal		0.66	1.03	--
Total Vegetation Cover		48.22	61.10	60.60
Cryptograms		3.56	0.41	--
Litter		44.66	28.28	33.84
Rock		0.22	0.14	--
Total Ground Cover		96.66	89.93	94.44
Bare Ground		3.34	10.07	5.56

**Table D8-2.5 (cont.): Summary by 2012 Mean Vegetation Cover Data, by Species, for the Upton Plant Site Permit Area.**

Lifeform/Scientific Name	Common Name	Mixed Shrubland	Reclaimed Grassland	Upland Grassland
		Absolute %	Absolute %	Absolute %
Native Annual Grasses				
Beckmannia syzigachne	American sloughgrass	--	--	--
Subtotal		--	--	--
Introduced Annual Grasses				
Bromus japonicus	Japanese brome	--	0.28	0.10
Subtotal		--	0.28	0.10
Native Cool Season Perennial Grasses				
Achnatherum hymenoides	Indian ricegrass	--	--	--
Elymus cinereus	Basin wildrye	--	--	--
Elymus lanceolatus	Thickspike wheatgrass	--	--	--
Elymus smithii	Western wheatgrass	6.80	22.72	2.64
Elymus spicatus	Bluebunch wheatgrass	--	2.18	--
Hesperostipa comata	Needleandthread	--	--	0.22
Hordeum jubatum	Foxtail barley	--	--	--
Koeleria macrantha	Prairie junegrass	3.80	1.00	0.42
Muhlenbergia asperifolia	Alkali muhly	--	--	--
Nassella viridula	Green needlegrass	4.70	0.28	0.22
Poa secunda	Sandberg bluegrass	3.90	1.00	3.06
Puccinellia nuttalliana	Alkaligrass	--	--	--
Subtotal		19.20	27.18	6.56

**Table D8-2.5 (Cont.): Summary by 2012 Mean Vegetation Cover Data, by Species, for the Upton Plant Site Permit Area.**

Lifeform/Scientific Name	Common Name	Mixed Shrubland	Reclaimed Grassland	Upland Grassland
		Absolute %	Absolute %	Absolute %
Native Warm Season Perennial Grasses				
<i>Bouteloua gracilis</i>	Blue grama	0.20	--	--
<i>Calamovilfa longifolia</i>	Prairie sandreed	0.60	0.10	1.06
<i>Schizachyrium scoparium</i>	Little bluestem	--	--	0.22
<i>Spartina pectinata</i>	Prairie cordgrass	--	--	--
<i>Sporobolus airoides</i>	Alkali sacaton	--	0.64	0.32
<i>Sporobolus cryptandrus</i>	Sand dropseed	--	0.28	--
Subtotal		0.80	1.02	1.60
Introduced Perennial Grasses				
<i>Agropyron cristatum</i>	Crested wheatgrass	12.00	7.64	38.22
<i>Bromus inermis</i>	Smooth brome	0.60	0.28	0.32
<i>Elymus hispidus</i>	Intermediate wheatgrass	--	--	--
<i>Phleum pratense</i>	Timothy	--	--	--
<i>Poa pratensis</i>	Kentucky bluegrass	--	--	--
Subtotal		12.60	7.92	38.54
Native Grasslike Species				
<i>Carex filifolia</i>	Threadleaf sedge	0.30	--	--
<i>Carex nebrascensis</i>	Nebraska sedge	--	--	--
<i>Carex praegracilis</i>	Clustered field sedge	--	--	--
<i>Eleocharis palustris</i>	Common spikerush	--	--	--
<i>Juncus balticus</i>	Mountain rush	--	--	--
<i>Juncus interior</i>	Inland rush	--	--	--
Subtotal		0.30	--	--

**Table D8-2.5 (Cont.): Summary by 2012 Mean Vegetation Cover Data, by Species, for the Upton Plant Site Permit Area.**

Lifeform/Scientific Name	Common Name	Mixed Shrubland	Reclaimed Grassland	Upland Grassland
		Absolute %	Absolute %	Absolute %
Native Annual Forbs				
<i>Chenopodium berlandieri</i>	Pitseed goosefoot	--	--	--
<i>Gnaphalium palustre</i>	Western marsh cudweed	0.10	--	--
<i>Xanthium strumarium</i>	Common cocklebur	--	--	--
Subtotal		0.10	--	--
Introduced Annual Forbs				
<i>Alyssum desertorum</i>	Desert alyssum	--	--	--
<i>Camelina microcarpa</i>	Littleseed falseflax	--	--	--
<i>Chenopodium glaucum</i>	Oakleaf goosefoot	--	--	--
<i>Descurainia sophia</i>	Flixweed	--	--	--
<i>Lepidium perfoliatum</i>	Shieldcress	--	--	--
<i>Polygonum aviculare</i>	Prostrate knotweed	--	--	--
<i>Thlaspi arvense</i>	Field pennycress	--	--	--
Subtotal		--	--	--
Introduced Biennial Forbs				
<i>Lactuca serriola</i>	Prickly lettuce	--	--	--
<i>Melilotus officinalis</i>	Sweetclover	0.40	0.36	0.42
<i>Tragopogon dubius</i>	Yellow salsify	0.10	--	--
Subtotal		0.50	0.36	0.42

**Table D8-2.5 (Cont.): Summary by 2012 Mean Vegetation Cover Data, by Species, for the Upton Plant Site Permit Area.**

Lifeform/Scientific Name	Common Name	Mixed Shrubland	Reclaimed Grassland	Upland Grassland
		Absolute %	Absolute %	Absolute %
Native Perennial Forbs				
<i>Achillea millefolium</i>	Western yarrow	0.70	--	--
<i>Astragalus bisulcatus</i>	Two-grooved milkvetch	--	--	--
<i>Astragalus spatulatus</i>	Spoonleaf milkvetch	0.20	--	--
<i>Calochortus gunnisonii</i>	Gunnison mariposalily	--	--	--
<i>Dalea candida</i>	White prairie clover	--	--	--
<i>Gaura coccinea</i>	Scarlet gaura	--	--	--
<i>Glycyrrhiza lepidota</i>	Wild licorice	--	--	--
<i>Grindelia squarrosa</i>	Curlycup gumweed	0.10	0.18	--
<i>Phlox hoodii</i>	Hoods phlox	0.10	--	--
<i>Psoralidium tenuiflorum</i>	Slimflower scurfpea	0.30	--	--
<i>Ratibida columnifera</i>	Upright prairie coneflower	0.20	--	--
<i>Sphaeralcea coccinea</i>	Scarlet globemallow	--	--	0.22
<i>Thermopsis rhombifolia</i>	Prairie thermopsis	0.90	0.46	0.32
<i>Typha latifolia</i>	Broadleaf cattail	--	--	--
<i>Vicia americana</i>	American vetch	0.10	--	--
Subtotal		2.60	0.64	0.54

**Table D8-2.5 (Cont.): Summary by 2012 Mean Vegetation Cover Data, by Species, for the Upton Plant Site Permit Area.**

Lifeform/Scientific Name	Common Name	Mixed Shrubland	Reclaimed Grassland	Upland Grassland
		Absolute %	Absolute %	Absolute %
Introduced Perennial Forbs				
<i>Astragalus cicer</i>	Chickpea milkvetch	--	--	--
<i>Cirsium arvense</i>	Canada thistle	--	--	--
<i>Medicago sativa</i>	Alfalfa	--	--	--
<i>Rumex crispus</i>	Curly dock	--	--	--
<i>Taraxacum officinale</i>	Common dandelion	--	--	0.10
<i>Trifolium pratense</i>	Red clover	--	--	--
Subtotal		--	--	0.10
Native Full Shrubs				
<i>Artemisia cana</i>	Silver sagebrush	--	--	--
<i>Artemisia tridentata</i>	Big sagebrush	7.50	--	0.42
<i>Atriplex canescens</i>	Four-wing saltbush	--	0.10	--
<i>Chrysothamnus viscidiflorus</i>	Yellow rabbitbrush	0.90	--	--
<i>Rosa woodsii</i>	Woods' rose	0.10	0.10	--
<i>Sarcobatus vermiculatus</i>	Greasewood	2.30	0.64	--
Subtotal		10.80	0.84	0.42

**Table D8-2.5 (Cont.): Summary by 2012 Mean Vegetation Cover Data, by Species, for the Upton Plant Site Permit Area.**

Lifeform/Scientific Name	Common Name	Mixed Shrubland	Reclaimed Grassland	Upland Grassland
		Absolute %	Absolute %	Absolute %
Native Half & Sub-Shrubs				
Artemisia frigida	Fringed sagewort	--	--	--
Atriplex gardneri	Gardner saltbush	0.10	--	--
Gutierrezia sarothrae	Broom snakeweed	0.90	--	--
Krascheninnikovia lanata	Winterfat	--	--	--
Subtotal		1.00	--	--
Native Succulents				
Opuntia polyacantha	Plains pricklypear	0.70	--	0.32
Subtotal		0.70	--	0.32
Total Vegetation Cover		48.60	38.24	48.60
Cryptograms		2.60	--	0.64
Litter		34.10	53.36	49.16
Rock		0.50	0.54	0.10
Total Ground Cover		85.80	92.14	98.50
Bare Ground		14.20	7.86	1.50



**Table D8-2.6: Number of Species with Greater Than 2% Relative Vegetation Cover within the Upton Plant Site Permit Area.**

<b>Lifeform</b>	<b>Big Sagebrush Shrubland</b>		<b>Greasewood Shrubland</b>		<b>Meadow Grassland</b>	
	<b>Total # of Species Sampled</b>	<b># of Species &gt; 2%</b>	<b>Total # of Species Sampled</b>	<b># of Species &gt; 2%</b>	<b>Total # of Species Sampled</b>	<b># of Species &gt; 2%</b>
Native Annual Grasses	--	--	--	--	1	--
Introduced Annual Grasses	1	--	1	--	1	--
Native Cool Season Perennial Grasses	6	5	6	2	7	2
Native Warm Season Perennial Grasses	2	1	2	--	3	2
Introduced Perennial Grasses	4	1	4	1	4	1
Native Grasslike Species	1	1	1	--	5	2
Native Annual Forbs	--	--	--	--	1	--
Introduced Annual Forbs	--	--	3	--	--	--
Introduced Biennial Forbs	2	--	1	--	1	--
Native Perennial Forbs	5	--	3	--	3	--
Introduced Perennial Forbs	2	--	--	--	5	--
Native Full Shrubs	3	1	4	2	1	--
Native Half & Sub-Shrubs	3	--	2	--	--	--
Native Succulents	1	--	1	--	--	--

**Table D8-2.6 (Cont.): Number of Species with Greater Than 2% Relative Vegetation Cover within the Upton Plant Site Permit Area.**

<b>Lifeform</b>	<b>Mixed Shrubland</b>		<b>Reclaimed Grassland</b>		<b>Upland Grassland</b>	
	<b>Total # of Species Sampled</b>	<b># of Species &gt; 2%</b>	<b>Total # of Species Sampled</b>	<b># of Species &gt; 2%</b>	<b>Total # of Species Sampled</b>	<b># of Species &gt; 2%</b>
Native Annual Grasses	--	--	--	--	--	--
Introduced Annual Grasses	--	--	1	--	1	--
Native Cool Season Perennial Grasses	4	4	5	4	5	2
Native Warm Season Perennial Grasses	2	--	3	--	3	1
Introduced Perennial Grasses	2	1	2	1	2	1
Native Grasslike Species	1	--	--	--	--	--
Native Annual Forbs	1	--	--	--	--	--
Introduced Annual Forbs	--	--	--	--	--	--
Introduced Biennial Forbs	2	--	1	--	1	--
Native Perennial Forbs	8	--	2	--	2	--
Introduced Perennial Forbs	--	--	--	--	1	--
Native Full Shrubs	4	2	3	--	1	--
Native Half & Sub-Shrubs	2	--	--	--	--	--
Native Succulents	1	--	--	--	1	--

**Table D8-2.7: Threatened and Endangered Plant Species Surveyed for and Potential Occurrence within the Upton Plant Site Permit Area.**

<b>Common Name</b>	<b>Scientific Name</b>	<b>Status</b>	<b>Habitat</b>	<b>Potential Occurrence within the Proposed Upton Plant Site Permit Area</b>
Ute ladies'-tresses	<i>Spiranthes diluvialis</i>	Threatened	Seasonally moist soils and wet meadows of drainages below 7,000ft. in elevation	Habitat Confirmed Unsuitable
Blowout penstemon	<i>Penstemon haydenii</i>	Endangered	Sand blowouts or dunes	Habitat Confirmed Unsuitable

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**ADDENDUM D8-2-B**

COMPREHENSIVE PLANT SPECIES LIST

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Acronym	Current Nomenclature	Common Name	Vegetation Community					
			BSS	GS	MG	MS	RG	UG
Native Annual Grasses								
BECSYZ	<i>Beckmannia syzigachne</i>	American sloughgrass			X			
Introduced Annual Grasses								
BROJAP	<i>Bromus japonicus</i>	Japanese brome	X	X	X		X	X
Native Cool Season Perennial Grasses								
ACHHYM	<i>Achnatherum hymenoides</i>	Indian ricegrass	X					
ELYCIN	<i>Elymus cinereus</i>	Basin wildrye						
ELYLAN	<i>Elymus lanceolatus</i>	Thickspike wheatgrass		X	X			
ELYSMI	<i>Elymus smithii</i>	Western wheatgrass	X	X	X	X	X	X
ELYSPI	<i>Elymus spicatus</i>	Bluebunch wheatgrass		X	X		X	
HESCOM	<i>Hesperostipa comata</i>	Needleandthread	X					X
HORJUB	<i>Hordeum jubatum</i>	Foxtail barley			X			
KOEMAC	<i>Koeleria macrantha</i>	Prairie junegrass	X	X		X	X	X
MUHASP	<i>Muhlenbergia asperifolia</i>	Alkali muhly			X			
NASVIR	<i>Nassella viridula</i>	Green needlegrass	X	X		X	X	X
POAJUN	<i>Poa juncifolia</i>	Alkali bluegrass						
POASEC	<i>Poa secunda</i>	Sandberg bluegrass	X	X	X	X	X	X
PUCNUT	<i>Puccinellia nuttalliana</i>	Alkaligrass			X			
Native Warm Season Perennial Grasses								
BOUGRA	<i>Bouteloua gracilis</i>	Blue grama	X			X		
CALLON	<i>Calamovilfa longifolia</i>	Prairie sandreed		X	X	X	X	X
DISSTR	<i>Distichlis stricta</i>	Inland saltgrass						
SCHSCO	<i>Schizachyrium scoparium</i>	Little bluestem						X
SPAPEC	<i>Spartina pectinata</i>	Prairie cordgrass		X	X			
SPOAIR	<i>Sporobolus airoides</i>	Alkali sacaton	X		X		X	X
SPOCRY	<i>Sporobolus cryptandrus</i>	Sand dropseed					X	

Acronym	Current Nomenclature	Common Name	Vegetation Community					
			BSS	GS	MG	MS	RG	UG

Introduced Perennial Grasses								
AGRCRI	<i>Agropyron cristatum</i>	Crested wheatgrass	X	X	X	X	X	X
BROINE	<i>Bromus inermis</i>	Smooth brome	X	X	X	X	X	X
ELYHIS	<i>Elymus hispidus</i>	Intermediate wheatgrass						
PHLPRA	<i>Phleum pratense</i>	Timothy	X	X	X			
POAPRA	<i>Poa pratensis</i>	Kentucky bluegrass	X	X	X			
Native Grasslike Species								
CARFIL	<i>Carex filifolia</i>	Threadleaf sedge	X	X		X		
CARNEB	<i>Carex nebrascensis</i>	Nebraska sedge			X			
CARPRA	<i>Carex praegracilis</i>	Clustered field sedge			X			
ELEPAL	<i>Eleocharis palustris</i>	Common spikerush			X			
JUNBAL	<i>Juncus balticus</i>	Mountain rush			X			
JUNINT	<i>Juncus interior</i>	Inland rush			X			
Native Annual Forbs								
ATRARG	<i>Atriplex argentea</i>	Silverscale saltbush						
ATRSUC	<i>Atriplex suckleyi</i>	Suckley's endolepis						
CHEBER	<i>Chenopodium berlandieri</i>	Pitseed goosefoot						
GNAPAL	<i>Gnaphalium palustre</i>	Western marsh cudweed				X		
XANSTR	<i>Xanthium strumarium</i>	Common cocklebur			X			
Introduced Annual Forbs								
ALYDES	<i>Alyssum desertorum</i>	Desert alyssum		X				
CAMMIC	<i>Camelina microcarpa</i>	Littleseed falseflax						
CHEGLA	<i>Chenopodium glaucum</i>	Oakleaf goosefoot						
DESSOP	<i>Descurainia sophia</i>	Flixweed		X				
LEPPER	<i>Lepidium perfoliatum</i>	Shieldcress		X				
POLAVI	<i>Polygonum aviculare</i>	Prostrate knotweed						
THLARV	<i>Thlaspi arvense</i>	Field pennycress						

Acronym	Current Nomenclature	Common Name	Vegetation Community					
			BSS	GS	MG	MS	RG	UG
Introduced Biennial Forbs								
LACSER	<i>Lactuca serriola</i>	Prickly lettuce			X			



MELOFF	<i>Melilotus officinalis</i>	Sweetclover	X	X		X	X	X
TRADUB	<i>Tragopogon dubius</i>	Yellow salsify	X			X		
<b>Native Perennial Forbs</b>								
ACHMIL	<i>Achillea millefolium</i>	Western yarrow	X	X	X	X		
APOCAN	<i>Apocynum cannabinum</i>	Indianhemp						
ASTBIS	<i>Astragalus bisulcatus</i>	Two-grooved milkvetch						
ASTSPA	<i>Astragalus spatulatus</i>	Spoonleaf milkvetch				X		
CALGUN	<i>Calochortus gunnisonii</i>	Gunnison mariposalily			X			
DALCAN	<i>Dalea candida</i>	White prairie clover						
ERIFLA	<i>Eriogonum flavum</i>	Alpine golden buckwheat						
GAUCOC	<i>Gaura coccinea</i>	Scarlet gaura						
<b>GLYLEP</b>	<i>Glycyrrhiza lepidota</i>	Wild licorice						
GRISQU	<i>Grindelia squarrosa</i>	Curlycup gumweed		X		X	X	
PHLHOO	<i>Phlox hoodii</i>	Hoods phlox	X	X		X		
PSOTEN	<i>Psoraleidium tenuiflorum</i>	Slimflower scurfpea				X		
RATCOL	<i>Ratibida columnifera</i>	Upright prairie coneflower	X			X		
RUMSAL	<i>Rumex salicifolius</i>	Willowleaf dock						
SPHCOC	<i>Sphaeralcea coccinea</i>	Scarlet globemallow	X					X
SYMASC	<i>Symphyotrichum ascendens</i>	Western aster						
SYMFAL	<i>Symphyotrichum falcatum</i>	White prairie aster						
THERHO	<i>Thermopsis rhombifolia</i>	Prairie thermopsis				X	X	X
TYPLAT	<i>Typha latifolia</i>	Broadleaf cattail			X			
VICAME	<i>Vicia americana</i>	American vetch	X			X		

Acronym	Current Nomenclature	Common Name	Vegetation Community					
			BSS	GS	MG	MS	RG	UG
Introduced Perennial Forbs								
ASTCIC	<i>Astragalus cicer</i>	Chickpea milkvetch	X		X			
<b>CIRARV</b>	<i>Cirsium arvense</i>	Canada thistle			X			
MEDSAT	<i>Medicago sativa</i>	Alfalfa						

<b>RUMCRI</b>	<i>Rumex crispus</i>	Curly dock			X			
TAROFF	<i>Taraxacum officinale</i>	Common dandelion	X		X			X
TRIPRA	<i>Trifolium pratense</i>	Red clover			X			
<b>Native Full Shrubs</b>								
ARTCAN	<i>Artemisia cana</i>	Silver sagebrush	X	X				X
ARTTRI	<i>Artemisia tridentata</i>	Big sagebrush	X	X	X	X		X
ATRCAN	<i>Atriplex canescens</i>	Four-wing saltbush					X	X
CHRVIS	<i>Chrysothamnus viscidiflorus</i>	Yellow rabbitbrush	X	X		X		
ROSWOO	<i>Rosa woodsii</i>	Woods' rose			X	X	X	X
SARVER	<i>Sarcobatus vermiculatus</i>	Greasewood	X	X	X	X	X	
<b>Native Half &amp; Sub-Shrubs</b>								
ARTFRI	<i>Artemisia frigida</i>	Fringed sagewort	X	X				
ATRGAR	<i>Atriplex gardneri</i>	Gardner saltbush	X	X		X		
<b>GUTSAR</b>	<i>Gutierrezia sarothrae</i>	Broom snakeweed	X	X		X		
KRALAN	<i>Krascheninnikovia lanata</i>	Winterfat	X					
<b>Native Trees</b>								
JUNSCO	<i>Juniperus scopulorum</i>	Rocky Mountain juniper						
POPDEL	<i>Populus deltoides</i>	Eastern cottonwood						
SALAMY	<i>Salix amygdaloides</i>	Peachleaf willow						
<b>Native Succulents</b>								
OPUPOL	<i>Opuntia polyacantha</i>	Plains pricklypear	X	X		X		X
X	Species sampled on cover or density transect.							
	Species observed, but not sampled.							
<b>Bold Acronym</b>	Species lacking creditable value, not counted in species diversity.							

**ADDENDUM D8-2-C**

COVER RAW DATA AND SUMMARIES

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**Rare Element Resources**  
**Polygon #BSS**  
**Cover Sample Data**  
Report Date: 12/14/2012  
Point Line Intercept Method, n = 36

Plant Species	Mean Abs Cover																																				
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	
<i>Bromus japonicus</i>	1	0	0	0	1	0	1	2	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0.25
Total Introduced Annual Grasses	1	0	0	0	1	0	1	2	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0.25
<i>Achnatherum hymenoides</i>	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.11
<i>Elymus smithii</i>	14	10	8	0	12	6	4	8	2	15	4	3	3	7	4	1	12	11	0	0	0	1	0	4	0	30	0	0	0	4	5	3	8	0	0	13	5.33
<i>Hesperostipa comata</i>	0	0	0	0	0	0	0	0	0	0	3	0	0	0	1	0	0	0	0	9	6	4	5	2	1	0	0	2	0	1	0	1	1	0	0	1	1.03
<i>Koeleria macrantha</i>	1	0	0	0	0	0	1	0	2	0	0	2	0	2	2	0	0	0	0	2	1	0	1	0	2	0	4	4	4	1	2	1	1	0	2	1	1.00
<i>Nassella viridula</i>	8	0	0	0	0	0	9	0	1	4	0	0	1	0	5	0	0	0	0	0	2	1	1	2	2	0	0	0	0	3	0	1	4	0	0	4	1.33
<i>Poa secunda</i>	4	1	1	2	0	0	6	0	0	0	0	0	0	0	7	0	0	0	0	2	2	5	1	5	1	2	3	0	4	5	2	1	1	4	0	0	1.64
Total Native Cool Season Perennial Grasses	27	11	9	2	13	6	20	8	5	19	7	5	4	9	19	1	14	12	0	13	11	11	8	13	6	32	7	6	8	14	9	7	15	4	2	19	10.44
<i>Bouteloua gracilis</i>	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	3	0	1	0	1	0	2	3	0	2	1	0	1	0	2	0	0.53
<i>Sporobolus airoides</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.06
Total Native Warm Season Perennial Grasses	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	2	1	3	0	1	0	1	0	2	3	0	2	1	0	1	0	2	0	0.59
<i>Agropyron cristatum</i>	0	0	0	34	2	0	0	2	0	1	0	0	0	0	0	0	0	0	21	5	0	0	1	5	2	0	0	0	4	2	2	1	1	18	11	8	3.33
<i>Bromus inermis</i>	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0.17
<i>Phleum pratense</i>	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.03
<i>Poa pratensis</i>	0	0	0	0	1	0	0	0	2	0	0	0	1	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.17
Total Introduced Perennial Grasses	0	0	0	34	3	0	0	3	2	1	2	0	1	0	2	0	1	1	21	5	0	0	1	5	2	0	0	0	4	2	2	3	1	18	11	8	3.70
<i>Carex filifolia</i>	0	1	0	0	0	5	0	0	0	0	0	1	2	0	0	3	0	0	0	0	3	1	7	0	8	0	4	4	0	0	2	1	0	0	0	0	1.17
Total Native Grasslike Species	0	1	0	0	0	5	0	0	0	0	0	1	2	0	0	3	0	0	0	0	3	1	7	0	8	0	4	4	0	0	2	1	0	0	0	0	1.17
<i>Melilotus officinalis</i>	0	0	1	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0.14
<i>Tragopogon dubius</i>	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0.06
Total Introduced Biennial Forbs	0	0	1	1	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0.20

## Point Line Intercept Method, n = 36

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**Rare Element Resources**  
**Polygon #BSS**  
**Cover Sample Data**  
 Report Date: 12/14/2012  
 Point Line Intercept Method, n = 36

Total Vegetation Cover	30	17	15	38	22	12	27	23	17	30	26	21	15	21	25	11	20	16	43	32	29	21	30	20	23	38	20	19	16	22	23	28	30	27	27	33	24.11	
Total Vegetation Cover w/out SLCV	29	17	15	38	21	12	26	21	17	26	25	21	15	21	25	9	20	15	43	32	28	21	30	20	22	38	20	19	16	22	22	28	28	27	27	33	23.61	
Total Vegetation w/Cryptograms	30	21	15	38	22	15	27	23	20	31	26	23	15	22	26	19	20	16	43	32	29	23	31	20	28	39	24	22	22	22	27	29	30	29	35	37	25.89	
Total Vegetation w/Cryptograms w/out SLCV	29	21	15	38	21	15	26	21	20	27	25	23	15	22	26	17	20	15	43	32	28	23	31	20	27	39	24	22	22	22	26	29	28	29	35	37	25.36	
Total Ground Cover	50	47	50	50	47	50	49	50	47	49	49	48	50	50	50	49	48	50	50	49	48	47	49	49	43	49	47	44	48	50	50	50	48	43	47	45	48.33	
Total Ground Cover w/out SLCV	49	47	50	50	46	50	48	48	47	45	48	48	50	50	50	47	48	49	50	49	47	47	49	49	42	49	47	44	48	50	49	50	46	43	47	45	47.84	
No. of Species Sampled excluding SLCV	6	4	4	4	6	3	6	7	5	7	6	5	8	5	7	5	4	4	4	10	11	7	11	6	10	4	7	8	4	8	10	11	10	4	7	8	6.56	
No. of Species Observed excluding SLCV	5	5	5	2	4	2	6	5	0	5	4	1	3	4	4	4	7	6	3	1	0	4	2	4	3	1	3	4	3	4	3	1	6	1	5	4	3.44	
Total No. of Species excluding SLCV	11	9	9	6	10	5	12	12	5	12	10	6	11	9	11	9	11	10	7	11	11	11	13	10	13	5	10	12	7	12	13	12	16	5	12	12	10.00	
Total No. of SLCV	1	0	0	0	1	0	1	1	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	1	1	0.28

**Rare Element Resources**  
**Polygon #GS**  
**Cover Sample Data**  
 Report Date: 12/14/2012  
 Point Line Intercept Method, n = 29

Plant Species	Sample Number Cover																													Mean Abs Cover
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	
<i>Bromus japonicus</i>	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	1	0	0	0	0	2	0.24
<b>Total Introduced Annual Grasses</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>0.24</b>
<i>Elymus lanceolatus</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	2	0.10
<i>Elymus smithii</i>	0	5	6	5	1	0	0	1	0	1	1	1	21	2	0	0	0	0	19	12	1	17	0	1	10	0	16	3	25	5.10
<i>Elymus spicatus</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0.03
<i>Koeleria macrantha</i>	0	0	0	0	0	2	1	0	1	1	1	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.38
<i>Nassella viridula</i>	0	3	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	9	0	0	0.55
<i>Poa secunda</i>	0	4	9	2	0	3	9	0	4	7	4	3	2	1	1	0	0	2	1	4	0	2	5	9	1	0	0	0	0	2.52
<b>Total Native Cool Season Perennial Grasses</b>	<b>0</b>	<b>12</b>	<b>15</b>	<b>8</b>	<b>1</b>	<b>5</b>	<b>10</b>	<b>1</b>	<b>5</b>	<b>9</b>	<b>6</b>	<b>4</b>	<b>23</b>	<b>8</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>24</b>	<b>16</b>	<b>1</b>	<b>20</b>	<b>5</b>	<b>10</b>	<b>11</b>	<b>0</b>	<b>25</b>	<b>3</b>	<b>27</b>	<b>8.69</b>
<i>Calamovilfa longifolia</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	4	0	2	0.24
<i>Spartina pectinata</i>	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.03
<b>Total Native Warm Season Perennial Grasses</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>0</b>	<b>2</b>	<b>0.28</b>
<i>Agropyron cristatum</i>	19	9	14	11	15	16	19	8	16	21	15	16	0	13	31	7	11	21	1	0	12	0	24	19	17	24	3	22	0	13.24
<i>Bromus inermis</i>	0	1	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0.28
<i>Phleum pratense</i>	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.03
<i>Poa pratensis</i>	0	0	0	1	1	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.24
<b>Total Introduced Perennial Grasses</b>	<b>19</b>	<b>10</b>	<b>14</b>	<b>17</b>	<b>16</b>	<b>16</b>	<b>19</b>	<b>14</b>	<b>16</b>	<b>21</b>	<b>15</b>	<b>16</b>	<b>0</b>	<b>13</b>	<b>31</b>	<b>7</b>	<b>11</b>	<b>21</b>	<b>1</b>	<b>0</b>	<b>12</b>	<b>0</b>	<b>24</b>	<b>21</b>	<b>17</b>	<b>24</b>	<b>3</b>	<b>22</b>	<b>0</b>	<b>13.79</b>
<i>Carex filifolia</i>	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.07
<b>Total Native Grasslike Species</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0.07</b>
<i>Alyssum desertorum</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0.03
<i>Descurainia sophia</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.03
<i>Lepidium perfoliatum</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0.03
<b>Total Introduced Annual Forbs</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0.10</b>
<i>Melilotus officinalis</i>	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.03
<b>Total Introduced Biennial Forbs</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0.03</b>



Rare Element Resources  
Polygon #GS  
Cover Sample Data  
Report Date: 12/14/2012  
Point Line Intercept Method, n = 29

<i>Achillea millefolium</i>	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.07	
<i>Grindelia squarrosa</i>	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0.07	
<i>Phlox hoodii</i>	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.03	
Total Native Perennial Forbs	0	1	1	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0.17	
<i>Artemisia cana</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.03	
<i>Artemisia tridentata</i>	0	0	0	0	0	0	0	0	0	2	1	4	0	0	1	0	1	0	0	4	0	3	1	0	1	0	0	1	0	0	0.66	
<i>Chrysothamnus viscidiflorus</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0.03	
<i>Sarcobatus vermiculatus</i>	0	2	1	0	4	6	1	6	4	4	4	7	17	5	0	6	2	4	2	12	2	24	6	7	16	16	0	8	4	0	5.86	
Total Native Full Shrubs	0	2	1	0	4	6	1	6	4	6	5	11	17	6	1	6	3	4	2	17	2	27	7	7	17	16	0	9	4	0	6.59	
<i>Artemisia frigida</i>	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.03	
<i>Gutierrezia sarothrae</i>	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.03	
Total Native Half &Sub-Shrubs	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.07	
<i>Opuntia polyacantha</i>	0	1	0	0	0	2	0	0	3	1	1	1	0	1	1	1	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0.52	
Total Native Succulents	0	1	0	0	0	2	0	0	3	1	1	1	0	1	1	1	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0.52	
Lichen	0	0	0	0	0	2	0	0	0	0	2	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0.21	
Fungi	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00	
Algae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00	
Moss	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00	
Total Cryptograms	0	0	0	0	0	2	0	0	0	0	2	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0.21	
Bare Ground	19	2	1	1	5	9	8	12	11	2	2	6	5	0	2	22	8	5	3	5	10	1	0	1	2	2	1	1	0	0	5.03	
Litter	12	21	18	21	23	10	11	17	11	11	17	11	3	21	14	14	27	15	14	11	25	2	14	10	3	8	17	15	14	0	14.14	
Rock	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0.07	
Total Vegetation Cover	19	27	31	28	22	29	31	21	28	37	29	33	40	29	34	14	14	30	33	33	15	47	36	39	45	40	32	34	36	0	30.55	
Total Vegetation Cover w/out SLCV	19	27	31	26	22	29	31	21	28	37	28	33	40	29	34	14	14	30	31	33	15	47	36	38	45	40	32	34	34	0	30.28	
Total Vegetation w/Cryptograms	19	27	31	28	22	31	31	21	28	37	31	33	41	29	34	14	15	30	33	33	15	47	36	39	45	40	32	34	36	0	30.76	
Total Vegetation w/Cryptograms w/out SLCV	19	27	31	26	22	31	31	21	28	37	30	33	41	29	34	14	15	30	31	33	15	47	36	38	45	40	32	34	34	0	30.48	
Total Ground Cover	31	48	49	49	45	41	42	38	39	48	48	44	45	50	48	28	42	45	47	45	40	49	50	49	48	48	49	49	50	0	44.97	
Total Ground Cover w/out SLCV	31	48	49	47	45	41	42	38	39	48	47	44	45	50	48	28	42	45	45	45	40	49	50	48	48	48	49	49	48	0	44.69	
No. of Species Sampled excluding SLCV	1	9	5	7	5	5	5	5	5	7	8	7	3	8	4	3	3	4	10	5	3	5	4	5	5	2	4	4	5	0	5.03	
No.of Species Observed excluding SLCV	3	2	1	0	3	5	3	2	2	4	0	2	0	3	4	3	4	3	4	0	2	0	1	0	0	2	7	5	4	0	2.38	
Total No. of Species excluding SLCV	4	11	6	7	8	10	8	7	7	11	8	9	3	11	8	6	7	7	14	5	5	5	5	5	5	4	11	9	9	0	7.41	
Total No. of SLCV	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	1	0	0	1	0	0	0	0	1	0	0	0	0	2	0	0.24	

Rare Element Resources  
 Polygon #MG  
 Cover Sample Data  
 Report Date: 12/14/2012  
 Point Line Intercept Method, n = 24

Plant Species	Sample Number Cover																								Mean Abs Cover
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
<i>Beckmannia syzigachne</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	4	0	0	0.33
<b>Total Native Annual Grasses</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>0</b>	<b>0</b>	0.33
<i>Bromus japonicus</i>	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0.08
<b>Total Introduced Annual Grasses</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	0.08
<i>Elymus lanceolatus</i>	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.08
<i>Elymus smithii</i>	3	0	5	9	12	4	2	8	6	21	19	27	11	8	2	1	19	1	25	11	32	0	12	12	10.42
<i>Elymus spicatus</i>	0	0	0	0	0	0	0	0	0	4	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0.25
<i>Hordeum jubatum</i>	3	0	0	0	0	1	3	0	0	1	2	2	0	1	1	1	0	0	1	2	0	0	9	4	1.29
<i>Muhlenbergia asperifolia</i>	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.13
<i>Poa secunda</i>	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0.08
<i>Puccinellia nuttalliana</i>	5	1	0	0	0	1	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.42
<b>Total Native Cool Season Perennial Grasses</b>	<b>11</b>	<b>4</b>	<b>5</b>	<b>9</b>	<b>12</b>	<b>6</b>	<b>7</b>	<b>9</b>	<b>8</b>	<b>26</b>	<b>22</b>	<b>30</b>	<b>12</b>	<b>9</b>	<b>3</b>	<b>2</b>	<b>20</b>	<b>1</b>	<b>26</b>	<b>13</b>	<b>32</b>	<b>0</b>	<b>21</b>	<b>16</b>	12.67
<i>Calamovilfa longifolia</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11	7	7	0	0	0	0	3	0	0	1.17
<i>Spartina pectinata</i>	0	0	5	0	0	2	0	0	7	10	8	0	7	24	8	1	0	21	0	22	0	17	13	0	6.04
<i>Sporobolus airoides</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.04
<b>Total Native Warm Season Perennial Grasses</b>	<b>0</b>	<b>0</b>	<b>5</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>7</b>	<b>10</b>	<b>8</b>	<b>0</b>	<b>7</b>	<b>24</b>	<b>19</b>	<b>8</b>	<b>7</b>	<b>21</b>	<b>0</b>	<b>22</b>	<b>0</b>	<b>20</b>	<b>13</b>	<b>1</b>	7.25
<i>Agropyron cristatum</i>	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0.04
<i>Bromus inermis</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0.04
<i>Phleum pratense</i>	0	0	1	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0.17
<i>Poa pratensis</i>	2	9	20	15	5	14	0	15	3	0	1	1	3	0	0	2	1	0	0	0	3	1	1	3	4.13
<b>Total Introduced Perennial Grasses</b>	<b>2</b>	<b>9</b>	<b>21</b>	<b>15</b>	<b>5</b>	<b>14</b>	<b>0</b>	<b>15</b>	<b>3</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>4</b>	<b>0</b>	<b>3</b>	<b>2</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>3</b>	<b>1</b>	<b>1</b>	<b>3</b>	4.38
<i>Carex nebrascensis</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	11	0	7	2	0	0	13	0	0	1.54
<i>Carex praegracilis</i>	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.04
<i>Eleocharis palustris</i>	7	0	0	0	0	1	19	5	23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2.29
<i>Juncus balticus</i>	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0.17
<i>Juncus interior</i>	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.04
<b>Total Native Grasslike Species</b>	<b>7</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>19</b>	<b>5</b>	<b>24</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>11</b>	<b>2</b>	<b>7</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>13</b>	<b>0</b>	<b>0</b>	4.08

[illegible]

**Rare Element Resources**  
**Polygon #MG**  
**Cover Sample Data**  
 Report Date: 12/14/2012  
 Point Line Intercept Method, n = 24

Total Vegetation Cover	20	16	36	24	17	26	26	29	46	38	36	31	27	39	33	26	30	32	29	37	35	38	36	20	30.30	
Total Vegetation Cover w /out SLCV	20	16	36	24	17	26	26	29	43	36	33	31	23	39	33	26	30	31	29	35	35	38	35	20	29.63	
Total Vegetation w /Cryptograms	20	16	36	24	17	26	26	29	46	38	36	31	27	39	33	26	30	32	29	37	35	38	36	20	30.30	
Total Vegetation w /Cryptograms w /out SLCV	20	16	36	24	17	26	26	29	43	36	33	31	23	39	33	26	30	31	29	35	35	38	35	20	29.63	
Total Ground Cover	46	23	50	47	34	45	48	47	50	50	50	50	49	49	50	50	50	50	50	50	50	46	49	50	47.22	
Total Ground Cover w /out SLCV	46	23	50	47	34	45	48	47	47	48	47	50	45	49	50	50	50	49	50	48	50	46	48	50	46.55	
No. of Species Sampled excluding SLCV	5	4	7	2	2	8	4	4	7	4	7	4	5	4	7	7	5	5	4	3	2	5	4	4	4.71	
No. of Species Observed excluding SLCV	1	2	6	1	2	2	2	7	2	1	1	1	1	3	2	1	3	1	3	1	1	2	2	0	2.00	
Total No. of Species excluding SLCV	6	6	13	3	4	10	6	11	9	5	8	5	6	7	9	8	8	6	7	4	3	7	6	4	6.71	
Total No. of SLCV	0	0	0	0	0	0	0	0	1	1	1	0	2	1	1	1	0	2	1	1	0	1	1	0	0.58	

Rare Element Resources  
 Polygon #MS  
 Cover Sample Data  
 Report Date: 12/14/2012  
 Point Line Intercept Method, n = 20

Plant Species	Sample Number Cover																				Mean Abs Cover
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
<i>Elymus smithii</i>	4	0	0	3	2	0	8	0	16	3	11	2	0	5	4	0	1	1	8	0	3.40
<i>Koeleria macrantha</i>	0	0	1	1	0	6	0	3	3	5	3	2	2	1	1	6	2	0	0	2	1.90
<i>Nassella viridula</i>	2	0	2	2	0	0	2	1	1	1	6	1	9	8	3	5	1	0	2	1	2.35
<i>Poa secunda</i>	3	0	8	4	3	0	1	2	1	2	1	2	1	1	0	5	1	0	3	1	1.95
<b>Total Native Cool Season Perennial Grasses</b>	<b>9</b>	<b>0</b>	<b>11</b>	<b>10</b>	<b>5</b>	<b>6</b>	<b>11</b>	<b>6</b>	<b>21</b>	<b>11</b>	<b>21</b>	<b>7</b>	<b>12</b>	<b>15</b>	<b>8</b>	<b>16</b>	<b>5</b>	<b>1</b>	<b>13</b>	<b>4</b>	<b>9.60</b>
<i>Bouteloua gracilis</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0.10
<i>Calamovilfa longifolia</i>	0	0	0	0	0	0	0	0	0	0	0	6	0	0	0	0	0	0	0	0	0.30
<b>Total Native Warm Season Perennial Grasses</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>6</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0.40</b>
<i>Agropyron cristatum</i>	0	5	5	2	15	18	4	0	7	2	0	0	4	2	0	2	19	18	1	16	6.00
<i>Bromus inermis</i>	0	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.30
<b>Total Introduced Perennial Grasses</b>	<b>0</b>	<b>5</b>	<b>5</b>	<b>8</b>	<b>15</b>	<b>18</b>	<b>4</b>	<b>0</b>	<b>7</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>2</b>	<b>0</b>	<b>2</b>	<b>19</b>	<b>18</b>	<b>1</b>	<b>16</b>	<b>6.30</b>
<i>Carex filifolia</i>	0	1	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0.15
<b>Total Native Grasslike Species</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0.15</b>
<i>Gnaphalium palustre</i>	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.05
<b>Total Native Annual Forbs</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0.05</b>
<i>Melilotus officinalis</i>	0	0	0	2	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0.20
<i>Tragopogon dubius</i>	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0.05
<b>Total Introduced Biennial Forbs</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0.25</b>

## Rare Element Resources

## Polygon #MS

## Cover Sample Data

Report Date: 12/14/2012

Point Line Intercept Method, n = 20

<i>Achillea millefolium</i>	0	2	1	0	0	0	0	0	0	1	0	2	0	0	1	0	0	0	0	0	0.35
<i>Astragalus spatulatus</i>	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0.10
<i>Grindelia squarrosa</i>	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0.05
<i>Phlox hoodii</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0.05
<i>Psoralea tenuiflorum</i>	0	0	0	0	0	0	1	0	0	0	0	1	0	0	1	0	0	0	0	0	0.15
<i>Ratibida columnifera</i>	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0.10
<i>Thermopsis rhombifolia</i>	1	2	0	0	0	0	0	1	0	1	0	1	0	0	1	1	0	0	1	0	0.45
<i>Vicia americana</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0.05
<b>Total Native Perennial Forbs</b>	<b>2</b>	<b>4</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>2</b>	<b>0</b>	<b>6</b>	<b>0</b>	<b>1</b>	<b>4</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>1.30</b>
<i>Artemisia tridentata</i>	4	4	1	3	4	2	0	6	0	8	1	7	6	3	5	4	2	6	2	7	3.75
<i>Chrysothamnus viscidiflorus</i>	0	1	0	0	0	0	0	1	0	0	0	2	0	0	2	0	0	0	3	0	0.45
<i>Rosa woodsii</i>	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0.05
<i>Sarcobatus vermiculatus</i>	3	1	5	0	0	0	3	0	0	8	0	0	2	0	0	0	0	0	1	0	1.15
<b>Total Native Full Shrubs</b>	<b>7</b>	<b>6</b>	<b>6</b>	<b>3</b>	<b>4</b>	<b>2</b>	<b>3</b>	<b>7</b>	<b>0</b>	<b>16</b>	<b>1</b>	<b>10</b>	<b>8</b>	<b>3</b>	<b>7</b>	<b>4</b>	<b>2</b>	<b>6</b>	<b>6</b>	<b>7</b>	<b>5.40</b>
<i>Atriplex gardneri</i>	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0.05
<i>Gutierrezia sarothrae</i>	3	0	0	0	0	0	1	1	0	0	1	0	1	0	0	1	0	0	1	0	0.45
<b>Total Native Half &amp; Sub-Shrubs</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0.50</b>
<i>Opuntia polyacantha</i>	0	0	0	0	1	0	0	0	0	0	0	0	2	0	0	0	2	1	0	1	0.35
<b>Total Native Succulents</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>0.35</b>
Lichen	0	4	0	0	2	1	0	6	0	0	1	0	0	4	2	0	0	5	1	0	1.30
Fungi	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
Algae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
Moss	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
<b>Total Cryptogams</b>	<b>0</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>1</b>	<b>0</b>	<b>6</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>5</b>	<b>1</b>	<b>0</b>	<b>1.30</b>
Bare Ground	15	14	3	5	4	7	6	15	5	6	1	9	2	2	18	10	4	7	7	2	7.10
Litter	14	14	23	21	18	14	23	14	16	13	23	12	20	21	11	15	18	11	20	20	17.05
Rock	0	2	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0.25

**Rare Element Resources****Polygon #MS****Cover Sample Data**

Report Date: 12/14/2012

Point Line Intercept Method, n = 20

Total Vegetation Cover	21	16	23	24	26	27	21	15	29	31	25	29	28	23	19	25	28	26	22	28	24.30
Total Vegetation Cover w/out SLCV	18	16	23	24	26	27	20	14	29	31	24	29	27	23	19	24	28	26	21	28	23.85
Total Vegetation w/Cryptograms	21	20	23	24	28	28	21	21	29	31	26	29	28	27	21	25	28	31	23	28	25.60
Total Vegetation w/Cryptograms w/out SLCV	18	20	23	24	28	28	20	20	29	31	25	29	27	27	21	24	28	31	22	28	25.15
Total Ground Cover	35	36	47	45	46	43	44	35	45	44	49	41	48	48	32	40	46	43	43	48	42.90
Total Ground Cover w/out SLCV	32	36	47	45	46	43	43	34	45	44	48	41	47	48	32	39	46	43	42	48	42.45
No. of Species Sampled excluding SLCV	7	7	7	9	6	4	7	6	6	9	7	13	8	8	9	7	7	4	8	6	7.25
No. of Species Observed excluding SLCV	2	6	4	4	3	4	3	5	4	5	4	1	2	4	3	7	0	4	4	5	3.70
Total No. of Species excluding SLCV	9	13	11	13	9	8	10	11	10	14	11	14	10	12	12	14	7	8	12	11	10.95
Total No. of SLCV	1	1	1	1	0	1	1	1	1	1	1	0	1	1	1	1	1	0	1	2	0.90

Rare Element Resources  
 Polygon #RG  
 Cover Sample Data  
 Report Date: 12/14/2012  
 Point Line Intercept Method, n = 22

Plant Species	Sample Number Cover																						Mean Abs Cover
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	
<i>Bromus japonicus</i>	0	1	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0.14
<b>Total Introduced Annual Grasses</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	0.14
<i>Elymus smithii</i>	11	6	8	13	8	8	8	9	8	6	3	10	15	5	20	17	13	17	17	15	15	18	11.36
<i>Elymus spicatus</i>	2	0	1	5	5	2	2	0	1	3	0	0	2	0	0	0	0	0	0	0	1	0	1.09
<i>Koeleria macrantha</i>	0	0	0	0	0	1	6	1	0	0	0	1	0	0	0	0	1	1	0	0	0	0	0.50
<i>Nassella viridula</i>	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0.14
<i>Poa secunda</i>	0	0	0	0	0	3	1	0	0	0	1	0	3	0	0	0	2	0	1	0	0	0	0.50
<b>Total Native Cool Season Perennial Grasses</b>	<b>13</b>	<b>6</b>	<b>9</b>	<b>18</b>	<b>13</b>	<b>16</b>	<b>17</b>	<b>10</b>	<b>9</b>	<b>9</b>	<b>4</b>	<b>11</b>	<b>20</b>	<b>5</b>	<b>20</b>	<b>17</b>	<b>17</b>	<b>18</b>	<b>18</b>	<b>15</b>	<b>16</b>	<b>18</b>	13.59
<i>Calamovilfa longifolia</i>	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.05
<i>Sporobolus airoides</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	7	0	0	0	0	0	0	0	0	0.32
<i>Sporobolus cryptandrus</i>	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.14
<b>Total Native Warm Season Perennial Grasses</b>	<b>0</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>7</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	0.51
<i>Agropyron cristatum</i>	0	1	7	2	3	1	2	2	3	3	4	3	0	12	5	3	5	10	7	6	4	1	3.82
<i>Bromus inermis</i>	0	1	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.14
<b>Total Introduced Perennial Grasses</b>	<b>0</b>	<b>2</b>	<b>7</b>	<b>2</b>	<b>5</b>	<b>1</b>	<b>2</b>	<b>2</b>	<b>3</b>	<b>3</b>	<b>4</b>	<b>3</b>	<b>0</b>	<b>12</b>	<b>5</b>	<b>3</b>	<b>5</b>	<b>10</b>	<b>7</b>	<b>6</b>	<b>4</b>	<b>1</b>	3.96
<i>Melilotus officinalis</i>	0	0	0	3	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.18
<b>Total Introduced Biennial Forbs</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	0.18
<i>Grindelia squarrosa</i>	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.09
<i>Thermopsis rhombifolia</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0.23
<b>Total Native Perennial Forbs</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>5</b>	0.32



## Point Line Intercept Method, n = 22

59

Rare Element Resources  
 Polygon #UG  
 Cover Sample Data  
 Report Date: 12/14/2012  
 Point Line Intercept Method, n = 19

Plant Species	Sample Number Cover																			Mean Abs Cover
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	
<i>Bromus japonicus</i>	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.05
<b>Total Introduced Annual Grasses</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	0.05
<i>Elymus smithii</i>	0	1	0	0	2	0	1	0	2	11	1	1	2	2	1	1	0	0	0	1.32
<i>Hesperostipa comata</i>	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.11
<i>Koeleria macrantha</i>	0	0	0	0	2	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0.21
<i>Nassella viridula</i>	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0.11
<i>Poa secunda</i>	0	0	0	1	1	0	0	1	0	0	0	0	8	0	18	0	0	0	0	1.53
<b>Total Native Cool Season Perennial Grasses</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>3</b>	<b>5</b>	<b>0</b>	<b>2</b>	<b>1</b>	<b>2</b>	<b>13</b>	<b>1</b>	<b>1</b>	<b>10</b>	<b>2</b>	<b>19</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	3.28
<i>Calamovilfa longifolia</i>	0	0	0	0	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.53
<i>Schizachyrium scoparium</i>	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.11
<i>Sporobolus airoides</i>	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0.16
<b>Total Native Warm Season Perennial Grasses</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>12</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	0.80
<i>Agropyron cristatum</i>	22	19	27	20	0	20	15	23	20	1	23	23	21	24	13	19	27	18	28	19.11
<i>Bromus inermis</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0.16
<b>Total Introduced Perennial Grasses</b>	<b>22</b>	<b>19</b>	<b>27</b>	<b>20</b>	<b>0</b>	<b>20</b>	<b>15</b>	<b>23</b>	<b>20</b>	<b>1</b>	<b>23</b>	<b>23</b>	<b>21</b>	<b>24</b>	<b>13</b>	<b>19</b>	<b>27</b>	<b>21</b>	<b>28</b>	19.27
<i>Melilotus officinalis</i>	0	0	0	0	0	0	0	0	1	0	1	0	0	2	0	0	0	0	0	0.21
<b>Total Introduced Biennial Forbs</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	0.21

## Rare Element Resources

## Polygon #UG

## Cover Sample Data

Report Date: 12/14/2012

Point Line Intercept Method, n = 19

<i>Sphaeralcea coccinea</i>	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0.11
<i>Thermopsis rhombifolia</i>	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.16
<b>Total Native Perennial Forbs</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0.27</b>
<i>Taraxacum officinale</i>	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.05
<b>Total Introduced Perennial Forbs</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0.05</b>
<i>Artemisia tridentata</i>	0	0	1	1	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0.21
<b>Total Native Full Shrubs</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0.21</b>
<i>Opuntia polyacantha</i>	0	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.16
<b>Total Native Succulents</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0.16</b>
Lichen	0	0	0	4	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.32
Fungi	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
Algae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
Moss	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
<b>Total Cryptograms</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0.32</b>
Bare Ground	0	0	0	0	8	0	0	6	1	0	0	0	0	0	0	0	0	0	0	0.75
Litter	27	29	19	21	19	30	33	18	26	34	25	23	19	22	18	30	23	29	22	24.58
Rock	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.05

**Rare Element Resources****Polygon #UG****Cover Sample Data**

Report Date: 12/14/2012

Point Line Intercept Method, n = 19

Total Vegetation Cover	23	21	31	25	20	20	17	26	23	16	25	27	31	28	32	20	27	21	28	24.30
Total Vegetation Cover w/out SLCV	22	21	31	25	20	20	17	26	23	16	25	27	31	28	32	20	27	21	28	24.25
Total Vegetation w/Cryptograms	23	21	31	29	22	20	17	26	23	16	25	27	31	28	32	20	27	21	28	24.62
Total Vegetation w/Cryptograms w/out SLCV	22	21	31	29	22	20	17	26	23	16	25	27	31	28	32	20	27	21	28	24.57
Total Ground Cover	50	50	50	50	42	50	50	44	49	50	50	50	50	50	50	50	50	50	50	49.25
Total Ground Cover w/out SLCV	49	50	50	50	42	50	50	44	49	50	50	50	50	50	50	50	50	50	50	49.20
No. of Species Sampled excluding SLCV	1	3	4	5	6	1	3	3	3	4	3	3	3	3	3	2	1	2	1	2.84
No. of Species Observed excluding SLCV	1	0	3	2	4	1	4	0	4	3	2	0	1	0	0	5	1	5	3	2.05
Total No. of Species excluding SLCV	2	3	7	7	10	2	7	3	7	7	5	3	4	3	3	7	2	7	4	4.89
Total No. of SLCV	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0.11

RARE ELEMENT RESOURCES  
Report: Cover Summary

<b>Project Name:</b>	2012 Upton Plant Site	<b>Sampling Method:</b>	Point Line Intercept
<b>Polygon Name:</b>	BSS	<b>Sample Size:</b>	1
<b>Community Type:</b>	Big Sagebrush Shrubland	<b>Number of Samples:</b>	36
<b>Date:</b>	11/19/2014	<b>Report Date:</b>	12/14/2012

Species	Mean Absolute	Cover Relative (%)	Std. Dev. (n-1)	Frequency			Rank
				Absolute	Relative (%)	LV*	
Introduced Annual Grasses							
<i>Bromus japonicus</i>	0.50	1.04	1.10	19.44	2.66	3.70	13
Sub-Total	0.50	1.04	1.10	19.44	2.66	3.70	
Native Cool Season Perennial Grasses							
<i>Achnatherum hymenoides</i>	0.22	0.46	0.80	8.33	1.14	1.60	20
<i>Elymus smithii</i>	10.66	22.11	12.60	69.44	9.50	31.61	2
<i>Hesperostipa comata</i>	2.06	4.27	4.04	36.11	4.94	9.21	9
<i>Koeleria macrantha</i>	2.00	4.15	2.44	52.77	7.22	11.37	6
<i>Nassella viridula</i>	2.66	5.52	4.54	41.66	5.70	11.22	7
<i>Poa secunda</i>	3.28	6.80	4.08	55.55	7.60	14.40	5
Sub-Total	20.88	43.31	14.02	263.86	36.10	79.41	
Native Warm Season Perennial Grasses							
<i>Bouteloua gracilis</i>	1.06	2.20	1.76	33.33	4.56	6.76	10
<i>Sporobolus airoides</i>	0.12	0.25	0.66	2.77	0.38	0.63	24
Sub-Total	1.18	2.45	1.82	36.10	4.94	7.39	
Introduced Perennial Grasses							
<i>Agropyron cristatum</i>	6.66	13.81	14.32	47.22	6.46	20.27	3
<i>Bromus inermis</i>	0.34	0.71	1.12	8.33	1.14	1.85	18
<i>Phleum pratense</i>	0.06	0.12	0.34	2.77	0.38	0.50	25
<i>Poa pratensis</i>	0.34	0.71	0.90	13.88	1.90	2.61	15
Sub-Total	7.40	15.35	14.1	72.20	9.88	25.23	
Native Grasslike Species							
<i>Carex filifolia</i>	2.34	4.85	4.16	36.11	4.94	9.79	8
Sub-Total	2.34	4.85	4.16	36.11	4.94	9.79	
Introduced Biennial Forbs							
<i>Melilotus officinalis</i>	0.28	0.58	0.84	11.11	1.52	2.10	16
<i>Tragopogon dubius</i>	0.12	0.25	0.46	5.55	0.76	1.01	23
Sub-Total	0.40	0.83	1.16	16.66	2.28	3.11	
Native Perennial Forbs							
<i>Achillea millefolium</i>	0.28	0.58	0.98	8.33	1.14	1.72	19
<i>Phlox hoodii</i>	0.94	1.95	1.48	33.33	4.56	6.51	11
<i>Ratibida columnifera</i>	0.22	0.46	0.64	11.11	1.52	1.98	17
<i>Sphaeralcea coccinea</i>	0.16	0.33	0.74	5.55	0.76	1.09	22
<i>Vicia americana</i>	0.06	0.12	0.34	2.77	0.38	0.50	25
Sub-Total	1.66	3.44	2.22	61.09	8.36	11.80	
Introduced Perennial Forbs							
<i>Astragalus cicer</i>	0.06	0.12	0.34	2.77	0.38	0.50	25
<i>Taraxacum officinale</i>	0.12	0.25	0.46	5.55	0.76	1.01	23
Sub-Total	0.18	0.37	0.56	8.32	1.14	1.51	
Native Full Shrubs							
<i>Artemisia tridentata</i>	12.12	25.13	8.52	97.22	13.30	38.43	1
<i>Chrysothamnus viscidiflorus</i>	0.06	0.12	0.34	2.77	0.38	0.50	25
<i>Sarcobatus vermiculatus</i>	0.16	0.33	0.56	8.33	1.14	1.47	21
Sub-Total	12.34	25.58	8.68	108.32	14.82	40.41	

**Native Half & Sub-Shrubs**

<i>Artemisia frigida</i>	0.50	1.04	1.30	16.66	2.28	3.32	14
<i>Gutierrezia sarothrae</i>	0.06	0.12	0.34	2.77	0.38	0.50	25
<i>Krascheninnikovia lanata</i>	0.12	0.25	0.46	5.55	0.76	1.01	23
<b>Sub-Total</b>	<b>0.68</b>	<b>1.41</b>	<b>1.44</b>	<b>24.98</b>	<b>3.42</b>	<b>4.83</b>	

**Native Succulents**

<i>Opuntia polyacantha</i>	0.66	1.37	1.06	30.55	4.18	5.55	12
<b>Sub-Total</b>	<b>0.66</b>	<b>1.37</b>	<b>1.06</b>	<b>28.21</b>	<b>4.18</b>	<b>5.55</b>	

**Cryptograms**

<i>Moss</i>	0.00	0.00	0.00	0.00	0.00	0.00	26
<i>Lichen</i>	3.56	6.87	4.58	55.55	7.60	14.47	4
<i>Algae</i>	0.00	0.00	0.00	0.00	0.00	0.00	26
<i>Fungi</i>	0.00	0.00	0.00	0.00	0.00	0.00	26
<b>Sub-Total</b>	<b>3.56</b>	<b>6.87</b>	<b>4.58</b>	<b>55.55</b>	<b>7.60</b>	<b>13.56</b>	

<b>Totals</b>	<b>Std. Dev.</b>	
<i>Total Vegetation</i>	48.22	14.84
<i>Total Vegetation w/Cryptograms</i>	51.78	13.98
<i>Total Vegetation excluding SLCV</i>	47.66	14.86
<i>Litter</i>	44.66	14.96
<i>Rock</i>	0.22	0.80
<i>Total Ground Cover</i>	96.66	3.96
<i>Total Ground Cover excluding SLCV</i>	96.10	4.16
<i>Bare Soil</i>	3.34	3.96
<b>Total Cover</b>	<b>100.00</b>	

\* I.V. Stands for Importance Value

RARE ELEMENT RESOURCES  
BASELINE ASSESSMENT  
Report: Cover Summary

<b>Project Name:</b>	2012 Upton Plant Site	<b>Sampling Method:</b>	Point Line Intercept
<b>Polygon Name:</b>	GS	<b>Sample Size:</b>	1
<b>Community Type:</b>	Greasewood Shrubland	<b>Number of Samples:</b>	29
<b>Date:</b>	12/2/2014	<b>Report Date:</b>	12/14/2012

Species	Mean Absolute	Cover Relative (%)	Std. Dev. (n-1)	Frequency			
				Absolute	Relative (%)	I.V*	Rank
Introduced Annual Grasses							
<i>Bromus japonicus</i>	0.48	0.79	1.28	13.79	2.52	3.31	10
Sub-Total	0.48	0.79	1.28	13.79	2.52	3.31	
Native Cool Season Perennial Grasses							
<i>Elymus lanceolatus</i>	0.20	0.33	0.82	6.90	1.26	1.59	13
<i>Elymus smithii</i>	10.20	16.69	14.96	65.52	11.95	28.64	3
<i>Elymus spicatus</i>	0.06	0.10	0.38	3.45	0.63	0.73	15
<i>Koeleria macrantha</i>	0.76	1.24	2.02	20.69	3.77	5.01	8
<i>Nassella viridula</i>	1.10	1.80	3.60	13.79	2.52	4.32	9
<i>Poa secunda</i>	5.04	8.25	5.80	65.52	11.95	20.20	4
Sub-Total	17.36	28.41	16.76	175.87	32.08	60.49	
Native Warm Season Perennial Grasses							
<i>Calamovilfa longifolia</i>	0.48	0.79	1.66	10.34	1.89	2.68	12
<i>Spartina pectinata</i>	0.06	0.10	0.38	3.45	0.63	0.73	15
Sub-Total	0.54	0.89	1.68	13.79	2.52	3.41	
Introduced Perennial Grasses							
<i>Agropyron cristatum</i>	26.48	43.34	16.64	86.21	15.72	59.06	1
<i>Bromus inermis</i>	0.56	0.92	2.00	10.34	1.89	2.81	11
<i>Phleum pratense</i>	0.06	0.10	0.38	3.45	0.63	0.73	15
<i>Poa pratensis</i>	0.48	0.79	1.90	10.34	1.89	2.68	12
Sub-Total	27.58	45.15	16.64	110.34	20.13	65.28	
Native Grasslike Species							
<i>Carex filifolia</i>	0.14	0.23	0.52	6.90	1.26	1.49	14
Sub-Total	0.14	0.23	0.52	6.90	1.26	1.49	
Introduced Annual Forbs							
<i>Alyssum desertorum</i>	0.06	0.10	0.38	3.45	0.63	0.73	15
<i>Descurainia sophia</i>	0.06	0.10	0.38	3.45	0.63	0.73	15
<i>Lepidium perfoliatum</i>	0.06	0.10	0.38	3.45	0.63	0.73	15
Sub-Total	0.18	0.30	0.82	10.35	1.89	2.19	
Introduced Biennial Forbs							
<i>Melilotus officinalis</i>	0.06	0.10	0.38	3.45	0.63	0.73	15
Sub-Total	0.06	0.10	0.38	3.45	0.63	0.73	

**Native Perennial Forbs**

<i>Achillea millefolium</i>	0.14	0.23	0.52	6.90	1.26	1.49	14
<i>Grindelia squarrosa</i>	0.14	0.23	0.52	6.90	1.26	1.49	14
<i>Phlox hoodii</i>	0.06	0.10	0.38	3.45	0.63	0.73	15
<b>Sub-Total</b>	<b>0.34</b>	<b>0.56</b>	<b>0.76</b>	<b>17.25</b>	<b>3.15</b>	<b>3.71</b>	

**Native Full Shrubs**

<i>Artemisia cana</i>	0.06	0.10	0.38	3.45	0.63	0.73	15
<i>Artemisia tridentata</i>	1.32	2.16	2.34	34.48	6.29	8.45	5
<i>Chrysothamnus viscidiflorus</i>	0.06	0.10	0.38	3.45	0.63	0.73	15
<i>Sarcobatus vermiculatus</i>	11.72	19.18	11.76	86.21	15.72	34.90	2
<b>Sub-Total</b>	<b>13.16</b>	<b>21.54</b>	<b>13.02</b>	<b>127.59</b>	<b>23.27</b>	<b>44.81</b>	

**Native Half & Sub-Shrubs**

<i>Artemisia frigida</i>	0.06	0.10	0.38	3.45	0.63	0.73	15
<i>Gutierrezia sarothrae</i>	0.06	0.10	0.38	3.45	0.63	0.73	15
<b>Sub-Total</b>	<b>0.12</b>	<b>0.20</b>	<b>0.52</b>	<b>6.90</b>	<b>1.26</b>	<b>1.46</b>	

**Native Succulents**

<i>Opuntia polyacantha</i>	1.04	1.70	1.74	34.48	6.29	7.99	6
<b>Sub-Total</b>	<b>1.04</b>	<b>1.70</b>	<b>1.74</b>	<b>34.48</b>	<b>6.29</b>	<b>7.99</b>	

**Cryptograms**

<i>Moss</i>	0.00	0.00	0.00	0.00	0.00	0.00	16
<i>Lichen</i>	0.41	0.00	1.12	27.59	5.03	5.03	7
<i>Algae</i>	0.00	0.00	0.00	0.00	0.00	0.00	16
<i>Fungi</i>	0.00	0.00	0.00	0.00	0.00	0.00	16
<b>Sub-Total</b>	<b>0.41</b>	<b>0.00</b>	<b>1.12</b>	<b>27.59</b>	<b>5.03</b>	<b>5.03</b>	

<b>Totals</b>	<b>Std. Dev.</b>	
<i>Total Vegetation</i>	61.10	16.88
<i>Total Vegetation w/Cryptograms</i>	61.51	16.80
<i>Total Vegetation excluding SLCV</i>	60.56	16.78
<i>Litter</i>	28.28	12.34
<i>Rock</i>	0.14	0.52
<i>Total Ground Cover</i>	89.93	11.08
<i>Total Ground Cover excluding SLCV</i>	89.39	10.78
<i>Bare Soil</i>	10.07	11.08
<b>Total Cover</b>	<b>100.00</b>	

\* I.V. Stands for Importance Value



RARE ELEMENT RESOURCES  
Report: Cover Summary

<b>Project Name:</b>	2012 Upton Plant Site	<b>Sampling Method:</b>	Point Line Intercept
<b>Polygon Name:</b>	MG	<b>Sample Size:</b>	1
<b>Community Type:</b>	Meadow Grassland	<b>Number of Samples:</b>	24
<b>Date:</b>	11/19/2014	<b>Report Date:</b>	12/14/2012

Species	Mean Absolute	Cover Relative (%)	Std. Dev. (n-1)	Frequency			Rank
				Absolute	Relative (%)	LV*	
Native Annual Grasses							
<i>Beckmannia syzigachne</i>	0.66	1.09	2.26	8.33	1.65	2.74	12
Sub-Total	0.66	1.09	2.26	8.33	1.65	2.74	
Introduced Annual Grasses							
<i>Bromus japonicus</i>	0.16	0.26	0.82	4.17	0.83	1.09	16
Sub-Total	0.16	0.26	0.82	4.17	0.83	1.09	
Native Cool Season Perennial Grasses							
<i>Elymus lanceolatus</i>	0.16	0.26	0.82	4.17	0.83	1.09	16
<i>Elymus smithii</i>	20.84	34.39	18.26	91.66	18.19	52.58	1
<i>Elymus spicatus</i>	0.50	0.83	1.70	12.50	2.48	3.31	10
<i>Hordeum jubatum</i>	2.58	4.26	4.02	54.16	10.75	15.01	4
<i>Muhlenbergia asperifolia</i>	0.26	0.43	1.22	4.16	0.83	1.26	15
<i>Poa secunda</i>	0.16	0.26	0.56	8.33	1.65	1.91	14
<i>Puccinellia nuttalliana</i>	0.84	1.39	2.20	20.83	4.13	5.52	9
Sub-Total	25.34	41.82	18.80	195.81	38.85	80.67	
Native Warm Season Perennial Grasses							
<i>Calamovilfa longifolia</i>	2.34	3.86	5.82	16.66	3.31	7.17	7
<i>Spartina pectinata</i>	12.08	19.93	15.82	54.16	10.75	30.68	2
<i>Sporobolus airoides</i>	0.08	0.13	0.40	4.16	0.83	0.96	17
Sub-Total	14.50	23.93	16.54	74.98	14.88	38.81	
Introduced Perennial Grasses							
<i>Agropyron cristatum</i>	0.08	0.13	0.40	4.16	0.83	0.96	17
<i>Bromus inermis</i>	0.08	0.13	0.40	4.16	0.83	0.96	17
<i>Phleum pratense</i>	0.34	0.56	1.28	8.33	1.65	2.21	13
<i>Poa pratensis</i>	8.26	13.63	11.74	70.83	14.05	27.68	3
Sub-Total	8.76	14.46	11.8	87.48	17.36	31.82	
Native Grasslike Species							
<i>Carex nebrascensis</i>	3.08	5.08	7.24	20.83	4.13	9.21	6
<i>Carex praegracilis</i>	0.08	0.13	0.40	4.16	0.83	0.96	17
<i>Eleocharis palustris</i>	4.58	7.56	12.08	20.83	4.13	11.69	5
<i>Juncus balticus</i>	0.34	0.56	1.12	8.33	1.65	2.21	13
<i>Juncus interior</i>	0.08	0.13	0.40	4.16	0.83	0.96	17
Sub-Total	8.16	13.47	13.08	58.31	11.57	25.04	

<b>Native Annual Forbs</b>							
<i>Xanthium strumarium</i>	0.76	1.25	2.70	8.33	1.65	2.90	11
<b>Sub-Total</b>	<b>0.76</b>	<b>1.25</b>	<b>2.70</b>	<b>8.33</b>	<b>1.65</b>	<b>2.9</b>	
<b>Introduced Biennial Forbs</b>							
<i>Lactuca serriola</i>	0.08	0.13	0.40	4.16	0.83	0.96	17
<b>Sub-Total</b>	<b>0.08</b>	<b>0.13</b>	<b>0.40</b>	<b>4.16</b>	<b>0.83</b>	<b>0.96</b>	
<b>Native Perennial Forbs</b>							
<i>Achillea millefolium</i>	0.08	0.13	0.40	4.16	0.83	0.96	17
<i>Calochortus gunnisonii</i>	0.08	0.13	0.40	4.16	0.83	0.96	17
<i>Typha latifolia</i>	0.26	0.43	1.22	4.16	0.83	1.26	15
<b>Sub-Total</b>	<b>0.42</b>	<b>0.69</b>	<b>1.32</b>	<b>12.48</b>	<b>2.48</b>	<b>3.17</b>	
<b>Introduced Perennial Forbs</b>							
<i>Astragalus cicer</i>	0.08	0.13	0.40	4.16	0.83	0.96	17
<i>Cirsium arvense</i>	0.26	0.43	1.22	4.16	0.83	1.26	15
<i>Rumex crispus</i>	0.92	1.52	1.76	25.00	4.96	6.48	8
<i>Taraxacum officinale</i>	0.08	0.13	0.40	4.16	0.83	0.96	17
<i>Trifolium pratense</i>	0.08	0.13	0.40	4.16	0.83	0.96	17
<b>Sub-Total</b>	<b>1.42</b>	<b>2.34</b>	<b>2.46</b>	<b>41.64</b>	<b>8.26</b>	<b>10.61</b>	
<b>Native Full Shrubs</b>							
<i>Sarcobatus vermiculatus</i>	0.34	0.56	1.28	8.33	1.65	2.21	13
<b>Sub-Total</b>	<b>0.34</b>	<b>0.56</b>	<b>1.28</b>	<b>8.33</b>	<b>1.65</b>	<b>2.21</b>	
<b>Cryptograms</b>							
<i>Moss</i>	0.00	0.00	0.00	0.00	0.00	0.00	18
<i>Lichen</i>	0.00	0.00	0.00	0.00	0.00	0.00	18
<i>Algae</i>	0.00	0.00	0.00	0.00	0.00	0.00	18
<i>Fungi</i>	0.00	0.00	0.00	0.00	0.00	0.00	18
<b>Sub-Total</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	
<b>Totals</b>							
<i>Total Vegetation</i>	60.60	15.14					
<i>Total Vegetation w/Cryptograms</i>	60.60	15.14					
<i>Total Vegetation excluding SLCV</i>	59.26	14.32					
<i>Litter</i>	33.84	12.50					
<i>Rock</i>	0.00	0.00					
<i>Total Ground Cover</i>	94.44	12.38					
<i>Total Ground Cover excluding SLCV</i>	93.10	12.04					
<i>Bare Soil</i>	5.56	12.38					
<b>Total Cover</b>	<b>100.00</b>						

\* I.V. Stands for Importance Value

RARE ELEMENT RESOURCES  
BASELINE ASSESSMENT  
Report: Cover Summary

<b>Project Name:</b>	2012 Upton Plant Site	<b>Sampling Method:</b>	Point Line Intercept
<b>Polygon Name:</b>	MS	<b>Sample Size:</b>	1
<b>Community Type:</b>	Mixed Shrubland	<b>Number of Samples:</b>	20
<b>Date:</b>	12/2/2014	<b>Report Date:</b>	12/14/2012

Species	Mean Absolute	Cover	Std. Dev. (n-1)	Frequency			
		Relative (%)		Absolute	Relative (%)	I.V*	Rank
Native Cool Season Perennial Grasses							
<i>Elymus smithii</i>	6.80	13.99	8.70	65.00	7.65	21.64	3
<i>Koeleria macrantha</i>	3.80	7.82	3.88	70.00	8.24	16.06	6
<i>Nassella viridula</i>	4.70	9.67	5.24	80.00	9.41	19.08	4
<i>Poa secunda</i>	3.90	8.02	3.98	80.00	9.41	17.43	5
Sub-Total	19.20	39.50	11.50	295.00	34.71	74.21	
Native Warm Season Perennial Grasses							
<i>Bouteloua gracilis</i>	0.20	0.41	0.90	5.00	0.59	1.00	17
<i>Calamovilfa longifolia</i>	0.60	1.23	2.68	5.00	0.59	1.82	15
Sub-Total	0.80	1.64	2.78	10.00	1.18	2.82	
Introduced Perennial Grasses							
<i>Agropyron cristatum</i>	12.00	24.69	13.90	75.00	8.82	33.51	1
<i>Bromus inermis</i>	0.60	1.23	2.68	5.00	0.59	1.82	15
Sub-Total	12.60	25.92	13.80	80.00	9.41	35.33	
Native Grasslike Species							
<i>Carex filifolia</i>	0.30	0.62	0.74	15.00	1.76	2.38	14
Sub-Total	0.30	0.62	0.74	15.00	1.76	2.38	
Native Annual Forbs							
<i>Gnaphalium palustre</i>	0.10	0.21	0.44	5.00	0.59	0.80	18
Sub-Total	0.10	0.21	0.44	5.00	0.59	0.80	
Introduced Biennial Forbs							
<i>Melilotus officinalis</i>	0.40	0.82	1.04	15.00	1.76	2.58	13
<i>Tragopogon dubius</i>	0.10	0.21	0.44	5.00	0.59	0.80	18
Sub-Total	0.50	1.03	1.10	20.00	2.35	3.38	
Native Perennial Forbs							
<i>Achillea millefolium</i>	0.70	1.44	1.34	25.00	2.94	4.38	12
<i>Astragalus spatulatus</i>	0.20	0.41	0.62	10.00	1.18	1.59	16
<i>Grindelia squarrosa</i>	0.10	0.21	0.44	5.00	0.59	0.80	18
<i>Phlox hoodii</i>	0.10	0.21	0.44	5.00	0.59	0.80	18
<i>Psoraleidium tenuiflorum</i>	0.30	0.62	0.74	15.00	1.76	2.38	14
<i>Ratibida columnifera</i>	0.20	0.41	0.62	10.00	1.18	1.59	16
<i>Thermopsis rhombifolia</i>	0.90	1.85	1.20	40.00	4.71	6.56	9
<i>Vicia americana</i>	0.10	0.21	0.44	5.00	0.59	0.80	18
Sub-Total	2.60	5.36	3.26	115.00	13.54	18.90	

Native Full Shrubs							
<i>Artemisia tridentata</i>	7.50	15.43	4.80	90.00	10.59	26.02	2
<i>Chrysothamnus viscidiflorus</i>	0.90	1.85	1.78	25.00	2.94	4.79	11
<i>Rosa woodsii</i>	0.10	0.21	0.44	5.00	0.59	0.80	18
<i>Sarcobatus vermiculatus</i>	2.30	4.73	4.26	35.00	4.12	8.85	8
<b>Sub-Total</b>	<b>10.80</b>	<b>22.22</b>	<b>7.18</b>	<b>155.00</b>	<b>18.24</b>	<b>40.46</b>	

Native Half & Sub-Shrubs							
<i>Atriplex gardneri</i>	0.10	0.21	0.44	5.00	0.59	0.80	18
<i>Gutierrezia sarothrae</i>	0.90	1.85	1.52	35.00	4.12	5.97	10
<b>Sub-Total</b>	<b>1.00</b>	<b>2.06</b>	<b>1.66</b>	<b>40.00</b>	<b>4.71</b>	<b>6.77</b>	

Native Succulents							
<i>Opuntia polyacantha</i>	0.70	1.44	1.34	25.00	2.94	4.38	12
<b>Sub-Total</b>	<b>0.70</b>	<b>1.44</b>	<b>1.34</b>	<b>25.00</b>	<b>2.94</b>	<b>4.38</b>	

Cryptograms							
<i>Moss</i>	0.00	0.00	0.00	0.00	0.00	0.00	19
<i>Lichen</i>	2.60	0.00	3.84	90.00	10.59	10.59	7
<i>Algae</i>	0.00	0.00	0.00	0.00	0.00	0.00	19
<i>Fungi</i>	0.00	0.00	0.00	0.00	0.00	0.00	19
<b>Sub-Total</b>	<b>2.60</b>	<b>0.00</b>	<b>3.84</b>	<b>90.00</b>	<b>10.59</b>	<b>10.59</b>	

Totals		Std. Dev.
Total Vegetation	48.60	8.68
Total Vegetation w/Cryptograms	51.20	7.18
Total Vegetation excluding SLCV	47.70	9.28
Litter	34.10	8.24
Rock	0.50	1.10
Total Ground Cover	85.80	9.90
Total Ground Cover excluding SLCV	84.90	10.48
Bare Soil	14.20	9.90
<b>Total Cover</b>	<b>100.00</b>	

\* I.V. Stands for Importance Value

RARE ELEMENT RESOURCES  
Report: Cover Summary

<b>Project Name:</b>	2012 Upton Plant Site	<b>Sampling Method:</b>	Point Line Intercept
<b>Polygon Name:</b>	RG	<b>Sample Size:</b>	1
<b>Community Type:</b>	Reclaimed Grassland	<b>Number of Samples:</b>	22
<b>Date:</b>	11/19/2014	<b>Report Date:</b>	12/14/2012

Species	Mean Absolute	Cover Relative (%)	Std. Dev. (n-1)	Absolute	Frequency Relative (%)	LV*	Rank
<b>Introduced Annual Grasses</b>							
<i>Bromus japonicus</i>	0.28	0.73	0.70	13.63	3.61	4.34	7
<b>Sub-Total</b>	<b>0.28</b>	<b>0.73</b>	<b>0.70</b>	<b>13.63</b>	<b>3.61</b>	<b>4.34</b>	
<b>Native Cool Season Perennial Grasses</b>							
<i>Elymus smithii</i>	22.72	59.41	9.68	100.00	26.52	85.03	1
<i>Elymus spicatus</i>	2.18	5.70	3.14	45.45	12.05	17.75	3
<i>Koeleria macrantha</i>	1.00	2.62	2.60	27.27	7.23	9.49	5
<i>Nassella viridula</i>	0.28	0.73	0.94	9.09	2.41	3.14	9
<i>Poa secunda</i>	1.00	2.62	1.92	27.27	7.23	9.85	4
<b>Sub-Total</b>	<b>27.18</b>	<b>71.08</b>	<b>9.90</b>	<b>209.08</b>	<b>55.44</b>	<b>126.52</b>	
<b>Native Warm Season Perennial Grasses</b>							
<i>Calamovilfa longifolia</i>	0.10	0.26	0.42	4.54	1.20	1.46	14
<i>Sporobolus airoides</i>	0.64	1.67	2.98	4.54	1.20	2.87	10
<i>Sporobolus cryptandrus</i>	0.28	0.73	1.28	4.45	1.18	2.49	11
<b>Sub-Total</b>	<b>1.02</b>	<b>2.67</b>	<b>3.20</b>	<b>13.53</b>	<b>3.59</b>	<b>6.26</b>	
<b>Introduced Perennial Grasses</b>							
<i>Agropyron cristatum</i>	7.64	19.98	6.16	90.90	24.10	44.08	2
<i>Bromus inermis</i>	0.28	0.73	0.94	9.09	2.41	3.14	9
<b>Sub-Total</b>	<b>7.92</b>	<b>20.71</b>	<b>6.10</b>	<b>99.99</b>	<b>26.51</b>	<b>47.32</b>	
<b>Introduced Biennial Forbs</b>							
<i>Melilotus officinalis</i>	0.36	0.94	1.32	9.09	2.41	3.35	8
<b>Sub-Total</b>	<b>0.36</b>	<b>0.94</b>	<b>1.32</b>	<b>9.09</b>	<b>2.41</b>	<b>3.35</b>	
<b>Native Perennial Forbs</b>							
<i>Grindelia squarrosa</i>	0.18	0.47	0.86	4.54	1.20	1.67	13
<i>Thermopsis rhombifolia</i>	0.46	1.20	2.14	4.54	1.20	2.40	12
<b>Sub-Total</b>	<b>0.64</b>	<b>1.67</b>	<b>2.26</b>	<b>9.08</b>	<b>2.41</b>	<b>4.08</b>	
<b>Native Full Shrubs</b>							
<i>Atriplex canescens</i>	0.10	0.26	0.42	4.54	1.20	1.46	14
<i>Rosa woodsii</i>	0.10	0.26	0.42	4.54	1.20	1.46	14
<i>Sarcobatus vermiculatus</i>	0.64	1.67	2.18	13.63	3.61	5.28	6
<b>Sub-Total</b>	<b>0.84</b>	<b>2.20</b>	<b>2.20</b>	<b>22.71</b>	<b>6.02</b>	<b>8.22</b>	
<b>Cryptograms</b>							
<i>Moss</i>	0.00	0.00	0.00	0.00	0.00	0.00	15
<i>Lichen</i>	0.00	0.00	0.00	0.00	0.00	0.00	15
<i>Algae</i>	0.00	0.00	0.00	0.00	0.00	0.00	15
<i>Fungi</i>	0.00	0.00	0.00	0.00	0.00	0.00	15
<b>Sub-Total</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	

Totals	Std. Dev.
Total Vegetation	38.24
Total Vegetation w/Cryptograms	10.26
Total Vegetation excluding SLCV	38.24
Litter	37.96
Rock	11.22
Total Ground Cover	53.36
Total Ground Cover excluding SLCV	10.70
Bare Soil	0.54
Total Cover	92.14
	7.76
	91.86
	7.80
	7.86
	7.76
<b>Total Cover</b>	<b>100.00</b>

\* LV. Stands for Importance Value

RARE ELEMENT RESOURCES  
Report: Cover Summary

<b>Project Name:</b>	2012 Upton Plant Site	<b>Sampling Method:</b>	Point Line Intercept
<b>Polygon Name:</b>	UG	<b>Sample Size:</b>	1
<b>Community Type:</b>	Upland Grassland	<b>Number of Samples:</b>	19
<b>Date:</b>	11/19/2014	<b>Report Date:</b>	12/14/2012

Species	Mean Absolute	Cover Relative (%)	Std. Dev. (n-1)	Absolute	Frequency Relative (%)	IV*	Rank
<b>Introduced Annual Grasses</b>							
<i>Bromus japonicus</i>	0.10	0.21	0.46	5.26	1.54	1.75	12
<b>Sub-Total</b>	<b>0.10</b>	<b>0.21</b>	<b>0.46</b>	<b>5.26</b>	<b>1.54</b>	<b>1.75</b>	
<b>Native Cool Season Perennial Grasses</b>							
<i>Elymus smithii</i>	2.64	5.43	4.94	57.89	16.92	22.35	2
<i>Hesperostipa comata</i>	0.22	0.45	0.92	5.26	1.54	1.99	11
<i>Koeleria macrantha</i>	0.42	0.86	1.26	10.53	3.08	3.94	6
<i>Nassella viridula</i>	0.22	0.45	0.64	10.53	3.08	3.53	9
<i>Poa secunda</i>	3.06	6.30	8.78	26.32	7.69	13.99	3
<b>Sub-Total</b>	<b>6.56</b>	<b>13.50</b>	<b>10.34</b>	<b>110.53</b>	<b>32.31</b>	<b>45.80</b>	
<b>Native Warm Season Perennial Grasses</b>							
<i>Calamovilfa longifolia</i>	1.06	2.18	4.58	5.26	1.54	3.72	8
<i>Schizachyrium scoparium</i>	0.22	0.45	0.92	5.26	1.54	1.99	11
<i>Sporobolus airoides</i>	0.32	0.66	1.38	5.26	1.54	2.20	10
<b>Sub-Total</b>	<b>1.60</b>	<b>3.29</b>	<b>5.6</b>	<b>15.78</b>	<b>4.62</b>	<b>7.91</b>	
<b>Introduced Perennial Grasses</b>							
<i>Agropyron cristatum</i>	38.22	78.64	15.18	94.74	27.69	106.33	1
<i>Bromus inermis</i>	0.32	0.66	1.38	5.26	1.54	2.20	10
<b>Sub-Total</b>	<b>38.54</b>	<b>79.30</b>	<b>15.18</b>	<b>100.00</b>	<b>29.23</b>	<b>108.53</b>	
<b>Introduced Biennial Forbs</b>							
<i>Melilotus officinalis</i>	0.42	0.86	1.08	15.79	4.62	5.48	4
<b>Sub-Total</b>	<b>0.42</b>	<b>0.86</b>	<b>1.08</b>	<b>15.79</b>	<b>4.62</b>	<b>5.48</b>	
<b>Native Perennial Forbs</b>							
<i>Sphaeralcea coccinea</i>	0.22	0.45	0.92	5.26	1.54	1.99	11
<i>Thermopsis rhombifolia</i>	0.32	0.66	1.38	5.26	1.54	2.20	10
<b>Sub-Total</b>	<b>0.54</b>	<b>1.11</b>	<b>1.62</b>	<b>10.52</b>	<b>3.08</b>	<b>4.19</b>	
<b>Introduced Perennial Forbs</b>							
<i>Taraxacum officinale</i>	0.10	0.21	0.46	5.26	1.54	1.75	12
<b>Sub-Total</b>	<b>0.10</b>	<b>0.21</b>	<b>0.46</b>	<b>5.26</b>	<b>1.54</b>	<b>1.75</b>	
<b>Native Full Shrubs</b>							
<i>Artemisia tridentata</i>	0.42	0.86	1.08	15.79	4.62	5.48	4
<b>Sub-Total</b>	<b>0.42</b>	<b>0.86</b>	<b>1.08</b>	<b>15.79</b>	<b>4.62</b>	<b>5.48</b>	
<b>Native Succulents</b>							
<i>Opuntia polyacantha</i>	0.32	0.66	1.00	10.53	3.08	3.74	7
<b>Sub-Total</b>	<b>0.32</b>	<b>0.66</b>	<b>1.00</b>	<b>52.63</b>	<b>15.39</b>	<b>3.74</b>	
<b>Cryptograms</b>							
<i>Moss</i>	0.00	0.00	0.00	0.00	0.00	0.00	13
<i>Lichen</i>	0.64	1.30	2.00	10.53	3.08	4.38	5
<i>Algae</i>	0.00	0.00	0.00	0.00	0.00	0.00	13
<i>Fungi</i>	0.00	0.00	0.00	0.00	0.00	0.00	13
<b>Sub-Total</b>	<b>0.64</b>	<b>1.30</b>	<b>2.00</b>	<b>10.53</b>	<b>3.08</b>	<b>4.38</b>	
<b>Totals</b>							
<b>Total Vegetation</b>	<b>48.60</b>	<b>9.40</b>					
<b>Total Vegetation w/Cryptograms</b>	<b>49.24</b>	<b>9.48</b>					
<b>Total Vegetation excluding SLCV</b>	<b>48.50</b>	<b>9.44</b>					
<b>Litter</b>	<b>49.16</b>	<b>10.30</b>					
<b>Rock</b>	<b>0.10</b>	<b>0.46</b>					
<b>Total Ground Cover</b>	<b>98.50</b>	<b>4.46</b>					
<b>Total Ground Cover excluding SLCV</b>	<b>98.40</b>	<b>4.44</b>					
<b>Bare Soil</b>	<b>1.50</b>	<b>4.46</b>					
<b>Total Cover</b>	<b>100.00</b>						

\* I.V. Stands for Importance Value

**ADDENDUM D8-2-D**  
SHRUB DENSITY SUMMARIES

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RARE ELEMENT RESOURCES  
 BASELINE ASSESSMENT  
 Report: Density Summary

<b>Project Name</b>	2012 Upton Plant Site	<b>Plot Size</b>	100 Square Meters
<b>Polygon Name</b>	BSS	<b>Sample Size</b>	1
<b>Community Type</b>	Big Sagebrush	<b>Number of Samples</b>	36
<b>Date</b>	12/2/2014	<b>Report Date</b>	12/14/2012

	Mean (Number/Plot)	Relative Density	Std. Dev. n-1 (Number/Plot)	Mean (Number/sq.m.)	Mean (Number/Acre)
<i>Artemisia cana</i>	0.06	0.07	0.33	0.00	2.43
<i>Artemisia tridentata</i>	72.75	90.27	35.08	0.73	2,944.09
<i>Chrysothamnus viscidiflorus</i>	0.08	0.10	0.50	0.00	3.24
<i>Sarcobatus vermiculatus</i>	0.58	0.72	2.71	0.01	23.47
<b>Total Native Full Shrubs</b>	<b>73.47</b>	<b>91.17</b>	<b>35.21</b>	<b>0.73</b>	<b>2,973.23</b>
<i>Artemisia frigida</i>	4.56	5.66	11.60	0.05	0.00
<i>Atriplex gardneri</i>	0.92	1.14	3.29	0.01	37.23
<i>Gutierrezia sarothrae</i>	0.17	0.21	0.74	0.00	6.88
<i>Krascheninnikovia lanata</i>	1.47	1.82	3.34	0.01	59.49
<b>Total Native Half &amp; Sub-Shrubs</b>	<b>7.12</b>	<b>8.83</b>	<b>12.22</b>	<b>0.07</b>	<b>103.60</b>
<b>Total</b>	<b>80.59</b>	<b>100.00</b>	<b>34.41</b>	<b>0.81</b>	<b>3,076.83</b>

RARE ELEMENT RESOURCES  
BASELINE ASSESSMENT  
Report: Density Summary

<b>Project Name</b>	2012 Upton Plant Site	<b>Plot Size</b>	100 Square Meters
<b>Polygon Name</b>	GS	<b>Sample Size</b>	1
<b>Community Type</b>	Other	<b>Number of Samples</b>	29
<b>Date</b>	12/4/2014	<b>Report Date</b>	12/14/2012

	Mean (Number/Plot)	Relative Density	Std. Dev. n-1 (Number/Plot)	Mean (Number/sq.m.)	Mean (Number/Acre)
<i>Artemisia cana</i>	0.1	0.12	0.31	0	4.05
<i>Artemisia tridentata</i>	24.03	26.73	36.73	0.24	972.49
<i>Chrysothamnus viscidiflorus</i>	0.34	0.38	1.86	0	13.76
<i>Sarcobatus vermiculatus</i>	64.17	71.36	40.08	0.64	2,596.96
<b>Total Native Full Shrubs</b>	<b>88.66</b>	<b>98.58</b>	<b>64.83</b>	<b>0.89</b>	<b>3,588.07</b>
<i>Atriplex gardneri</i>	0.97	1.07	2.91	0.01	39.26
<i>Gutierrezia sarothrae</i>	0.31	0.35	1.17	0	12.55
<b>Total Native Half &amp; Sub-Shrubs</b>	<b>1.28</b>	<b>1.42</b>	<b>3.03</b>	<b>0.01</b>	<b>51.8</b>
<b>Total</b>	<b>89.93</b>	<b>100.01</b>	<b>65.62</b>	<b>0.9</b>	<b>3,639.47</b>

RARE ELEMENT RESOURCES  
BASELINE ASSESSMENT  
Report: Density Summary

<b>Project Name</b>	2012 Upton Plant Site	<b>Plot Size</b>	100 Square Meters
<b>Polygon Name</b>	MG	<b>Sample Size</b>	1
<b>Community Type</b>	Meadow Grassland	<b>Number of Samples</b>	24
<b>Date</b>	12/2/2014	<b>Report Date</b>	12/14/2012

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	Mean (Number/Plot)	Relative Density	Std. Dev. n-1 (Number/Plot)	Mean (Number/sq.m.)	Mean (Number/Acre)
<i>Artemisia tridentata</i>	0.08	6.20	0.41	0.00	3.24
<i>Rosa woodsii</i>	0.04	3.10	0.20	0.00	1.62
<i>Sarcobatus vermiculatus</i>	1.17	90.70	3.60	0.01	47.35
<b>Total Native Full Shrubs</b>	<b>1.29</b>	<b>100.00</b>	<b>3.64</b>	<b>0.01</b>	<b>52.21</b>
<b>Total</b>	<b>1.29</b>	<b>100.00</b>	<b>3.64</b>	<b>0.01</b>	<b>52.21</b>

RARE ELEMENT RESOURCES  
 BASELINE ASSESSMENT  
 Report: Density Summary

<b>Project Name</b>	2012 Upton Plant Site	<b>Plot Size</b>	100 Square Meters
<b>Polygon Name</b>	MS	<b>Sample Size</b>	1
<b>Community Type</b>	Other	<b>Number of Samples</b>	20
<b>Date</b>	12/4/2014	<b>Report Date</b>	12/14/2012

	Mean (Number/Plot)	Relative Density	Std. Dev. n-1 (Number/Plot)	Mean (Number/sq.m.)	Mean (Number/Acre)
<i>Artemisia tridentata</i>	87.05	69.31	44.14	0.87	3,522.91
<i>Chrysothamnus viscidiflorus</i>	14.5	11.54	29.42	0.15	586.82
<i>Sarcobatus vermiculatus</i>	11.1	8.84	14.33	0.11	449.22
<b>Total Native Full Shrubs</b>	<b>112.65</b>	<b>89.69</b>	<b>48.75</b>	<b>1.13</b>	<b>4,558.95</b>
<i>Atriplex gardneri</i>	0.9	0.72	2.69	0.01	36.42
<i>Gutierrezia sarothrae</i>	12.05	9.59	17.98	0.12	487.66
<b>Total Native Half &amp; Sub-Shrubs</b>	<b>12.95</b>	<b>10.31</b>	<b>17.86</b>	<b>0.13</b>	<b>524.09</b>
<b>Total</b>	<b>125.6</b>	<b>100</b>	<b>62.58</b>	<b>1.26</b>	<b>5,083.03</b>

RARE ELEMENT RESOURCES  
BASELINE ASSESSMENT  
Report: Density Summary

<b>Project Name</b>	2012 Upton Plant Site	<b>Plot Size</b>	100 Square Meters
<b>Polygon Name</b>	RG	<b>Sample Size</b>	1
<b>Community Type</b>	Reclaimed Grassland	<b>Number of Samples</b>	22
<b>Date</b>	12/2/2014	<b>Report Date</b>	12/14/2012

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	<b>Mean (Number/Plot)</b>	<b>Relative Density</b>	<b>Std. Dev. n-1 (Number/Plot)</b>	<b>Mean (Number/sq.m.)</b>	<b>Mean (Number/Acre)</b>
<i>Atriplex canescens</i>	0.05	0.37	0.21	0.00	2.02
<i>Rosa woodsii</i>	0.32	2.34	1.49	0.00	12.95
<i>Sarcobatus vermiculatus</i>	13.32	97.30	45.45	0.13	539.04
<b>Total Native Full Shrubs</b>	<b>13.69</b>	<b>100.00</b>	<b>45.37</b>	<b>0.14</b>	<b>554.01</b>
<b>Total</b>	<b>13.69</b>	<b>100.00</b>	<b>45.37</b>	<b>0.14</b>	<b>554.01</b>

RARE ELEMENT RESOURCES  
BASELINE ASSESSMENT  
Report: Density Summary

<b>Project Name</b>	2012 Upton Plant Site	<b>Plot Size</b>	100 Square Meters
<b>Polygon Name</b>	UG	<b>Sample Size</b>	1
<b>Community Type</b>	Upland Grassland	<b>Number of Samples</b>	19
<b>Date</b>	12/2/2014	<b>Report Date</b>	12/14/2012

	Mean (Number/Plot)	Relative Density	Std. Dev. n-1 (Number/Plot)	Mean (Number/sq.m.)	Mean (Number/Acre)
<i>Artemisia cana</i>	0.21	2.58	0.92	0.00	8.50
<i>Artemisia tridentata</i>	4.89	60.00	11.76	0.05	197.89
<i>Atriplex canescens</i>	0.05	0.61	0.23	0.00	2.02
<i>Rosa woodsii</i>	3.00	36.81	12.60	0.03	121.41
<b>Total Native Full Shrubs</b>	<b>8.15</b>	<b>100.00</b>	<b>16.90</b>	<b>0.08</b>	<b>329.82</b>
<b>Total</b>	<b>8.15</b>	<b>100.00</b>	<b>16.90</b>	<b>0.08</b>	<b>329.82</b>

**ADDENDUM D8-2-E**

PHOTOGRAPHS

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Big Sagebrush Shrubland 3



Big Sagebrush Shrubland 9





Greasewood Shrubland 3



Greasewood Shrubland 4





Greasewood Shrubland 5



Greasewood Shrubland 10





Meadow Grassland 7



Meadow Grassland 9





Mixed Shrubland 2



Mixed Shrubland 1



Reclaimed Grassland 3



Reclaimed Grassland 1





Upland Grassland 1



Upland Grassland 2

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**ADDENDUM D8-2-F**

MAPS



**MAP D8-2.1**  
2012 BASELINE VEGETATION ASSESSMENT



**MAP D8-2.2**  
2012 BASELINE WEED INVENTORY