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VEGETATION INFORMATION FOR THE WILBERG MINE

REPORT PREPARED FOR  
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VEGETATION INFORMATION FOR  
THE WILBERG MINE (783.19)

This reports the vegetational information for the Wilberg Mine area. Only vegetational data for the reference site are reported, since this mine was existing at the time of vegetation sampling. No new disturbances are planned within the permit area.

Methodology

Data for the vegetation types were collected for the Wilberg Mine August 26, 1980, and were analyzed September 8 and 9, 1980.

Six vegetational types were identified within the permit area and adjacent areas and mapped (see map 2-11). Aerial photography (scale 1:24,000) and field reconnaissance were utilized to construct the map. Aerial photography (taken in 1962) and the vegetation of adjacent canyons and areas were used to infer what species composition and aerial cover were before the present disturbance occurred at the mine site.

A reference site to represent the vegetation type disturbed by mining was located as close to the disturbed area as feasible. Differences in species composition, aerial cover, slope, aspect, soils and geology were minimized as much as possible between the disturbed area and respective reference site. The reference site was marked at the

corners with metal T-posts in the field and located on the vegetation map and Map 2-12 in the Soil Section.

Vegetational analyses of the reference site consisted of measuring aerial plant cover and species composition by life form. Also, tree density and size class composition were determined. Aerial cover was measured by the step-point method. Plant cover, litter, rock or bare ground was determined at every third step along a 20 point transect. The starting point and direction of each transect was randomly selected. Species composition was determined by listing each plant species by life form which occurred along the transects. Tree density was obtained by counting each tree by species within each reference site. Tree size class was determined by measuring diameter at breast height (DBH) for all tree species except pinyon pine and Utah juniper. Basal diameters were measured for these two species.

Statistical adequacy for the step-point transects was determined after 10 transects had been completed. A 90 percent confidence level with a 10 percent error of the mean was used to determine the proper sample size (Table 1, see appendix for field sheets).

Personnel from the Forest Service and Division of Wildlife Resources located in Price, Utah, were consulted with regards to livestock and big game use within the permit area.

Table 1. Sample size and statistical adequacy for step-point transects which measured aerial plant cover of the reference site. A 90 percent confidence level with a 10 percent error of the mean was used to determine the proper sample size.

<u>Reference Site</u>	<u>No. Sampled</u>	<u>No. Required</u>
<u>Wilberg Mine</u>		
Pinyon-juniper	24	23

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Permit Area Vegetation

The mine property permit area is 12,000 acres. Six major vegetation types are identified within the permit area and adjacent land (see Map 2-11, Vegetation Map). Mixed conifer, pinyon-juniper, sagebrush, grass, riparian and salt desert shrub are the six vegetation types (Table 1-A). The mixed conifer type occurs mainly at the higher elevations (above 9,000 ft.) or at lower elevations with a northern exposure. The pinyon-juniper vegetation type is found mainly on the steep, rocky slopes with a southern exposure. Elevation for this vegetation type varies from 7,000 to 9,000 feet. The sagebrush and grass vegetation types also occur at the high elevations, but are restricted to the

Table 1-A. Vegetation types and size of each that are found within the permit area and adjacent land.

<u>Vegetation Type</u>	<u>Total Acres</u>	<u>% of Permit Area</u>
Mixed Conifer	9,037.06	50.2
Pinyon-juniper	4,524.41	25.1
Sagebrush	4,053.03	22.5
Grass	301.51	1.7
Riparian	<u>83.99</u>	<u>0.5</u>
TOTAL	18,000	100
Salt Desert Shrub <sup>1</sup>	281.71	

<sup>1</sup> The salt desert shrub type is located on adjacent land to the permit area. It is influenced by the Des-Bee-Dove Pond (see vegetational Map 2-11).

more xeric sites than the mixed conifer. The riparian vegetation type is located along Deer Creek, Cottonwood and Grimes Wash. This vegetation type is well developed along Deer Creek below the mine, but is poorly developed along Cottonwood and Grimes Wash. The salt desert shrub vegetation type is not found within the permit area, but is located on adjacent land. It has a southwestern exposure and elevation varies from 6,600 to 7,600 feet.

#### Area Disturbed By Mining

Table 2 lists the vegetation types and acres disturbed by mining activities.

#### Wilberg Mine

The disturbed area of the Wilberg Mine is about 18 acres. Elevation varies from 7,500 to 8,000 feet. The general slope varies from 33-36°. Annual precipitation averages about 8 inches. The topography is dominated by a southern exposure. The vegetation type disturbed by mining activities was a pinyon-juniper gradating into a mixed conifer (Table 3). Pinyon pine and Utah juniper were the dominant trees. However, white fir and Douglas fir were also present. Saskatoon serviceberry, low rabbitbrush and Mormon tea were important shrubs. Herbaceous plants included salina wildrye, bluebunch wheatgrass, and corymbed eriogonum. Total aerial plant cover varied around 30-35 percent. Soils were probably a Torriorthent.

Table 2. Vegetation type, number of acres, and percent of vegetation type disturbed by mining at the Wilberg Mine.

Mine

Vegetation Type      Acres Disturbed      % of Vegetation Type

Pinyon-juniper

18

0.1

Table 3. Plant species that are assumed to have been growing within the disturbed portion of the pinyon-juniper vegetation type at the Wilberg Mine.

<u>Scientific Name</u>	<u>Common Name</u>
<u>Trees</u>	
<u>Abies concolor</u>	White fir
<u>Juniperus osteosperma</u>	Utah juniper
<u>Pinus edulis</u>	Pinyon pine
<u>Pseudotsuga menziesii</u>	Douglas fir
<u>Shrubs</u>	
<u>Amelanchier alnifolia</u>	Saskatoon serviceberry
<u>Atriplex cuneata</u>	Cuneate saltbush
<u>Chrysothamus viscidiflorus</u>	Low rabbitbrush
<u>Ephedra viridis</u>	Mormon tea
<u>Xanthocephalum sarothrae</u>	Snakeweed
<u>Forbs</u>	
<u>Eriogonum corymbosum</u>	Corymbed eriogonum
<u>Hedysarum boreale</u>	Utah sweetvetch
<u>Grasses</u>	
<u>Agropyron spiciatum</u>	Bluebunch wheatgrass
<u>Elymus salinus</u>	Salina wildrye
<u>Oryzopsis hymenoides</u>	Indian-rice grass

### Reference Sites

A reference site was established to represent the vegetation types disturbed by mining activities (Table 4).

The reference site (5,926 yd<sup>2</sup> in size) for the pinyon-juniper vegetation type has an eastern exposure with an elevation of 7,500 feet. Slope varies around 35°. Important plants include Utah juniper, pinyon pine, white fir, Douglas fir, saskatoon serviceberry, Mormon tea, corymbed eriogonum, bluebunch wheatgrass and salina wildrye (Table 5). Total aerial cover is 38 percent. The trees provide most of the cover. Pinyon pine has the greatest density (Table 6). Most of the trees occur in the smallest size class. The soil is loamy-skeletal mixed mesic Lithic Ustic Torriorthent of the Sunup series.

### Wildlife And Livestock

The mining permit area is located within the Ferron Ranger District of the Manti-LaSal National Forest managed by the United States Forest Service. Both wildlife and livestock utilize the permit area for grazing. However, wildlife and livestock grazing is limited to the higher elevations. Very little wildlife and livestock grazing occurs on the steep slopes where the mine is located.

Table 4. Similarity in species composition, aerial cover, geology, soil, slope and aspect between the disturbed area and reference site for the Wilberg Mine.

Mine

Vegetation Type

	Species Composition		Aerial Cover, %		Geology		Soil <sup>2</sup>		Slope, °		Aspect	
	R <sup>1</sup>	D	R	D	R	D	R	D	R	D	R	D
<u>Wilberg</u> Pinyon-juniper	16	14	38	30-35			Torrrior- thent	Torrrior- thent	33-36	35-38	SE	SE, SW

<sup>1</sup>R = Reference Site  
D = Disturbed Area

<sup>2</sup>Classified at the great group level.

Table 5. Plant species and aerial plant cover occurring within the pinyon-juniper vegetation type reference site at the Wilberg Mine.

<u>Scientific Name</u>	<u>Symbol</u> <sup>1</sup>	<u>Common Name</u>
<u>Trees</u>		
<u>Abies concolor</u>	ABCO	White fir
<u>Juniperus osteosperma</u>	JUOS	Utah juniper
<u>Pinus edulis</u>	PIED	Pinyon pine
<u>P. flexilis</u>	PIFL	Limber pine
<u>Pseudotsuga menziesii</u>	PSME	Douglas fir
<u>Shrubs</u>		
<u>Amelanchier alnifolia</u>	AMAL	Saskatoon serviceberry
<u>Atriplex cuneata</u>	ATCU	Cuneata saltbush
<u>Chrysothamum viscidiflorus</u>	CHVI	Low rabbitbrush
<u>Ephedra viridis</u>	EPVI	Mormon tea
<u>Xanthocephalum sarothrae</u>	XASA	Snakeweed
<u>Forbs</u>		
<u>Eriogonum corymbosum</u>	ERCO	Corymbed eriogonum
<u>Galium sp.</u>	GAsp	Galium
<u>Hedysarum boreale</u>	HEBO	Utah sweetvetch
<u>Grasses</u>		
<u>Agropyron spicatum</u>	AGSP	Bluebunch wheatgrass
<u>Elymus salinus</u>	ELSA	Salina wildrye
<u>Oryzopsis hymenoides</u>	ORHY	Indian-rice grass

<u>Item</u>	<u>% Cover</u>
Tree	17
Shrub	8
Forb	4
Grass	10
Total Aerial Cover	<u>39</u>
Litter	4
Rock	16
Bare ground	42

<sup>1</sup> Plant symbols are used for easy reference to the field data sheets.

Table 6. Tree size class (DBH) and number of trees found within each size class by species for the pinyon-juniper vegetation type reference site at the Wilberg Mine.

	Diameter At Breast Height				<u>% Of Total</u>
	Inches				
	<u>0 - 4</u>	<u>4 - 10</u>	<u>10 - 20</u>	<u>&gt; 20</u>	
<u>Mixed Conifer</u>					
Pinyon pine	49	1	0	0	54
Utah juniper	7	6	0	0	14
White fir	7	0	0	0	8
Douglas fir	19	1	0	0	22
Limber pine	0	1	1	0	2
% Of Total	<u>89</u>	<u>10</u>	<u>1</u>	<u>0</u>	

Deer, elk, and moose utilize the area for grazing (Table 7). Deer have a greater impact on the vegetation than elk or moose because of their high numbers.

Besides wildlife use, the area provides summer grazing for cattle (Table 8). Cattle grazing occurs on the East Mountain allotment of the Ferron Ranger District. For the past several years, there has been a 10 percent non-use of the available AUM's. This year (1980) all AUM's are being utilized. Overall range condition is fair.

#### Endangered Or Threatened Plants

During the vegetation sampling, no endangered or threatened plant species were identified.

APPENDIX

Field Data For The Vegetation Reference Area<sup>1</sup>

<sup>1</sup> Plant symbols were used for convenience in the field. For proper identification, refer to the description of the vegetation reference area in the text.

## COVER DATA

Vegetation Type Pinon-juniper at Wilberg  
 Date \_\_\_\_\_ Affected or Control

Point No	Transect Number									
	11	12	13	14	15	16	17	18	19	20
1	XASA	B	B	B	R	PSME	R	B	ERCO	B
2	R	PIED	B	R	B	PIED	B	R	B	AGSP
3	R	ORHY	B	R	B	R	B	ATCU	B	ABCO
4	HEBO	R	B	AGSP	B	R	B	ATCU	B	ABCO
5	B	ERSA	L	R	B	R	B	ATCU	B	AMAL
6	B	B	L	L	ORHY	R	ERCO	B	B	R
7	R	ERSA	AMAL	L	ORHY	PIED	ERCO	ERSA	R	B
8	R	R	AMAL	B	L	B	B	B	B	L
9	ERSA	B	AMAL	R	PIED	B	B	R	B	B
10	R	R	PSME	R	PIED	B	B	R	ERSA	B
11	HEBO	ORHY	PSME	R	B	AMAL	B	ERSA	R	R
12	B	PIED	PSME	JUOS	B	AMAL	ERCO	B	L	L
13	B	PIED	PSME	B	CHUI	AMAL	R	ATCU	PIFL	R
14	B	PIED	PSME	PIED	B	B	R	ATCU	PIFL	R
15	B	PIED	B	PIED	ERCO	R	L	ERCO	PIFL	ERSA
16	R	PIED	B	PIED	B	R	R	B	B	PIED
17	R	PIED	B	B	ERCO	R	B	B	B	B
18	R	PIED	B	B	B	B	B	B	ERSA	EPUI
19	PIED	B	HEBO	PIED	ERSA	L	B	R	L	EPUI
20	PIED	R	B	PIED	R	B	ERSA	B	B	EPUI

## COVER DATA

Vegetation Type Mixed Conifer at Wilberg

Date \_\_\_\_\_

Affected or Control

Point No	Transect Number									
	1	2	3	4	5	6	7	8	9	10
1	B	CHUI	ATCU	B	ELSA	ORHY	B	L	B	B
2	B	B	ATCU	ELSA	B	R	B	JUOS	B	B
3	ELSA	B	ATCU	B	AGSP	ELSA	B	JUOS	R	R
4	R	B	B	B	P	R	B	JUOS	R	L
5	R	B	ATCU	B	PIED	R	B	JUOS	R	B
6	R	B	R	JUOS	ABCO	R	PIED	ELSA	ERCO	AMAL
7	HE30	B	AGSP	B	ABCO	R	PIED	B	B	AMAL
8	PIED	B	AMAL	B	L	ELSA	PIED	B	B	AMAL
9	PIED	B	B	B	ABCO	R	PIED	B	B	ERCO
10	B	B	B	B	L	R	PIED	AMAL	B	ORHY
11	B	B	L	ELSA	ABCO	R	B	B	B	ORHY
12	PIED	B	B	PSME	ABCO	B	B	L	B	B
13	PIED	AMAL	B	L	B	B	B	AMAL	B	B
14	AMAL	AMAL	L	B	B	R	ABCO	B	B	HEBO
15	B	AMAL	B	ELSA	PIED	AGSP	R	AGSP	B	B
16	B	AMAL	B	B	PIED	ORHY	R	ORHY	PIED	B
17	B	AMAL	R	ELSA	PIED	B	B	L	PIED	XASA
18	R	B	PSME	B	ELSA	ELSA	PIED	B	PIED	YASA
19	R	B	PSME	R	B	B	B	B	ABCO	R
20	R	AMAL	AMAL	ELSA	L	B	B	HEBO	ABCO	L

## COVER DATA

Vegetation Type Pineau-juniper at Wilberg  
 Date \_\_\_\_\_ Affected or Control

Point No	Transect Number			
	21	22	23	24
1	R	ELSA	PIED	R
2	R	PSME	PIED	B
3	R	L	B	B
4	B	B	B	B
5	B	ELSA	PIED	B
6	B	B	PIED	PIED
7	AMAL	ELSA	PIED	ERCO
8	PIED	B	R	B
9	PIED	R	JUOS	B
10	PIED	ELSA	R	B
11	B	B	R	B
12	B	B	R	ERCO
13	PIED	B	R	ELSA
14	PIED	B	B	B
15	HEBD	JUOS	L	N
16	R	R	L	B
17	R	B	R	L
18	R	B	AGSP	R
19	ELSA	ESA	B	B
20	B	B	R	B

Tree sizes and densities for the Pinyon-juniper vegetation type at Wilberg Mine.

<u>Species</u>	<u>DBH(inches)</u>	<u>Total</u>
<u>Pinus edulis</u>	2, 4, 12, 14, 2, 3, 9, 2, 11, 9, 3, 3, 18, 2, 6, 9, 7, 24, 3, 3, 3, 3, 7, 3, 9, 4, 2, 4, 3, 3, 2, 2, 2, 3, 3, 2, 4, 3, 3, 1, 1, 1, 2, 2, 2, 2, 5, 2, 2, 2, 25, 1 2, 4	54
<u>Juniperus osteosperma</u>	3, 3, 3, 11, 2, 2, 4, 6	8
<u>Pinus flexilis</u>	25, 40	2
<u>Pseudotsuga menziesii</u>	2, 10, 11, 2, 2, 2, 2, 2, 2, 3, 3, 2, 1, 1, 2, 7, 3, 2, 1, 3	20