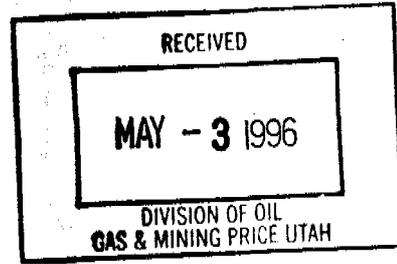


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Mini File



**HIDDEN VALLEY RECLAMATION
VEGETATION TREND STUDY**

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Hidden Valley Trend Study

1.0 Introduction

Eight permanent vegetation trend transects were established by JBR Environmental Consultants, Inc. for the Hidden Valley reclamation site in June, 1995. The trend study was established in addition to the Department of Oil Gas and Mining (DOGGM) permitting requirements. The purpose of the study is to quantitatively and qualitatively monitor trend of the reclamation site. A correct interpretation of trend, the direction of change in ecological condition, is an important tool in a vegetative inventory.

Single point in time data alone does not indicate whether the plant community is improving or deteriorating in relationship to reclamation goals. Several factors are critical to determine trend, plant composition changes, abundance of seedlings and young plants, plant residues, plant vigor and condition of soil surface. (Soil Conservation Service, 1976) The evaluation of these parameters and the location of permanent transects will assist in the determination of the trend of this revegetated site. Further, the rating system implemented will provide a record of density and plant development through time. The contribution of this rating system is that factors which make for a successful stand are surveyed and evaluated to determine the success of the reclamation. (Hull, A.C. 1954) Finally, a photographic record of one permanently marked photo plot per transect was established.

2.0 Methodology

The eight permanent transects were established throughout the revegetation area with the assistance of the State of Utah, DOGM State Reclamation Biologist, Susan White. These transects were placed randomly within eight distinctive areas. The eight areas were chosen for sampling were based on slope, aspect, topographic similarities, vegetation types, soil types and treatment/non-treatment areas within the revegetation site. Transects were mapped and permanently marked with 18" rebar stakes. Opposing ends of each transect were numbered with metal tags so that they will be identifiable as a matched pair for repeatable sampling. (Appendix I Location Map and Key)

One of the eight transects was established as a "control" plot in an untreated area, inaccessible to livestock grazing within the revegetated area. This transect is not intended to be used as a comparison in any form or fashion to the revegetated area, as it is not representative of the site. The control area is to be compared to itself through time as an indication of trend in the native plant community. For example if trend is indicated to be downward along the revegetated transects, it may be explainable as an overall ecosystem downward trend indicative of the environmental factors affecting revegetated as well as the native plant community.

A single sample is defined as the data set collected per transect, per year. An analysis of these eight transects will give, over time, a measurement of change or trend.

2.1 Quantitative Sample Types

Plant Composition.

The primary factor measured to determine trend was plant composition. Composition was measured and documented as a factor of percent cover. Vegetative cover is the best indicator of the overall trend of the plant community composition.

Upward trend is most generally recognized by the movement of the plant community composition from annual pioneer plants to stable perennial plants which make up a proportionately larger percentages. Individual plant counts or density measurements, particularly in the lower seral stages tend to be very high for the annual species. Annual species tend to respond overwhelmingly to higher rainfall creating more individuals which skews the figures for a single year. On the other hand percent cover data is the best indicator of plant community composition as it accurately reflects perennial vegetation and its stability.

Cover

The line-intercept method for cover by vegetative species and cover delineations by bare ground, litter and rock cover were collected. A 100-foot tape measure was stretched between the two permanent stakes at each transect site. Data was recorded in tenths of a foot increments. (Appendix II-Vegetative Cover)

Plant Development

Another important factor in determining trend of the reclamation site is the abundance of seedlings and young plants and plant vigor. Plant development of each plant recorded along the line intercept transect was identified by the following symbols: S=seedlings, B=boot for grasses, buds for forbs/shrubs; H=headed out; SR=seed ripe; SS=seed shattered; DR=plants dry and dormant (perennial) DD=dead. Growth type, annual vs. perennial plants were also noted. This information gives an accurate record of plant development which is an identifiable measurement of trend by species.

This information is handled in the report in a narrative format, as individuals within a species were consistently the same in their development. However, this data does exist in the raw measurements and can be retrieved if necessary for further evaluation.

Upon evaluation of the 1995 data, it was determined that plant development data would be best taken in conjunction with the density plots and eliminated from the line intercept data. Further, it is necessary to only take plant development data on the perennial species and a cursory note made of the overall plant development for the annual species.

Density

Density was measured by the number of plants per square foot counted. A frame 2' x 2' square, subdivided into four units 1' x 1' was placed at 4 foot intervals, starting with zero along the left hand side of the permanent 100 foot transect. This gave 100 1-foot square observation units. The

average of the 100 observation units will give the density for the sample, which is the 100 foot permanent transect. Each species of plant rooted within the 1-foot square plot is counted to provide density. A total of 8 samples of 100 observation points were collected. (Appendix III- Vegetative Density)

Soil Surface Condition

The final measurement to contribute to the data base for the evaluation of trend is plant residue or litter and the condition of soil surface. Detailed information regarding bare ground, litter and rock was collected and compiled (See Appendix IV - Soil Surface Condition), but not analyzed in this vegetation trend report. It will be used at a later date to address erosion and site stability issues.

Photo Trend Plots

At the beginning of each permanent transect a 2' x 2' square photo plot was established. Two of the corners were permanently staked with angle iron to insure a repeatable photograph. The frame as described in the density-rating system was placed inside of the angle irons to delineate the plot for the photograph. A backdrop was placed for reference. (Appendix V-Photo Trend Plots)

3.0 Data Analysis

3.1 Quantitative

Overall data analysis is not possible until additional samples are taken in subsequent years. Trend is a measurement that is done along a time continuum. The continuation of data collection and significant change will be evaluated in subsequent years by statistical analysis. Trend will be evaluated as a function of time and the following will need to be answered:

1. Is the trend toward revegetation objectives?

The following table is compilation of the data for the 7 cover transects and an evaluation of the percent perennial vegetation of the total vegetation cover within in the revegetated area.

As an evaluation of this data, statistical adequacy tests were applied to determine sampling adequacy using the formula presented in the DOGM guidelines. An 80 percent confidence level, with a 20 percent change in the mean was used to determine sample adequacy levels for cover, bare ground and percent perennial vegetation parameters. Results of the adequacy tests are shown in Table 3.1.1. The bare ground value was sampled adequately for the given confidence level.

Table 3.1.1 Sample Adequacy Information

Sampling Adequacy Information Hidden Valley - Revegetation Area				
Parameter	n	Mean	Std.	n min
Cover	7	24.4%	14.0	27
Bare Ground	7	58.0%	14.6	5
Percent perennial vegetation of total vegetation	7	28.3%	16.2	27

Qualitative Observations

Overall the vigor of the perennial species was excellent. Shrubs and perennial grasses were either flowering or in early seed production stages (H=headed out). Vegetative production was also extremely high due to the high rainfall received in this area during the critical growth season for the native species.

Observed recruitment of perennial native grasses and shrubs was estimated to be about 30%. The species included in this recruitment were *Oryzopsis hymenoides*, *Atriplex canescens*, *Ceratoides lanata* and *Atriplex corrugata*.

Literature Cited

Hull, A.C. Jr., 1954, Rating Seeded Stands on Experimental Range Plots. J. Range Management 7(3): 122-124.

Soil Conservation Service, U.S. Department of Agriculture, 1976, Trend in Range Condition. National Range Handbook, SCS-RANGE-700(S1): 307.1-307.5.

APPENDIX I

Location Map and Key

APPENDIX II

Vegetative Cover

Hidden Valley
Trend Data - Percent Cover
Area 1 (Transect 41-42)

Plant Species	Percent Cover		Trend/ Statistical Variation
	1995	199	
Atriplex canescens	3.0		
Total Shrubs	3.0		
Agropyron cristatum	0.1		
Total Grasses	0.1		
Halogeton glomeratus	1.2		
Kochia spp.	5.3		
Salsola kali	3.6		
Lipidium spp.	1.2		
Arabis spp.	2.5		
Total Forbs (Annuals)	13.8		
Total Vegetation	16.9		
Bare Ground	58.2		
Rock	3.1		
Litter	21.8		
% Perennial Vegetation of Total Vegetation	18.3		

Hidden Valley
Trend Data - Percent Cover
Area 2 (Transect 39-40)

Plant Species	Percent Cover		Trend/ Statistical Variation
	1995	199	
<i>Atriplex canescens</i>	2.7		
Total Shrubs	2.7		
Total Grasses	0.0		
<i>Kochia</i> spp.	4.5		
<i>Lepidium</i> spp.	25.1		
<i>Lappula redowskii</i>	1.3		
<i>Arabis</i> spp.	5.7		
<i>Halogeton glomeratus</i>	1.0		
<i>Malcolmia africana</i>	0.4		
Total Forbs (Annuals)	38.0		
Total Vegetation	40.7		
Bare Ground	43.1		
Rock	0.6		
Litter	15.6		
% Perennial Vegetation of Total Vegetation	6.6		

Hidden Valley
Trend Data - Percent Cover
Area 3 (Transect 37-38)

Plant Species	Percent Cover		Trend/ Statistical Variation
	1995	199	
Ceratoides lanata	1.6		
Atriplex confertifolia	0.4		
Total Shrubs	2.0		
Agropyron cristatum	3.0		
Elymus junceus	1.8		
Bromus tectorum	0.2		
Total Grasses	5.0		
Halogeton glomeratus	7.5		
Arabis spp.	0.3		
Descurainia spp.	0.9		
Kochia spp.	4.5		
Salsola kali	0.2		
Total Forbs (Annuals)	13.4		
Total Vegetation	20.4		
Bare Ground	62.5		
Rock	1.5		
Litter	15.6		
% Perennial Vegegation of Total Vegetation	34.7		

Hidden Valley
Trend Data - Percent Cover
Area 4 (Transect 33-34)

Plant Species	Percent Cover		Trend/ Statistical Variation
	1995	199	
Atriplex canescens	0.6		
Atriplex cuneata	1.2		
Total Shrubs	1.8		
Total Grasses	0.0		
Halogeton glomeratus	6.5		
Arabis spp.	1.4		
Lepidium spp.	0.4		
Total Forbs (Annuals)	8.2		
Total Vegetation	10.1		
Bare Ground	75.1		
Rock	2.5		
Litter	12.3		
% Perennial Vegetation of Total Vegetation	18.0		

Hidden Valley
Trend Data - Percent Cover
Area 5 (Transect 35-36)

Plant Species	Percent Cover		Trend/ Statistical Variation
	1995	199	
Atriplex canescens	9.2		
Ceratoides lanata	1.0		
Chrysothamnus nauseosus	2.8		
Total Shrubs	13.0		
Oryzopsis hymenoides	0.6		
Agropyron cristatum	3.0		
Elymus junceus	6.2		
Total Grasses	9.8		
Halogeton glomeratus	4.3		
Malcolmia africana	8.0		
Salsola kali	0.2		
Lappula redowskii	0.5		
Lepidium spp.	6.8		
Kochia	5.0		
Total Forbs (Annuals)	24.8		
Total Vegetation	47.6		
Bare Ground	34.0		
Rock	1.7		
Litter	16.7		
% Perennial Vegetation of Total Vegetation	52.1		

Hidden Valley
Trend Data - Percent Cover
Roadway Reclamation Above Gate (Transect 43-44)

Plant Species	Percent Cover		Trend/ Statistical Variation
	1995	199	
Chrysothamnus nauseosus	2.7		
Atriplex cuneata	0.6		
Total Shrubs	3.3		
Agropyron cristatum	3.1		
Oryzopsis hymenoides	0.3		
Elymus junceus	2.0		
Total Grasses	5.4		
Halogeton glomeratus	10.8		
Total Forbs (Annuals)	10.8		
Total Vegetation	19.5		
Bare Ground	67.3		
Rock	2.2		
Litter	11.0		
% Perennial Vegetation of Total Vegetation	44.6		

Hidden Valley
Trend Data - Percent Cover
Roadway Reclamation Below Gate (Transect 47-48)

Plant Species	Percent Cover		Trend/ Statistical Variation
	1995	199	
Atriplex canescens	2.3		
Atriplex cuneata	1.4		
Total Shrubs	3.7		
Total Grasses	0.0		
Halogeton glomeratus	11.4		
Kochia spp.	0.8		
Total Forbs (Annuals)	12.2		
Total Vegetation	15.9		
Bare Ground	68.4		
Rock	6.2		
Litter	9.5		
% Perennial Vegetation of Total Vegetation	23.3		

Hidden Valley
Trend Data - Percent Cover
Control Area (Transect 45-46)

Plant Species	Percent Cover		Trend/ Statistical Variation
	1995	199	
<i>Atriplex confertifolia</i>	2.3		
<i>Xanthocephalum sarothrae</i>	4.5		
<i>Artemisia nova</i>	4.0		
Total Shrubs	10.8		
<i>Sporobolus cryptandrus</i>	3.8		
<i>Oryzopsis hymenoides</i>	1.4		
<i>Hilaria jamesii</i>	2.0		
Total Grasses	7.2		
<i>Lepidium</i> spp.	0.8		
<i>Descurainia</i> spp.	0.7		
<i>Arabis</i> spp.	0.1		
<i>Lappula redowskii</i>	0.2		
Total Forbs (Annuals)	1.8		
Total Vegetation	19.8		
Bare Ground	55.3		
Rock	20.6		
Litter	4.3		
% Perennial Vegetation of Total Vegetation	88.7		

APPENDIX III

Vegetative Density

Hidden Valley
Trend Data - Density
Area 1 (Transect 41-42)

Plant Species	Plants/100 sq. ft.		Trend/ Statistical Variation
	1995	199	
Atriplex cuneata	6		
Ceratoides lanata	1		
Atriplex canescens	5		
Total Shrubs	12		
Agropyron cristatum	1		
Total Grasses	1		
Halogeton glomeratus	142		
Kochia spp.	312		
Salsola kali	74		
Lipidium spp.	1		
Amaranthus spp.	1		
Arabis spp.	1		
Total Forbs (Annuals)	531		

Hidden Valley
Trend Data - Density
Area 2 (Transect 39-40)

Plant Species	Plants/100 sq.ft.		Trend/ Statistical Variation
	1995	199	
Ceratoides lanata	3		
Atriplex canescens	6		
Total Shrubs	9		
Oryzopsis hymenoides	1		
Agropyron cristatum	3		
Bromus tectorum	2		
Total Grasses	6		
Kochia spp.	592		
Lepidium spp.	414		
Lappula redowskii	121		
Arabis spp.	86		
Halogeton glomeratus	54		
Salsola kali	16		
Machaeranthera spp. (perennial)	1		
Malcolmia africana	1		
Total Forbs (Annuals)	1284		

Hidden Valley
Trend Data - Density
Area 3 (Transect 37-38)

Plant Species	Plants/100 sq. ft.		Trend/ Statistical Variation
	1995	199	
Ceratoides lanata	1		
Atriplex canescens	2		
Atriplex cuneata	2		
Total Shrubs	5		
Agropyron cristatum	7		
Elymus junceus	4		
Bromus tectorum	2		
Total Grasses	13		
Halogeton glomeratus	525		
Descurainia spp.	3		
Kochia spp.	271		
Salsola kali	4		
Total Forbs (Annuals)	803		

Hidden Valley
Trend Data - Density
Area 4 (Transect 33-34)

Plant Species	Plants/100 sq. ft.		Trend/ Statistical Variation
	1995	199	
Ceratoides lanata	1		
Atriplex gardneri	1		
Atriplex canescens	1		
Atriplex cuneata	1		
Total Shrubs	4		
Agropyron cristatum	2		
Total Grasses	2		
Halogeton glomeratus	347		
Arabis spp.	6		
Lepidium spp.	5		
Total Forbs (Annuals)	358		

Hidden Valley
Trend Data - Density
Area 5 (Transect 35-36)

Plant Species	Plants/100 sq. ft.		Trend/ Statistical Variation
	1995	199	
<i>Atriplex canescens</i>	27		
<i>Ceratoides lanata</i>	7		
<i>Atriplex confertifolia</i>	5		
<i>Chrysothamnus nauseosus</i>	6		
Total Shrubs	45		
<i>Oryzopsis hymenoides</i>	4		
<i>Bromus tectorum</i>	6		
<i>Agropyron cristatum</i>	36		
<i>Elymus junceus</i>	48		
Total Grass	94		
<i>Halogeton glomeratus</i>	547		
<i>Malcolmia africana</i>	124		
<i>Salsola kali</i>	4		
<i>Lappula redowskii</i>	42		
<i>Arabis</i> spp.	13		
<i>Lepidium</i> spp.	51		
<i>Kochia</i>	397		
Total Forbs (Annuals)	1178		

Hidden Valley
Trend Data - Density
Roadway Reclamation Above Gate (Transect 43-44)

Plant Species	Plants/100 sq.ft.		Trend/ Statistical Variation
	1995	199	
<i>Chrysothamnus nauseosus</i>	12		
<i>Xanthocephalum sarothrae</i>	1		
<i>Artemisia tridentata</i>	2		
<i>Artemisia</i> spp.	2		
<i>Atriplex confertifolia</i>	6		
Total Shrubs	23		
<i>Agropyron cristatum</i>	22		
<i>Oryzopsis hymenoides</i>	1		
<i>Elymus junceus</i>	5		
Total Grasses	28		
<i>Halogeton glomeratus</i>	873		
<i>Lappula redowskii</i>	78		
<i>Malcolmia africana</i>	1		
<i>Lepidium</i> spp.	7		
Total Forbs (Annuals)	959		

Hidden Valley
Trend Data - Density
Roadway Reclamation Below Gate (Transect 47-48)

Plant Species	Plants/100 sq.ft.		Trend/ Statistical Variation
	1995	199	
Ceratoides lanata	3		
Total Shrubs	3		
Elymus junceus	1		
Total Grasses	1		
Halogeton glomeratus	435		
Kochia spp.	31		
Total Forbs (Annuals)	466		

Hidden Valley
Trend Data - Density
Control Area (Transect 45-46)

Plant Species	Plants/Acre		Trend/ Statistical Variation
	1995	199	
Atriplex confertifolia	23		
Xanthocephalum sarothrae	15		
Chrysothamnus spp.	1		
Artemisia nova	8		
Total Shrubs	47		
Sporobolus cryptandrus	51		
Oryzopsis hymenoides	3		
Hilaria jamesii	47		
Total Grasses	101		
Lepidium spp.	36		
Descurainia spp.	69		
Arabis spp.	3		
Erigeron spp.	2		
Lappula redowskii	11		
Total Forbs (Annuals)	121		
Plantago (purshii or patagonica) perennial forb	256		

APPENDIX IV

Soil Surface Condition

TRANSECT NO #41-42 AREA 1

All measurements are represented in tenths of feet.

BARE GROUND and GRAVEL

Deposited by runoff	Sheet washed	Rill (<6 inches)		Gully (>6 inches)		Crusted	Visibly Cryptogamic	Stable
		Active	Inactive	Active	Inactive			
	47.9	9.1		0.7				0.5

LITTER

Redeposited, washed from upstream	Fallen, in-place Standing in-place	Windblown	Unknown	Serves as sediment trap
16.7	5.1			

ROCK

Particle Size			Forms pedestal cap	Serves to trap sediment or litter on upgradient side
Small Cobble (2.5-10 inches)	Large Cobble (5 - 10 inches)	Boulder (>10 inches)		
0.2	0.3	2.6		

TRANSECT NO #39-40 AREA 2

All measurements are represented in tenths of feet.

BARE GROUND and GRAVEL

Deposited by runoff	Sheet washed	Rill (<6 inches)		Gully (>6 inches)		Crusted	Visibly Crypto-gamic	Stable
		Active	Inactive	Active	Inactive			
								43.1

LITTER

Redeposited, washed from upstream	Fallen, in-place Standing in-place	Windblown	Unknown	Serves as sediment trap
	15.6			

ROCK

Particle Size			Forms pedestal cap	Serves to trap sediment or litter on upgradient side
Small Cobble (2.5-10 inches)	Large Cobble (5 - 10 inches)	Boulder (>10 inches)		
0.3				

TRANSECT NO #37-38 AREA 3

All measurements are represented in tenths of feet.

BARE GROUND and GRAVEL

Deposited by runoff	Sheet washed	Rill (<6 inches)		Gully (>6 inches)		Crusted	Visibly Crypto-gamic	Stable
		Active	Inactive	Active	Inactive			
	45.7	5.7						11.1

LITTER

Redeposited, washed from 'upstream	Fallen, in-place Standing in-place	Windblown	Unknown	Serves as sediment trap
8.4	7.2			

ROCK

Particle Size			Forms pedestal cap	Serves to trap sediment or litter on upgradient side
Small Cobble (2.5-10 inches)	Large Cobble (5 - 10 inches)	Boulder (>10 inches)		
1.2	0.3			

TRANSECT NO #33-34 AREA 4

All measurements are represented in tenths of feet.

BARE GROUND and GRAVEL

Deposited by runoff	Sheet washed	Rill (<6 inches)		Gully (>6 inches)		Crusted	Visibly Crypto-gamic	Stable
		Active	Inactive	Active	Inactive			
	53.4	19.3		2.1				0.3

LITTER

Redeposited, washed from upstream	Fallen, in-place Standing in-place	Windblown	Unknown	Serves as sediment trap
8.4	3.9			

ROCK

Particle Size			Forms pedestal cap	Serves to trap sediment or litter on upgradient side
Small Cobble (2.5-10 inches)	Large Cobble (5 - 10 inches)	Boulder (>10 inches)		
1.9	0.5			

TRANSECT NO #35-36 AREA 5

All measurements are represented in tenths of feet.

BARE GROUND and GRAVEL

Deposited by runoff	Sheet washed	Rill (<6 inches)		Gully (>6 inches)		Crusted	Visibly Cryptogamic	Stable
		Active	Inactive	Active	Inactive			
								34.0

LITTER

Redeposited, washed from upstream	Fallen, in-place Standing in-place	Windblown	Unknown	Serves as sediment trap
	16.7			

ROCK

Particle Size			Forms pedestal cap	Serves to trap sediment or litter on upgradient side
Small Cobble (2.5-10 inches)	Large Cobble (5 - 10 inches)	Boulder (>10 inches)		
0.9	0.8			

TRANSECT NO #43-44 On the road above the gate

All measurements are represented in tenths of feet.

BARE GROUND and GRAVEL

Deposited by runoff	Sheet washed	Rill (<6 inches)		Gully (>6 inches)		Crusted	Visibly Cryptogamic	Stable
		Active	Inactive	Active	Inactive			
								63.3

LITTER

Redeposited, washed from upstream	Fallen, in-place Standing in-place	Windblown	Unknown	Serves as sediment trap
	11.0			

ROCK

Particle Size			Forms pedestal cap	Serves to trap sediment or litter on upgradient side
Small Cobble (2.5-10 inches)	Large Cobble (5 - 10 inches)	Boulder (>10 inches)		
0.9	1.3			

TRANSECT NO #47-48 On the road below the gate

All measurements are represented in tenths of feet.

BARE GROUND and GRAVEL

Deposited by runoff	Sheet washed	Rill (<6 inches)		Gully (>6 inches)		Crusted	Visibly Crypto-gamic	Stable
		Active	Inactive	Active	Inactive			
	60.2	1.8		3.1				3.3

LITTER

Redeposited, washed from upstream	Fallen, in-place Standing in-place	Windblown	Unknown	Serves as sediment trap
4.9	4.6			

ROCK

Particle Size			Forms pedestal cap	Serves to trap sediment or litter on upgradient side
Small Cobble (2.5-10 inches)	Large Cobble (5 - 10 inches)	Boulder (>10 inches)		
1.1	5.1			

TRANSECT NO Control Plot

All measurements are represented in tenths of feet.

BARE GROUND and GRAVEL

Deposited by runoff	Sheet washed	Rill (<6 inches)		Gully (>6 inches)		Crusted	Visibly Crypto-gamic	Stable
		Active	Inactive	Active	Inactive			
		0.4		2.5			37.8	14.7

LITTER

Redeposited, washed from upstream	Fallen, in-place Standing in-place	Windblown	Unknown	Serves as sediment trap
	4.3			

ROCK

Particle Size			Forms pedestal cap	Serves to trap sediment or litter on upgradient side
Small Cobble (2.5-10 inches)	Large Cobble (5 - 10 inches)	Boulder (>10 inches)		
0.3	1.5	18.5		

Transects:

Area 1

Start at stake #41; run tape along at 99 degrees; end at stake #42.

Area 2

Start at stake #39; run tape along at 283 degrees; end at stake #40.

Area 3

Start at stake #37; run tape along at 289 degrees; end at stake #48.

Area 4

Start at stake #33; run tape along at 288 degrees; end at stake #34.

Area 5

Start at stake #35; run tape along at 20 degrees; end at stake #36.

Roadway reclamation below the gate

Pace approximately 326 steps up from the bottom of the roadway reclamation; start at stake #47; run tape approximately NE; end at stake #48.

Roadway reclamation above the gate

Transect starts approximately 48.5 feet above the fence on the west side of the road. Start at stake #43; run tape at approximately 30 degrees; end at stake #44.

Control plot

Transect sits above roadway on bench midway to the top of the plateau, it starts just below the upper gate/fence. Start at stake #45; run tape at approximately 345 degrees; end at stake #46.