

TRACKING FORM

I. KEY FEATURES OF PERMITTEE'S AMENDMENT APPLICATION

Permittee Pacific Corp	Mine Name Cottonwood	Amendment # ACT/015/019-97A	Date Received / via 1-9-97 US Mail
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Proposal: **Silt fencing at Waste Rock Site**
 Description: **Remove silt fencing from Waste Rock Site. Refuse Haul or Access Road. Revegetation cover established, remove high maintenance items + utilize vegetation for controlling runoff**

II. AMENDMENT CLASSIFICATION

<input type="checkbox"/> Major Amendment	Public Notice Required	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
<input checked="" type="checkbox"/> Minor Amendment	Outside of Permit Area	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
	Outside of Disturbed Area	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No

III. SUMMARY OF DOGM PROCESSING DATES

Reviews Completed	1/27/97	FOLLOWUP REQUIREMENTS	
Approved Effective	1/30/97	MRP "After Const" Documents	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Disapproved	N/A	TA	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Mailed		CHIA	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Filed MRP - SLO		Responds Within 15 days of Receipt? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If no, explain below.	

IV. COORDINATED REVIEWS

EXTERNAL AGENCIES (Mine Specific) <small>(Adverse Comments, if Any, Include in Item V)</small>	DOGM REVIEWS/DISCIPLINES		
	COPY SENT	CONTACTED	
OSM	<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/> C <input checked="" type="checkbox"/> N/A	Generalists WJM 1/27/97 <input checked="" type="checkbox"/> Yes <input type="checkbox"/> N/A
BLM 1/27/97	<input type="checkbox"/> Y <input type="checkbox"/> N	<input checked="" type="checkbox"/> C <input type="checkbox"/> N/A	INTELDISCIPLINARY APPROACH
US Forest Service	<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/> C <input type="checkbox"/> N/A	- Administrative <input type="checkbox"/> Yes <input type="checkbox"/> N/A
US Fish & Wildlife	<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/> C <input type="checkbox"/> N/A	- Biology <input type="checkbox"/> Yes <input type="checkbox"/> N/A
US National Parks	<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/> C <input type="checkbox"/> N/A	- Engineering <input type="checkbox"/> Yes <input type="checkbox"/> N/A
UT Environmental Quality	<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/> C <input type="checkbox"/> N/A	- Geology <input type="checkbox"/> Yes <input type="checkbox"/> N/A
UT Wildlife Resources	<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/> C <input type="checkbox"/> N/A	- Hydrology <input type="checkbox"/> Yes <input type="checkbox"/> N/A
UT State History	<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/> C <input type="checkbox"/> N/A	- Soils <input type="checkbox"/> Yes <input type="checkbox"/> N/A
UT Water Rights	<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/> C <input type="checkbox"/> N/A	- Permitting <input type="checkbox"/> Yes <input type="checkbox"/> N/A
UT SITLA	<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/> C <input type="checkbox"/> N/A	- Other <input type="checkbox"/> Yes <input type="checkbox"/> N/A
Other	<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/> C <input type="checkbox"/> N/A	

V. FOOTNOTES/ADDITIONAL EXPLANATION AS NECESSARY

Requires followup submission of Surface Schedules

INCORPORATED
EFFECTIVE:

97A

JAN 30 1997

UTAH DIVISION OIL, GAS AND MINING
PACIFIC FIELD OFFICE

APPLICATION FOR PERMIT CHANGE

Title of Change:

SILT FENCING REMOVAL AMENDMENT

Permit Number: ACT/015/019

Mine: COTTONWOOD/WILBERG

Permittee: PACIFICORP

Description, include reason for change and timing required to implement:

To Remove Silty Fencing from Waste Rock Refuse Haul or Access Road. Revegetation Cover established, remove high Maintenance item + utilize vegetation for controlling runoff.

- Yes No 1. Change in the size of the Permit Area? _____ acres increase decrease.
- Yes No 2. Change in the size of the Disturbed Area? _____ acres increase decrease.
- Yes No 3. Will permit change include operations outside the Cumulative Hydrologic Impact Area?
- Yes No 4. Will permit change include operations in hydrologic basins other than currently approved?
- Yes No 5. Does permit change result from cancellation, reduction or increase of insurance or reclamation bond?
- Yes No 6. Does the permit change require or include public notice publication?
- Yes No 7. Does the permit change require or include ownership, control, right-of-entry, or compliance information?
- Yes No 8. Permit change as a result of a Violation? Violation # _____
- Yes No 9. Permit change as a result of Division Order? D.O. # _____
- Yes No 10. Permit change as a result of other laws or regulations or policies? Explain: _____
- Yes No 11. Does the permit change affect the surface landowner or change the post mining land use?
- Yes No 12. Does permit change require or include underground design or mine sequence and timing? (Modification of R2P2?)
- Yes No 13. Does permit change require or include collection and reporting of any baseline information?
- Yes No 14. Could the permit change have any effect on wildlife or vegetation outside the current disturbed area?
- Yes No 15. Does permit change require or include soil removal, storage or placement?
- Yes No 16. Does permit change require or include vegetation monitoring, removal or revegetation activities?
- Yes No 17. Does permit change require or include construction, modification, or removal of surface facilities?
- Yes No 18. Does permit change require or include water monitoring, sediment or drainage control measures?
- Yes No 19. Does permit change require or include certified designs, maps, or calculations?
- Yes No 20. Does permit change require or include subsidence control or monitoring?
- Yes No 21. Have reclamation costs for bonding been provided for any change in the reclamation plan?
- Yes No 22. Is permit change within 100 feet of a public road or perennial stream or 500 feet of an occupied dwelling?
- Yes No 23. Is this coal exploration activity?

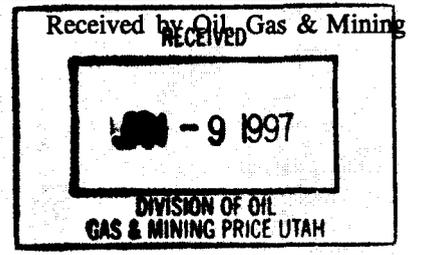
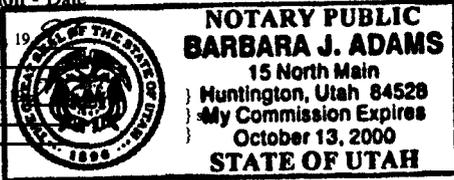
UTAH DIVISION OF OIL, GAS AND MINING
 FIELD OFFICE
 RECEIVED
 JAN 30 1997
 97A

Attach 7 complete copies of proposed permit change as it would be incorporated into the Mining and Reclamation Plan.

I hereby certify that I am a responsible official of the applicant and that the information contained in this application is true and correct to the best of my information and belief in all respects with the laws of Utah in reference to commitments, undertakings, and obligations herein.

Richard Anthony Civ. Eng. 1-7-97
Signed - Name - Position - Date

Subscribed and sworn to before me this _____ day of _____
Barbara J. Adams
 Notary Public
 My Commission Expires: 10-13
 Attest: STATE OF _____ COUNTY OF _____
Barbara J. Adams



ASSIGNED PERMIT CHANGE NUMBER
97A

John M. Schweitzer
Date Position Assumed
6/13/84

Assistant Secretary
700 NE Multnomah, Suite 950
Portland, OR 97232-4116

John R. Stageberg
Date Position Assumed
8/15/90

Assistant Treasurer
700 NE Multnomah, Suite 1600
Portland, OR 97232-4116

Bruce N. Williams
Date Position Assumed
8/15/90

Assistant Treasurer
700 NE Multnomah, Suite 1600
Portland, OR 97232-4116

C. K. Ferguson
Date Position Assumed
5/10/95

Assistant Secretary
570 Lloyd Center Tower
Portland, or 97232

Thomas W. Forsgren
Date Position Assumed
5/10/95

Vice President
201 South Main, 2300 OUC
Salt Lake City, Utah 84140

John F. Fryer
Date Position Assumed
2/8/95

Assistant Treasurer
700 NE Multnomah, Suite 1600
Portland, OR 97232-4116

J. Brett Harvey
Date Position Assumed
11/9/94

Vice President
201 South Main, 2300 OUC
Salt Lake City, Utah 84140

Thomas A. Lockhart
Date Position Assumed
5/10/95

Vice President
1607 Cy Avenue, P O Box 720
Casper, Wyoming 82602

John E. Mooney
Date Position Assumed
11/9/94

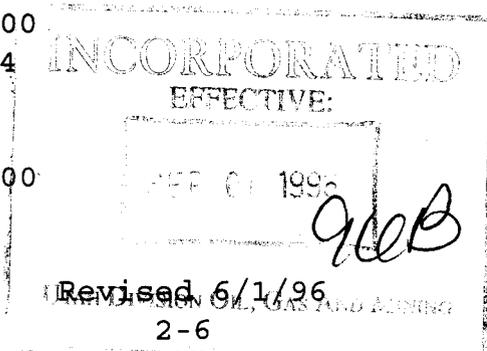
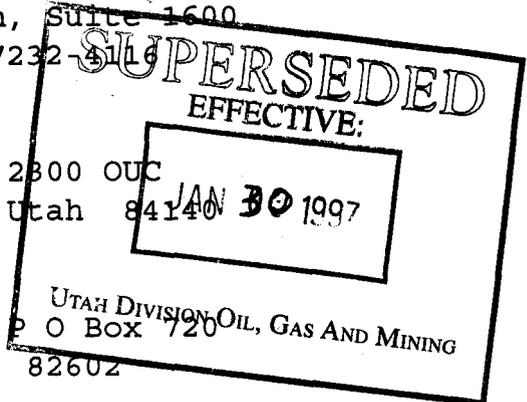
Senior Vice President
201 South Main, 2300 OUC
Salt Lake City, Utah 84140

Edwin J. O'Mara
Date Position Assumed
12/1/94

Vice President
920 SW Sixth, Suite 1500
Portland, Oregon 97204

Paul N. Pechersky
Date Position Assumed
1/6/95

Vice President
920 SW Sixth, Suite 1500
Portland, OR 97204



H. Arnold Wagner
Date Position Assumed
5/10/95

Controller of Utah Power & Light
Assit. Secretary of PacifiCorp
201 South Main, Suite 700
Salt Lake City, Utah 84140

Staff Board
not on Board

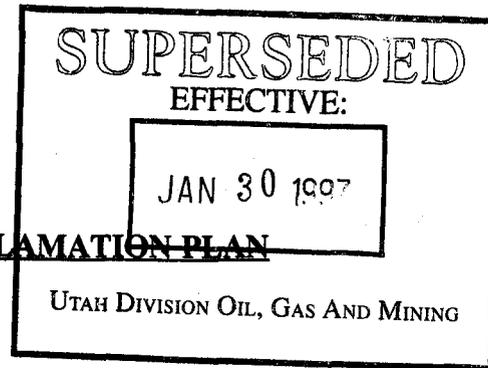
Richard D. Westerberg
Date Position Assumed
5/10/95

2484 Washington Blvd. Suite 400
Ogden, Utah 84401

INCORPORATED
EFFECTIVE:
1996
RDB
Revised 8/30/96
2-7

**PacifiCorp
Trail Mountain Mine**

OPERATION AND RECLAMATION PLAN



3.1 SCOPE

Chapter 3 sets out the plans that PacifiCorp intends to undertake during the permit term and life of the operation. The chapter is divided into five sections: surface facilities, operation plan, environmental protection, reclamation plan, and bibliography.

3.2 SURFACE FACILITIES

The Trail Mountain Mine is an existing operation that was started in the 1940's. All surface facilities are in place under an approved mining and reclamation plan ACT/015/009.

3.2.1 SITE SELECTION AND PREPARATION

The mine site was selected for its location. Access to the coal seam is facilitated by the intersection at the mine site of the coal outcrop and the canyon floor.

Site preparation consisted of clearing the site, construction of pads and facilities, and development of portals.

3.2.2 PORTALS

Five portals provide access to the Trail Mountain Mine. One portal located on the corner of the outcrop of Cottonwood Canyon and a small side-drainage canyon is a fan portal. The second portal, 150 feet south of the fan portal, is the main intake and travel portal. The third portal is the belt portal. It is located just to the south of the main portal. The fourth portal is south of the belt portal and is used as a ventilation portal.



State of Utah
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS AND MINING

Michael O. Leavitt
Governor
Ted Stewart
Executive Director
James W. Carter
Division Director

1594 West North Temple, Suite 1210
P.O. Box 145801
Salt Lake City, Utah 84114-5801
(801) 538-5340
(801) 359-3940 (Fax)

January 28, 1997

Chuck Semborski
PacifiCorp
Energy West Mining
P.O. Box 310
Huntington, Utah 84528

RE: Silt Fence Removal at Waste Rock Site, PacifiCorp, Cottonwood Mine, ACT/015/019-97A,
Folder #3, Emery County, Utah

Dear Mr. Semborski:

This approves your January 7, 1997 titled amendment wherein your proposal to remove silt fences on three sites or as follows, effective January 30, 1997:

- (1) along haul road to the active waste rock site (site I),
- (2) along the access road to the sediment pond that provides sediment control for the contiguous soil stock pile (site II), and
- (3) along the exterior boundary of the leach field and contiguous to State Highway #57 (site III).

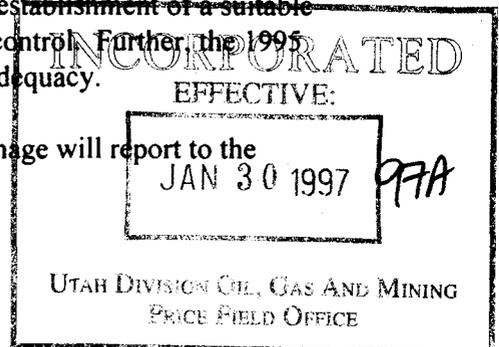
Follow-up

The only follow-up documents required after approval is the submission of a certified surface facilities map. As a courtesy, would appreciate hearing from you when the designated silt fences have been removed and the ancillary road regraded.

Project Description/Analysis

The silt fences were required at the time of construction on all three sites in order to provide alternative sediment control on the areas to be disturbed. Since then, on sites I and III, it has been determined by the permittee and endorsed by DOGM staff, Johnson, Baker, and Davidson that the aforementioned silt fences can be removed because of the establishment of a suitable vegetal cover that by itself would provide the necessary sediment control. Further, the 1995 vegetal report prepared by the consultant supports the vegetation adequacy.

On site I, the road will be regraded and the road soil stockpile drainage will report to the sediment pond.



Page 2

C. Semborski/Cottonwood
Silt Fence Removal-97A
January 28, 1997

Findings

- (1) Amendment Application. The applicant submitted a complete and accurate amendment application.
- (2) DOG M Permit Status. The amendment embraces a disturbed area within an active approved DOGM coal mine permit.
- (3) Land Status. The surface estate is owned by the U. S. Government under the administration of the Bureau of Land Management.
- (4) Coordination. This amendment has been coordinated with the Bureau of Land Management and other agencies as required.
- (5) Impacts. The instant project does not have an adverse impact on the hydrologic balance, nor does it adversely impact critical habitat areas.
- (6) Sediment Control. Vegetation will provide sediment control in lieu of silt fences on the leach field and the waste rock haul road, sites I & III. The ancillary road to the waste rock, site II, will be regraded to have the disturbed area drain to and be treated by the waste rock sediment pond in lieu of silt fences adjoining the road.
- (7) Records Update. The TA nor CHIA need to be updated because of this project.
- (8) Reclamation and Bonding. The amendment does not require a change in the reclamation plan nor in bonding. The scope of the reclamation has not changed as a result of this project.

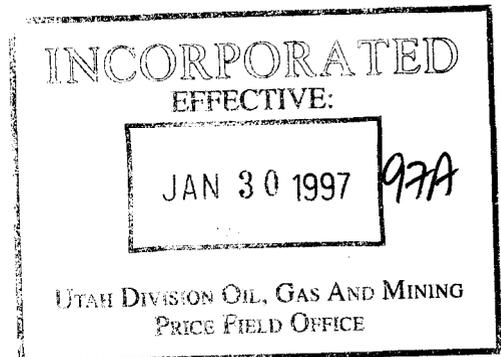
Sincerely,



Wm. J. Malencik
Reclamation Specialist

sd
enclosures

cc: Ranvir Singh, OSM, Denver
Richard Manus, BLM, Price
Janette Kaiser, USFS, Price
Mark Page, Water Rights, Price, w/o enc
Dave Ariotti, DEQ, Price, w/o enc
Bill Bates, DWR, Price, w/o enc
Joe Helfrich, DOGM, SLC





January 7, 1997

Utah Coal Regulatory Program
Division of Oil, Gas and Mining
451 East 400 North
Box 156
Price, Utah 84501

Attention: Mr. Bill Malencik

97A

**Re: AMENDMENT TO SILT FENCING AT WASTE ROCK SITE,
PACIFICORP, DES-BEE-DOVE MINE, ACT /015/017,
COTTONWOOD MINE, ACT/015/019, AND TRAIL MTN. MINE,
ACT/015/009, EMERY COUNTY, UTAH.**

PacifiCorp, by and through its wholly-owned subsidiary, Energy West Mining Company ("Energy West") as mine operator, herewith request an amendment to remove silt fencing placed along the access road leading to the waste rock disposal site, and silt fencing along the access road to the Waste Rock Site sediment pond area.

INCORPORATED
EFFECTIVE:
JAN 30 1997 97A
DIVISION OF OIL, GAS AND MINING
SERVICE

GENERAL INTRODUCTION:

As introduced in the permit, chapter two, page 2-1, waste rock storage volume, an access road was constructed to the refuse storage facility site. The horizontal and vertical alignment, with cuts and fills was completed conforming to existing topography as closely as possible. The length of the roadway to the refuse storage site is approximately 1400' ft. The East end of the storage site was designed and is used to stockpile sub-soil material and provides access to the sediment pond. As part of the initial construction phases, it states in chapter three, page 3-1, paragraph two, that sediment control measures will be put in place to minimize the effects of the initial construction. With this in mind, silt fencing was placed the full length of the access road and around the sub-soil storage site to the pond area (South and East side of roads); thus, insuring surface runoff would be controlled during construction phases. Subsequently these areas are designated alternate sediment control areas. See drawing CM-10821-WB, 4-2 (included for

Huntington Office:
(801) 687-9821

Fax (801) 687-2695

Purchasing Fax (801) 687-9092

Deer Creek Mine:
(801) 381-2317

Fax (801) 381-2285

Cottonwood Mine:
(801) 748-2319

Fax (801) 748-2380

your convenience of review).

FINDINGS

After construction, all silt fencing remained in place to help prevent erosion or silt influences outside the disturbed areas and insure time for slope stability. Revegetation implemented and regulated by R645-301-354 was completed, and has now provided suitable coverage on the slopes.

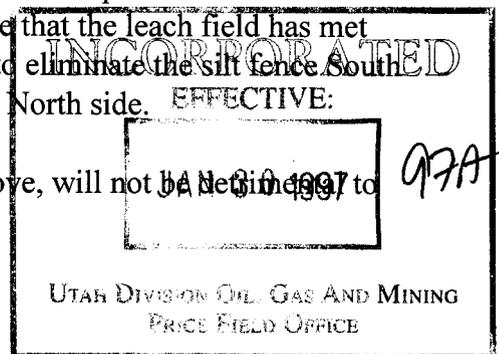
As indicated in the permit for interim revegetation methodology, criteria for interim revegetation success will be the establishment of at least 60% ground cover, on the majority of the slope, which prevents or minimizes erosion. Revegetation cover is now established on all slopes of the access road and storage site. Revegetation cover studies, performed by Mt. Nebo Scientific Inc., are provided in PacifiCorp's Annual Report , and attached for your review. Analysis of these studies confirms that the permit requirements have been met.

Visual inspections and evaluations of the area between the slopes and silt fence, for the most part, have shown minimal signs of erosion and nothing in the way of silt buildup at the silt fence lines. Even so, areas of silt fencing will be retained at locations determined questionable as to needs, such as top soil stock piles along the access roadway; concentrated areas of runoff and silt fence perpendicular to the ditch line along the access road. Drawing CM-10826-WB depicts the silt fencing to remain and other methods of erosion control to be employed. 3 copies attached for your convenience of review.

As mentioned above, an access road to the sediment pond area, which is located on the East side of the sub-soil pile has silt fencing along the permit boundary to treat any runoff from the sub-soil pile to the undisturbed area. This access road is maintained with a 2 % slope towards the sub-soil pile and with proper grading directs runoff water to the sediment pond. A silt fence, with backing support will be placed perpendicular to the flow at the crest of the slope to the pond and will capture any silt from the sub-soil pile. Treatment through the pond for the sub-soil pile and roadway runoff will eliminate the need for any silt fencing along the permit boundary, parallel to the pond access road.

In conjunction with the Waste Rock Storage Facility, the area referred to as the Cottonwood Mine Leach Field, has silt fencing that could be eliminated. The silt fencing is parallel to highway 57 and has been maintained as an erosion control measure for a number of years. Recent visual evaluation indicates that adequate revegetation has been established. As with the waste rock site, an evaluation inspection was conducted by the same personnel as mentioned below. It was recommended at that time, that a documented revegetation cover test be conducted, relative to cover quantity, quality, etc., at random locations, approximately 3 to 4 quadrats within the leach field area. Test results are attached (7 copies) to substantiate that the leach field has met the 60% or better coverage as it visually appears. The proposal is to eliminate the silt fence South of the access road into the leach field and retain the fencing on the North side.

It is our contention that removal of the silt fencing, as outlined above, will not be a net gain to



the surrounding undisturbed area, both in controlling of erosion or silt influences into the nearby natural drainages.

PacifiCorp will continue to visually monitor all areas of the access road and refuse storage facility site for problem areas, erosion or otherwise, on a monthly or more frequent basis. If any areas of concern are detected during these inspections they will be handled as outlined in the permit.

The silt fence removal process will be accomplished by cutting loose the silt fence at the ground line and from the bolts, removing that portion and allowing the remaining part to stay in place on the ground. This will eliminate any chance of disturbing the area along the base that is filled in to hold the fencing down when installing. The bolt supports will remain in place for the time being.

An evaluation review of the site and conditions was made by the Division of Oil, Gas and Mining by, Hydrologist (Steve Johnson), Soils Scientist, (Robert Davidson) and (Biologist) Paul Baker. The proposed plan and map delineation are presented using recommendations from these qualified individuals.

A vegetative cover report from 1995 is attached for your review. The report indicates that acceptable revegetation coverage for the cut and fill slopes along the access road have been met.

Certain sections of text in the permit require revisions at this time, found in the Waste Rock Volume, Chapter 2, page 2-6, 2-7, 2-7.1, Chapter 3, page 3-1. Seven copies are attached and highlighted at this time.

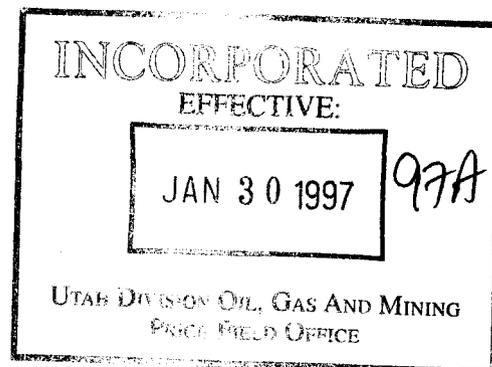
Nothing further, to our knowledge, is required at this time to allow approval for this amendment.

Please feel free to call Richard Northrup at 687-4822, if there are any questions or concerns regarding this amendment.

Sincerely,



Richard Northrup
Env. Eng.



**VEGETATION SAMPLING
AT THE
COTTONWOOD/WILBERG
LEACH FIELD**



INCORPORATED EFFECTIVE: JAN 30 1997	97A
UTAH DIVISION OIL, GAS AND MINING PRICE FIELD OFFICE	

Prepared by

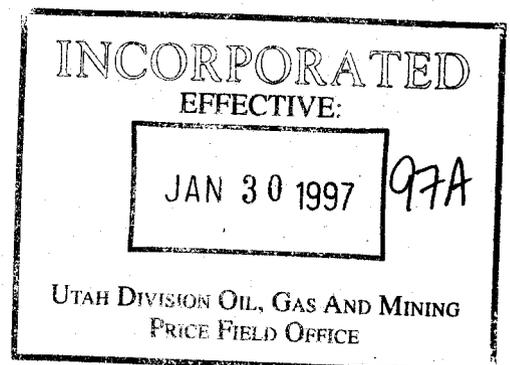
MT. NEBO SCIENTIFIC, INC.
330 East 400 South, Suite 6
P.O. Box 337
Springville, Utah 84663
(801) 489-6937

Patrick D. Collins, Ph.D.

for

PACIFICORP/ENERGY WEST
P.O. Box 310
Huntington, Utah 84528

December 1996



**VEGETATION SAMPLING
AT THE
COTTONWOOD/WILBERG
LEACH FIELD**

INTRODUCTION

Silt fences have been installed in the runoff area of the leach field to control erosion until enough vegetation could be established to perform this function. Vegetation sampling was conducted as an attempt to show that enough cover presently exists to eliminate the silt fences. Results from the sampling are contained within this report.

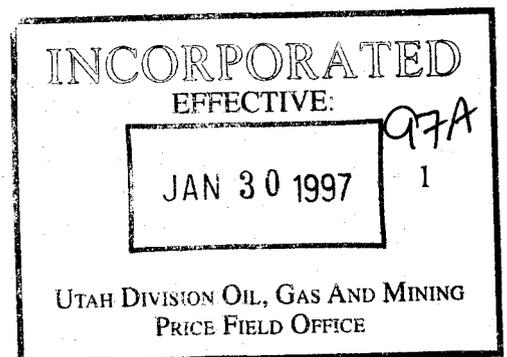
METHODS

Transect lines for sampling were placed within the leach field to adequately represent the area.

From these transect lines, sample locations were chosen using random numbers at right angles to them.

Cover estimates were made using ocular methods with meter square quadrats. Species composition was also assessed from the quadrat data. Plant nomenclature follows "A Utah Flora" (Welsh et al. 1993).

Sample adequacy for cover was achieved using formulas from Snedocor and Cochran (1980), with the goal that 80% of the samples were within 10% of the true mean for the shrub communities of the area. The following formula was used:



$$n_{min} = \left[\frac{1.28 (s)}{x (.1)} \right]^2$$

where,

nmin = minimum adequate sample
s = standard deviation
x = sample mean
.1 = confidence interval

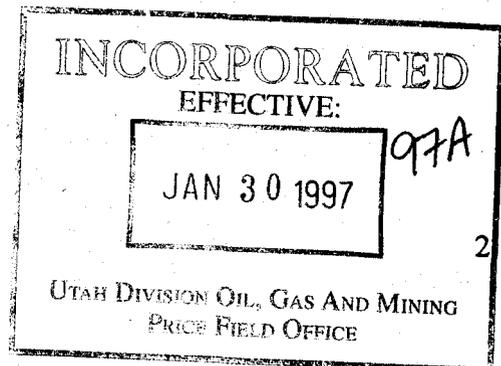
All sample means, standard deviations, and raw data were included in this report to enable the reviewers to apply further statistical tests if desired. The raw data summarized on spreadsheets has been included in Appendix A of the report.

RESULTS

Results for total cover from the vegetation sampling is shown below. Additional information about the vegetation (e.g. cover by species and composition.) is show on the raw data spreadsheets included in Appendix A.

Total Cover	<u>% Mean Cover</u>	<u>Standard Deviation</u>	<u>Sample Size</u>
Living Cover	67.00	17.42	20
Litter	22.20	17.00	20
Bareground	3.60	1.39	20
Rock	7.20	12.00	20

Therefore, total cover over the bare ground was 96.40%

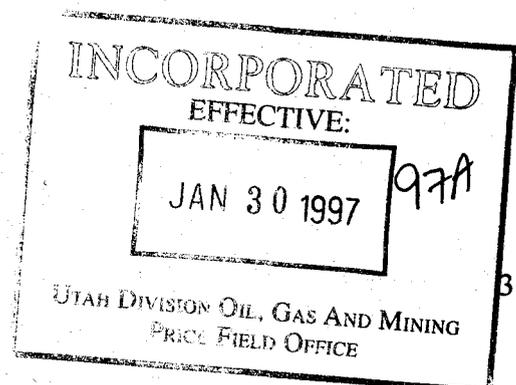


DISCUSSION

Silt fencing to prevent significant sediment release downslope was constructed to intercept storm runoff flow for the leach field until a protective vegetative cover could become established. As shown in the Results section above, the total cover over the bare ground was over 96%, a value that almost certainly prevents significant erosion from the area.

One small area that comprised approximately 20-25 percent of the total area was dominated by an annual species called tumbling mustard (*Sisymbrium altissimum*). The remainder of the leach field was dominated by a woody species called rubber rabbitbrush (*Chrysothamnus nauseosus*). Although tumbling mustard is an annual plant, it still provides a very good ground cover (litter) even when its life cycle for the growing season has been completed (i.e. winter months). Sampling was done to reflect these differences and are shown in the raw data.

It may therefore be concluded that removal of the silt fences used control significant erosion may be justified.



APPENDIX A

INCORPORATED
EFFECTIVE:
JAN 30 1997 97A
UTAH DIVISION OIL, GAS AND MINING
PRICE FIELD OFFICE

PACIFICORP 1996

PACIFICORP (Energy West)

Cottonwood Leachfield

Disturbed PJ/Rabbitbrush

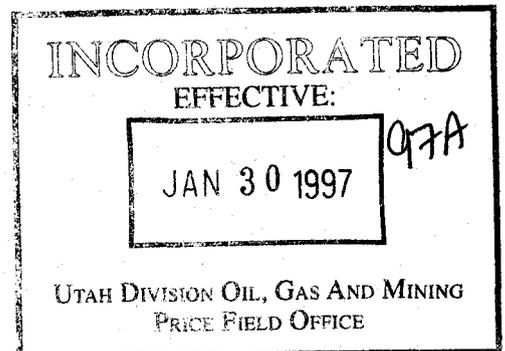
Exposure: E

1-17 RUBBER RABBITBRUSH DOMINANT

Slope: 1-2 deg

Sample Date: 7 Nov 1996

	1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00
TREES & SHRUBS								
Gutierrezia sarothrae	0.00	5.00	0.00	10.00	0.00	0.00	0.00	0.00
Chrysothamnus nauseosus	20.00	70.00	45.00	35.00	55.00	90.00	85.00	70.00
FORBS								
Sisymbrium altissimum	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
GRASSES								
Bromus tectorum	0.00	0.00	0.00	5.00	0.00	0.00	0.00	0.00
COVER								
Total Living Cover	20.00	75.00	45.00	50.00	55.00	90.00	85.00	70.00
Litter	78.00	22.00	48.00	35.00	10.00	5.00	10.00	20.00
Bareground	1.00	2.00	2.00	5.00	5.00	4.00	4.00	5.00
Rock	1.00	1.00	5.00	10.00	30.00	1.00	1.00	5.00
% COMPOSITION								
Shrubs	100.00	100.00	100.00	90.00	100.00	100.00	100.00	100.00
Forbs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grasses	0.00	0.00	0.00	10.00	0.00	0.00	0.00	0.00



17-20 TUMBLING MUSTARD DOMINANT

9.00	10.00	11.00	12.00	13.00	14.00	15.00	16.00	17.00	18.00
25.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25.00	85.00	25.00	65.00	75.00	75.00	55.00	70.00	0.00	0.00
0.00	0.00	25.00	10.00	10.00	0.00	15.00	0.00	60.00	65.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
50.00	85.00	50.00	75.00	85.00	75.00	70.00	70.00	60.00	65.00
10.00	10.00	5.00	15.00	10.00	20.00	25.00	25.00	35.00	30.00
5.00	4.00	5.00	5.00	4.00	4.00	4.00	4.00	3.00	4.00
35.00	1.00	40.00	5.00	1.00	1.00	1.00	1.00	2.00	1.00
100.00	100.00	50.00	86.67	88.24	100.00	78.57	100.00	0.00	0.00
0.00	0.00	50.00	13.33	11.76	0.00	21.43	0.00	100.00	100.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

INCORPORATED

EFFECTIVE:

JAN 30 1997

97A

UTAH DIVISION OIL, GAS AND MINING
PRICE FIELD OFFICE

PACIFICORP
QUALITATIVE SAMPLING DATA SHEET AND
QUANTITATIVE/QUALITATIVE NOTES
1995

SITE NAME: Road Slopes

AREA: Cottonwood Mine New Waste Rock Area (1990 Interim)

DATE: 9/6/95

WORKERS: P. Collins, D. Collins

SLOPE: variable

EXPOSURE: variable

ANIMAL USE/DISTURBANCE: Slight

EROSION: Negligible

COVER: (see quant. data)

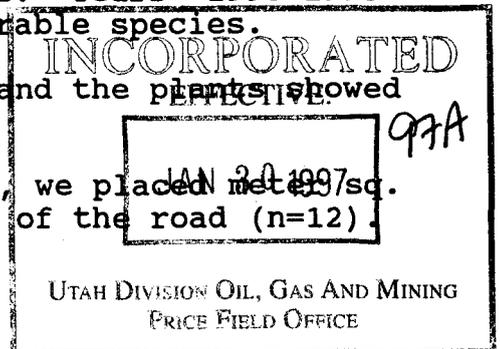
DOMINANT PLANT SPECIES OBSERVED:

Artemisia tridentata
Atriplex canescens
Ceratoides lanata
Opuntia polyacantha

Halogeton glomeratus
Hedysarum boreale
Melilotus officinalis
Salsola pestifer
Lepidium montanum
Medicago sativa
Penstemon palmeri

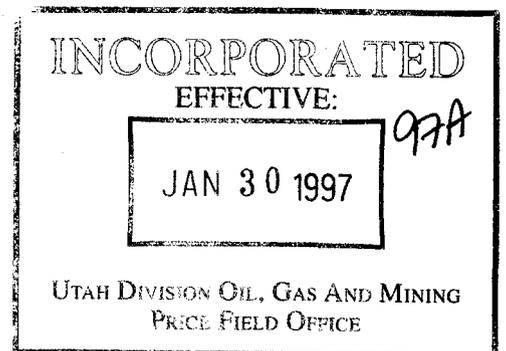
Elymus lanceolatus
Elymus cinereus
Stipa hymenoides
Bromus tectorum

- NOTES: 1) In 1992 there was approximately 50% of the cover dominated by weedy plant species. Years' 1993-1995 about 90% of the cover was desirable species.
- 2) This was a good year for prec. and the plants showed it here to.
- 3) To record the quantitative data, we placed meter² quadrats randomly entire length of the road (n=12).



UP&L-COTTONWOOD MINE
 Road Slopes
 New Waste Rock Site (1990)
 Slope: variable
 Exposure: variable
 Sample Date: 6 Sept 95

	1.00	2.00	3.00	4.00	5.00	6.00
SHRUBS						
Atriplex canescens	5.00	5.00	20.00	0.00	0.00	0.00
Ceratoides lanata	0.00	5.00	0.00	0.00	5.00	5.00
Artemisia tridentata	0.00	0.00	5.00	0.00	0.00	0.00
Opuntia polyacantha	0.00	0.00	0.00	0.00	0.00	0.00
FORBS						
Lepidium montanum	0.00	5.00	0.00	0.00	0.00	5.00
Medicago sativa	0.00	5.00	0.00	0.00	0.00	0.00
Penstemon palmeri	0.00	0.00	5.00	0.00	0.00	0.00
GRASSES						
Stipa hymenoides	5.00	0.00	0.00	10.00	0.00	0.00
Sporobolus airoides	0.00	0.00	0.00	5.00	0.00	0.00
Elymus cinereus	5.00	5.00	5.00	0.00	5.00	5.00
Elymus lanceolatus	25.00	20.00	15.00	20.00	20.00	10.00
Bromus tectorum	0.00	0.00	0.00	5.00	0.00	0.00
Sitanion hystrix	0.00	0.00	0.00	0.00	5.00	0.00
COVER						
Total Living Cover	40.00	45.00	50.00	40.00	35.00	25.00
Litter	5.00	5.00	10.00	10.00	10.00	25.00
Bareground	30.00	25.00	15.00	25.00	30.00	25.00
Rock	25.00	25.00	25.00	25.00	25.00	25.00
% COMPOSITION						
Shrubs	12.50	22.22	50.00	0.00	14.29	20.00
Forbs	0.00	22.22	10.00	0.00	0.00	20.00
Grasses	87.50	55.56	40.00	100.00	85.71	60.00



7.00	8.00	9.00	10.00	11.00	12.00	Mean	SDev	Freq
5.00	5.00	10.00	10.00	5.00	0.00	5.42	5.57	66.67
0.00	0.00	0.00	5.00	5.00	5.00	2.50	2.50	50.00
0.00	0.00	0.00	0.00	0.00	0.00	0.42	1.38	8.33
0.00	0.00	0.00	0.00	0.00	5.00	0.42	1.38	
0.00	0.00	0.00	0.00	0.00	0.00	0.83	1.86	16.67
5.00	0.00	5.00	0.00	0.00	0.00	1.25	2.17	25.00
0.00	5.00	0.00	0.00	0.00	5.00	1.25	2.17	25.00
10.00	0.00	0.00	0.00	0.00	0.00	2.08	3.80	25.00
0.00	0.00	0.00	0.00	0.00	0.00	0.42	1.38	8.33
10.00	5.00	0.00	0.00	5.00	0.00	3.75	2.98	66.67
10.00	20.00	25.00	30.00	5.00	20.00	18.33	6.87	100.00
0.00	0.00	0.00	0.00	25.00	0.00	2.50	6.92	16.67
0.00	0.00	0.00	0.00	0.00	0.00	0.42	1.38	8.33
40.00	35.00	40.00	45.00	45.00	35.00	39.58	6.28	
5.00	10.00	5.00	10.00	10.00	5.00	9.17	5.34	
30.00	45.00	30.00	15.00	15.00	35.00	26.67	8.50	
25.00	10.00	25.00	30.00	30.00	25.00	24.58	4.77	
12.50	14.29	25.00	33.33	22.22	28.57	21.24	12.06	
12.50	14.29	12.50	0.00	0.00	14.29	8.82	8.07	
75.00	71.43	62.50	66.67	77.78	57.14	69.94	15.76	

INCORPORATED
EFFECTIVE:

JAN 30 1997

 97A
UTAH DIVISION OIL, GAS AND MINING
PRICE FIELD OFFICE

UP&L-COTTONWOOD MINE
Road Slopes
New Waste Rock Site (1990)
Slope: variable
Exposure: variable
Sample Date: 6 Sept 95

SHRUBS

Atriplex canescens
Ceratooides lanata
Artemisia tridentata
Opuntia polyacantha

FORBS

Lepidium montanum
Medicago sativa
Penstemon palmeri

GRASSES

Stipa hymenoides
Sporobolus airoides
Elymus cinereus
Elymus lanceolatus
Bromus tectorum
Sitanion hystrix

COVER

Total Living Cover
Litter
Bareground
Rock

% COMPOSITION

Shrubs
Forbs
Grasses



PACIFICORP
QUALITATIVE SAMPLING DATA SHEET AND
QUANTITATIVE/QUALITATIVE NOTES
1995

SITE NAME: Topsoil Stockpiles

AREA: Cottonwood Mine Waste Rock Area (1990 Interim)

DATE: 9/6/95

WORKERS: P. Collins, D. Collins

SLOPE: variable

EXPOSURE: variable

ANIMAL USE/DISTURBANCE: Slight

EROSION: Slight

COVER: (see quantitative data)

DOMINANT PLANT SPECIES OBSERVED:

Atriplex canescens

Ceratoides lanata

Halogeton glomeratus

Hedysarum boreale

Melilotus officinalis

Salsola pestifer

Elymus lanceolatus

Elymus cinereus

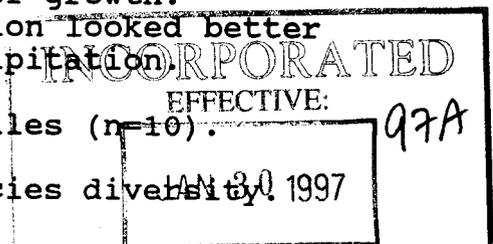
Stipa hymenoides

Poa secunda

Sitanion hystrix

Sporobolus airoides

- NOTES: 1) Like last year, we sampled 2 piles. Both desirable and weedy species were common, the north pile was about 1:4 desirable spp. vs. weedy. The south pile had > 90% desirable spp. (the data were combined on the summary sheets).
- 2) All areas had good representation of growth. Compared to last year, the vegetation looked better probably due to the increased precipitation.
- 3) We placed quadrats randomly on 2 piles (n=10).
- 4) Like last year, there was good species diversity.



UP&L-COTTONWOOD MINE

Topsoil Stockpiles

New Waste Rock Site (1990)

Slope: variable

Exposure: variable

Sample Date: 6 Sept 95

	1.00	2.00	3.00	4.00	5.00	6.00
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SHRUBS

Ceratoides lanata	0.00	5.00	5.00	0.00	0.00	5.00
Atriplex canescens	5.00	5.00	0.00	5.00	5.00	5.00
Atriplex confertifolia	0.00	0.00	5.00	10.00	10.00	0.00
Artemisia tridentata	0.00	0.00	0.00	0.00	0.00	0.00

FORBS

Malcomia africana	0.00	0.00	0.00	0.00	0.00	0.00
Lepidium perforatum	0.00	0.00	0.00	0.00	0.00	0.00
Medicago sativa	5.00	0.00	0.00	0.00	0.00	0.00
Penstemon palmeri	5.00	0.00	0.00	0.00	0.00	0.00
Lepidium montanum	0.00	0.00	0.00	10.00	0.00	0.00
Sisymbrium altissimum	0.00	0.00	0.00	0.00	10.00	0.00
Salsola pestifer	0.00	0.00	0.00	0.00	0.00	0.00

GRASSES

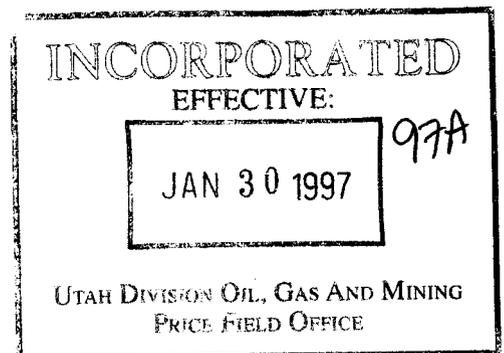
Stipa hymenoides	5.00	0.00	0.00	20.00	0.00	0.00
Bromus tectorum	0.00	0.00	0.00	0.00	0.00	0.00
Elymus lanceolatus	25.00	20.00	20.00	0.00	25.00	35.00
Elymus cinereus	5.00	10.00	0.00	0.00	0.00	0.00

COVER

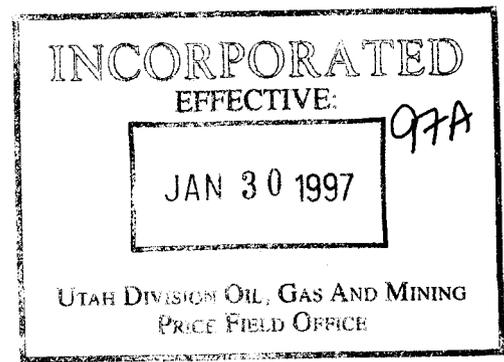
Total Living Cover	50.00	40.00	30.00	45.00	50.00	45.00
Litter	5.00	5.00	5.00	25.00	10.00	10.00
Bareground	20.00	30.00	40.00	10.00	15.00	20.00
Rock	25.00	25.00	25.00	20.00	25.00	25.00

% COMPOSITION

Shrubs	10.00	25.00	33.33	33.33	30.00	22.22
Forbs	20.00	0.00	0.00	22.22	20.00	0.00
Grasses	70.00	75.00	66.67	44.44	50.00	77.78



7.00	8.00	9.00	10.00	Mean	SDev	Freq	UP&L-CO Topsoil St New Was Slope: va Exposure: Sample D
							SHRUBS
0.00	0.00	0.00	0.00	1.50	2.29	30.00	Ceratoide
0.00	0.00	0.00	5.00	3.00	2.45	60.00	Atriplex c
0.00	10.00	0.00	0.00	3.50	4.50	30.00	Atriplex c
0.00	0.00	5.00	0.00	0.50	1.50	10.00	Artemisia
							FORBS
0.00	35.00	25.00	0.00	6.00	12.21	20.00	Malcomia
20.00	0.00	0.00	0.00	2.00	6.00	10.00	Lepidium
0.00	0.00	0.00	5.00	1.00	2.00	20.00	Medicago
0.00	0.00	0.00	0.00	0.50	1.50	10.00	Penstemo
0.00	0.00	0.00	0.00	1.00	3.00	10.00	Lepidium
0.00	0.00	0.00	0.00	1.00	3.00	10.00	Sisymbriu
0.00	0.00	5.00	0.00	0.50	1.50	10.00	Salsola p
							GRASSE
0.00	0.00	0.00	0.00	2.50	6.02	20.00	Stipa hym
15.00	0.00	0.00	10.00	2.50	5.12	20.00	Bromus t
15.00	5.00	5.00	20.00	17.00	10.30	90.00	Elymus la
0.00	0.00	5.00	0.00	2.00	3.32	30.00	Elymus ci
							COVER
50.00	50.00	45.00	40.00	44.50	6.10		Total Livi
15.00	10.00	10.00	20.00	11.50	6.34		Litter
15.00	20.00	20.00	15.00	20.50	8.20		Baregrou
20.00	20.00	25.00	25.00	23.50	2.29		Rock
							% COMP
0.00	20.00	11.11	12.50	19.75	10.58		Shrubs
40.00	70.00	66.67	12.50	25.14	24.65		Forbs
60.00	10.00	22.22	75.00	55.11	22.23		Grasses



PACIFICORP
QUALITATIVE SAMPLING DATA SHEET AND
QUANTITATIVE/QUALITATIVE NOTES
1995

SITE NAME: Subsoil Piles

AREA: Cottonwood Mine New Waste Rock Area (1990 Interim)

DATE: 9/6/95

WORKERS: P. Collins, D. Collins

SLOPE: variable

EXPOSURE: variable

ANIMAL USE/DISTURBANCE: Slight

EROSION: Slight

COVER: (see quantitative data)

DOMINANT PLANT SPECIES OBSERVED:

Artemisia tridentata

Atriplex canescens

Atriplex canescens

Ceratoides lanata

Halogeton glomeratus

Hedysarum boreale

Melilotus officinalis

Salsola pestifer

Bromus tectorum

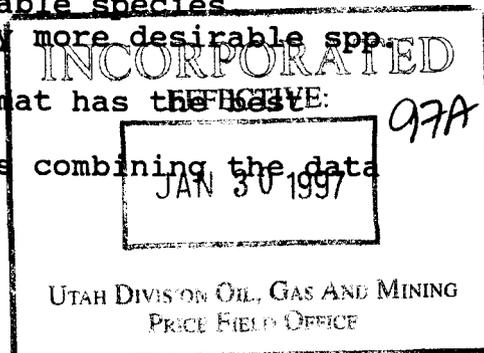
Elymus lanceolatus

Elymus cinereus

Stipa hymenoides

Sitanion hystrix

- NOTES: 1) Like last year, the top of the pile had more desirable spp. growth in areas where water had collected.
- 2) As previous years', more growth continues to occur in gouges.
- 3) Unmulched areas were dominated by weeds, but they are beginning to support more desirable species.
- 4) Areas that were mulched had many more desirable spp. and a minimum of erosion.
- 5) The areas with erosion control mat has the best representation of shrub growth.
- 6) We sampled randomly on all piles combining the data for summaries (n=10)



UP&L-COTTONWOOD MINE

Subsoil Piles

New Waste Rock Site (1990)

Slope: variable

Exposure: variable

Sample Date: 6 Sept 95

	1.00	2.00	3.00	4.00	5.00	6.00
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SHRUBS

Atriplex canescens	15.00	20.00	10.00	25.00	20.00	10.00
Ceratoides lanata	0.00	0.00	0.00	0.00	5.00	0.00
Atriplex confertifolia	0.00	5.00	0.00	0.00	0.00	0.00

FORBS

Halogeton glomeratus	0.00	0.00	5.00	0.00	0.00	0.00
Salsola pestifer	0.00	0.00	5.00	0.00	0.00	0.00
Hedysarum boreale	0.00	0.00	0.00	0.00	5.00	0.00
Malcomia africana	0.00	0.00	0.00	0.00	0.00	15.00

GRASSES

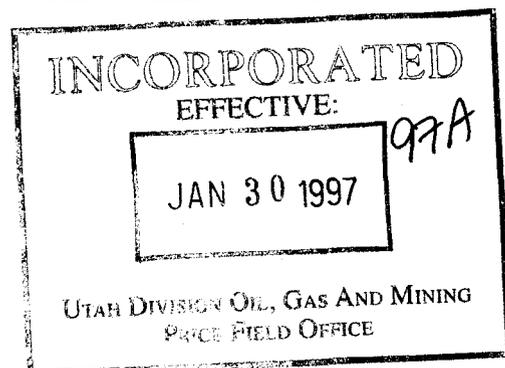
Bromus tectorum	0.00	0.00	0.00	0.00	0.00	0.00
Elymus lanceolatus	20.00	5.00	5.00	5.00	5.00	0.00
Elymus cinereus	0.00	0.00	0.00	5.00	0.00	0.00

COVER

Total Living Cover	35.00	30.00	25.00	35.00	35.00	25.00
Litter	25.00	5.00	10.00	25.00	5.00	10.00
Bareground	35.00	60.00	60.00	35.00	55.00	60.00
Rock	5.00	5.00	5.00	5.00	5.00	5.00

% COMPOSITION

Shrubs	42.86	83.33	40.00	71.43	71.43	40.00
Forbs	0.00	0.00	40.00	0.00	14.29	60.00
Grasses	57.14	16.67	20.00	28.57	14.29	0.00



7.00	8.00	9.00	10.00	Mean	SDev	Freq	UP&L-CO Subsoil Pi New Was Slope: va Exposure: Sample D
<hr/>							SHRUBS
10.00	0.00	5.00	5.00	12.00	7.48	90.00	Atriplex c
0.00	0.00	0.00	5.00	1.00	2.00	20.00	Ceratoide
0.00	0.00	0.00	0.00	0.50	1.50	10.00	Atriplex c
 							FORBS
5.00	10.00	5.00	5.00	3.00	3.32	50.00	Halogeton
0.00	0.00	0.00	0.00	0.50	1.50	10.00	Salsola p
0.00	0.00	0.00	5.00	1.00	2.00	20.00	Hedysaru
15.00	20.00	20.00	15.00	8.50	8.67	50.00	Malcomia
 							GRASSE
5.00	0.00	0.00	0.00	0.50	1.50	10.00	Bromus t
0.00	0.00	5.00	0.00	4.50	5.68	60.00	Elymus la
0.00	0.00	0.00	0.00	0.50	1.50	10.00	Elymus ci
 							COVER
35.00	30.00	35.00	35.00	32.00	4.00		Total Livi
5.00	10.00	10.00	5.00	11.00	7.35		Litter
55.00	55.00	50.00	55.00	52.00	9.00		Baregrou
5.00	5.00	5.00	5.00	5.00	0.00		Rock
 							% COMP
28.57	0.00	14.29	28.57	42.05	25.18		Shrubs
57.14	100.00	71.43	71.43	41.43	34.22		Forbs
14.29	0.00	14.29	0.00	16.52	16.25		Grasses

INCORPORATED
 EFFECTIVE:

 JAN 30 1997

 97A
 UTAH DIVISION OIL, GAS AND MINING
 PRICE FIELD OFFICE

PACIFICORP
QUALITATIVE SAMPLING DATA SHEET AND
QUANTITATIVE/QUALITATIVE NOTES
1995

SITE NAME: Sediment Pond Banks

AREA: Cottonwood Mine New Waste Rock Area (1990 Interim)

DATE: 9/6/95

WORKERS: P. Collins, D. Collins

SLOPE: variable

EXPOSURE: variable

ANIMAL USE/DISTURBANCE: Slight

EROSION: Negligible

COVER: (see quantitative data)

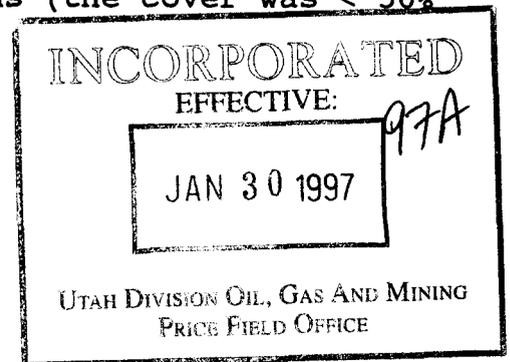
DOMINANT PLANT SPECIES OBSERVED:

Artemisia tridentata
Atriplex canescens
Atriplex confertifolia
Ceratoides lanata
Gutierrezia sarothrae

Malcomia africana
Medicago sativa
Penstemon palmeri

Elymus lanceolatus
Elymus cinereus
Stipa hymenoides
Sitanion hystrix
Sporobolus airoides

- NOTES: 1) This year and in 1993 and 1994, the cover was represented by < 25% weeds (the cover was < 50% weeds in 1992).
- 2) Site looked good.



UP&L-COTTONWOOD MINE
 Sediment Pond Banks
 New Waste Rock Site (1990)
 Slope: variable
 Exposure: variable
 Sample Date: 6 Sept 95

	1.00	2.00	3.00	4.00	5.00	6.00
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SHRUBS

Atriplex confertifolia	0.00	5.00	0.00	0.00	0.00	5.00
Atriplex canescens	0.00	5.00	15.00	10.00	5.00	25.00
Ceratoides lanata	5.00	0.00	0.00	0.00	0.00	0.00
Artemisia tridentata	5.00	0.00	0.00	0.00	0.00	0.00
Gutierrezia sarothrae	0.00	5.00	0.00	0.00	0.00	0.00

FORBS

Medicago sativa	5.00	0.00	0.00	0.00	5.00	0.00
Penstemon palmeri	5.00	0.00	0.00	5.00	5.00	0.00
Malcomia africana	0.00	0.00	0.00	0.00	0.00	0.00

GRASSES

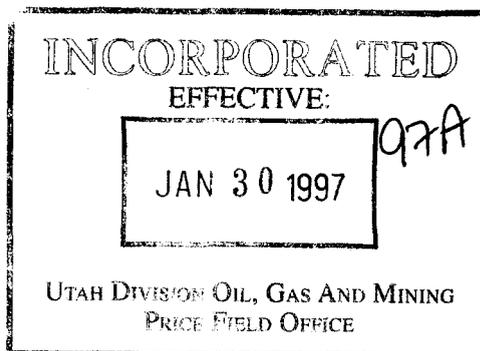
Stipa hymenoides	5.00	0.00	5.00	0.00	0.00	0.00
Elymus lanceolatus	5.00	5.00	10.00	5.00	0.00	5.00
Elymus cinereus	0.00	5.00	5.00	0.00	5.00	0.00
Sitanion hystrix	0.00	0.00	0.00	5.00	10.00	0.00

COVER

Total Living Cover	30.00	25.00	35.00	25.00	30.00	35.00
Litter	25.00	10.00	10.00	25.00	5.00	10.00
Bareground	20.00	30.00	30.00	25.00	40.00	20.00
Rock	25.00	35.00	25.00	25.00	25.00	35.00

% COMPOSITION

Shrubs	33.33	60.00	42.86	40.00	16.67	85.71
Forbs	33.33	0.00	0.00	20.00	33.33	0.00
Grasses	33.33	40.00	57.14	40.00	50.00	14.29



7.00	8.00	9.00	10.00	Mean	SDev	Freq	UP&L-CO Sediment New Was Slope: va Exposure: Sample D
							SHRUBS
0.00	0.00	0.00	0.00	1.00	2.00	20.00	Atriplex c
15.00	20.00	10.00	5.00	11.00	7.35	90.00	Atriplex c
0.00	0.00	5.00	0.00	1.00	2.00	20.00	Ceratoide
0.00	0.00	0.00	0.00	0.50	1.50	10.00	Artemisia
0.00	0.00	0.00	0.00	0.50	1.50	10.00	Gutierrezia
							FORBS
0.00	0.00	0.00	0.00	1.00	2.00	20.00	Medicago
0.00	0.00	0.00	0.00	1.50	2.29	30.00	Penstemo
5.00	0.00	0.00	10.00	1.50	3.20	20.00	Malcomia
							GRASSE
0.00	0.00	0.00	0.00	1.00	2.00	20.00	Stipa hym
5.00	10.00	5.00	10.00	6.00	3.00	90.00	Elymus la
0.00	5.00	5.00	0.00	2.50	2.50	50.00	Elymus ci
0.00	5.00	0.00	0.00	2.00	3.32	30.00	Sitanion h
							COVER
25.00	40.00	25.00	25.00	29.50	5.22		Total Livi
25.00	10.00	15.00	10.00	14.50	7.23		Litter
25.00	30.00	40.00	40.00	30.00	7.42		Baregrou
25.00	20.00	20.00	25.00	26.00	4.90		Rock
							% COMP
60.00	50.00	60.00	20.00	46.86	19.79		Shrubs
20.00	0.00	0.00	40.00	14.67	15.72		Forbs
20.00	50.00	40.00	40.00	38.48	12.56		Grasses

