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DIVISION OF  
OIL, GAS & MINING

WELLINGTON PREPARATION PLANT  
ACT/007/013

1986 ANNUAL REPORT  
SOILS & VEGETATION INFORMATION

MAY 18, 1987

**KAISER  
COAL**

KAISER COAL CORPORATION  
Sunnyside Coal Mines  
P.O. Box 10  
Sunnyside, Utah 84539  
Telephone (801) 888-4421

007/012 file Act/007/012 #6  
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MAY 18 1987

DIVISION OF  
OIL, GAS & MINING

May 18, 1987

Mr. Lowell P. Braxton, Administrator  
Mineral Resource Development & Reclamation Program  
Utah Division of Oil, Gas & Mining  
355 W. North Temple  
3 Triad Center, Suite 350  
Salt Lake City, Utah 84180-1203

*Refile*

Re: 1986 Annual Reports

Sunnyside ACT/007/007 3

Horse Canyon ACT/007/017 - Act/007/017

Wellington ACT/007/018 2

Dear Mr. Braxton:

As previously agreed, attached are the Soils and Vegetation sections of the subject reports. Your patience in waiting for this work is very much appreciated. Should there be any questions concerning it, please do not hesitate to contact either Mr. Barry Grosely or myself. Mr. Grosely is replacing me in engineering while I move into the personnel department.

Sincerely,

*Carl W. Winters*

Carl W. Winters  
Senior Mining Engineer

attach

cc: B. J. Bourquin

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# ANNUAL REPORT FOR THE WELLINGTON COAL CLEANING PLANT

## INTRODUCTION

Kaiser Coal acquired the Wellington Coal Cleaning Plant in 1985, and since that time has been responsible for maintenance of the plant. These responsibilities will continue until such time when the property is either reclaimed or plant related activities are resumed. Responsibilities for this property include any interim reclamation activities that may be required, and continued monitoring of the reclamation test plots. This annual report contains two primary sections: (1) a report on the interim reclamation activities that were conducted in 1986, and (2) 1986 monitoring results for the four reclamation test plots.

## INTERIM RECLAMATION

During the fall of 1986, interim stabilization measures were implemented at DOGM's request on several areas located at the Wellington Coal Cleaning Plant. This stabilization was conducted in order to protect soil and hydrologic resources, and to comply with permit requirements and stipulations. The goal of the interim stabilization or revegetation program was to stabilize those disturbed areas that will not be permanently reclaimed for several years.

### Background

A total of four sites involving approximately 9 acres were selected to receive interim stabilization. These areas were selected by the Division based on permit requirements and stipulations regarding runoff and erosion control from disturbed areas. The stabilized areas are as follows:

- Topsoil and subsoil stockpile area
- Sauerman dragline tail tower area
- Rock gabion and pond area on east side of Price River
- Spoil pile near office and facilities

The areas generally included locations where disturbances had occurred and where no vegetative cover or other soil stabilization measures were in effect. Attachment 1 indicates the locations of these temporarily stabilized areas. Stabilization and revegetation efforts were similar for all areas except the spoil pile; the section on Spoil Pile Stabilization discusses procedures implemented on this area.

The interim stabilization measures were designed such that they would not alter the established drainage system of the site. Consequently, all disturbed area runoff protection measures were maintained, and interim revegetated area runoff was either bermed or routed to and passed through sediment ponds. The Sauerman Dragline area was terraced and contour plowed

along the steep slope in order to reduce runoff. Furthermore, this site drains towards the slurry ponds where surface runoff is contained.

### Interim Stabilization Procedures

The reclamation stabilization procedures that were implemented at the Wellington Coal Cleaning Plant for the purpose of interim stabilization are as follows: (1) soil sampling and analysis, (2) earthwork and recontouring; (3) seeding; and (4) hydromulching, fertilization, and tackifying.

### Soil Sampling and Analysis

Soil samples were collected at sites that were anticipated to be included for interim stabilization. Samples were collected in order to determine soil characteristics, as well as determine required soil amendments and fertilizer levels. Wellington soil sample #1 was a composite sample obtained from the spoil pile located near the preparation plant (0-8 inch depth). Sample #2 was a composite sample obtained from the rock gabeon and catchment pond and adjacent drainage area into the pond (0-12 inch depth). Sample #3 was obtained from the topsoil stockpile (0-14 inch depth). Sample #4 was obtained from the subsoil stockpile area (0-14 inch depth). Sample #5 was a composite sample collected from the Sauerman Dragline tail tower area (0-12 inch depth). Sample #6 was a composite sample collected along the south side of the access road to the rock/gabeon pond (0-16 inch depth). Each sample was a composite sample taken from a minimum of three locations within the area being sampled. Since the primary objective of this sampling was to identify soil amendments and fertilizer levels of the areas to be reclaimed, it was judged that the depths sampled were sufficient for this purpose. Furthermore, nutrient uptake in plants takes place largely within this soil horizon.

Samples were analyzed for the following parameters: saturation percent, pH, conductivity, calcium, magnesium, sodium, SAR, nitrogen/nitrate, phosphorus, potassium, neutralization potential as percent  $\text{CaCO}_3$ , organic matter, general texture class, and the percent sand, silt, and clay. Attachment 2 presents the results of the soil analyses. Additionally, all samples were analyzed for boron and selenium levels since they are influenced significantly by shale. All samples were analyzed according to DOGM Guidelines. Soil fertility parameters were analyzed since soil amendment and fertilizer levels needed to be determined.

### Earthwork and Recontouring

All earthwork, regrading, fertilizing, seeding, and mulching was contracted to B and R Reclamation, Helper, Utah, under supervision of Kaiser Coal.

All of the areas selected for stabilization were ripped, disked, fertilized, seeded, and mulched. Additionally, the area adjacent to the rock gabeon and catchment pond was regraded in order to better channel runoff along the slurry pipeline and into the existing catchment pond located east of the Price River.

The earthwork included scarification of the in-place materials utilizing a crawler tractor. The ground was ripped to a depth of approximately 18 inches to reduce surface compaction, to provide a roughened surface (thus ensuring seed and mulch adherence), as well as to promote vegetational root penetration. Following ripping, approximately 2 tons of native hay was disked into the upper 6 to 8 inches of soil. This was done in order to improve soil texture and moisture holding capacity.

### Seeding, Fertilization, and Mulching

The goal of this interim stabilization or revegetation program is to stabilize selected disturbed areas that cannot be permanently reclaimed for several years. For these purposes, an interim seed mixture was developed in cooperation with DOGM. This mix was developed based on the species potential ability to stabilize the area in order to minimize soil erosion and to protect hydrologic resources. Despite several unsuccessful reclamation attempts at this site by US Steel, it was felt that these species may become established. A mixture of leguminous and grass species was chosen because it will increase soil nutrients, including nitrogen, thereby improving soil characteristics. The seed mix and seeding rates were proposed in a letter from Doug Pearce to Susan Linner (Attachment 3). Final seeding mixtures and rates are presented in a letter from Susan C. Linner to Rob Wiley (Attachment 4).

All of the areas were drill seeded and dragged with a chain. Following seeding, approximately 2,000 pounds of wood fiber mulch per acre with 60 pounds of tac in combination with fertilizer were oversprayed on all areas. Fertilizer was applied at a rate of 200 pounds of 16-16-8 per acre with the mulch and tackifier.

Seeding of the areas was completed by November 17, 1986 in accordance with agreements with DOGM. Revegetation success of this interim stabilization effort will be judged by the vegetation's ability to stabilize soils and prevent erosion. Success will be a qualitative determination based upon field observations by Kaiser and DOGM in accordance with DOGM requirements stated in the November 14, 1986 letter to Rob Wiley (Attachment 4).

### Spoil Pile Stabilization

Soil samples were obtained from the spoil pile as discussed the Soil Sampling and Analysis section. Results from these analyses indicated high ph, conductivity, sodium, and SAR values. Thus, Kaiser felt that vegetative stabilization of this area would be unsuccessful and requested that alternative stabilization measures be implemented (Attachment 5). The Division concurred with this request and recommended that Kaiser resample the pile (Attachment 6, Letter dated November 21, 1986 from Susan Linner to Susan Hasenjager). Kaiser also developed cross-sections of the pile to demonstrate pile configuration (Drawing C4-0071), and constructed a berm around the perimeter of the pile to contain runoff from the pile (Attachment 7, Letter from Carl Winters to Lowell Braxton, December 30, 1986). Kaiser has resampled the spoil pile, and submitted the results to the Division.

## PERMANENT RECLAMATION

No permanent reclamation has been attempted on the Wellington Coal Cleaning Plant permit area. At this time, the Plant is under Temporary Cessation, and no plans exist to initiate final reclamation.

## RECLAMATION TEST PLOT RESULTS

### BACKGROUND

As a permit stipulation, the Division of Oil, Gas and Mining required that US Steel construct test plots in order to determine reclamation methodologies for the Wellington Coal Cleaning Plant near Wellington, Utah. Four test plots were designed to test reclamation procedures for the four major types of disturbance on the property: (1) the Surface Facilities; (2) Coarse Refuse Pile; (3) Coarse Slurry Material; and (4) Fine Slurry Material. One of the primary variables to be tested was whether or not supplemental irrigation would be required in order to achieve successful reclamation on the disturbed areas. The original plot designs and treatment variables are described in the US Steel permit. However, some of the plot designs, seeding mixtures, and treatment replications were altered at the time of plot construction. Attachments 8, 9, 10, and 11 present the as implemented seeding mixtures for the test plots.

The Surface Facilities test plot was constructed in the fall of 1984; first year's data were collected in 1985 and submitted in early 1986. The remaining three test plots were constructed by US Steel in 1985; first year's data were collected in 1986. Thus, this report contains the second year's data for the Surface Facility test plot, and the first year's data for the other three test plots.

### METHODOLOGY

Within each test plot, a number of treatments were designed in order to test various reclamation procedures. Both the number of treatments and the type of treatment vary among test plots. Attachments 12, 13, 14, and 15 identify the treatments tested, the number of replications per treatment, and the number of samples taken for that treatment. It should be noted that while standard research procedures generally require three replications per treatment, several of the treatments on the Coarse Refuse Test Plot have a varied number of replications, ranging from 1 to 5 replications per treatment. While it is believed that the number of replications was intended to be three, apparent indications from the original US Steel plot designs show that the actual number of replications implemented varied.

Each replication or subplot was sequentially numbered, and five 1 m<sup>2</sup> quadrats

per subplot were sampled for vegetative cover. Actual vegetative cover was estimated; cover classes were not utilized. This methodology was selected because it was utilized to obtain the first year's data for the Surface Facilities test plot. It should be noted that this is a subjective method for obtaining cover estimates, and while the data collected are relatively precise within a given year, they may not be accurately comparable between years due to observer bias. Utilizing the same methodology, however yields a more comparable cover parameter estimate than by utilizing a different sampling methodology.

Density estimates were not obtained since very few shrubs are present on any of the test plots.

### IRRIGATION

All test plots were irrigated 16 hours per week from approximately June 1, through July 15, 1986. In early June, irrigation was temporarily suspended for approximately 10 days as a result of 30 feet of main pump line being removed from the property by an unknown party. Irrigation was discontinued in mid-July because both the pump house and the pump were again vandalized. The pump was not repaired until September because of parts supply difficulties.

The Coarse Slurry and Fine Slurry test plots were irrigated simultaneously each Monday and Wednesday during the irrigation period for 8 hours per day. Both the Surface Facilities and the Coarse Refuse test plot were irrigated for 8 hours on Tuesday and Thursday during the irrigation period. A single pump, on a timer, provided water directly from the Price River. The valves to direct water flow from one side of the river to the other were manually set each day. No pan tests were conducted.

### RESULTS

Results of the sampling and data analysis are presented for each plot and treatment in Attachments 16, 17, 18, and 19. These analyses present the vegetative cover for each species sampled, and for rock, litter, and bare ground. The standard deviation is also presented, as is the constancy for each species. Constancy was defined as the number of quadrats in which a species occurred, calculated as a percentage of the number of possible quadrats.

## Attachment 2. Soil uata Analyses

ACZ INC./LABORATORY DIVISION  
SOILS ANALYSES REPORT

Clients: Kaiser Coal Company  
Sunnyside Mine  
Sunnyside, Utah 84539  
Attn: Mr. Doug Pearce  
CC: Ms. Susan Hasenjaeger

Report Date: October 10, 1986  
Date Received: September 15, 1986

LAB NO.	SAMPLE I.D.	SAMPLE DATE	Saturation I	pH 1 (units)	Conductivity 1 (µmhos/cm @ 25 °C)	Calcium 1 (mg/l)	Magnesium 1 (mg/l)	Sodium 1 (mg/l)	Boron 2 (mg/kg)	SAR	Nitrogen, 2		Phosphorus 3 (mg/kg)	Potassium 3 (mg/kg)	Neutralization Potential as CaCO <sub>3</sub> 1
											Nitrate (mg/kg)	Selenium 2 (mg/kg)			
B6-1239-Soil	Wellington #1	Unknown	42	8.7	16.8	24.4	20.3	196	1.9	41.3	.03	24.9	68.0	35	13.6
B6-1240-Soil	Wellington #2	Unknown	33	7.9	3.08	26.5	13.4	7.44	1.1	1.67	-.01	2.5	2.2	45	13.8
B6-1241-Soil	Wellington #3	Unknown	39	7.7	6.00	29.6	8.38	43.6	0.8	10.0	-.01	38.6	10.2	65	5.5
B6-1242-Soil	Wellington #4	Unknown	38	7.8	1.66	8.95	3.23	9.46	0.9	3.83	-.01	15.2	12.7	80	6.8
B6-1243-Soil	Wellington #5	Unknown	44	7.7	2.95	29.4	7.87	9.84	1.3	2.28	.01	4.2	1.8	50	12.7
B6-1244-Soil	Wellington #6	Unknown	38	7.7	3.12	26.5	12.0	11.7	1.4	2.67	-.02	0.2	0.2	30	11.3

LAB NO.	SAMPLE I.D.	SAMPLE DATE	Organic				Texture
			Water I	Sand I	Silt I	Clay I	
B6-1239-Soil	Wellington #1	Unknown	0.4	34	38	28	CL
B6-1240-Soil	Wellington #2	Unknown	0.9	56	23	21	SCL
B6-1241-Soil	Wellington #3	Unknown	0.8	37	40	23	L
B6-1242-Soil	Wellington #4	Unknown	1.0	39	39	22	L
B6-1243-Soil	Wellington #5	Unknown	1.0	34	26	40	C,CL
B6-1244-Soil	Wellington #6	Unknown	0.4	56	20	24	SCL

1 Saturated Paste Extraction 2 Hot Water Extraction 3 AB-DTPA Extraction

*Ralph V. Poulsen*  
Ralph V. Poulsen, Director

Attachment 3

**KAISER  
COAL**

Proposed Interim Seed Mixture

KAISER COAL CORPORATION  
Sunnyside Coal Mines  
P.O. Box 10  
Sunnyside, Utah 84539  
Telephone (801) 888-4421

October 24, 1986

Susan Linner  
Permit Supervisor  
State of Utah Natural Resources  
Oil, Gas and Mining  
355 W. North Temple  
3 Triad Center, Ste. 350  
Salt Lake City, UT 84180-1203

RE: Temporary seed mixes for use at Wellington Coal Cleaning Plant

Dear Ms. Linner:

Approximately 8 acres need to be temporarily reclaimed at the Wellington Coal Cleaning Plant in 1986. Kaiser has expended considerable effort in researching the best technical approach and working towards resolving issues related to the composition and seeding rates of a temporary seed mix. At this time the primary issue, that of utilizing Ephraim crested wheatgrass in the seed mix, is unresolved. Kaiser requests that the proposed seed mix discussed in this submittal be approved for site stabilization.

Kaiser has had several conversations with Lynn Kunzler, DOGM (10/6/86, 10/17/86), concerning proposed seed mixes for the Wellington site. These conversations have been primarily directed towards resolution of the species composition for the mix.

All of the plant species that are proposed, with the exception of the Ephraim crested wheatgrass, have been approved by the DOGM for use in the temporary seed mix in the drill rates proposed. Ephraim crested wheatgrass has been approved, but has been recommended at a rate not to exceed 1 to 2 PLS lbs/ac. Kaiser proposes that Ephraim be used in a mix not to exceed 25% of the mix at a rate of 2.7 PLS lbs/ac drilled.

The current status of reclamation at the Wellington Coal Cleaning Plant may be summarized as follows:

- Areas to be reclaimed have been previously disturbed, erosion is occurring on some sites, and stabilization is required.

- Site stabilization is Kaiser's first priority in accordance with Utah regulations and guidelines concerning temporary reclamation.
- Kaiser has been informed that NOV's will be issued if stabilization of these sites is not conducted.
- The site is harsh consisting of saline, sodic, heavy soils; precipitation is 8 to 10 inches/yr; with very hot summers and very cold winter seasons. Reclamation is acknowledged to be difficult.
- US Steel has used a minimum of 27 plant species in a number of attempts, including test plots, to establish vegetation; these reclamation attempts have met with little to no success.
- The only species that has consistently performed well at Wellington is crested wheatgrass, which is located at least two sites--including the Sauerman Dragline.
- Kaiser requests that DOGM allow planting a small amount of Ephraim crested wheatgrass in a diverse, and otherwise largely native seed mix in order to stabilize the sites.
- Ephraim crested wheatgrass is known to establish in difficult conditions, to effectively stabilize sites, and to control erosion.
- Kaiser continues to commit to monitoring reclaimed areas for species performance, and to seek a solution to acknowledged difficulties in achieving permanent reclamation success.

The proposed seed mix is as follows:

<u>Species</u>	<u>% Mix</u>	<u>Drill (PLS/ac)</u>	<u>Broadcast (PLS/ac)</u>
Ephraim crested	25	2.7	4.0
Russian wildrye	15	1.9	2.8
Squirreltail	5	0.5	0.8
Indian ricegrass	10	1.6	2.3
Sodar streambank	10	1.4	2.0
Slender wheatgrass	15	2.0	3.0
Fourwing saltbush	5	2.0	3.0
Yellow sweetclover	5	0.4	0.6
Prostrate kochia	5	1.0	2.0
Gardner saltbush	5	1.0	1.5
Total		14.5	22.0

It should be noted that these seeding rates have been recommended by the SCS in Price, Upper Colorado Plant Materials Center, Los Lunas Plant Materials Center, SCS Seeding Guides for Utah,

Los Lunas Plant Materials Center, SCS Seeding Guides for Utah, and others.

The following section identifies DOGM's apparent concerns regarding Ephraim crested wheatgrass, and Kaiser's responses to those concerns. These responses are based on current literature and on interviews with reclamation specialists. A list of personnel contacted and a selected bibliography is contained in Attachment 1. In addition, the SCS in Price has composed a recommended seeding mix for use at the Wellington site based on their experience in the area (Attachment 1).

ISSUE:

DOGM is concerned that stands of crested wheatgrass may develop into monocultures.

RESPONSE:

- Results of research and field trials conducted with Ephraim crested wheatgrass have demonstrated that under the extreme environmental conditions present at Wellington, Ephraim will not perform aggressively, and is unlikely to form a monoculture.
- Monocultures of crested wheatgrass are formed when crested wheatgrass is seeded as a single species. When crested wheatgrass is seeded in a mixture, monocultures are not formed.
- Conclusions concerning development of monocultures have resulted from research conducted with other varieties of crested wheatgrass. Research has indicated that Ephraim will not respond in precisely the same manner as other crested varieties.
- Virtual monocultures are approved by the regulatory agency for temporary reclamation when only 3 to 4 species are allowed in a mix. Diversity is an issue only where permanent reclamation is concerned.

ISSUE

DOGM is concerned that crested wheatgrass is unpalatable except for a limited time in the spring.

RESPONSE

- Ephraim stays greener for a longer period of time in the spring than other crested varieties, thereby allowing increased duration of grazing.
- Grazing studies conducted by the Utah Shrub Lab have demonstrated that Ephraim is considerably more palatable

- Kaiser does not intend to permit grazing, and indeed will not allow grazing to be conducted on any reclaimed sites at Wellington. Species palatability, therefore is of no concern at this time.

#### ISSUE

DOGM is concerned that crested wheatgrass is persistent after it becomes established.

#### RESPONSE

- Final reclamation will involve regrading, recountouring, and other substantial earth moving activities which will preclude the ultimate survival of this species in permanently reclaimed areas.
- Ephraim crested wheatgrass can be easily controlled with a light application of an herbicide such as "Round-up". Kaiser has committed to monitoring species performance, and if necessary to control the presence of this species by the use of herbicide or by other mechanical means.

Kaiser requests that the proposed seed mix be approved for the following reasons:

- Both the plant species and the seeding rates at which they have been proposed are known to effectively control erosion on steep slopes and on poor soils.
- Kaiser wishes to continue testing species performance at Wellington while complying with regulatory requirements. Site specific field evaluations of reclamation success will be conducted by Kaiser.

We sincerely appreciate your timely assistance and cooperation in approving this temporary seed mix to be used for site stabilization and temporary reclamation at the Wellington Coal Cleaning Plant. Kaiser plans to complete reclamation activities as soon as practicable in early November, 1986.

Sincerely,

  
Doug Pearce  
Mining Engineer

cc: R. Wiley  
M. Holmes  
S. Hasenjager

ATTACHMENT 1

LIST OF RECLAMATION SPECIALIST CONTACTS

Wendell Oaks  
Manager Plant Materials Center  
Los Lunas, New Mexico

Sam Stranathan  
Manager Upper Colorado Plant Materials Center  
Meeker, Colorado

John Olson  
General Manager, Director of Reclamation  
Antelope Coal, Nerco  
Douglas, Wyoming

Mike Coats  
Reclamation Biologist  
York Canyon Mine  
Raton, New Mexico

Marcia Wolfe  
Manager of Reclamation  
Bechtel Corporation  
Bakersfield, California

Larry Kline  
Office of Surface Mining  
Denver, Colorado

Ray Austin  
Reclamation Biologist  
Montana Dept. State Lands  
Helena, MT

Page Smith  
Reclamation Biologist, Range Scientist  
Wyoming Dept. Environmental Quality  
Cheyenne, WY

Jack Smith  
Reclamation Biologist, Range Scientist  
Wyoming Dept. Environmental Quality  
Cheyenne, WY

Wendell Hassell  
SCS Plant Materials Specialist  
Denver, CO

Gary Noler  
Plant Materials Specialist  
Upper Colorado Plant Materials Center  
Meeker, CO

Richard Stevens  
Utah Div. of Wildlife  
Ephraim, Ut

Stan Young  
Plant Services Department  
Logan, UT

Scott Ferguson  
Range Conservationist  
Soil Conservation Service  
Price, Utah

George Cook  
Range Conservationist  
Soil Conservation Service  
Price, UT

Jacy Gibbs  
Plant Materials Specialist  
Soil Conservation Service  
Boise, ID

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UNITED STATES DEPARTMENT OF AGRICULTURE  
SOIL CONSERVATION SERVICE  
350 N. 4th E. Price, UT. 84501

October 20, 1986

Ms. Susan Hasenjager  
Sunnyside Mines  
Sunnyside, UT. 84539

Dear Ms. Hasenjager:

This letter is in response to your request for reclamation seeding mixes and rates. All rates are in Pure Live Seed, drilled.

Wellington-Washer Site (app. 10 in. annual precipitation)

Siberian Wheatgrass	2	lbs.	per	acre
Fairway Crested Wheatgrass	2	"	"	"
Ephriam Crested Wheatgrass	2	"	"	"
Indian Ricegrass	2	"	"	"
Russian Wildrye	2	"	"	"
Penstemon	1	"	"	"
Yellow Sweetclover	1/2	"	"	"
Fourwing Saltbush	2	"	"	"

13 1/2 total lbs. per acre

Pinyon-Juniper Site (app. 12 in. annual precipitation)

All the above, with the addition of 'Appar' Lewis FLax at 1 lb. per acre. From your description of the site, it sounds marginal for 'Delar' Small Burnet, but you could try it at 2 lbs. per acre.

Please give me a call if you need any further assistance.

*Scott E. Ferguson*

Scott E. Ferguson  
Range Conservationist, SCS, Price, UT.

cc: Keith Beardall, District Conservationist, SCS, Price, UT.

Attachment 4. Approved Interim Seeding Mixture

 STATE OF UTAH  
NATURAL RESOURCES  
Oil, Gas & Mining

Norman H. Bangerter, Governor  
Dee C. Hansen, Executive Director  
Dianne R. Nielson, Ph.D., Division Director

355 W. North Temple • 3 Triad Center • Suite 350 • Salt Lake City, UT 84180-1203 • 801-538-5340

*Received 11/20  
DDB*

November 14, 1986

CERTIFIED RETURN RECEIPT REQUESTED  
P-402-459-473

Mr. Rob Wiley  
Kaiser Coal Company  
P. O. Box 10  
Sunnyside, Utah 84539

Dear Mr. Wiley:

Re: Approved Changes in the Temporary Seed Mix for the Wellington Coal Cleaning Plant, ACT/007/012, Folder No. 4 and 14, Carbon County, Utah

The Division has reviewed your October 24, 1986 request to revise the seed mix to be used for temporary stabilization at the Wellington Coal Cleaning Plant.

While the Division appreciates the effort Kaiser has made in developing the proposed mix, and recognizes the harshness of the site and the difficulty in establishing vegetation at the Wellington site, it does not agree with all statements made in your request based on personal experience and consulting with other professional reclamationists, including some that you have referenced.

As proposed, the seed mix normally would not be acceptable. However, under the following conditions and changes in the seeding rate, the Division will allow the use of these species for 1986 planting on an experimental basis.

Page 2  
Mr. Rob Wiley  
ACT/007/012  
November 14, 1986

Species	Drill Rate PLS/ac
Russian wildrye ( <u>Elymus junceus</u> )	2.0
Squirreltail ( <u>Sitanion hystrix</u> )	1.0
Indian Ricegrass ( <u>Oryzopsis hymenoides</u> )	3.0
Streambank wheatgrass ( <u>Agropyron riparium</u> )	3.0
Slender Wheatgrass ( <u>Agropyron trachycaulum</u> )	3.0
Yellow Sweetclover ( <u>Melilotus officinalis</u> )	1.0
Four-wing saltbush ( <u>Atriplex canescens</u> )	2.0
Gardner saltbush ( <u>Atriplex gardneri</u> )	1.0
*'immgrant' forage kochia ( <u>Kochia prostrata</u> )	1.0*

\* Forage kochia does not establish from drill seeding and should be broadcast on the surface at 1 pound/acre PLS.

Areas that will be broadcast seeded are to be seeded at double the drill seeding rate.

Ephraim crested wheatgrass may be added at 1 pound/acre PLS (Drill rate) to all areas except topsoil or substitute topsoil stockpiles.

Since it is believed that many of the past seeding failures may be due to poor quality seed, the Division would like a current seed analysis so that if success is not achieved one could more easily determine the cause. Therefore, once the seed has been obtained please contact Carl Bott, Seed Inspector in Price at 637-4500 to obtain a sample for analysis at the State Seed Lab. A copy of the results is to be submitted to DOGM.

The Division appreciates Kaiser's willingness to perform the necessary revegetation tasks. The primary goal of revegetation is to stabilize the soils. Recognizing the costs involved and the

Page 3

Mr. Rob Wiley

ACT/007/012

November 14, 1986

"slow" development of many native species, the Division will allow a minimum of two growing seasons before areas of apparent poor success are required to be reseeded, provided:

1. there are no obvious revegetation problems;
2. soils are stable;
3. a map showing the locations of the areas that are seeded this year must be submitted with the annual reclamation report.

Should you have any questions, please feel free to call.

Sincerely,



Susan C. Linner  
Reclamation Biologist/  
Permit Supervisor

jvb

cc: D. Lof

L. Kunzler

0092R-41

Attachment 5. Spoil Pile Reclamation Alternative Request  
Susan D. Hasenjager permitting/environmental consultant  
9337 W. Iowa Ave.  
Lakewood, Colorado 80226

November 10, 1986

Susan Linner  
Permit Supervisor  
State of Utah Natural Resources  
Oil, Gas and Mining  
355 W. North Temple  
3 Triad Center, Ste. 350  
Salt Lake City, Utah 84180-1203

RE: Wellington Coal Cleaning Plant Soil Samples and Reclamation  
of Spoil Pile

Dear Ms. Linner:

The purpose of this letter is to transmit certain soil analyses to the Division, and to recommend based on these data that non-vegetative measures be employed to stabilize the spoil pile located near the Wellington Preparation Plant. Per the DOGM's request, temporary vegetative reclamation of this area is scheduled for the week of November 10, 1986. However, it is Kaiser's concern that vegetative stabilization of this site will be unsuccessful due to high sodium and SAR values, and that increased erosion will occur as a result of the attempted reclamation. Consequently, Kaiser objects to vegetative stabilization of the site, and recommends that the already regraded pile be further stabilized by constructing a berm at the base of the pile to control runoff. It is further recommended that seeding of this area not occur at this time. Kaiser requests that this alternative stabilization method be approved by DOGM. I discussed this matter with James Leatherwood on November 10, 1986.

Please find enclosed a copy of the analyses for soil samples that were collected at the Wellington Plant in early September, 1986. A continuous, one quart composite sample was obtained from each site to be reclaimed by sampling three to five holes, 0 to 16" deep. Each sample was collected for the individual specific area requiring temporary reclamation; these areas are identified as Samples # 1 through 6.

<u>Sample #</u>	<u>Site Location</u>
#1	Spoil pile located near preparation plant, 0-8" depth
#2	Rock gabion and catchment pond, on slurry pond side of river. 0-12" depth
#3	Topsoil stockpile, 0-14" depth
#4	Subsoil stockpile, 0-14" depth
#5	Sauerman Dragline tail tower, 0-12" depth
#6	Roadside on way to rock gabion and catchment pond, 0-16" depth

The spoil pile has been regraded such that the slope is relatively flat; a majority of the pile is probably between 4 or 5h: 1 v, with the steepest portion being approximately 2.5 or 3 h: 1 v. Currently, the area shows no signs of erosion, and appears to be quite stable. Permanent reclamation of this pile will include replacement of the material into the excavated pit, topsoiling, and revegetation utilizing the permanent seed mix.

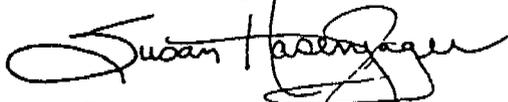
The DOGM has requested that Kaiser temporarily reclaim the spoil pile area utilizing the mix approved for the fall 1986 seeding. However, the soil sampling results for the spoil pile, Sample #1, indicate very high pH, conductivity, sodium, and SAR values. Consequently, it is Kaiser's concern that if reclamation is attempted on this material without topsoiling or other extensive soil modification such as leaching, any vegetative establishment is extremely unlikely. It should be further noted that prior to reclamation, the area would require deep ripping and scarification, thereby significantly increasing erosion and runoff on this site. Additional questions concerning stabilization and erosion control, would likely arise as a result of this procedure.

Because vegetative stabilization of the site is highly unlikely, Kaiser recommends that in addition to the already completed regrading, the site be further protected by constructing a berm around the base of the pile to contain runoff. This protection would remain in place until final reclamation. Seeding of the pile would not occur at this time. However, if the pile exhibits erosion or other problems prior to final reclamation, Kaiser will utilize soil modification techniques, chemical stabilizers, or reclamation in order to achieve temporary stabilization. Kaiser feels that this proposed procedure would provide for protection of the site, and prevent runoff contamination of the surrounding area.

Kaiser requests that DOGM approve this non-vegetative, temporary stabilization procedure for the spoil pile. We would appreciate any additional comments or suggestions that the Division may have concerning this matter or any other reclamation measures which may be appropriate for the property.

If you have any questions concerning this proposal. please feel free to contact either Brad Bourquin, Sunnyside Mines new Chief Engineer, or myself. Thank you for your assistance.

Sincerely,

A handwritten signature in cursive script, appearing to read "Susan Hasenjaeger".

Susan D. Hasenjaeger  
Permitting/Environmental  
Consultant

cc: Brad Bourquin  
Marty Holmes

Attachment 6



STATE OF UTAH  
NATURAL RESOURCES  
Oil, Gas & Mining

DOGM Spoil Pile Approval Letter

Norman H. Bangerter, Governor  
Dee C. Hanson, Executive Director  
Dianne R. Nielson, Ph.D., Division Director

355 W. North Temple • 3 Triad Center • Suite 350 • Salt Lake City, UT 84180-1203 • 801-538-5340

November 21, 1986

Ms. Susan Hasenjager  
9337 West Iowa Avenue  
Lakewood, Colorado 80226

Dear Ms. Hasenjager:

Re: Spoil Pile Stabilization, Kaiser Steel Corporation, Wellington  
Coal Prep Plant, ACT/007/012, Carbon County, Utah

The Division concurs with your recommendation that non-vegetative measures be temporarily employed to stabilize the spoil pile located near the Wellington Preparation Plant. The spoil analysis indicates a toxic sodium adsorption ratio level, a high pH and high conductivity. However, due to the possibility of error in sample analysis further extensive analysis is required. At a minimum this must include three (3) sample sites with samples taken at every two (2) feet in depth. The analysis shall include the following parameters: pH, conductivity, calcium, magnesium, sodium, and sodium adsorption ratio. Spoil analysis data must be submitted to the Division prior to March 1, 1987. Upon submittal of this information the Division will make a determination as to the appropriate methodology to stabilize the spoil material. If you have any questions please don't hesitate to call.

Sincerely,

*Susan C. Linner*  
Susan C. Linner  
Reclamation Biologist/  
Permit Supervisor

jvb  
cc: L. Kunzler  
J. Leatherwood  
D. Lof  
0060R-35

**KAISER  
COAL**

KAISER COAL CORPORATION  
Sunnyside Coal Mines  
P.O. Box D  
Sunnyside, Utah 84539  
Telephone (801) 888-4421

Attachment 7  
Cross-section Submittal  
Letter for Spoil Pile

December 30, 1986

Mr. Lowell P. Braxton, Administrator  
Mineral Resource Development and Reclamation Program  
Utah Division of Oil, Gas & Mining  
355 W. North Temple  
3 Triad Center, Suite 350  
Salt Lake City, Utah 84180-1203

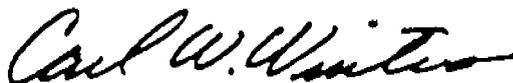
Re: Spoil Pile II  
Wellington Coal Preparation Plant  
ACT/007/012

Dear Mr. Braxton:

Enclosed you will please find seven (7) prints of drawing C4-0071 which shows cross-sections of the subject spoil pile. These prints are submitted in accordance with the second stipulation to which Ms. Susan Hasenjager committed Kaiser Coal in her November 24 letter to Ms. Susan Linner.

The first stipulation Ms. Hasenjager committed to was to construct a berm around the subject spoil pile. This berm has been constructed. Additionally, as stipulated by both Ms. Hasenjager and Ms. Linner (November 21), Kaiser Coal will resample the spoil pile and submit the analysis to DOGM by March 1, 1987, weather permitting.

Sincerely,



Carl W. Winters  
Senior Mining Engineer

cc: Susan Hasenjager ✓

ATTACHMENT 8

SEEDING MIXTURE FOR THE SURFACE FACILITIES TEST PLOT  
MIXTURE A

Plant Species	Common Name	Broadcast Rate <sup>1</sup> (PLS/ac)
Agropyron trachycaulum	Slender wheatgrass	3.15
Bouteloua gracilis	Blue gramma grass	0.75
Hilaria jamesii	Galleta	1.5
Oryzopsis hymenoides	Indian ricegrass	2.7
Sporobolis airoides	Alkali sacaton	0.3
Eriogonum umbellatum	Sulfer buckwheat	0.38
Melilotus officinalis	Yellow sweetclover	0.75
Sphaeracea coccinea	Scarlet globemallow	0.38
Artemisia nova	Black sagebrush	0.45
Chrysothamnus nauseosus	Rubber rabbitbrush	0.3
Atriplex canescens	Fourwing saltbush	0.75
Atriplex confertifolia	Shadscale	0.6
Ceratoides lanata	Winterfat	0.75
Ephedra viridis	Green ephedra	0.45
	TOTAL PLS/AC	13.21

<sup>1</sup> = Rates based on broascast rate of 80 PLS/ft<sup>2</sup>

NOTE: The above rates were doubled to 160 PLS/ft<sup>2</sup> at the time of seeding.

ATTACHMENT 9

SEEDING MIXTURE FOR SURFACE FACILITIES  
MIXTURE B

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Plant Species	Common Name	Broadcast Rate <sup>1</sup> (PLS/ac)
Sporobolis airoides	Alkali sacaton	0.62
Hilaria jamesii	Galleta	2.32
Penstemon strictus	Bandera Rocky Mt. penstemon	1.10
Atriplex canescens	Fourwing saltbush	12.57
	TOTAL PLS/AC	16.61

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<sup>1</sup> = Rates based on broadcasting 80 PLS/ft<sup>2</sup>

Note: Rates were doubled to 160 PLS/ft<sup>2</sup> at the time of seeding.

ATTACHMENT 10

COARSE REFUSE AND COARSE SLURRY TEST PLOTS SEEDING MIXTURES

Plant Species	Common Name	Broadcast Rate <sup>1</sup> (PLS/ac)
<i>Agropyron trachycaulum</i>	Slender wheatgrass	4.2
<i>Poa pratensis</i>	Kentucky bluegrass	1.0
<i>Hilaria jamesii</i>	Galleta	2.0
<i>Oryzopsis hymenoides</i>	Indian ricegrass	3.6
<i>Sporobolis airoides</i>	Alkali sacaton	0.4
<i>Aster chilensis</i>	Pacific aster	0.3
<i>Melilotis officinalis</i>	Yellow sweetclover	1.0
<i>Linum lewisii</i>	Lewis flax	0.3
<i>Sphalcerea coccinea</i>	Scarlet globemallow	0.5
<i>Artemisia nova</i>	Black sagebrush	0.6
<i>Chrysothamnus nauseosus</i>	Rubber rabbitbrush	0.4
<i>Atriplex canescens</i>	Fourwing saltbush	1.0
<i>Atriplex confertifolia</i>	Shadscale	0.8
<i>Ceratoides lanata</i>	Winterfat	1.0
<i>Ephedra viridis</i>	Green ephedra	0.6
<i>Penstemon strictus</i>	Bandera Rocky Mt. pentemon	0.3
	TOTAL PLS/AC	18.0

<sup>1</sup> = Rates based on broadcasting rate of 108 PLS/ft<sup>2</sup>.

ATTACHMENT 11

SEEDING MIXTURE FOR FINE SLURRY TEST PLOT

Plant Species	Common Name	Broadcast Rate <sup>1</sup> (PLS/ac)
<i>Agropyron dasystachum</i>	Thickspike wheatgrass	3.0
<i>Agropyron trachycaulum</i>	Slender wheatgrass	3.0
<i>Agropyron smithii</i>	Western wheatgrass	1.0
<i>Elymus cinereus</i>	Great basin wildrye	1.0
<i>Hilaria jamesii</i>	Galleta	2.0
<i>Oryzopsis hymenoides</i>	Indian ricegrass	2.6
<i>Sporobolis airoides</i>	Alkali sacaton	0.3
<i>Helianthus annuus</i>	Annual sunflower	1.3
<i>Linum lewisii</i>	Lewis flax	1.0
<i>Melilotus officinalis</i>	Yellow sweetclover	1.3
<i>Atriplex canescens</i>	Fourwing saltbush	1.0
<i>Atriplex gardneri</i>	Gardner saltbush	1.0
<i>Ceratoides lanata</i>	Winterfat	1.3
<i>Chrysothamnus nauseosus</i>	Rubber rabbitbrush	0.4
<i>Sarcobatus vermiculatus</i>	Greasewood	0.5
<i>Penstemon strictus</i>	rocky mountain penstemon	1.0
	TOTAL PLS/AC	21.7

<sup>1</sup> = Rates based on broadcast rate of 108 PLS/ft<sup>2</sup>

ATTACHMENT 12

SURFACE FACILITIES TEST PLOT  
TREATMENTS, NUMBER OF REPLICATIONS AND SAMPLES

<u>TREATMENT</u>		<u>REPLICATIONS</u>	<u>SAMPLES</u>
1	Unirrigated, Species Mix A, 3 in. Topsoil	3	15
2	Unirrigated, Species Mix A, 0 in. Topsoil	3	15
3	Unirrigated, Species Mix B, 0 in. Topsoil	3	15
4	Unirrigated, Species Mix B, 3 in. Topsoil	3	15
5	Irrigated, Species Mix A, 0 in. Topsoil	3	15
6	Irrigated, Species Mix A, 3 in. Topsoil	3	15
7	Irrigated, Species Mix B, 3 in. Topsoil	3	15
8	Irrigated, Species Mix B, 0 in. Topsoil	3	15

ATTACHMENT 13

COARSE REFUSE TEST PLOT  
TREATMENTS, NUMBER OF REPLICATIONS AND SAMPLES

<u>TREATMENT</u>	<u>REPLICATIONS</u>	<u>SAMPLES</u>
1 Unirrigated, 6 in. Topsoil, Organic, C. S.	3	15
2 Unirrigated, 6 in. Topsoil, None, C.S.	3	15
3 Unirrigated, 6 in. Topsoil, Organic, No C.S.	3	15
4 Unirrigated, 6 in. Topsoil, None, No C.S.	3	15
5 Irrigated, 6 in. Topsoil, Organic, C.S.	5	25
6 Irrigated, 6 in. Topsoil, None, C.S.	2	10
7 Irrigated, 6 in. Topsoil, Organic, No C.S.	1	5
8 Irrigated, 6 in. Topsoil, None, No C.S.	4	20
9 Unirrigated, 12 in. Topsoil, Organic, C.S.	3	15
10 Unirrigated, 12 in. Topsoil, None, C.S.	3	15
11 Unirrigated, 12 in. Topsoil, Organic, No C.S.	3	15
12 Unirrigated, 12 in. Topsoil, None, No C.S.	3	15
13 Irrigated, 12 in. Topsoil, Organic, C.S.	2	10
14 Irrigated, 12 in. Topsoil, None, C.S.	4	20
15 Irrigated, 12 in. Topsoil, Organic, No C.S.	4	20
16 Irrigated, 12 in. Topsoil, None, No C.S.	2	10

Organic = Organic Amendment added  
None = No Organic Amendment added.  
C.S. = Coarse Slurry Cover  
No C.S. = No Coarse Slurry Cover

ATTACHMENT 14

COARSE SLURRY TEST PLOT  
TREATMENTS, NUMBER OF REPLICATIONS AND SAMPLES

<u>TREATMENT</u>	<u>REPLICATIONS</u>	<u>SAMPLES</u>
1 Unirrigated, 6 in. topsoil, None	3	15
2 Unirrigated, 6 in. topsoil, Organic	3	15
3 Irrigated, 6 in. topsoil, None	3	15
4 Irrigated, 6 in. topsoil, Organic	3	15
5 Unirrigated, 12 in. topsoil, None	3	15
6 Unirrigated, 12 in. topsoil, Organic	3	15
7 Irrigated, 12 in. topsoil, None	3	15
8 Irrigated, 12 in. topsoil, Organic	3	15

Organic = Organic Amendment added.  
None = No Organic Aementment added.

ATTACHMENT 15

FINE SLURRY TEST PLOT  
TREATMENTS, NUMBER OF REPLICATIONS AND SAMPLES

<u>TREATMENT</u>	<u>REPLICATIONS</u>	<u>SAMPLES</u>
1 Irrigated, Slurry cover, Organic, 12 in.	3	15
2 Irrigated, Slurry cover, None, 12 in.	3	15
3 Irrigated, Slurry cover, Organic, 6 in.	3	15
4 Irrigated, Slurry cover, None, 6 in.	3	15
5 Unirrigated, Slurry cover, Organic, 12 in.	3	15
6 Unirrigated, Slurry cover, None, 12 in.	3	15
7 Unirrigated, Slurry cover, Organic, 6 in.	3	15
8 Unirrigated, Slurry cover, None, 6 in.	3	15
9 Irrigated, No Slurry cover, Organic, 12 in.	3	15
10 Irrigated, No Slurry cover, None, 12 in.	3	15
11 Irrigated, No Slurry cover, Organic, 6 in.	3	15
12 Irrigated, No Slurry cover, None, 6 in.	3	15
13 Unirrigated, No Slurry cover, Organic, 12 in.	3	15
14 Unirrigated, No Slurry cover, None, 12 in.	3	15
15 Unirrigated, No Slurry cover, Organic, 6 in.	3	15
16 Unirrigated, No Slurry cover, None, 6 in.	3	15

Organic = Organic Amendment (Sewage Sludge) added.

None = No Organic Amendment added.

in. = Amount of borrowed topsoil added.

ATTACHMENT 16

PLANT SPECIES LIST

SCIENTIFIC NAMES

COMMON NAMES

SHRUBS

<i>Atriplex canescens</i>	Fourwing saltbush
<i>Atriplex confertifolia</i>	Shadscale
<i>Ceratoides lanata</i>	Winterfat
<i>Chrysothamnus nauseosus</i>	Rubber rabbitbrush

FORBS

<i>Achillea milifolium</i>	Western yarrow
<i>Chenopodium fremontii</i>	Fremont goosefoot
<i>Convolvulus arvensis</i>	Goosefoot
<i>Descurania pinnata</i>	Tansy mustard
<i>Grindelia squarrosa</i>	Gumweed
<i>Gutierrezia sarothrae</i>	Snakeweed
<i>Halogeton glomeratus</i>	Halogeton
<i>Helianthus annuus</i>	Annual sunflower
<i>Iva axillaris</i>	Povertyweed
<i>Kochia scoparia</i>	Summer cypress
<i>Linum lewisii</i>	Lewis flax
<i>Machaeranthera canescens</i>	Hoary aster
<i>Malcomia africana</i>	African mustard
<i>Medicago sativa</i>	Alfalfa
<i>Melilotus alba</i>	White sweetclover
<i>Melilotus officinalis</i>	Yellow sweetclover
<i>Penstemon strictus</i> var. <i>bandera</i>	Bandera penstemon
<i>Polygonum aviculare</i>	Prostrate knotweed
<i>Polygonum ramosissimum</i>	Bushy knotweed
<i>Salsola iberica</i>	Russian thistle
<i>Schedonnardus paniculatus</i>	Tumblegrass
<i>Sisymbrium altissimum</i>	Tumble mustard
<i>Sphaeralcea coccinea</i>	Globemallow
<i>Suaeda torreyana</i>	Seepweed

GRASSES

<i>Agropyron trachycaulum</i>	Slender wheatgrass
<i>Avena fatua</i>	Oats
<i>Bouteloua gracilis</i>	Bluegramma grass
<i>Bromus commutatus</i>	Hairy chess
<i>Bromus tectorum</i>	Cheatgrass
<i>Hilaria jamesii</i>	Galleta
<i>Hordeum jubatum</i>	Foxtail barley
<i>Oryzopsis hymenoides</i>	Indian ricegrass
<i>Sporobolus airoides</i>	Alkali sacaton
<i>Triticum aestivum</i>	Wheat

ATTACHMENT 17

SURFACE FACILITIES TEST PLOT  
SAMPLING RESULTS

	Treatment 1			Treatment 2		
	MEAN	STD	CONST.	MEAN	STD	CONST.
<b>FORBS</b>						
CONVOLVULUS ARVENSIS						
DESCURANIA PINNATA	1.45	1.89	60.0	0.50	0.50	13.3
GRINDELIA SQUARROSA				3.00		6.7
GUTIERREZIA SAROTHRÆ				2.00	2.00	13.3
HALOGETON GLOMERATUS	4.00	2.11	86.7	6.62	3.65	86.7
IVA AXILLARIS						
KOCHIA SCOPARIA	14.43	6.32	93.3	3.67	1.70	80.0
LINUM LEWISII						
MACHAERANTHERA CANESCENS						
MELILOTUS ALBA				1.00		6.7
MELILOTUS OFFICINALIS	3.50	0.50	13.3	2.78	0.92	60.0
PENSTEMON BANDERA						
POLYGONUM AVICULARE	2.50	1.12	26.7			
POLYGONUM RAMOSISSIMUM				0.00		6.7
SALSOLA IBERICA	7.00		6.7	5.80	4.79	33.3
SCHEDONNARDUS PANICULATUS						
SISYMBRIUM ALTISSIMUM	0.00		6.7			
SUBTOTAL	32.88			25.37		
<b>GRAMINOIDS</b>						
AGROPYRON SPICATUM				2.00		6.7
AGROPYRON TRACHYCAULUM	2.75	1.79	26.7	4.80	5.40	66.7
BOUTELOUA GRACILIS	0.00		6.7			
BROMUS TECTORUM				1.50	1.50	13.3
HILARIA JAMESII						
HORDEUM JUBATUM						
SUBTOTAL	2.75			8.30		
<b>SHRUBS &amp; SUBSHRUBS</b>						
ATRIPLEX CANESCENS	2.60	1.85	33.3	2.17	0.37	40.0
ATRIPLEX CONFERTIFOLIA				2.00	1.41	20.0
CERATOIDES LANATA	1.00		13.3	2.50	1.50	13.3
CHRYSOTHAMNUS NAUSEOSUS	1.50	1.50	13.3	3.00		6.7
SUBTOTAL	5.10			9.67		
TOTAL VEGETATION	40.73	17.08		43.33	23.74	
BARE	59.00	18.98	100.0	50.33	27.48	100.0
ROCK	1.00		13.3	8.29	9.57	93.3
LITTER	19.53	15.22	100.0	23.73	21.39	100.0

ATTACHMENT 17 (CONT.)

SURFACE FACILITIES TEST PLOT  
SAMPLING RESULTS

	Treatment 3			Treatment 4		
	MEAN	STD	CONST.	MEAN	STD	CONST.
<b>FORBS</b>						
CONVOLVULUS ARVENSIS						
DESCURANIA PINNATA	2.75	1.48	26.7	5.00		6.7
GRINDELIA SQUARROSA						
GUTIERREZIA SAROTHRAE	4.00		6.7	2.00		6.7
HALOGETON GLOMERATUS	4.86	2.67	93.3	2.44	1.34	60.0
IYA AXILLARIS						
KOCHIA SCOPARIA	5.20	1.83	100.0	4.93	1.53	100.0
LINUM LEWISII						
MACHAERANTHERA CANESCENS	3.00	1.00	13.3	0.50	0.50	13.3
MELILOTUS ALBA				1.67	1.25	20.0
MELILOTUS OFFICINALIS				4.00		6.7
PENSTEMON BANDERA				1.00		6.7
POLYGONUM AVICULARE						
POLYGONUM RAMOSISSIMUM	0.75	1.30	26.7	1.00	1.00	13.3
SALSOLA IBERICA						
SCHEDONNARDUS PANICULATUS						
SISYMBRIUM ALTISSIMUM						
SUBTOTAL	20.56			22.54		
<b>GRAMINOIDS</b>						
AGROPYRON SPICATUM						
AGROPYRON TRACHYCAULUM	1.75	1.48	26.7	2.50	0.50	13.3
BOUTELOUA GRACILIS						
BROMUS TECTORUM				2.33	0.47	20.0
HILARIA JAMESII						
HORDEUM JUBATUM						
SUBTOTAL	1.75			4.83		
<b>SHRUBS &amp; SUBSHRUBS</b>						
ATRIPLEX CANESCENS	3.09	0.90	73.3	4.30	1.95	66.7
ATRIPLEX CONFERTIFOLIA				3.25	1.30	26.7
CERATOIDES LANATA						
CHRYSOTHAMNUS NAUSEOSUS	2.50	1.66	26.7	1.20	0.98	33.3
SUBTOTAL	5.59			8.75		
TOTAL VEGETATION	27.90	12.32		36.13	10.82	
BARE	67.80	23.12	100.0	66.40	28.86	100.0
ROCK	2.80	1.66	66.7	2.00	1.00	26.7
LITTER	15.60	22.72	100.0	20.40	27.51	100.0

ATTACHMENT 17 (CONT.)

SURFACE FACILITIES TEST PLOT  
SAMPLING RESULTS

	Treatment 5			Treatment 6		
	MEAN	STD	CONST.	MEAN	STD	CONST.
<b>FORBS</b>						
CONVOLVULUS ARVENSIS				1.00		6.7
DESCURANIA PINNATA						
GRINDELIA SQUARROSA				1.75	0.43	26.7
GUTIERREZIA SAROTHRAE	1.00		20.0			
HALOGETON GLOMERATUS	4.57	2.56	46.7	6.40	6.92	33.3
IVA AXILLARIS	1.00		6.7	2.50	2.50	13.3
KOCHIA SCOPARIA	1.50	1.38	40.0	2.78	1.40	60.0
LINUM LEWISII	0.00		20.0			
MACHAERANTHERA CANESCENS	1.00		6.7	0.00		6.7
MELILOTUS ALBA	12.00	10.22	60.0	6.17	4.18	40.0
MELILOTUS OFFICINALIS	12.14	15.93	46.7	3.00	1.53	40.0
PENSTEMON BANDERA				1.00		6.7
POLYGONUM AVICULARE						
POLYGONUM RAMOSISSIMUM						
SALSOLA IBERICA				3.00		6.7
SCHEDONNARDUS PANICULATUS	3.00		6.7			
SISYMBRIUM ALTISSIMUM						
SUBTOTAL	36.21			27.60		
<b>GRAMINOIDS</b>						
AGROPYRON SPICATUM						
AGROPYRON TRACHYCAULUM	7.93	7.83	100.0	6.00	3.01	100.0
BOUTELOUA GRACILIS	0.00		20.0	1.60	0.80	33.3
BROMUS TECTORUM						
HILARIA JAMESII				2.00		6.7
HORDEUM JUBATUM	1.00		6.7	5.00		6.7
SUBTOTAL	8.93			14.60		
<b>SHRUBS &amp; SUBSHRUBS</b>						
ATRIPLEX CANESCENS	1.17	1.07	40.0	3.60	1.50	33.3
ATRIPLEX CONFERTIFOLIA	1.00	0.82	20.0	2.00		6.7
CERATOIDES LANATA	0.00		20.0	1.50	1.50	13.3
CHRYSOTHAMNUS NAUSEOSUS	1.50	1.50	13.3	0.00		20.0
SUBTOTAL	3.67			7.10		
TOTAL VEGETATION	48.82	41.30		49.30	23.76	
BARE	35.53	22.22	100.0	51.40	24.16	100.0
ROCK	13.87	14.23	100.0	4.25	5.17	26.7
LITTER	24.93	19.56	100.0	29.13	21.74	100.0

ATTACHMENT 17 (CONT.)

SURFACE FACILITIES TEST PLOT  
SAMPLING RESULTS

	Treatment 7			Treatment 8		
	MEAN	STD	CONST.	MEAN	STD	CONST.
<b>FORBS</b>						
CONVOLVULUS ARVENSIS	0.00		6.7			
DESCURANIA PINNATA	1.00		6.7	0.00		6.7
GRINDELIA SQUARROSA	1.83	1.07	40.0			
GUTIERREZIA SAROTHRAE	3.33	1.25	20.0	1.60	1.85	33.3
HALOGETON GLOMERATUS	1.75	0.83	26.7	4.11	1.45	60.0
IYA AXILLARIS	1.67	1.70	20.0	0.00		13.3
KOCHIA SCOPARIA	2.54	1.60	86.7	3.86	2.07	93.3
LINUM LEWISII						
MACHAERANTHERA CANESCENS	3.00		6.7	1.25	1.09	26.7
MELILOTUS ALBA	5.09	2.27	73.3			
MELILOTUS OFFICINALIS				5.00		6.7
PENSTEMON BANDERA	2.82	0.94	73.3	2.44	2.11	60.0
POLYGONUM AVICULARE						
POLYGONUM RAMOSISSIMUM				0.00		6.7
SALSOLA IBERICA						
SCHEDONNARDUS PANICULATUS						
SISYMBRIUM ALTISSIMUM						
SUBTOTAL	23.03			18.26		
<b>GRAMINOIDS</b>						
AGROPYRON SPICATUM				1.00		6.7
AGROPYRON TRACHYCAULUM	1.50	0.96	40.0	4.00		6.7
BOUTELOUA GRACILIS						
BROMUS TECTORUM	2.17	1.07	40.0	2.50	2.94	66.7
HILARIA JAMESII				2.00	1.00	13.3
HORDEUM JUBATUM	1.00		20.0			
SUBTOTAL	4.67			9.50		
<b>SHRUBS &amp; SUBSHRUBS</b>						
ATRIPLEX CANESCENS	3.50	1.84	93.3	5.27	3.43	100.0
ATRIPLEX CONFERTIFOLIA				1.50	1.50	13.3
CERATOIDES LANATA						
CHRYSOTHAMNUS NAUSEOSUS	1.00		13.3	3.14	1.55	46.7
SUBTOTAL	4.50			9.91		
TOTAL VEGETATION	32.20	13.52		37.68	19.00	
BARE	51.13	29.47	100.0	54.33	19.49	100.0
ROCK	1.50	0.71	53.3	5.33	3.36	100.0
LITTER	30.07	30.19	100.0	18.53	20.44	100.0

## ATTACHMENT 18

COARSE REFUSE TEST PLOT  
SAMPLING RESULTS

	Treatment 1			Treatment 2		
	MEAN	STD	CONST.	MEAN	STD	CONST.
<b>FORBS</b>						
ATRIPLEX SP.						
DESCURANIA PINNATA						
GRINDELIA SQUARROSA						
HALOGETON GLOMERATUS						
KOCHIA SCOPARIA	16.80	6.58	100.0	16.40	6.91	100.0
MACHAERANTHERA CANESCENS						
MELILOTUS OFFICINALIS						
PENSTEMON BANDERA						
POLYGONUM AVICULARE						
POLYGONUM RAMOSISSIMUM	0.33	0.47	40.0	0.20	0.40	33.3
SALSOLA IBERICA						
SUBTOTAL	17.13			16.60		
<b>GRAMINOIDS</b>						
BROMUS COMMUTATUS						
AGROPYRON SPICATUM	0.90	0.70	66.7	0.80	0.40	33.3
BROMUS TECTORUM						
HORDEUM JUBATUM						
ORYZOPSIS HYMENOIDES			73.3			33.3
SITANION HYSTRIX						
SUBTOTAL	0.90			0.80		
<b>SHRUBS &amp; SUBSHRUBS</b>						
ATRIPLEX CANESCENS						
CERATOIDES LANATA	0.00		13.3	1.00		6.7
CHRYSOTHAMNUS NAUSEOSUS						
SUBTOTAL	0.00			1.00		
TOTAL VEGETATION	18.04	7.75		18.40	7.71	
LITTER	13.80	11.14	100.0	17.93	18.12	100.0
ROCK				1.50	0.50	13.3
BARE	68.13	14.46	100.0	64.73	19.15	100.0

ATTACHMENT 18 (CONT.)

COARSE REFUSE TEST PLOT  
SAMPLING RESULTS

	Treatment 3			Treatment 4		
	MEAN	STD	CONST.	MEAN	STD	CONST.
<b>FORBS</b>						
ATRIPLEX SP.						
DESCURANIA PINNATA	0.00		6.7	0.00		13.3
GRINDELIA SQUARROSA						
HALOGETON GLOMERATUS	1.00		6.7			
KOCHIA SCOPARIA	17.53	10.65	100.0	16.20	10.20	100.0
MACHAERANTHERA CANESCENS						
MELILOTUS OFFICINALIS						
PENSTEMON BANDERA	0.00		6.7	0.00		6.7
POLYGONUM AVICULARE						
POLYGONUM RAMOSISSIMUM	0.17	0.37	40.0	0.89	0.88	60.0
SALSOLA IBERICA						
SUBTOTAL	18.70			17.09		
<b>GRAMINOIDS</b>						
BROMUS COMMUTATUS						
AGROPYRON SPICATUM	0.88	1.05	53.3	1.30	0.90	66.7
BROMUS TECTORUM						
HORDEUM JUBATUM						
ORYZOPSIS HYMENOIDES			73.3			60.0
SITANION HYSTRIX						6.7
SUBTOTAL	0.88			1.30		
<b>SHRUBS &amp; SUBSHRUBS</b>						
ATRIPLEX CANESCENS						
CERATOIDES LANATA	0.00		6.7	0.00		20.0
CHRYSOTHAMNUS NAUSEOSUS						
SUBTOTAL	0.00			0.00		
TOTAL VEGETATION	19.58	12.07		18.39	11.97	
LITTER	9.93	5.47	100.0	37.00	26.50	100.0
ROCK	1.00		6.7	1.00		6.7
BARE	71.53	13.54	100.0	44.73	28.62	100.0

ATTACHMENT 18 (CONT.)

COARSE REFUSE TEST PLOT  
SAMPLING RESULTS

	Treatment 5			Treatment 6		
	MEAN	STD	CONST.	MEAN	STD	CONST.
<b>FORBS</b>						
ATRIPLEX SP.	0.00		6.7	1.00		6.7
DESCURANIA PINNATA	1.00	1.00	13.3			
GRINDELIA SQUARROSA						
HALOGETON GLOMERATUS	0.00		26.7	1.00	1.00	13.3
KOCHIA SCOPARIA	22.08	12.39	166.7	25.50	8.20	66.7
MACHAERANTHERA CANESCENS						
MELILOTUS OFFICINALIS	0.00		6.7	0.00		6.7
PENSTEMON BANDERA						
POLYGONUM AVICULARE						
POLYGONUM RAMOSISSIMUM	0.92	1.21	86.7	1.50	1.12	53.3
SALSOLA IBERICA	0.00		6.7			
SUBTOTAL	24.00			29.00		
<b>GRAMINOIDS</b>						
BROMUS COMMUTATUS						
AGROPYRON SPICATUM	0.52	0.71	153.3	1.25	0.66	53.3
BROMUS TECTORUM	0.00		6.7			
HORDEUM JUBATUM	0.20	0.40	33.3			
ORYZOPSIS HYMENOIDES			86.7			26.7
SITANION HYSTRIX						
SUBTOTAL	0.72			1.25		
<b>SHRUBS &amp; SUBSHRUBS</b>						
ATRIPLEX CANESCENS						
CERATOIDES LANATA	0.00		33.3	0.33	0.47	20.0
CHRYSOTHAMNUS NAUSEOSUS	1.00		6.7	0.00		6.7
SUBTOTAL	1.00			0.33		
TOTAL VEGETATION	24.73	15.71		30.59	11.45	
LITTER	5.12	1.80	166.7	6.00	2.57	66.7
ROCK						
BARE	71.52	12.32	166.7	65.20	6.60	66.7

ATTACHMENT 18 (CONT.)

COARSE REFUSE TEST PLOT  
SAMPLING RESULTS

	Treatment 7			Treatment 8		
	MEAN	STD	CONST.	MEAN	STD	CONST.
FORBS						
ATRIPLEX SP.						
DESCURANIA PINNATA						
GRINDELIA SQUARROSA				0.00		6.7
HALOGETON GLOMERATUS	0.00		6.7	0.00		26.7
KOCHIA SCOPARIA	37.00	25.42	33.3	18.80	12.33	133.3
MACHAERANTHERA CANESCENS						
MELILOTUS OFFICINALIS				0.00		6.7
PENSTEMON BANDERA						
POLYGONUM AVICULARE						
POLYGONUM RAMOSISSIMUM	0.00	0.63	33.3	0.60	0.80	100.0
SALSOLA IBERICA						
SUBTOTAL	38.00			19.40		
GRAMINOIDS						
BROMUS COMMUTATUS				0.00		13.3
AGROPYRON SPICATUM	0.00		20.0	0.61	0.68	120.0
BROMUS TECTORUM	0.00		13.3			
HORDEUM JUBATUM				0.00		6.7
ORYZOPSIS HYMENOIDES			13.3			46.7
SITANION HYSTRIX						
SUBTOTAL	0.00			0.00		
SHRUBS & SUBSHRUBS						
ATRIPLEX CANESCENS						
CERATOIDES LANATA				0.00		13.3
CHRYSOTHAMNUS NAUSEOSUS	1.00		20.0			
SUBTOTAL	1.00			0.00		
TOTAL VEGETATION	38.00	26.05		20.02	13.81	
LITTER	5.40	1.50	33.3	5.70	4.43	133.3
ROCK						
BARE	56.60	27.10	33.3	74.40	13.42	133.3

ATTACHMENT 18 (CONT.)

COARSE REFUSE TEST PLOT  
SAMPLING RESULTS

	Treatment 9			Treatment 10		
	MEAN	STD	CONST.	MEAN	STD	CONST.
FORBS						
ATRIPLEX SP.	0.00		6.7			
DESCURANIA PINNATA						
GRINDELIA SQUARROSA						
HALOGETON GLOMERATUS						
KOCHIA SCOPARIA	17.27	7.31	100.0	18.67	8.29	100.0
MACHAERANTHERA CANESCENS						
MELILOTUS OFFICINALIS						
PENSTEMON BANDERA						
POLYGONUM AVICULARE						
POLYGONUM RAMOSISSIMUM	1.00		33.3	1.00	0.67	60.0
SALSOLA IBERICA						
SUBTOTAL	18.27			19.67		
GRAMINOIDS						
BROMUS COMMUTATUS						
AGROPYRON SPICATUM	0.93	0.59	93.3	1.31	0.91	86.7
BROMUS TECTORUM						
HORDEUM JUBATUM						
ORYZOPSIS HYMENOIDES	0.91	0.79	73.3	0.22	0.42	60.0
SITANION HYSTRIX						
SUBTOTAL	1.84			1.53		
SHRUBS & SUBSHRUBS						
ATRIPLEX CANESCENS						
CERATOIDES LANATA	0.00		20.0	0.00		26.7
CHRYSOTHAMNUS NAUSEOSUS						
SUBTOTAL	0.00			0.00		
TOTAL VEGETATION	20.11	8.69		21.20	10.28	
LITTER	17.33	16.59	100.0	5.27	1.95	100.0
ROCK	1.00		6.7	1.00		20.0
BARE	62.93	21.25	100.0	73.67	8.70	100.0

ATTACHMENT 18 (CONT.)

COARSE REFUSE TEST PLOT  
SAMPLING RESULTS

	Treatment 11			Treatment 12		
	MEAN	STD	CONST.	MEAN	STD	CONST.
FORBS						
ATRIPLEX SP.				0.60	0.80	33.3
DESCURANIA PINNATA	0.00		13.3	0.00		6.7
GRINDELIA SQUARROSA						
HALOGETON GLOMERATUS	0.50	0.50	13.3	1.00	1.41	20.0
KOCHIA SCOPARIA	22.33	6.74	100.0	16.87	8.72	100.0
MACHAERANTHERA CANESCENS				0.00		6.7
MELILOTUS OFFICINALIS						
PENSTEMON BANDERA						
POLYGONUM AVICULARE				0.00		6.7
POLYGONUM RAMOSISSIMUM	0.72	0.70	46.7	0.50	0.65	80.0
SALSOLA IBERICA				0.00		6.7
SUBTOTAL	23.55			18.97		
GRAMINOIDS						
BROMUS COMMUTATUS						
AGROPYRON SPICATUM	0.64	0.72	93.3	1.22	1.32	93.3
BROMUS TECTORUM	0.00		6.7			
HORDEUM JUBATUM						
ORYZOPSIS HYMENOIDES	0.31	0.46	86.7	0.72	0.70	46.7
SITANION HYSTRIX						
SUBTOTAL	0.95			1.94		
SHRUBS & SUBSHRUBS						
ATRIPLEX CANESCENS	0.00		6.7	0.50	0.50	13.3
CERATOIDES LANATA				0.00		20.0
CHRYSOTHAMNUS NAUSEOSUS						
SUBTOTAL	0.00			0.50		
TOTAL VEGETATION	24.50	9.12		21.41	14.09	
LITTER	20.20	20.93	100.0	16.60	19.53	100.0
ROCK	1.00		6.7			
BARE	55.87	23.29	100.0	63.60	20.66	100.0

ATTACHMENT 18 (CONT.)

COARSE REFUSE TEST PLOT  
SAMPLING RESULTS

	Treatment 13			Treatment 14		
	MEAN	STD	CONST.	MEAN	STD	CONST.
FORBS						
ATRIPLEX SP.	0.50	0.50	13.3			
DESCURANIA PINNATA						
GRINDELIA SQUARROSA						
HALOGETON GLOMERATUS	1.00	1.00	13.3			
KOCHIA SCOPARIA	25.20	18.69	66.7	25.85	13.29	100.0
MACHAERANTHERA CANESCENS						
MELILOTUS OFFICINALIS				0.00		5.0
PENSTEMON BANDERA						
POLYGONUM AVICULARE						
POLYGONUM RAMOSISSIMUM	0.50	0.50	40.0	0.72	0.59	70.0
SALSOLA IBERICA	0.00		6.7	0.00		5.0
SUBTOTAL	27.20			26.57		
GRAMINOIDS						
BROMUS COMMUTATUS						
AGROPYRON SPICATUM	0.56	0.50	60.0	0.95	0.76	95.0
BROMUS TECTORUM				1.00		10.0
HORDEUM JUBATUM	0.00		6.7			
ORYZOPSIS HYMENOIDES	0.57	0.49	46.7	0.70	0.64	50.0
SITANION HYSTRIX						
SUBTOTAL	1.13			2.65		
SHRUBS & SUBSHRUBS						
ATRIPLEX CANESCENS				0.00		5.0
CERATOIDES LANATA	0.00		6.7	0.33	0.47	15.0
CHRYSOTHAMNUS NAUSEOSUS						
SUBTOTAL	0.00			0.33		
TOTAL VEGETATION	28.33	21.68		29.55	15.75	
LITTER	5.10	3.36	66.7	5.65	3.35	100.0
ROCK						
BARE	68.20	20.52	66.7	66.50	14.40	100.0

ATTACHMENT 18 (CONT.)

COARSE REFUSE TEST PLOT  
SAMPLING RESULTS

	Treatment 15			Treatment 16		
	MEAN	STD	CONST.	MEAN	STD	CONST.
FORBS						
ATRIPLEX SP.						
DESCURANIA PINNATA	0.67	0.94	15.0			
GRINDELIA SQUARROSA						
HALOGETON GLOMERATUS						
KOCHIA SCOPARIA	33.60	24.09	100.0	49.00	27.55	66.7
MACHAERANTHERA CANESCENS						
MELILOTUS OFFICINALIS	0.00		5.0			
PENSTEMON BANDERA	1.00		5.0			
POLYGONUM AVICULARE						
POLYGONUM RAMOSISSIMUM	0.67	0.67	45.0	1.57	1.59	46.7
SALSOLA IBERICA						
SUBTOTAL	35.94			50.57		
GRAMINOIDS						
BROMUS COMMUTATUS						
AGROPYRON SPICATUM	1.00	0.89	75.0	1.13	0.93	53.3
BROMUS TECTORUM	1.00		5.0			
HORDEUM JUBATUM	1.00		5.0			
ORYZOPSIS HYMENOIDES	0.73	0.45	55.0	1.33	0.94	40.0
SITANION HYSTRIX						
SUBTOTAL	3.73			2.46		
SHRUBS & SUBSHRUBS						
ATRIPLEX CANESCENS						
CERATOIDES LANATA	0.50	0.50	10.0			
CHRYSOTHAMNUS NAUSEOSUS				1.00		6.7
SUBTOTAL	0.5			1.00		
TOTAL VEGETATION	40.16	27.54		54.03	31.01	
LITTER	5.30	2.24	100.0	4.30	2.49	66.7
ROCK						
BARE	59.35	24.48	100.0	43.80	25.89	66.7

ATTACHMENT 19

COARSE SLURRY TEST PLOT  
SAMPLING RESULTS

	Treatment 1			Treatment 2		
	MEAN	STD	CONST.	MEAN	STD	CONST.
<b>FORBS</b>						
ACHILLEA MILLEFOLIUM						
ATRIPLEX SP.						
DESCURANIA PINNATA						
GRINDELIA SQUARROSA						
HALOGETON GLOMERATUS	0.00		6.7	0.00		6.7
KOCHIA SCOPARIA	20.70	12.20	133.3	17.67	11.13	100.0
MEDICAGO SATIVA	0.33	0.47	20.0	0.00		6.7
POLYGONUM RAMOSISSIMUM	0.92	0.92	86.7	0.46	0.50	73.3
SALSOLA IBERICA	0.00		13.3	0.00		6.7
SPHAERALCEA COCCINEA						
SUAEDA TORREYANA						
SUBTOTAL	21.95			18.13		
<b>GRAMINOIDS</b>						
AGROPYRON SPICATUM	0.63	0.70	106.7	0.55	0.50	73.3
AGROPYRON TRACHYCAULUM						
BROMUS TECTORUM						
HORDEUM JUBATUM	1.00		6.7			
ORYZOPSIS HYMENOIDES	0.00		40.0	0.00		26.7
TRITICUM AESTIVUM	1.00	0.93	46.7	0.38	0.70	53.3
SUBTOTAL	2.63			0.93		
<b>SHRUBS &amp; SUBSHRUBS</b>						
ATRIPLEX CANESCENS	0.00		6.7			
CERATOIDES LANATA	0.13	0.33	53.3	0.00		13.3
SUBTOTAL	0.13			0.00		
TOTAL VEGETATION	24.71	15.54		19.05	12.82	
BARE	63.00	16.23	133.3	66.40	17.18	100.0
ROCK						
LITTER	14.70	12.33	133.3	15.00	10.33	100.0

ATTACHMENT 19 (CONT.)

COARSE SLURRY TEST PLOT  
SAMPLING RESULTS

	Treatment 3			Treatment 4		
	MEAN	STD	CONST.	MEAN	STD	CONST.
FORBS						
ACHILLEA MILLEFOLIUM	0.00		6.7			
ATRIPLEX SP.				0.00		6.7
DESCURANIA PINNATA						
GRINDELIA SQUARROSA	0.67	0.47	20.0			
HALOGETON GLOMERATUS						
KOCHIA SCOPARIA	38.33	20.63	100.0	45.67	21.67	100.0
MEDICAGO SATIVA	1.20	0.98	33.3	0.67	0.47	40.0
POLYGONUM RAMOSISSIMUM	1.42	0.76	80.0	1.54	1.01	86.7
SALSOLA IBERICA	2.00		6.7	0.00		6.7
SPHAERALCEA COCCINEA				0.00		6.7
SUAEDA TORREYANA	1.00		6.7			
SUBTOTAL	44.62			47.88		
GRAMINOIDS						
AGROPYRON SPICATUM	0.64	0.61	93.3	0.75	0.60	80.0
AGROPYRON TRACHYCAULUM	1.00		13.3	0.50	0.50	26.7
BROMUS TECTORUM				0.00		6.7
HORDEUM JUBATUM	1.00		6.7	1.00		6.7
ORYZOPSIS HYMENOIDES	0.29	0.45	46.7	0.57	0.49	46.7
TRITICUM AESTIVUM	0.33	0.47	20.0	0.00		26.7
SUBTOTAL	3.26			2.82		
SHRUBS & SUBSHRUBS						
ATRIPLEX CANESCENS	1.00		6.7			
CERATOIDES LANATA	0.40	0.49	33.3	0.00		20.0
SUBTOTAL	1.40			0.00		
TOTAL VEGETATION	49.28	24.86		50.70	24.74	
BARE	46.33	18.65	100.0	34.87	23.49	100.0
ROCK				0.00		6.7
LITTER	12.13	8.47	100.0	16.80	18.16	100.0

ATTACHMENT 19 (CONT.)

COARSE SLURRY TEST PLOT  
SAMPLING RESULTS

	Treatment 5			Treatment 6		
	MEAN	STD	CONST.	MEAN	STD	CONST.
FORBS						
ACHILLEA MILLEFOLIUM				0.00		13.3
ATRIPLEX SP.				0.00		40.0
DESCURANIA PINNATA	1.00	1.22	26.7			
GRINDELIA SQUARROSA						
HALOGETON GLOMERATUS	0.00		13.3	1.00		6.7
KOCHIA SCOPARIA	32.85	23.07	133.3	34.10	25.36	133.3
MEDICAGO SATIVA						
POLYGONUM RAMOSISSIMUM	1.00	0.63	66.7	0.36	0.48	93.3
SALSOLA IBERICA	0.25	0.43	26.7	0.00		40.0
SPHAERALCEA COCCINEA						
SUAEDA TORREYANA						
SUBTOTAL	35.10			35.46		
GRAMINOIDS						
AGROPYRON SPICATUM	0.60	0.49	100.0	0.60	0.61	100.0
AGROPYRON TRACHYCAULUM						
BROMUS TECTORUM	0.00		6.7			
HORDEUM JUBATUM						
ORYZOPSIS HYMENOIDES	0.30	0.46	66.7	0.10	0.30	66.7
TRITICUM AESTIVUM	0.72	0.88	46.7	0.50	0.50	40.0
SUBTOTAL	1.62			1.20		
SHRUBS & SUBSHRUBS						
ATRIPLEX CANESCENS				0.00		13.3
CERATOIDES LANATA	0.13	0.33	53.3			
SUBTOTAL	0.13			0.00		
TOTAL VEGETATION	36.85	27.52		36.66	27.25	
BARE	40.10	28.63	133.3	47.35	26.50	133.3
ROCK				0.00		13.3
LITTER	25.30	23.32	133.3	17.60	17.65	133.3

ATTACHMENT 19 (CONT.)

COARSE SLURRY TEST PLOT  
SAMPLING RESULTS

	Treatment 7			Treatment 8		
	MEAN	STD	CONST.	MEAN	STD	CONST.
FORBS						
ACHILLEA MILLEFOLIUM						
ATRIPLEX SP.	0.00		6.7			
DESCURANIA PINNATA	0.00		20.0	0.00		6.7
GRINDELIA SQUARROSA	0.00		6.7	1.00		6.7
HALOGETON GLOMERATUS				0.00		6.7
KOCHIA SCOPARIA	54.87	17.08	100.0	55.47	20.89	100.0
MEDICAGO SATIVA	0.00		13.3	0.00		13.3
POLYGONUM RAMOSISSIMUM	2.60	2.76	66.7	1.36	1.30	73.3
SALSOLA IBERICA	0.50	0.50	26.7	0.00		13.3
SPHAERALCEA COCCINEA						
SUAEDA TORREYANA						
SUBTOTAL	57.97			57.83		
GRAMINOIDS						
AGROPYRON SPICATUM	0.92	1.04	80.0	0.75	0.43	53.3
AGROPYRON TRACHYCAULUM	1.00		13.3			
BROMUS TECTORUM						
HORDEUM JUBATUM	1.00		6.7	0.00		6.7
ORYZOPSIS HYMENOIDES	0.50	0.50	13.3	0.40	0.49	33.3
TRITICUM AESTIVUM	0.00		6.7	0.00		13.3
SUBTOTAL	3.42			1.15		
SHRUBS & SUBSHRUBS						
ATRIPLEX CANESCENS				0.00		66.7
CERATOIDES LANATA				0.00	1.00	13.3
SUBTOTAL	0.00			0.00		
TOTAL VEGETATION	61.39	21.88		58.99	24.11	
BARE	35.07	16.42	100.0	24.00	17.25	100.0
ROCK						
LITTER	7.13	4.27	100.0	18.93	15.97	100.0

ATTACHMENT 20

FINE SLURRY TEST PLOT  
SAMPLING RESULTS

	Treatment 1			Treatment 2		
	MEAN	STD	CONST.	MEAN	STD	CONST.
FORBS						
ACHILLEA MILLEFOLIUM	1.00		6.7			
CHENOPODIUM FREMONTII						
CONVOLVULUS ARVENSIS						
DESCURANIA PINNATA				0.00		6.7
GRINDELIA SQUARROSA				0.00		13.3
HALOGETON GLOMERATUS						
HELIANTHUS ANNUUS	0.00		20.0			
KOCHIA SCOPARIA	37.67	25.80	100.0	60.93	19.43	100.0
LINUM LEWISII	0.50	0.87	26.7	0.50	0.50	13.3
LINUM PERENNE						
MALCOMIA AFRICANA	0.00		6.7			
MEDICAGO SATIVA	1.11	0.87	60.0	1.80	1.33	33.3
MELILOTUS OFFICINALIS						
POLYGONUM RAMOSISSIMUM	5.92	10.59	80.0	4.57	2.41	93.3
SALSOLA IBERICA	0.50	0.50	13.3	0.00		6.7
SUBTOTAL	46.70			67.80		
GRAMINOIDS						
BROMUS COMMUTATUS						
AGROPYRON SPICATUM	1.53	0.81	100.0	2.67	2.47	100.0
AGROPYRON TRACHYCAULUM	2.00	0.82	20.0	1.67	0.94	20.0
BROMUS TECTORUM						
HORDEUM JUBATUM	1.25	0.43	26.7	0.50	0.50	26.7
ORYZOPSIS HYMENOIDES	1.00		40.0	0.33	0.47	20.0
SUBTOTAL	5.78			5.17		
SHRUB & SUBSHRUBS						
ATRIPLEX CANESCENS	0.00		33.3			
SUBTOTAL	0.00					
TOTAL VEGETATION	52.48	40.68		72.98	28.05	
BARE	33.53	22.69	100.0	19.27	17.37	100.0
LITTER	20.33	24.77	100.0	11.60	13.50	100.0

ATTACHMENT 20 (CONT.)

FINE SLURRY TEST PLOT  
SAMPLING RESULTS

	Treatment 3			Treatment 4		
	MEAN	STD	CONST.	MEAN	STD	CONST.
<b>FORBS</b>						
ACHILLEA MILLEFOLIUM	1.00		6.7			
CHENOPODIUM FREMONTII						
CONVOLVULUS ARVENSIS						
DESCURANIA PINNATA						
GRINDELIA SQUARROSA	0.50	0.50	13.3			
HALOGETON GLOMERATUS						
HELIANTHUS ANNUUS	1.00		6.7	1.00		6.7
KOCHIA SCOPARIA	40.67	22.50	100.0	34.67	14.77	100.0
LINUM LEWISII						
LINUM PERENNE				1.00		6.7
MALCOMIA AFRICANA						
MEDICAGO SATIVA	2.25	1.79	26.7	2.60	1.63	33.3
MELILOTUS OFFICINALIS						
POLYGONUM RAMOSISSIMUM	3.33	3.68	100.0	1.50	0.73	93.3
SALSOLA IBERICA				0.00		6.7
SUBTOTAL	48.75			40.77		
<b>GRAMINOIDS</b>						
BROMUS COMMUTATUS						
AGROPYRON SPICATUM	2.43	1.29	93.3	0.80	0.91	100.0
AGROPYRON TRACHYCAULUM	2.33	1.89	20.0	1.00		13.3
BROMUS TECTORUM						
HORDEUM JUBATUM	0.00		6.7			
ORYZOPSIS HYMENOIDES	1.00	0.89	33.3	0.13	0.33	53.3
SUBTOTAL	5.76			1.93		
<b>SHRUB &amp; SUBSHRUBS</b>						
ATRIPLEX CANESCENS	0.67	0.47	20.0	0.00		13.3
SUBTOTAL	0.67			0.00		
TOTAL VEGETATION	55.18	33.01		42.70	18.37	
BARE	41.73	19.27	100.0	50.93	19.24	100.0
LITTER	10.27	8.85	100.0	10.93	12.28	100.0

ATTACHMENT 20 (CONT.)

FINE SLURRY TEST PLOT  
SAMPLING RESULTS

	Treatment 5			Treatment 6		
	MEAN	STD	CONST.	MEAN	STD	CONST.
FORBS						
ACHILLEA MILLEFOLIUM						
CHENOPODIUM FREMONTII						
CONVOLVULUS ARVENSIS						
DESCURANIA PINNATA	0.50	0.50	13.3			
GRINDELIA SQUARROSA						
HALOGETON GLOMERATUS	0.00		6.7			
HELIANTHUS ANNUUS						
KOCHIA SCOPARIA	4.80	1.83	100.0	24.27	28.52	100.0
LINUM LEWISII						
LINUM PERENNE						
MALCOMIA AFRICANA				0.00		6.7
MEDICAGO SATIVA						
MELILOTUS OFFICINALIS	0.00		6.7			
POLYGONUM RAMOSISSIMUM	0.14	0.35	46.7	0.50	0.87	26.7
SALSOLA IBERICA						
SUBTOTAL	5.44			24.77		
GRAMINOIDS						
BROMUS COMMUTATUS						
AGROPYRON SPICATUM	1.40	0.80	100.0	1.73	2.54	100.0
AGROPYRON TRACHYCAULUM						
BROMUS TECTORUM						
HORDEUM JUBATUM						
ORYZOPSIS HYMENOIDES	0.72	0.59	93.3	0.75	0.66	53.3
SUBTOTAL	2.12			2.48		
SHRUB & SUBSHRUBS						
ATRIPLEX CANESCENS						
SUBTOTAL	0.00			0.00		
TOTAL VEGETATION	7.56	4.07		27.25	32.59	
BARE	66.07	26.45	100.0	62.53	29.93	100.0
LITTER	26.73	25.15	100.0	10.87	10.53	100.0

## ATTACHMENT 20 (CONT.)

FINE SLURRY TEST PLOT  
SAMPLING RESULTS

	Treatment 7			Treatment 8		
	MEAN	STD	CONST.	MEAN	STD	CONST.
-----						
FORBS						
ACHILLEA MILLEFOLIUM						
CHENOPODIUM FREMONTII						
CONVOLVULUS ARVENSIS						
DESCURANIA PINNATA	0.00		13.3	0.00		6.7
GRINDELIA SQUARROSA						
HALOGETON GLOMERATUS						
HELIANTHUS ANNUUS						
KOCHIA SCOPARIA	4.47	1.63	100.0	5.13	2.22	100.0
LINUM LEWISII						
LINUM PERENNE						
MALCOMIA AFRICANA						
MEDICAGO SATIVA						
MELILOTUS OFFICINALIS						
POLYGONUM RAMOSISSIMUM	0.00		6.7	0.00		26.7
SALSOLA IBERICA						
SUBTOTAL	4.47			5.13		
GRAMINOIDS						
BROMUS COMMUTATUS						
AGROPYRON SPICATUM	2.13	0.96	100.0	1.87	1.31	100.0
AGROPYRON TRACHYCAULUM						
BROMUS TECTORUM	0.00		13.3	2.50	1.50	13.3
HORDEUM JUBATUM						
ORYZOPSIS HYMENOIDES	0.58	0.49	80.0	0.80	0.60	66.7
SUBTOTAL	2.63			5.17		
SHRUB & SUBSHRUBS						
ATRIPLEX CANESCENS						
SUBTOTAL	0.00			0.00		
TOTAL VEGETATION	7.19	3.08		10.30	5.63	
BARE	54.40	24.40	100.0	62.20	26.11	100.0
LITTER	37.87	23.88	100.0	28.87	26.11	100.0

ATTACHMENT 20 (CONT.)

FINE SLURRY TEST PLOT  
SAMPLING RESULTS

	Treatment 9			Treatment 10		
	MEAN	STD	CONST.	MEAN	STD	CONST.
<b>FORBS</b>						
ACHILLEA MILLEFOLIUM						
CHENOPODIUM FREMONTII						
CONVOLVULUS ARVENSIS						
DESCURANIA PINNATA				0.50	0.50	13.3
GRINDELIA SQUARROSA				1.00		6.7
HALOGETON GLOMERATUS						
HELIANTHUS ANNUUS						
KOCHIA SCOPARIA	52.67	21.12	100.0	44.00	21.70	100.0
LINUM LEWISII	0.67	0.47	20.0			
LINUM PERENNE						
MALCOMIA AFRICANA						
MEDICAGO SATIVA	2.56	2.27	60.0	1.46	1.73	73.3
MELILOTUS OFFICINALIS						
POLYGONUM RAMOSISSIMUM	3.20	1.17	100.0	2.50	1.84	93.3
SALSOLA IBERICA	0.00		6.7			
SUBTOTAL	59.10			49.46		
<b>GRAMINOIDS</b>						
BROMUS COMMUTATUS						
AGROPYRON SPICATUM	2.20	1.17	100.0	1.57	0.82	93.3
AGROPYRON TRACHYCAULUM	1.20	0.98	33.3	1.57	0.73	46.7
BROMUS TECTORUM				0.00		6.7
HORDEUM JUBATUM	0.00		13.3	1.00		33.3
ORYZOPSIS HYMENOIDES	1.00		6.7	0.00		6.7
SUBTOTAL	4.40			4.14		
<b>SHRUB &amp; SUBSHRUBS</b>						
ATRIPLEX CANESCENS	0.00		6.7	0.00		6.7
SUBTOTAL	0.00			0.00		
TOTAL VEGETATION	63.49	27.17		53.60	27.31	
BARE	30.87	17.72	100.0	42.27	19.08	100.0
LITTER	8.93	6.61	100.0	7.60	4.44	100.0

*missing  
samples from  
11 through 16  
(no slurry cover treatments)  
PB, 1992*