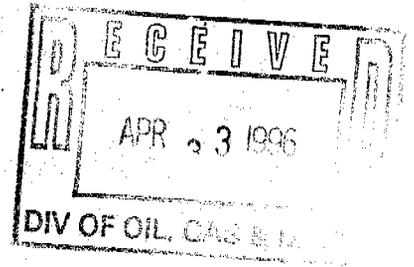


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# **CO-OP MINING COMPANY**

## **ANNUAL REPORT 1995**

**Bear Canyon Mine**  
*ACT/015/025*

**Trail Canyon Mine**  
*ACT/015/021*

**CO-OP MINING COMPANY**

**ANNUAL REPORT 1995**

**BEAR CANYON MINE  
ACT/015/025**

**TRAIL CANYON MINE  
ACT/015/021**

**Prepared by**

**Mangum Engineering Consultants  
388 East Boynton Road  
Kaysville, Utah 84037  
(801) 547-9887**

**for**

**Co-Op Mining Company  
P.O. Box 1245  
Huntington, Utah 84528**

***Kimly C. Mangum, P.E.  
Charles Reynolds, B.S.***

***March 1996***

**Co-Op Mining Company  
Annual Report for 1995  
Bear Canyon and Trail Canyon Mines**

**1 SCOPE**

The following document contains information pertaining to Co-Op Mining Company's Bear Canyon and Trail Canyon Mines. Bear Canyon Mine is an active mine, under current production in three coal seams, the Blind Canyon Seam, Hiawatha Seam and the Tank Seam. Coal mining production was terminated in 1981 at Trail Canyon Mine and the mine has undergone extensive reclamation. Trail Canyon Mine remains under the required bond liability period. The Division approved Phase I Bond Release in the amount of \$120,000 for the Trail Canyon Mine on July 18, 1994, and Phase II Bond Release in the amount of \$50,000 on January 31, 1996.

This report was compiled based on the letter of instruction received by Co-Op from the Division of Oil Gas and Mining dated January 18, 1996.

## COAL MINING AND RECLAMATION OPERATIONS FOR 1995

**Permittee:** Co-Op Mining Company

**Mine Name:** Bear Canyon Mine / Trail Canyon Mine

**Mailing Address:** 53 West Angelo Avenue  
Salt Lake City, Utah 84115

**Company Representative:** Kimly C. Mangum, P.E., M.E.C.

**Resident Agent:** Mr. Wendell Owen  
Co-Op Mining Co.  
P.O. Box 1245  
Huntington, Utah 84528

**Permit Number:** Bear Canyon Mine - ACT/015/025  
Trail Canyon Mine - ACT/015/021

**MSHA ID Number:** Bear Canyon #1 Mine - 42-01697  
Bear Canyon #2 Mine - 42-02095  
Trail Canyon Mine - 42-00081-0

**Date of Initial Permanent Program Permit:** Bear Canyon Mine - Nov. 1, 1985  
Trail Canyon Mine - May 30, 1989

**Date of Permit Renewal:** Bear Canyon Mine - Nov. 2, 1995  
Trail Canyon Mine - May 30, 1994

**Quantity of Coal Mined (tonnage) 1995:** 409809 short tons

Updated Mine Sequence Maps for the Bear Canyon #1 Mine are attached as Plates 3-4A and 3-4B and for Bear Canyon #2 Mine as Plate 3-4C.

## **2 WATER MONITORING**

All water monitoring data for 1995 has been submitted to the Division quarterly. Copies of the summary pages are included as Quattro Pro database files (enclosed).

### **2.1 Mine Discharge**

The excess water encountered in the Bear Canyon Mine is discharged into Bear Creek in accordance with Co-Op Mining Company's UPDES permit number UTG040006 (Point 004). A copy of the Utah General Permit for Coal Mining can be found in Appendix 7-B of the Bear Canyon Mine PAP. The total amount of Water discharged by Co-Op in 1994 was approximately 64,523,200 gallons. This was an average flow of 103 gallons per minute. The monthly flows are summarized in the Fourth Quarter Water Monitoring Report (NPDES).

Monthly flows varied from 130 gpm to 215 gpm prior to June, 1995, and 81 gpm to 115 gpm subsequent to June, 1995. The variability in flow during these periods is due to the fact that the volume of water discharged from the sumps each month is not necessarily the same as the volume which flows into the mine. Some months, an excess amount of water is discharged (i.e. March), which often results in a reduction in discharge in other months while the sumps refill (i.e. April). In June, 1995, mining retreated past the location of sump SBC-10, which resulted in the reduction in mine water discharge subsequent to June. No mine water discharge occurred from the Trail Canyon Mine in 1995. All portals were sealed subsequent to 1989.

## **2.2 ND PES discharge Points**

In August 22 and 23, 1995, two back to back storm events, which delivered a combined precipitation of 1.97 inches of rain occurring with an intensity of 1.15 iph and 3 iph, respectively. Severe flooding of the minesite resulted, primarily due to offsite water from undisturbed areas, as well as Bear Creek, topping the banks and subsequently flowing into the sediment ponds. This caused unplanned discharges from all three sediment ponds at the Bear Canyon Mine, with Sediment Pond "C" receiving much of the discharge from Sediment Pond "A". This was the only discharge from these sediment ponds in 1995.

No discharge occurred from the Trail Canyon Sediment Pond in 1995. In December, 1995, the Trail Canyon Sediment Pond was reclaimed as part of the Phase II Bond Release Application (see Amendment 95E).

## **2.3 Springs and Monitor Wells**

The springs and wells monitored during 1995 included SBC-3, SBC-4, SBC-5, SBC-6, SBC-9, SBC-10, DH-1A, DH-2, DH-4, PS-1, TS-1, CS-1 and BP-1. A summary of the water monitoring for each point is included in the Fourth Quarter Water Monitoring Report and as Quattro Pro data files. Locations of these points are shown on Plate 7-4 of the Bear Canyon PAP and Plates 7-4 of the Trail Canyon PAP. Tables 2-1 and 2-2 show the 1995 monitoring matrix for Bear and Trail Canyon respectively.

**Table 2-1. Bear Canyon Monitoring Matrix - 1995**

Location	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Upper Bear Creek BC-1		base.			base.	field	field	base.	field	base.		
Lower Bear Creek BC-2		base.			base.	field	field	base.	field	base.		
Rt Fork Bear Cr. BC-3		base.			base.	field	field	base.	field	base.		
Huntington Spr. (1) SBC-4		base.			base.			base.		base.		
Birch Spring (1) SBC-5		base.			base.			base.		base.		
Co-Op Dev Spring SBC-6		base.			base.			base.		base.		
1st N. Section #42 SBC-9		base.			base.			base.		base.		
2nd E. Bleeder #3 N SBC-10		base.			base.							
2nd W. Mon. Well DH-1A	level	base.	level	level	base.	level	level	base.	level	base.	level	level
3rd W. Mon. Well DH-2	level	base.	level	level	base.	level	level	base.	level	base.	level	level
3rd W. bldr Well DH-4	level	base.	level	level	base.	level	level	base.	level	base.	level	level

- Notes:
1. SBC-4 and SBC-5 were also tested for oil and grease.
  2. oper. = operational, base. = baseline
  3. See Tables 7.1-7 and 7.2-5 of the PAP for water quality parameters.

**Table 2-2. Trail Canyon Monitoring Matrix - 1995**

Location	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Upper Trail Creek UT-1					oper.					oper.		
Lower Trail Creek LT-1					oper.					oper.		
Portal Spring PS-1					oper.					oper.		
Trail Canyon Spring TS-1					oper.					oper.		
Co-Op Spring CS-1					oper.					oper.		
Ballpark Spring BP-1					oper.					oper.		
Birch Spring (1) SBC-5		base.			base.			base.		base.		
Sed. Pond Inlet SP-1					oper.					oper.		
Culvert TCC-6 Outlet CO-1												See Note # 3
Sealed Mine Entries and access												See Note # 4

- Notes: 1. SBC-5 was monitored as part of the Bear Canyon monitoring (Same as Table 2-1).  
 2. oper. = operational, base. = baseline  
 3. Sampling to occur during storm events or spring runoff at outlet to culvert TCC-6 when flows occur and tested for oper.  
 4. Unplanned discharges will be sampled on a quarterly basis until bond release. (No discharges have occurred).  
 5. See Tables 7.2-5 and 7.2-6 of the PAP for water quality parameters.

Monitoring points SBC-9 and SBC-10 represent the flow of water into the Bear Canyon Mine. In June, 1995, mining retreated past the SBC-10 sump, making it inaccessible. Due to the dip of the coal seam, the flows from this area of the mine flow into the gob area, rather than to the active mine workings. Monitoring of the reclaimed upper Bear Canyon portal, which is on the downhill side of the gob, has shown that to date no discharge has occurred, indicating that water levels in the gob have not reached a point to result in any discharge. The flow of SBC-9 through 1993, 1994 and 1995 has showed a steady decline, which is characteristic of perched aquifer systems. No changes in water quality have been noted from these or any of the other groundwater monitoring points. The 1995 underground water survey is included in the report as Plates 7-10A, 7-10B and 7-10C.

Monitor points DH-1A, DH-2 and DH-4 are all underground monitor wells which have been completed in the Spring Canyon Aquifer of the Starpoint Sandstone. SBC-3 is a monitor well completed on the surface near Bear Creek. The average water levels for the wells are as follows:

<u>Well #</u>	<u>DH-1A</u>	<u>DH-2</u>	<u>DH-4</u>	<u>SBC-3</u>
1993	113.74	23.84	-----	27.25
1994	113.7	24.42	60.76	29.38
1995	111.74	23.19	62.67	24.22

DH-1A revealed an increase in the average level of approximately 2 feet from 1994 to 1995, after holding steady for the previous two years. DH-2 observed a minor increase in the water level. DH-4, which began monitoring in 1994, has shown a decrease in the well level of approximately 2 feet. SBC-3 also showed an increase in the level from 1994 to 1995. There is not enough data available on this well to observe a trend. Co-Op will continue to monitor the changes in water levels in this well in order to see whether this pattern will continue, or whether it will follow the same pattern as the other three wells.

## 2.4 Surface Water

Surface water monitoring points for 1995 included BC-1, BC-2 and BC-3 for the Bear Canyon Mine and UT-1 and LT-1 for the Trail Canyon Mine. A summary of the water monitoring for each of these points is included in the Fourth Quarter Water Monitoring Report and as Quattro Pro Data files. Monitoring point locations are shown on Plate 7-4 of the Bear Canyon PAP and Plates 7-4A and 7-4D of the Trail Canyon PAP. Tables 2-1 and 2-2 show the 1995 monitoring matrix for Bear and Trail Canyon respectively.

No significant changes have been observed in any of the surface water monitoring points. The baseline data collected in 1995 did not show any significant changes from the previous baseline data, collected in 1989. The water quality data for BC-2 has indicated an overall general improvement in quality over the data from 1989, which is attributed to the mine water discharge, which began in April, 1991. The flows in all of the surface water monitoring reports has shown increases from 1994 to 1995, with the exception of BC-3, which has remained dry since monitoring began. Water quality data from BC-1 and BC-2 show a significant improvement in the water quality downstream of the Bear Canyon Mine as compared to upstream. This is due to the mine water discharge, which is of a better quality than the upstream water in Bear Creek.

UT-1, which was dry throughout 1994, has shown a continuous flow in 1995 beginning in the early spring, indicating a significant increase in water in Trail Creek.

### **3 CLIMATOLOGICAL DATA**

A total of 14.34 inches of precipitation was measured at the Bear Canyon Precipitation Gauge during 1995, and 22.58 inches were measured in Trail Canyon. Precipitation increased by 6.44 inches from 1994 at Bear Canyon and increased by 11.16 inches at Trail Canyon. In both locations, the precipitation nearly doubled from 1994 to 1995. Rain gauge monitoring data is summarized in Appendix A and as Quattro Pro data files (enclosed).

### **4 SUBSIDENCE MONITORING**

A monitoring network was installed in the summer of 1987, and has been monitored since that time. Monitoring stations are steel rebar with aluminum caps, set in concrete so weather, frost, heave or livestock/wildlife will not disturb them.

Ten permanent subsidence monitoring points (SMS-1 thru SMS-4, CON-5 thru CON-6, and SMS-7 thru SMS-10) are located on the mine site area. SMS-1, SMS-3, and SMS-4 are common to both the Trail Canyon and Bear Canyon Permits. CON-6 and SMS-7 thru SMS-10 were established 22 September 1991. Subsidence is monitored annually by Co-Op Mining Company.

Subsidence monitoring was performed in 1995 using the professional services of Blackhawk Engineering. The results of the survey are found in Appendix B. Monitoring point locations are shown on Plate 3-3 of the PAP (included in the maps section).

Mitigation work was completed on several subsidence holes which were discovered in the Bear Canyon Permit area (see Plate 3-3). The work involved the backfilling and reclaiming of three subsidence holes which had resulted from pulling pillars in the Blind Canyon Seam of the Bear Canyon #1 Mine. This reclamation work was completed in September, 1995.

No new areas were mined under in 1995 which required notification of surface property owners in accordance with R645-301-525.300.

In July, 1995, coal production began from the Bear Canyon #2 Mine (Tank Seam). The majority of coal production is anticipated to come from the Bear Canyon #2 Mine through 1996. The mining sequence is shown on Plates 3-4A, 3-4B and 3-4C.

## **5 VEGETATION MONITORING**

Qualitative vegetation monitoring for the Trail Canyon Mine was performed in 1995 using the professional services of Mt. Nebo Scientific Research & Consulting. A report of the monitoring is included in Appendix C.

In 1995, several revegetation projects were performed associated with the Bear Canyon mine. The first involved the reseeding and mulching of ASCA area "V", the cut slopes along the Tank Seam road, and the Tank Seam topsoil stockpiles. Seeding was completed by Environmental Industrial Services using the final reclamation seed mix. A copy of the seed mixture is shown in Appendix D.

The second project involved reseeding of the subsidence mitigation area "1", shown on Plate 3-3. This area was reseeded by hand using the same final reclamation seed mixture used along the Tank Seam road. A copy of the seed mixture is shown in Appendix D.

The third revegetation project in Bear Canyon involved the reseeding of the bank of Sediment Pond "B", which was disturbed during the sediment pond cleaning, and supplemental seeding on the Bathhouse topsoil stockpile. This seeding was completed in June, 1995, for the topsoil stockpile and in November, 1995, for the pond embankment. A copy of the seed mixture is shown in Appendix D.

The sediment pond at the Trail Canyon minesite was reclaimed in December, 1995, subsequent to the Phase II Bond Release application. This area was reseeded by hand in December. A copy of the seed mixture is shown in Appendix D. In the Spring of 1996, shrubs will be transplanted into this area to aid in shrub density and diversity for final reclamation.

## **6 ANNUAL IMPOUNDMENT INSPECTION**

Copies of the Annual Sediment Pond Inspection Reports are attached with this report in Appendix E. The annual inspection was performed by Mangum Engineering Consultants and was certified by Kimly C. Mangum.

## **7 ANNUAL SOIL DATA**

In September, 1995, Co-Op Mining Company collected Roof, Floor and Mid-Seam samples from site RFM-1 of the Tank Seam, shown on Plate 3-4C. The samples were collected by core drilling from the Blind Canyon Seam. Complete raw core samples were submitted to the laboratory for analysis. The coal seam thickness at RFM-1 was approximately 8 feet. The analyses were performed by Intermountain Laboratories, Inc., using the methods and parameters shown in Table 3K-1 of the Bear Canyon PAP. The results are included in Appendix F.

In October, 1995, Co-Op Mining Company completed the cleaning of Sediment Pond "B". Soil samples were collected in accordance with Appendix 3-K of the Bear Canyon PAP. The analyses were performed by Intermountain Laboratories, Inc., using the methods and parameters shown in Table 3K-1. The results are included in Appendix F.

## **8 ANNUAL REPORT OF OFFICERS**

A copy of the Profit Corporation Annual Report for C.W. Mining Company is included in Appendix G.

## **9 PERMIT STIPULATION STATUS**

There are no open stipulations from the latest permit renewals.

**APPENDIX A**

**CLIMATOLOGICAL DATA**

### Precipitation - Bear Canyon

<u>Date</u>	<u>Gauge Reading</u>	<u>Precipitation</u>	<u>Date</u>	<u>Gauge Reading</u>	<u>Precipitation</u>
01/01/95	0.00		03/12/95	0.02	lt. rain/snow
01/02/95	0.00		03/13/95	0.00	
01/03/95	0.00		03/14/95	0.00	
01/04/95	0.15	snow	03/15/95	0.00	
01/05/95	0.04	lt. snow	03/16/95	0.08	rain
01/06/95	0.00		03/17/95	0.22	rain
01/07/95	0.14	snow	03/18/95	0.00	
01/08/95	0.10	snow	03/19/95	0.14	rain/snow mix
01/09/95	0.00		03/20/95	0.00	
01/10/95	0.01	lt. snow	03/21/95	0.05	rain/snow
01/11/95	0.20	snow	03/22/95	0.00	
01/12/95	0.02	lt. snow	03/23/95	0.00	
01/13/95	0.04	snow	03/24/95	0.02	snow
01/14/95	0.00		03/25/95	0.00	
01/15/95	0.02	lt. snow	03/26/95	0.00	
01/16/95	0.00		03/27/95	0.00	
.	.	no precipitation	03/28/95	0.00	
.	.	during this	03/29/95	0.01	lt. snow
.	.	period	03/30/95	0.00	
01/23/95	0.00		.	.	no precipitation
01/24/95	0.03	snow	.	.	during this
01/25/95	0.15	snow	.	.	period
01/26/95	0.13	snow	04/07/95	0.00	
01/27/95	0.00		04/08/95	0.02	snow
.	.	no precipitation	04/09/95	0.00	
.	.	during this	.	.	no precipitation
.	.	period	.	.	during this
02/07/95	0.00		.	.	period
02/08/95	0.12	snow	04/13/95	0.00	
02/09/95	0.00		04/14/95	0.02	snow
02/10/95	0.00		04/15/95	0.03	snow
02/11/95	0.20	snow	04/16/95	0.01	lt. snow
02/12/95	0.00		04/17/95	0.38	snow
02/13/95	0.12	snow	04/18/95	0.30	snow
02/14/95	0.00		04/19/95	0.42	snow
.	.	no precipitation	04/20/95	0.15	snow
.	.	during this	04/21/95	0.27	snow
.	.	period	04/22/95	0.01	lt. snow
02/27/95	0.00		04/23/95	0.00	
02/28/95	0.00	lt. rain/snow	04/24/95	0.00	
03/01/95	0.00		04/25/95	0.04	rain
03/02/95	0.00		04/26/95	0.00	
03/03/95	0.09	snow	04/27/95	0.00	
03/04/95	0.04	snow	04/28/95	0.04	rain
03/05/95	0.01	lt. snow	04/29/95	0.15	rain
03/06/95	0.00		04/30/95	0.59	thunderstorm
03/07/95	0.00		05/01/95	0.55	thunderstorm
03/08/95	0.00		05/02/95	0.07	rain/snow
03/09/95	0.00		05/03/95	0.00	
03/10/95	0.02	lt. rain	05/04/95	0.00	
03/11/95	0.22	rain	05/05/95	0.00	

Precipitation - Bear Canyon

<u>Date</u>	<u>Gauge Reading</u>	<u>Precipitation</u>	<u>Date</u>	<u>Gauge Reading</u>	<u>Precipitation</u>
05/06/95	0.00		07/04/95	0.00	
05/07/95	0.00		.	.	no precipitation
05/08/95	0.00	trace of rain	.	.	during this
05/09/95	0.00	trace of rain	.	.	period
05/10/95	0.05	rain	07/08/95	0.00	
05/11/95	0.39	night rain	07/09/95	0.00	trace of rain
05/12/95	0.20	rain/lt. snow	07/10/95	0.01	lt. rain
05/13/95	0.00	lt. a.m. snow	07/11/95	0.00	
05/14/95	0.03	lt. rain	07/12/95	0.05	afternoon rain
05/15/95	0.00		07/13/95	0.00	
05/16/95	0.00		07/14/95	0.01	lt. rain
05/17/95	0.00		07/15/95	0.00	
05/18/95	0.00		07/16/95	0.00	
05/19/95	0.01	lt. rain	07/17/95	0.07	thunderstorm
05/20/95	0.00		07/18/95	0.00	
05/21/95	0.00		07/19/95	0.00	
05/22/95	0.01	lt. rain	07/20/95	0.08	thunderstorm
05/23/95	0.05	rain	07/21/95	0.00	
05/24/95	0.51	rain	07/22/95	0.01	afternoon rain
05/25/95	0.21	intermittent rain	07/23/95	0.00	
05/26/95	0.14	rain/snow	.	.	no precipitation
05/27/95	0.00		.	.	during this
05/28/95	0.15	rain	.	.	period
05/29/95	0.02	lt. rain/hail	08/08/95	0.00	
05/30/95	0.00		08/09/95	0.09	evening rain
05/31/95	0.00		08/10/95	0.49	rain
06/01/95	0.00		08/11/95	0.52	rain
06/02/95	0.14	rain	08/12/95	0.00	
06/03/95	0.01	lt. rain	08/13/95	0.00	
06/04/95	0.00		08/14/95	0.60	morning rain
06/05/95	0.00		08/15/95	0.00	
06/06/95	0.00		.	.	no precipitation
06/07/95	0.00		.	.	during this
06/08/95	0.09	rain	.	.	period
06/09/95	0.04	rain/lt. snow	08/19/95	0.00	
06/10/95	0.00		08/20/95	0.19	rain
.	.	no precipitation	08/21/95	0.00	
.	.	during this	08/22/95	0.96	flooding
.	.	period	08/23/95	1.01	flooding
06/15/95	0.00		08/24/95	0.00	
06/16/95	0.17	night rain	08/25/95	0.00	
06/17/95	0.10	rain	08/26/95	0.00	
06/18/95	0.00		08/27/95	0.01	lt. rain
.	.	no precipitation	08/28/95	0.00	
.	.	during this	08/29/95	0.00	
.	.	period	08/30/95	0.00	
06/29/95	0.00		08/31/95	0.00	
06/30/95	0.33	evening rain	09/01/95	0.02	afternoon rain
07/01/95	0.27	heavy rain	09/02/95	0.33	thunderstorm
07/02/95	0.05	rain	09/03/95	0.00	
07/03/95	0.07	rain/brief hail	09/04/95	0.00	trace of rain

### Precipitation - Bear Canyon

<u>Date</u>	<u>Gauge Reading</u>	<u>Precipitation</u>	<u>Date</u>	<u>Gauge Reading</u>	<u>Precipitation</u>
09/05/95	0.12	thunderstorm	11/11/95	0.00	
09/06/95	0.00		.	.	no precipitation
.	.	no precipitation	.	.	during this
.	.	during this	.	.	period
.	.	period	11/25/95	0.00	
09/16/95	0.00		11/26/95	0.07	snow
09/17/95	0.11	rain	11/27/95	0.00	
09/18/95	0.02	lt. rain	.	.	no precipitation
09/19/95	0.00		.	.	during this
.	.	no precipitation	.	.	period
.	.	during this	12/03/95	0.00	
.	.	period	12/04/95	0.03	lt. rain
09/27/95	0.00		12/05/95	0.07	night rain
09/28/95	0.21	rain	12/06/95	0.00	
09/29/95	0.00		12/07/95	0.08	snow
09/30/95	0.00		12/08/95	0.00	
10/01/95	0.00		12/09/95	0.00	
10/02/95	0.00		12/10/95	0.00	
10/03/95	0.11	rain/snow	12/11/95	0.00	
10/04/95	0.00		12/12/95	0.06	lt. evening snow
.	.	no precipitation	12/13/95	0.00	
.	.	during this	.	.	no precipitation
.	.	period	.	.	during this
11/01/95	0.00		.	.	period
11/02/95	0.10	rain	12/18/95	0.00	
11/03/95	0.00		12/19/95	0.00	lt. snow
.	.	no precipitation	12/20/95	0.00	
.	.	during this	.	.	no precipitation
.	.	period	.	.	during this
11/08/95	0.00		.	.	period
11/09/95	0.13	rain/snow	12/29/95	0.00	
11/10/95	0.00		12/30/95	0.30	snow (2")
			12/31/95	0.00	

Precipitation - Trail Canyon

<u>Date</u>	<u>Gauge Reading</u>	<u>Precipitation</u>	<u>Date</u>	<u>Gauge Reading</u>	<u>Precipitation</u>
01/01/95	0.00		03/15/95	0.00	
01/02/95	0.00		03/16/95	0.14	rain
01/03/95	0.00		03/17/95	0.45	rain
01/04/95	0.18	snow	03/18/95	0.00	
01/05/95	0.04	lt. snow	03/19/95	0.29	rain/snow mix
01/06/95	0.01	lt. snow	03/20/95	0.00	
01/07/95	0.14	snow	03/21/95	0.13	rain/snow
01/08/95	0.08	snow	03/22/95	0.00	
01/09/95	0.00		03/23/95	0.00	
01/10/95	0.00		03/24/95	0.06	snow
01/11/95	0.28	snow	03/25/95	0.00	
01/12/95	0.03	lt. snow	03/26/95	0.00	
01/13/95	0.00		03/27/95	0.00	
.	.	no precipitation	03/28/95	0.00	
.	.	during this	03/29/95	0.02	lt. snow
.	.	period	03/30/95	0.00	
01/23/95	0.00		.	.	no precipitation
01/24/95	0.10	snow	.	.	during this
01/25/95	0.30	snow	.	.	period
01/26/95	0.30	snow	04/07/95	0.00	
01/27/95	0.00		04/08/95	0.09	snow
.	.	no precipitation	04/09/95	0.00	
.	.	during this	.	.	no precipitation
.	.	period	.	.	during this
02/07/95	0.00		.	.	period
02/08/95	0.18	snow	04/13/95	0.00	
02/09/95	0.00		04/14/95	0.04	snow
02/10/95	0.00		04/15/95	0.04	snow
02/11/95	0.37	snow	04/16/95	0.01	lt. snow
02/12/95	0.00		04/17/95	0.70	heavy snow
02/13/95	0.22	snow	04/18/95	0.38	snow
02/14/95	0.00		04/19/95	0.54	snow
.	.	no precipitation	04/20/95	0.25	snow
.	.	during this	04/21/95	0.32	snow
.	.	period	04/22/95	0.02	lt. snow
02/27/95	0.00		04/23/95	0.00	
02/28/95	0.02	lt. rain/snow	04/24/95	0.00	
03/01/95	0.00		04/25/95	0.16	rain
03/02/95	0.00		04/26/95	0.00	
03/03/95	0.26	snow	04/27/95	0.00	
03/04/95	0.14	snow	04/28/95	0.07	rain
03/05/95	0.06	snow	04/29/95	0.18	rain
03/06/95	0.04	rain/lt. snow	04/30/95	0.90	thunderstorm
03/07/95	0.00		05/01/95	0.93	thunderstorm
03/08/95	0.00		05/02/95	0.15	rain/snow
03/09/95	0.00		05/03/95	0.00	
03/10/95	0.03	lt. rain	.	.	no precipitation
03/11/95	0.38	rain	.	.	during this
03/12/95	0.02	lt. rain/snow	.	.	period
03/13/95	0.00		05/07/95	0.00	
03/14/95	0.00		05/08/95	0.00	lt. rain

### Precipitation - Trail Canyon

<u>Date</u>	<u>Gauge Reading</u>	<u>Precipitation</u>	<u>Date</u>	<u>Gauge Reading</u>	<u>Precipitation</u>
05/09/95	0.00	lt. rain	07/09/95	0.00	trace of rain
05/10/95	0.11	rain	07/10/95	0.00	trace of rain
05/11/95	0.59	night rain	07/11/95	0.00	
05/12/95	0.14	rain	07/12/95	0.16	afternoon rain
05/13/95	0.00		07/13/95	0.00	
05/14/95	0.02	lt. rain	07/14/95	0.04	afternoon rain
05/15/95	0.00		07/15/95	0.00	
.	.	no precipitation	07/16/95	0.00	
.	.	during this	07/17/95	0.18	thunderstorm
.	.	period	07/18/95	0.00	
05/21/95	0.00		07/19/95	0.00	
05/22/95	0.00	trace of rain	07/20/95	0.09	thunderstorm
05/23/95	0.08	rain	07/21/95	0.00	
05/24/95	0.72	rain	07/22/95	0.01	afternoon rain
05/25/95	0.30	intermittent rain	07/23/95	0.00	
05/26/95	0.41	rain/snow	.	.	no precipitation
05/27/95	0.00		.	.	during this
05/28/95	0.09	rain	.	.	period
05/29/95	0.01	lt. rain/snow	08/08/95	0.00	
05/30/95	0.00		08/09/95	0.12	evening rain
05/31/95	0.00		08/10/95	0.56	rain
06/01/95	0.00		08/11/95	0.65	rain
06/02/95	0.16	rain	08/12/95	0.00	
06/03/95	0.01	lt. rain	08/13/95	0.00	
06/04/95	0.00		08/14/95	0.74	morning rain
06/05/95	0.00		08/15/95	0.00	
06/06/95	0.00		.	.	no precipitation
06/07/95	0.00		.	.	during this
06/08/95	0.24	evening rain	.	.	period
06/09/95	0.10	rain/lt. snow	08/19/95	0.00	
06/10/95	0.00		08/20/95	0.27	rain
.	.	no precipitation	08/21/95	0.00	
.	.	during this	08/22/95	0.90	heavy thunderstorr
.	.	period	08/23/95	1.75	Precip. fell within 1
06/15/95	0.00		08/24/95	0.00	
06/16/95	0.23	night rain	08/25/95	0.00	
06/17/95	0.14	rain	08/26/95	0.00	
06/18/95	0.00		08/27/95	0.02	lt. rain
.	.	no precipitation	08/28/95	0.00	
.	.	during this	08/29/95	0.00	
.	.	period	08/30/95	0.00	
06/29/95	0.00		08/31/95	0.00	
06/30/95	0.80	heavy night rain	09/01/95	0.05	afternoon rain
07/01/95	0.40	20 min. duration	09/02/95	0.38	thunderstorm
07/02/95	0.10	rain	09/03/95	0.00	
07/03/95	0.42	rain/brief hail	09/04/95	0.02	lt. rain
07/04/95	0.00		09/05/95	0.12	thunderstorm
.	.	no precipitation	09/06/95	0.00	
.	.	during this	09/07/95	0.00	
.	.	period	09/08/95	0.00	
07/08/95	0.00		09/09/95	0.00	

Precipitation - Trail Canyon

<u>Date</u>	<u>Gauge Reading</u>	<u>Precipitation</u>	<u>Date</u>	<u>Gauge Reading</u>	<u>Precipitation</u>
09/10/95	0.00		11/12/95	0.00	
.	.	no precipitation	11/13/95	0.00	
.	.	during this	11/14/95	0.00	
.	.	period	11/15/95	0.00	
09/16/95	0.00		11/16/95	0.40	snow (2")
09/17/95	0.21	rain	11/17/95	0.00	
09/18/95	0.03	lt. rain	.	.	no precipitation
09/19/95	0.00		.	.	during this
.	.	no precipitation	.	.	period
.	.	during this	12/03/95	0.00	
.	.	period	12/04/95	0.07	rain
09/27/95	0.00		12/05/95	0.16	night rain
09/28/95	0.26	rain	12/06/95	0.00	
09/29/95	0.00		12/07/95	0.10	snow
09/30/95	0.00		12/08/95	0.00	
10/01/95	0.00		12/09/95	0.00	
10/02/95	0.00		12/10/95	0.00	
10/03/95	0.18	rain/snow	12/11/95	0.00	
10/04/95	0.00		12/12/95	0.16	lt. evening snow
.	.	no precipitation	12/13/95	0.00	
.	.	during this	.	.	no precipitation
.	.	period	.	.	during this
11/01/95	0.00	evening snow	.	.	period
11/02/95	0.18	rain	12/18/95	0.00	
11/03/95	0.00		12/19/95	0.00	lt. snow
.	.	no precipitation	12/20/95	0.00	
.	.	during this	.	.	no precipitation
.	.	period	.	.	during this
11/08/95	0.00		.	.	period
11/09/95	0.27	rain/snow	12/29/95	0.00	
11/10/95	0.05	morning snow	12/30/95	0.33	snow (2")
11/11/95	0.00		12/31/95	0.00	

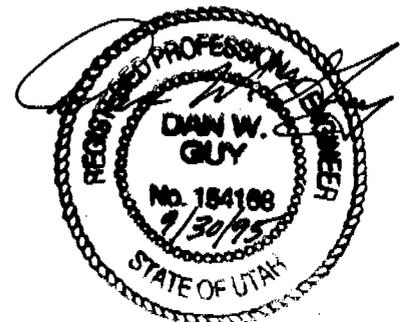
**APPENDIX B**

**SUBSIDENCE MONITORING**

CO-OP MINING COMPANY  
 SUBSIDENCE MONITORING  
TRAIL AND BEAR CANYON MINES

STATION	LOCATION	ELEVATION			CHANGE	
		7/19/87	08/28/94	09/30/95	Last	Acc.
SMS-1	Trail/Bear	9188.57	9188.20	9187.94	-0.26	-0.63
SMS-2	Bear Cyn.	8542.60	8541.65	8541.36	-0.29	-1.24
SMS-3	Trail Cyn.	8769.06	8768.52	8768.39	-0.13	-0.67
SMS-4	Trail Cyn.	8410.00	8409.56	8409.82	+0.26	-0.18
CON-5	Bear Cyn.	9379.91	9379.91	9379.91	-	-
CON-6	Bear Cyn.	9491.62	9491.62	9491.62	-	-
SMS-7	Bear Cyn.	9398.78	9398.78	9398.29	-0.49	-0.49
SMS-8	McCadden	9062.15	9062.17	9062.14	-0.03	-0.01
SMS-9	Bear Cyn.	9348.91	9348.87	9348.45	-0.42	-0.46
SMS-10	Bear Cyn.	9331.62	9331.71	9331.66	-0.05	+0.04

- Notes:
- (1) CON-6 and SMS-7 through SMS-10 established 9/22/91.
  - (2) The area was walked between all stations. No visible movement, cracks or other subsidence effects were noted during the survey, other than those shown on Plate 3-3.
  - (3) A subsidence hole was reclaimed in the drainage above Birch Springs in Huntington Canyon.



# **APPENDIX C**

## **VEGETATION MONITORING**

***VEGETATION MONITORING  
OF THE  
TRAIL CANYON AREA  
1995***

***FOR THE  
CO-OP MINING COMPANY***



*Prepared by*

**MT. NEBO SCIENTIFIC, INC.**

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**P.O. Box 337**

**Springville, Utah 84663**

**(801) 489-6937**

*for*

**CO-OP MINING COMPANY**

**P.O. Box 1245**

**Huntington, Utah 84528**

***Report: Patrick Collins, Ph.D.***

***Report Date: February 1996***  
***Fieldwork Date: October 1995***

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# VEGETATION MONITORING OF THE TRAIL CANYON AREAS

1995

## SCOPE

The purpose of this report is to provide annual vegetation monitoring data required by the State of Utah, Division of Oil, Gas & Mining (DOGM). The areas studied were those that were once disturbed by mining activities and later reclaimed.

## INTRODUCTION

Vegetation monitoring data have been recorded for the past several years in Trail Canyon for the CO-OP Mining Company. A general site description has been written and provided in a previous report. This description has also been included below.

### General Site Description

The study area was located in Trail Canyon, a branch of Huntington Canyon. Huntington Canyon is located west of the town of Huntington, Utah. Several previously disturbed areas have been reclaimed and reseeded in an effort to provide permanent,

self-perpetuating vegetative cover. Elevations of the reseeded areas in Trail Canyon range from 6,925 ft to nearly 7,275 ft above sea level. Slopes that surround the canyon were primarily dominated by pinyon-juniper, Salina wildrye and mountain brush communities. Prior to disturbance and development, the canyon bottoms were probably composed chiefly of sagebrush/grass and riparian communities. The vegetation of the reclaimed areas in the canyon were all the result of disturbances caused by previous mining activities.

The *Reference Area* that was previously selected by the CO-OP Mining Company was also located in Trail Canyon at approximately the same elevation as the reclaimed areas. The plant community of the *Reference Area* was pinyon-juniper/salina wildrye. It had an eastern exposure with a slope of approximately 30 degrees.

## METHODS

In past years the reclaimed areas of Trail Canyon have been sampled to provide quantitative as well as qualitative data for an estimation of the revegetation success. *In 1995 only qualitative monitoring was required.* The information recorded in the field included: 1) site name, 2) subdivision area (to compare to previous vegetation monitoring maps), 3) date of survey, 4) field workers, 5) slope, 6), exposure, 7) degree of animal disturbance, 8) erosion observed, 9) a rough estimate of living cover, 10) dominant plant species observed, and 11) additional relevant notes.

### Study Area Divisions

In 1995 and in previous sample years the data have been divided into areas that were close in proximity, disturbance type, or had other environmental variables in common. These divisions were called: 1) *Reclaimed Slopes*, 2) *Reclaimed Pads*, 3) *Reclaimed Road*, and 4) *Reference Area*. The division called *Reclaimed Slopes* included the following revegetated slopes in the Trail Canyon study area:

Middle Slopes,  
Slopes to Middle Pad,  
Slopes near the Residents ,  
Steep Slope Above Middle Pad.

The areas called *Reclaimed Pads* on the data sheets and summary tables included the following:

Lower Pad,  
Middle Pad,  
Slopes (nearby),  
Picnic Area.

The *Reclaimed Road* included the following:

Reclaimed Road,  
Substation Area.

The *Reference Area* included the only area chosen in Trail Canyon to represent the standard for revegetation success. Previous reports provide sample location maps of these areas.

### Photographs

Color photographs of each sample area were taken at the time of sampling and submitted with this report.

## **RESULTS**

Summaries of the qualitative data recorded in the field for each area was prepared and have been included in the following pages. Color photographs were also included to provide a more visual representation of the study areas.

CO-OP MINING COMPANY  
QUALITATIVE DATA SHEET  
-1995-

SITE NAME: Reclaimed Slopes (Middle Slopes; Slopes to Middle Pad;  
Slope Near Residents)

AREA: "A"

DATE: October 10, 1995

WORKERS: P. Collins

SLOPE: 5°-37°

EXPOSURE: West

ANIMAL USE/DISTURBANCE: Some slight use

EROSION: Slight to moderate on "Middle Slopes" (4"-6" deep in some areas, but  
vegetation seems to be reducing it).  
Erosion was negligible on "Slope Near Residents".

COVER: Approximately 45% (by visual estimate).

DOMINANT PLANT SPECIES OBSERVED:

Shrubs

*Artemisia tridentata*

*Chrysothamnus nauseosus*

Forbs

*Astragalus cicer*

*Malcomia africana*

*Medicago sativa*

*Penstemon palmeri*

*Sanquisorba minor*

Grasses

*Bromus inermis*

*Elymus spicatus*

*Elymus cinereus*

*Elymus lanceolatus*

*Elymus smithii*

*Stipa hymenoides*



Page 2  
CO-OP Mining Co.  
Area "A"

NOTES:

- 1) Qualitatively sampled the vegetation. No quantitative data were taken.
- 2) There was some coal fines mixed in with soils on "Slope to Middle Pad".
- 3) The past year has been a good year for precipitation. The plants verify this.



MT. NEBO SCIENTIFIC, INC.  
Springville, Utah

CO-OP MINING COMPANY  
QUALITATIVE DATA SHEET  
-1995-

SITE NAME: Steep Slopes Above Middle Pad

AREA: "B"

DATE: October 10, 1995

WORKERS: P. Collins

SLOPE: 37°

EXPOSURE: West

ANIMAL USE/DISTURBANCE: Some slight use

EROSION: There were about 3 or 4 moderate to severe erosion rills that were 4"-10" wide and 2"-4" deep.

COVER: Approximately 35% (by visual estimate).

DOMINANT PLANT SPECIES OBSERVED:

Shrubs

*Chrysothamnus nauseosus*

Forbs

*Aster foliaceus*

*Medicago sativa*

*Melilotus officinalis*

*Penstemon palmeri*

*Salsola pestifer*

Grasses

*Elymus cinereus*

*Elymus lanceolatus*

*Elymus spicatus*

NOTES:

- 1) Qualitatively sampled the vegetation. No quantitative data were taken.
- 2) The past year has been a good year for precipitation.
- 3) The general condition of the vegetation was fair to good.



CO-OP MINING COMPANY  
QUALITATIVE DATA SHEET  
-1995-

SITE NAME: Reclaimed Slopes (Lower Pad & Slopes)

AREA: "C"

DATE: October 10, 1995

WORKERS: P. Collins

SLOPE: 1°-5°

EXPOSURE: Variable

ANIMAL USE/DISTURBANCE: Some slight use

EROSION: Erosion has been repaired on these slopes

COVER: Approximately 40% (by visual estimate).

DOMINANT PLANT SPECIES OBSERVED:

Shrubs

*Artemisia tridentata*

*Chrysothamnus nauseosus*

*Populus angustifolia*

Forbs

*Achillea millefolium*

*Aster chilensis*

*Astragalus cicer*

*Linum lewisii*

*Machaeranthera canescens*

*Medicago sativa*

*Melilotus officinalis*

*Penstemon palmeri*

*Sanquisorba minor*

*Tragopogon dubius*

Grasses

*Bromus inermis*

*Elymus spicatus*

*Elymus cinereus*



Page 2  
CO-OP Mining Co.  
Area "C"

*Elymus lanceolatus*  
*Elymus smithii*  
*Stipa hymenoides*

NOTES:

- 1) Qualitatively sampled the vegetation. No quantitative data were taken.
- 2) Area looks good. Vegetation looked good and had excellent seed-set due to above average precipitation.



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Springville, Utah

CO-OP MINING COMPANY  
QUALITATIVE DATA SHEET  
-1995-

SITE NAME: Reclaimed Pads (Picnic Area)

AREA: "D"

DATE: October 10, 1995

WORKERS: P. Collins

SLOPE: 1°-5°

EXPOSURE: Variable

ANIMAL USE/DISTURBANCE: Some slight to moderate use

EROSION: Negligible

COVER: Approximately 35% (by visual estimate).

DOMINANT PLANT SPECIES OBSERVED:

Shrubs

*Chrysothamnus nauseosus*

Forbs

*Medicago sativa*

*Penstemon pachyphyllus*

Grasses

*Agropyron cristatum*

*Bromus carinatus*

*Elymus cinereus*

*Elymus lanceolatus*

*Stipa hymenoides*

NOTES:

- 1) Qualitatively sampled the vegetation. No quantitative data were taken.
- 2) This area had more woody species by density and cover than the other areas.
- 3) There was some coal fines mixed in with the soils.



CO-OP MINING COMPANY  
QUALITATIVE DATA SHEET  
-1995-

SITE NAME: Reclaimed Pads (Middle Pads)

AREA: "E"

DATE: October 10, 1995

WORKERS: P. Collins

SLOPE: 1°-5°

EXPOSURE: Variable

ANIMAL USE/DISTURBANCE: Some slight to moderate use

EROSION: Negligible

COVER: Approximately 40% (by visual estimate).

DOMINANT PLANT SPECIES OBSERVED:

Shrubs

*Artemisia tridentata*

*Chrysothamnus nauseosus*

Forbs

*Achillea millefolium*

*Aster chilensis*

*Astragalus cicer*

*Linum lewisii*

*Medicago sativa*

Grasses

*Elymus cinereus*

*Elymus lanceolatus*

*Elymus spicatus*

*Stipa hymenoides*

NOTES:

- 1) Qualitatively sampled the vegetation. No quantitative data were taken.
- 2) There was some coal fines mixed in with soils.
- 3) The past year has been a good year for precipitation.



CO-OP MINING COMPANY  
QUALITATIVE DATA SHEET  
-1995-

SITE NAME: Reclaimed Road & Substation

AREA: Road

DATE: October 10, 1995

WORKERS: P. Collins

SLOPE: Variable

EXPOSURE: Variable

ANIMAL USE/DISTURBANCE: Some moderate use

EROSION: Slight to moderate

COVER: Approximately 40% (by visual estimate).

DOMINANT PLANT SPECIES OBSERVED:

Shrubs

*Artemisia tridentata*

*Ceratoides lanata*

*Chrysothamnus nauseosus*

*Eriogonum corymbosum*

*Pinus ponderosa*

*Populus angustifolia*

*Tamarix ramosissima*

Forbs

*Achillea millefolium*

*Aster foliaceus*

*Astragalus cicer*

*Cirsium* sp.

*Linum lewisii*

*Machaeranthera canescens*

*Malcomia africana*

*Medicago sativa*

*Penstemon pachyphyllus*

*Sanquisorba minor*



Page 2  
CO-OP Mining Co.  
Reclaimed Road

Grasses

*Agropyron cristatum*

*Bromus inermis*

*Elymus spicatus*

*Elymus cinereus*

*Elymus lanceolatus*

*Elymus smithii*

*Poa pratensis*

*Poa secunda*

*Stipa hymenoides*

NOTES:

- 1) Qualitatively sampled the vegetation. No quantitative data were taken.
- 2) The area looks very good this year, probably better than ever and due to the above average precipitation.
- 3) There was a rock slide near the rocks that look as they have been burned.



CO-OP MINING COMPANY  
QUALITATIVE DATA SHEET  
-1995-

SITE NAME: Reference Area

DATE: October 10, 1995

WORKERS: P. Collins

SLOPE: 35°

EXPOSURE: East

ANIMAL USE/DISTURBANCE: Some moderate

EROSION: Negligible

COVER: Approximately 30% (by visual estimate).

DOMINANT PLANT SPECIES OBSERVED:

Shrubs

*Artemisia tridentata*

*Chrysothamnus nauseosus*

*Chrysothamnus viscidiflorus*

*Ephedra viridis*

*Eriogonum corymbosum*

*Gutierrezia sarothrae*

*Pinus edulis*

Forbs

*Artemisia ludoviciana*

*Cirsium sp.*

*Erigeron sp.*

*Hymenoxys richardsonii*

*Machaeranthera canescens*

Grasses

*Elymus salinus*

NOTES:

- 1) Qualitatively sampled the vegetation. No quantitative data were taken.
- 2) The past year has been a good year for precipitation. The plants verify this.



**COLOR PHOTOGRAPHS**



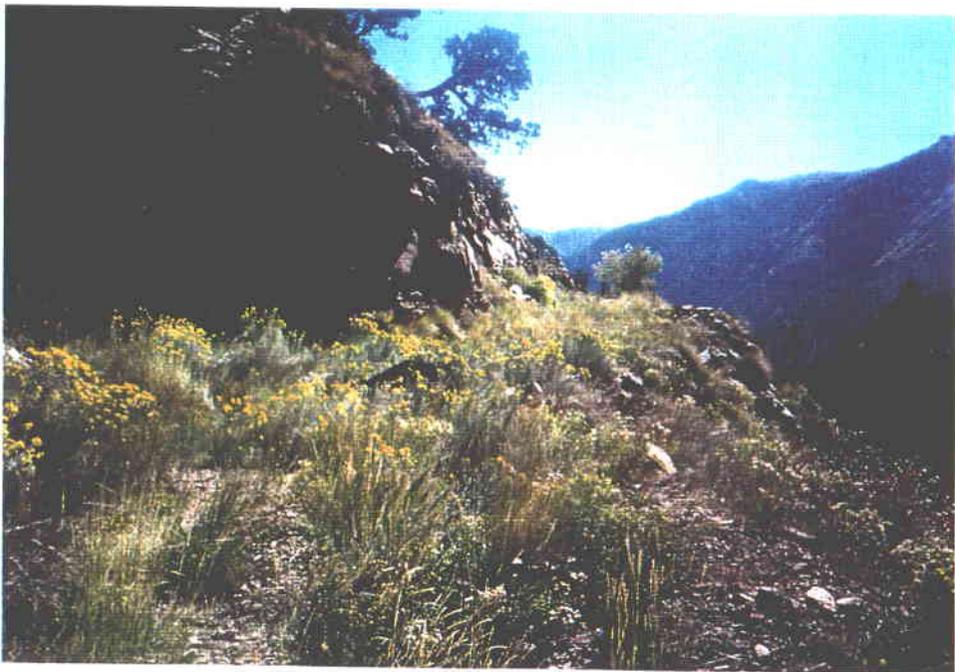
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*Springville, Utah*



Reclaimed Pads (Picnic Area)



Reclaimed Pads (Picnic Area)



Reclaimed Road



Reclaimed Road



Reclaimed Pads (Lower Pad & Slopes)



Reclaimed Pads (Steep Slope above Middle Pad)



Reclaimed Pads (Middle Pad)



Reclaimed Pads (Picnic Area)



Reference Area



Reclaimed Slopes (Middle Slopes)



Reclaimed Slopes (Slope to Middle Pad)



Reclaimed Slopes (Slopes near Residents)

# **APPENDIX D**

## **REVEGETATION SEED MIXES**

ASCA Area "V", Tank Seam Road & Topsoil Piles, Subsidence Mitigation Area "1"

CUSTOMER: CO-OP MINING CO.		LOT: #7461
MIXTURE NAME: PINION JUNIPER MIX		
P.O. NUMBER: 10924		
PURITY	MIXTURE CONTENTS	ORIGIN GERM/HARD
12.32%	GREAT BASIN WILDRYE	UTAH 83%
11.34%	INDIAN RICEGRASS	COLORA 90%
10.89%	WESTERN WHEATGRASS	MONTAN 94%
10.87%	BLUEBUNCH WHEATGRASS	WASHIN 94%
8.02%	MT. MAHOGANY	UTAH 85%
8.00%	SERVICE BERRY	UTAH 85%
7.25%	THICKSPICK WHEATGRASS	WASHIN 94%
5.30%	UTAH SWEET VETCH	UTAH 66% + 26%
4.31%	LEWIS BLUE FLAX	MONTAN 79%
4.26%	TRILOBATA SKUNKBUSH	UT 80%
3.63%	YELLOW BLOSSOM SWEET CLOVER	CANADA 86% + 8%
1.13%	RUBBER RABBIT BRUSH	UTAH 42% + 1%
0.62%	PALMER PENSTEMON	UTAH 81%

Part 1 of 2

lot number 7461 continued

0.61%	VASSEYANA SAGE	UTAH 77% + 3%
0.32%	PACIFIC ASTER	UT 75%
0.29%	YARROW	COLORA 88%

0.13% CROP 10.56% INERT OLDEST TEST DATE: 7/95  
 0.15% WEED NO NOXIOUS WEED FOUND

NET WEIGHT 20.54 LBS.

SHIP TO: CO-OP MINING CO.  
 BOX 1245  
 HUNTINGTON, UT 84528-  
 ut 822-18E

Part 2 of 2



Reclaimed Trail Canyon Sediment Pond Area

CUSTOMER: CO-OP MINING CO.  
P.O. NUMBER: 11347

LOT: #7654

PURITY	MIXTURE CONTENTS	ORIGIN	GERM/HARD
19.89%	SECAR BLUEBUNCH WHEATGRASS	WASHIN	88%
16.48%	CURL LEAF MT. MAHOGANY	UTAH	85%
11.47%	LEWIS BLUE FLAX	WASHIN	61%
10.98%	UTAH SERVICE BERRY	UTAH	85%
7.78%	INDIAN RICEGRASS	WASHIN	90%
7.45%	THICKSPICK WHEATGRASS	WASHIN	94%
5.24%	LUPINE	UTAH	38 + 86%
5.09%	NORTHERN SWEET VETCH	UTAH	66 + 26%
3.72%	WESTERN WHEATGRASS	MONTAN	94%
2.89%	SANDBERG BLUEGRASS	MONTAN	81%
1.45%	PALMER PENSTEMON	UTAH	81%
0.73%	VASSEYANA SAGE	UTAH	75 + 83%
0.47%	PACIFIC ASTER	UTAH	75%
0.37%	WESTERN YARROW	UTAH	93 + 1%

Part 1 of 2

lot number 7654 continued

0.20% CROP 5.56% INERT OLDEST TEST DATE: 07/95  
0.23% WEED NO NOXIOUS WEED FOUND

NET WEIGHT 42.08 LBS.

SHIP TO: CO-OP MINING CO.  
BOX 1245  
HWY 31  
HUNTINGTON, UT 84528-

Part 2 of 2

# **APPENDIX E**

## **ANNUAL IMPOUNDMENT CERTIFICATION**

**1995 ANNUAL IMPOUNDMENT CERTIFICATION REPORT**

1. I, hereby certify, in accordance with the approved plan that with respect to the following facility.

Name of Permittee: Co-Op Mining Company  
Permit No.: ACT/015/025  
Mine Name: Bear Canyon Mine

Water Impoundment Identification: Sediment Pond "A"  
Inspection Date: 12-8-95

2. I, or persons under my supervision have conducted adequate inspections of the maintenance of the structure; and
3. The maintenance has been performed in accordance with the Utah State Coal Program; and
4. The attached report is certified in accordance with the rules of professional conduct promulgated by the Utah Board of Examiners for Engineers; and
5. The attached report addresses the following points:
  - (a) any appearances of instability, structural weakness or other hazardous conditions;
  - (b) depth and elevation of impoundment water;
  - (c) existing storage capacity;
  - (d) existing or required monitoring procedures and instrumentation; and
  - (e) any other aspects of the structure affecting stability.
6. Comments

1995 ANNUAL IMPOUNDMENT CERTIFICATION REPORT cont.

On 8 December 1995, an inspection of Co-Op Mining Company, Bear Canyon Mine Sediment pond "A" revealed the following:

- A. The pond has been constructed and maintained in accordance with the approved plan.
- B. The pond's dam appeared sound with no signs of instability or hazardous conditions.
- C. The sediment elevation was 7085.5, 0.5 feet below sediment cleanout level (7086 ft (60 percent cleanout level)) and 2.5 feet below decant level. There was six inches of standing water in the pond.
- D. The existing storage capacity was 2.14 acre-feet which is greater than the 1.57 acre-feet required by the approved plan.
- E. Ponds are inspected quarterly for structural problems. Discharge monitoring is conducted monthly and reports are submitted to the Division and Utah Department of Health (UTG040006, Utah General Permit for Coal Mining. Discharge Point 002) as required in the approved plan. Discharge was reported in August of 1995 during upset conditions.

Based on this field inspection, Pond "A" has been certified as required by R645-301-514.310 through R645-301-514.313. I do hereby certify that the above information is a true and accurate representation of the pond at this time.

*Kimly C Mangum*  
name  
1-15-96  
date



1-15-96

**1995 ANNUAL IMPOUNDMENT CERTIFICATION REPORT**

1. I, hereby certify, in accordance with the approved plan that with respect to the following facility.

Name of Permittee: Co-Op Mining Company  
Permit No.: ACT/015/025  
Mine Name: Bear Canyon Mine

Water Impoundment Identification: Sediment Pond "B"  
Inspection Date: 10-21-95'

2. I, or persons under my supervision have conducted adequate inspections of the maintenance of the structure; and
3. The maintenance has been performed in accordance with the Utah State Coal Program; and
4. The attached report is certified in accordance with the rules of professional conduct promulgated by the Utah Board of Examiners for Engineers; and
5. The attached report addresses the following points:
  - (a) any appearances of instability, structural weakness or other hazardous conditions;
  - (b) depth and elevation of impoundment water;
  - (c) existing storage capacity;
  - (d) existing or required monitoring procedures and instrumentation; and
  - (e) any other aspects of the structure affecting stability.
6. **Comments** Cleaning had been completed on 10 Oct 1995. The Inlet was regraded and grouted with concrete on 13 Oct 1995. The road embankment was reseeded on 18 Oct 1995. Damage was caused by two consecutive eight hour storms, 22 Aug & 23 Aug 1995.

1995 ANNUAL IMPOUNDMENT CERTIFICATION REPORT cont.

On 21 October 1995, an inspection of Co-Op Mining Company, Bear Canyon Mine Sediment pond "B" revealed the following:

- A. The pond has been constructed and maintained in accordance with the approved plan.
- B. The pond's dam appeared sound with no signs of instability or hazardous conditions.
- C. The bottom elevation was 7062, 0.9 feet below sediment cleanout level (7062.9 ft (60 percent cleanout level)) and 2.9 feet below decant level, 7064.9 ft. Pond had six inches of standing water.
- D. The existing storage capacity was 0.30 acre-feet which is greater than the 0.185 acre-feet required by the approved plan.
- E. Ponds are inspected quarterly for structural problems. Discharge monitoring is conducted monthly and reports are submitted to the Division and Utah Department of Health (UTG040006, Utah General Permit for Coal Mining. Discharge Point 003) as required in the approved plan. Discharge was reported in August of 1995 during upset conditions.

Based on this field inspection, Pond "B" has been certified as required by R645-301-514.310 through R645-301-514.313. I do hereby certify that the above information is a true and accurate representation of the pond at this time.

Kimly C. Mangum, P.E.  
name

11-3-95  
date



11-3-95

**1995 ANNUAL IMPOUNDMENT CERTIFICATION REPORT**

1. I, hereby certify, in accordance with the approved plan that with respect to the following facility.

Name of Permittee: Co-Op Mining Company  
Permit No.: ACT/015/025  
Mine Name: Bear Canyon Mine

Water Impoundment Identification: Sediment Pond "C"  
Inspection Date: 12-8-95'

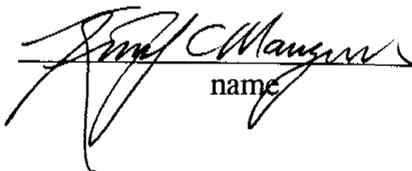
2. I, or persons under my supervision have conducted adequate inspections of the maintenance of the structure; and
3. The maintenance has been performed in accordance with the Utah State Coal Program; and
4. The attached report is certified in accordance with the rules of professional conduct promulgated by the Utah Board of Examiners for Engineers; and
5. The attached report addresses the following points:
  - (a) any appearances of instability, structural weakness or other hazardous conditions;
  - (b) depth and elevation of impoundment water;
  - (c) existing storage capacity;
  - (d) existing or required monitoring procedures and instrumentation; and
  - (e) any other aspects of the structure affecting stability.
6. Comments

**1995 ANNUAL IMPOUNDMENT CERTIFICATION REPORT cont.**

On 8 December 1995, an inspection of Co-Op Mining Company, Bear Canyon Mine Sediment pond "C" revealed the following:

- A. The pond has been constructed and maintained in accordance with the approved plan.
- B. The pond's dam appeared sound with no signs of instability or hazardous conditions.
- C. The sediment elevation was 7030, 0.3 feet below sediment cleanout level (7030.3 ft (60 percent cleanout level)). The pond was dry.
- D. The existing storage capacity was 0.30 acre-feet which is greater than the 0.195 acre-feet required by the approved plan.
- E. Ponds are inspected quarterly for structural problems. Discharge monitoring is conducted monthly and reports are submitted to the Division and Utah Department of Health (UTG040006, Utah General Permit for Coal Mining. Discharge Point 006) as required in the approved plan. Discharge was reported in August of 1995 during upset conditions.

Based on this field inspection, Pond "C" has been certified as required by R645-301-514.310 through R645-301-514.313. I do hereby certify that the above information is a true and accurate representation of the pond at this time.

  
name

1-15-96  
date



1-15-96

**1995 ANNUAL IMPOUNDMENT CERTIFICATION REPORT**

1. I, hereby certify, in accordance with the approved plan that with respect with the following facility.

Name of Permittee: Co-Op Mining Company  
Permit No.: ACT/015/021  
Mine Name: Trail Canyon Mine

Water Impoundment Identification: Trail Canyon Sediment Pond  
Inspection Date: 12-8-95

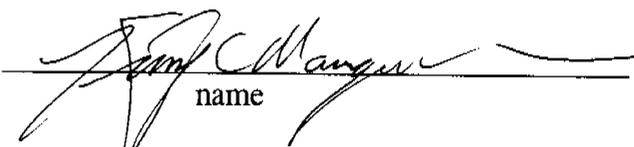
2. I, or persons under my supervision have conducted adequate inspections of the maintenance of the structure; and
3. The maintenance has been performed in accordance with the Utah State Coal Program; and
4. The attached report is certified in accordance with the rules of professional conduct promulgated by the Utah Board of Examiners for Engineers; and
5. The attached report addresses the following points:
  - (a) any appearances of instability, structural weakness or other hazardous conditions;
  - (b) depth and elevation of impoundment water;
  - (c) existing storage capacity;
  - (d) existing or required monitoring procedures and instrumentation; and
  - (e) any other aspects of the structure affecting stability.
6. Comments

1995 ANNUAL IMPOUNDMENT CERTIFICATION REPORT cont.

On 8 December 1995, an inspection of Co-Op Mining Company, Trail Canyon revealed the following:

- A. The pond has been constructed and maintained in accordance with the approved plan.
- B. The pond's dam appeared sound with no signs of instability or hazardous conditions.
- C. The pond was dry. Elevation was 6943.85, 0.30 feet below sediment cleanout level (6944.15 ft (60 percent cleanout level)). The pond was dry.
- D. The existing storage capacity was 1.81 acre-feet which is greater than the 1.082 acre-feet required by the approved plan.
- E. Ponds are inspected quarterly for structural problems. Discharge monitoring is conducted monthly and reports are submitted to the Division and Utah Department of Health (UTG040006, Utah General Permit for Coal Mining. Discharge Point 006) as required in the approved plan. No discharge was noted in 1995.
- F. The pond is scheduled for reclamation in December, 1995.

Based on this field inspection, the Trail Canyon Sediment Pond has been certified as required by R645-301-514.310 through R645-301-514.313. I do hereby certify that the above information is a true and accurate representation of the pond at this time.

  
name

1-15-96  
date



1-15-96

**APPENDIX F**

**SOIL ANALYSIS RESULTS**



Inter-Mountain Laboratories, Inc.

2506 West Main Street

Farmington, New Mexico 87401

Tel. (505) 326-4737

CO-OP MINING CO.  
Huntington, Utah

LOCATION: Bear Canyon #2 Mine

DATE SAMPLED: September 7, 1995  
DATE REPORTED: October 17, 1995

Lab No.	Location	Depths	pH	EC µmhos/cm @ 25°C	Satur- ation %	Calcium mg/l	Magnesium mg/l	Sodium mg/l	SAR	Coarse Fragments %	Sand %	Silt %	Clay %	Texture
42314	RFM 4:Roof		7.5	1.10	25.0	5.40	4.49	1.26	0.57	66.4	73.8	20.0	6.2	SANDY LOAM
42315	RFM 4:Coal		7.3	1.60	74.2	13.4	4.14	0.96	0.32	79.8	81.2	16.3	2.5	LOAMY SAND
42316	RFM 4:Floor		7.8	0.97	27.2	5.01	4.28	0.87	0.40	78.9	46.2	38.8	15.0	LOAM

6C-23  
B.C.  
11/10/95



Inter-Mountain Laboratories, Inc.

2506 West Main Street

Farmington, New Mexico 87401

Tel. (505) 326-4737

CO-OP MINING CO.  
Huntington, Utah

LOCATION: Bear Canyon #2 Mine

DATE SAMPLED: September 7, 1995  
DATE REPORTED: October 17, 1995

Lab No.	Location	Depths	Organic Matter %	Total Sulfur %	T.S. AB t/1000t	Neut. Pot. t/1000t	T.S. ABP t/1000t	Sulfate Sulfur %	Pyritic Sulfur %	Organic Sulfur %	PyrS AB t/1000t	PyrS ABP t/1000t
42314	RFM 4:Roof		11.6	0.02	0.70	423.	422.	<0.01	0.03	0.03	0.98	422.
42315	RFM 4:Coal		24.6	0.72	22.4	9.03	-13.3	0.03	0.11	0.58	3.50	5.53
42316	RFM 4:Floor		23.1	0.05	1.56	363.	362.	<0.01	0.10	0.06	3.21	360.

6C-24  
B.C.  
11/10/95

Abbreviations used in acid base accounting: T.S.= Total Sulfur, AB= Acid Base, ABP= Acid Base Potential, PyrS= Pyritic Sulfur, Pyr+Org= Pyritic Sulfur + Organic Sulfur, Neut. Pot.= Neutralization Potential



Inter-Mountain Laboratories, Inc.

2506 West Main Street

Farmington, New Mexico 87401

Tel. (505) 326-4737

CO-OP MINING CO.  
Huntington, Utah

LOCATION: Bear Canyon #2 Mine

DATE SAMPLED: September 7, 1995  
DATE REPORTED: October 17, 1995

Lab No.	Location	Depth	Nitrate-Nitrogen ppm	Boron ppm	Bulk Density	Total Kjeldahl Nitrogen %	1/3 bar	15 bar	H2O Sol Selenium ppm
42314	RFM 4:Roof		<0.01	0.04		0.03	11.1	1.5	<0.02
42315	RFM 4:Coal		<0.01	0.13		1.31	11.5	6.2	<0.02
42316	RFM 4:Floor		<0.01	0.12		0.13	9.2	3.2	<0.02

6C-25  
B.C.  
11/10/95

JB



Inter-Mountain Laboratories, Inc.

2506 West Main Street

Farmington, New Mexico 87401

Tel. (505) 326-4737

CO-OP MINING COMP.  
Huntington, Utah  
MINE: Bear Canyon Mine  
LOCATION: Pond "B"

DATE SAMPLED: October 4, 1995  
DATE REPORTED: November 14, 1995

Lab No.	Location	Depths	pH	EC microhos/cm @ 25°C	Satur- ation %	Calcium mg/l	Magnesium mg/l	Sodium mg/l	SAR	Coarse Fragments %	Sand %	Silt %	Clay %	Texture
3053	Pond B 1		7.8	3.11	39.7	10.7	11.7	8.92	2.67	57.3	76.0	18.0	6.0	LOAMY SAND
3054	Pond B 2		7.8	2.63	22.8	8.94	9.17	7.00	2.33	40.8	76.0	15.0	9.0	SANDY LOAM



InterMountain Laboratories, Inc.

2506 West Main Street

Farmington, New Mexico 87401

Tel. (505) 326-4737

CO-OP MINING COMP.  
Huntington, Utah  
MINE: Bear Canyon Mine  
LOCATION: Pond "B"

DATE SAMPLED: October 4, 1995  
DATE REPORTED: November 14, 1995

Lab No.	Location	Depths	Organic Matter %	Total Sulfur %	T.S. AB t/1000t	Neut. Pot. t/1000t	T.S. ABP t/1000t	Sulfate Sulfur %	Pyritic Sulfur %	Organic Sulfur %	PyrS AB t/1000t	PyrS ABP t/1000t
3053	Pond B 1		6.0	0.22	6.78	171.	164.					
3054	Pond B 2		5.3	0.20	6.37	178.	171.					

Abbreviations used in acid base accounting: T.S.= Total Sulfur, AB= Acid Base, ABP= Acid Base Potential, PyrS= Pyritic Sulfur, Pyr+Org= Pyritic Sulfur + Organic Sulfur, Neut. Pot.= Neutralization Potential

JB



Inter-Mountain Laboratories, Inc.

2506 West Main Street

Farmington, New Mexico 87401

Tel. (505) 326-4737

CO-OP MINING COMP.  
Huntington, Utah  
MINE: Bear Canyon Mine  
LOCATION: Pond "B"

DATE SAMPLED: October 4, 1995  
DATE REPORTED: November 14, 1995

Lab No.	Location	Depth	Nitrate-Nitrogen ppm	Boron ppm	Bulk Density	Total Kjeldahl Nitrogen %	1/3 bar	15 bar	H2O Sol Selenium ppm
3053	Pond B 1		<0.01	0.74	1.85	0.38	10.0	4.7	<0.02
3054	Pond B 2		<0.01	0.70	1.18	0.33	11.3	4.6	<0.02

Abbreviations for extractants: PE= Saturated Paste Extract, H2OSol= water soluble, ABPTA= Ammonium Bicarbonate-DPTA, AAO= Acid Ammonium Oxalate

JB

**APPENDIX G**

**ANNUAL REPORT OF OFFICERS**



# MAPS