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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

January 6, 1986

FEDERAL EXPRESS  
(511 831 596)

Mr. Charles S. McNeil  
President  
Kaiser Coal Corporation  
P. O. Box 2679  
Colorado Springs, Colorado 80901-2679

Dear Mr. McNeil:

RE: Final Permit Approval, Sunnyside Mines, ACT/007/007, #2  
and #4, Carbon County, Utah

Please find enclosed two copies of the final state permit for the Sunnyside Mines. Appended to the actual permit is the Technical Analysis (TA) and supporting documentation. Please examine the TA and associated stipulations and sign both copies of the attached permit, ACT/007/007, 1/86, on page 5 of that document. Upon signing, please keep one copy of the permit for your records and return one copy Certified Return Receipt Requested to the Division at your earliest convenience.

A Self Bonding and Indemnity Agreement in the amount of \$3,397,349.00 has been executed and filed with the Division. Therefore, upon your signature of the permit, it will become valid and enforceable.

Thank you for your cooperation on this matter. Should you have any questions, please feel free to contact the Division.

Best regards,

Dianne R. Nielson  
Director

JJW/btb  
Enclosures  
cc: Allen Klein  
Robert Hagen  
Lowell Braxton

Joe Helfrich  
Technical Review Team

9294R-43

FEDERAL  
(February 1985)

Permit Number ACT/007/007 , 1/86

STATE OF UTAH  
DEPARTMENT OF NATURAL RESOURCES  
DIVISION OF OIL, GAS AND MINING  
355 West North Temple  
3 Triad Center, Suite 350  
Salt Lake City, Utah 84180-1203  
(801) 538-5340

This permit, ACT/007/007, which incorporates the Office of Surface Mining (OSM) Permit UT-0014, 1/86, is issued for the state of Utah by the Utah Division of Oil, Gas and Mining (DOGM) to:

Kaiser Coal Corporation  
P. O. Box 2679  
102 South Tejon, Suite 800  
Colorado Springs, Colorado 80901-2679

for the Sunnyside Mine. Kaiser Coal Corporation is the lessee of federal coal leases SL 062966-063383, U 010140, U 32083, SL 068754, and/or the lessee/owner of certain fee-owned parcels listed in the Legal Description following Section 2. The permit is not valid until a performance bond is filed with the DOGM in the amount of \$3,397,349.00, payable to the state of Utah, Division of Oil, Gas and Mining and OSM, and the DOGM has received a copy of this permit signed and dated by the permittee.

- Sec. 1 STATUTES AND REGULATIONS - This permit is issued pursuant to the Utah Coal Mining and Reclamation Act of 1979, Utah Code Annotated (UCA) 40-10-1 et seq, hereafter referred to as UCMRA.
- Sec. 2 The permittee is authorized to conduct surface coal mining and reclamation operations on the following described lands (as shown on ownership map) within the permit area at the Sunnyside Mines situated in the state of Utah, Carbon County, and located:

Fee Land

Township 14 South, Range 14 East, SLB&M, Utah

Sec. 6: N1/2, S1/2 SW1/4, S1/2 SE1/4, NW1/4 SE1/4

Sec. 7: NW1/4, SW1/4 NE1/4, E1/2 SW1/4, S1/2 SE1/4, NW1/4 SE1/4

Sec. 17: NE1/4, SE1/4 NW1/4, SW1/4, S1/2 SE1/4

Sec. 18: E1/2, S1/2 SW1/4, NE1/4 SW1/4, NW1/4 SW1/4, SW1/4 NW1/4 less the following described area:

Beginning at the NW corner of SW1/4 NW1/4 of Section 18, Township 14 South, Range 14 East:

thence S 45° 05' E, 1,577.42 ft;  
thence S 39° 25' W, 1,759.22 ft;  
thence N 2,472.87 ft to point of beginning.

Sec. 19 and 20: All  
Sec. 21: W1/2  
Sec. 28 and 29: All  
Sec. 30: NE1/4, NE1/4 NW1/4, NW1/4 SE1/4  
Sec. 31: S1/2 NE1/4, NE1/4 NE1/4  
Sec. 32 and 33: All  
Sec. 34: W1/2

Township 15 South, Range 14, East, SLB&M, Utah

Sec. 3: W1/2  
Sec. 4: All  
Sec. 5: NE1/4, N1/2 SE1/4, SE1/4 SE1/4, W1/2, SW1/4 SE1/4  
Sec. 6: S1/2 SE1/4, SE1/4 SW1/4, portions of N1/2 SE1/4 and NE1/4 SW1/4, South of the D&RGW Railroad right-of-way.  
Sec. 7: N1/2 NE1/4, N3/4 NW1/4  
Sec. 8: NE1/4 NE1/4, N1/2 NW1/4, NW1/4 NE1/4  
Sec. 9: All  
Sec. 10: W1/2, SE1/4  
Sec. 15: W1/2, N1/2 NE1/4  
Sec. 16: E1/2, NW1/4, E1/2 SW1/4  
Sec. 17: E1/2 NE1/4

Federal Leases

Federal Coal Leases numbers Salt Lake 062966-063383-Utah 010140, Utah 32083 and SL-068754. Areas within both the leases and the permit area are described as follows:

Township 14 South, Range 13 East, SLB&M, Utah

Sec. 1: SE1/4, SE1/4 SW1/4  
Sec. 12: NW1/4, NE1/4, SE1/4, NE1/4 SW1/4 less the following described area:

Beginning at a point which bears S 1,320 ft from the NW corner of Section 12:

thence S, 1,320 ft;  
thence S 89° 55' 30" E, 1,327.01 ft;  
thence S, 1,320 ft;  
thence S 89° 53' 15" E, 1,327.22 ft;  
thence S, 1,320 ft;  
thence S 89° 51' E, 1,327.43 ft;  
thence N 45° 05' 07" W, 5,623.40 ft to the place of beginning.

Sec. 13: Portions of: NE1/4 NE1/4, E1/2 SE1/4, SW1/4 SE1/4, SE1/4 SW1/4, NE1/4 SW1/4, NW1/4 SW1/4, SW1/4 NW1/4 which are shown on Plate II-2 of the Mining and Reclamation Plan (MRP).

Sec. 24: S1/2 SE1/4, Portions of: N1/2 NE1/4, SE1/4 NE1/4, N1/2 SE1/4 and NE1/4 SW1/4 which are shown on Plate II-2 of the MRP.

Sec. 14: Portions of: NE1/4 which is shown on Plate II-2 of the MRP.

Sec. 11: Portions of: SW1/4 SE1/4 which is shown on Plate II-2 of the MRP.

Sec. 25: NE1/4 NE1/4

Township 14 South, Range 14 East, SLB&M, Utah

Sec. 6: N1/2 SW1/4

Sec. 7: W1/2 SW1/4

Sec. 8: SW1/4, SW1/4 SE1/4

Sec. 17: W1/2 NW1/4, NE1/4 NW1/4, N1/2 SE1/4

Sec. 18: E1/2 NW1/4, NW1/4 NW1/4

Sec. 30: NW1/4 NW1/4, SE1/4 NW1/4, NE1/4 SW1/4, S1/2 SE1/4, NE1/4 SE1/4

Sec. 31: NW1/4 NE1/4

Carbon County Lease

Salt Lake Meridian, Utah

Township 14 South, Range 14 East

Sec. 21: SE1/4

Sec. 27: SW1/4, SW1/4 NW1/4

Sec. 34: E1/2

Township 15 South, Range 14 East

Sec. 3: E1/2

Sec. 10: NE1/4

This legal description is for the permit boundary (as shown on the permit area map) of the Sunnyside Mines. The permittee is authorized to conduct surface and reclamation operations connected with mining on the foregoing described property subject to the conditions of the leases, the approved mining plan, and OSM permit UT-0014, 1/86, to be issued January 6, 1986, including all conditions and all other applicable conditions, laws and regulations.

Sec. 3 This permit is issued for a term of five (5) years commencing on the date the permit is signed by the permittee, except that this permit will terminate if the permittee has not begun the surface coal mining and reclamation operations covered herein within three (3) years of the date of issuance.

- Sec. 4 The permit rights may not be transferred, assigned or sold without the approval of the Director, DOGM. Request for transfer, assignment or sale of permit rights must be done in accordance with applicable regulations including but not limited to 30 CFR 740.13(e) and UMC 788.17-.19.
- Sec. 5 The permittee shall allow the authorized representative of the DOGM, including but not limited to inspectors, and representatives of the Office of Surface Mining, without advance notice or a search warrant, upon presentation of appropriate credentials, and without delay to:
- A. have the rights of entry provided for in 30 CFR 840.12, UMC 840.12, 30 CFR 842.13 and UMC 842.13; and,
  - B. be accompanied by private persons for the purpose of conducting an inspection in accordance with UMC 842.12 and 30 CFR 842, when the inspection is in response to an alleged violation reported by the private person.
- Sec. 6 The permittee shall conduct surface coal mining and reclamation operations only on those lands specifically designated as within the permit area on the maps submitted in the mining plan and permit application and approved for the term of the permit and which are subject to the performance bond.
- Sec. 7 The permittee shall minimize any adverse impact to the environment or public health and safety including but not limited to:
- A. accelerated monitoring to determine the nature and extent of noncompliance and the results of the noncompliance;
  - B. immediate implementation of measures necessary to comply; and
  - C. warning, as soon as possible after learning of such noncompliance, any person whose health and safety is in imminent danger due to the noncompliance.
- Sec. 8 The permittee shall dispose of solids, sludge, filter backwash or pollutants in the course of treatment or control of waters or emissions to the air in the manner required by the approved Utah State Program and the Federal Lands Program which prevents violation of any applicable state or federal law.
- Sec. 9 The lessee shall conduct its operations:

- A. in accordance with the terms of the permit to prevent significant, imminent environmental harm to the health and safety of the public; and
- B. utilizing methods specified as conditions of the permit by DOGM and OSM in approving alternative methods of compliance with the performance standards of the Act, the approved Utah State Program and the Federal Lands Program.

- Sec. 10 The permittee shall provide the names, addresses and telephone numbers of persons responsible for operations under the permit to whom notices and orders are to be delivered.
- Sec. 11 The permittee shall comply with the provisions of the Water Pollution Control Act (33 USC 1151 et seq,) and the Clean Air Act (42 USC 7401 et seq), UCA 26-11-1 et seq, and UCA 26-13-1 et seq.
- Sec. 12 Upon expiration, this permit may be renewed for areas within the boundaries of the existing permit in accordance with the Act, the approved Utah State Program and the Federal Lands Program.
- Sec. 13 If during the course of mining operations, previously unidentified cultural resources are discovered, the applicant shall ensure that the site(s) is not disturbed and shall notify the state Regulatory Authority (RA). The state RA, after coordination with OSM, shall inform the operator of necessary actions required.
- Sec. 14 APPEALS - The lessee shall have the right to appeal: (a) under 30 CFR 775 from actions or decisions of any official of OSM; (b) under 43 CFR 3000.4 from an action or decision of any official of the Bureau of Land Management; (c) under 30 CFR 290 from an action, order or decision of any official of the Minerals Management Service; or (d) under applicable regulations from any action or decision of any other official of the Department of the Interior arising in connection with this permit. In addition, the lessee shall have the right to appeal as provided for under UMC 787.
- Sec. 15 SPECIAL CONDITIONS - In addition to the general obligations and of performance set out in the leases, OSM permit UT-0014, 1/86 and this permit, the permittee shall comply with the special conditions of OSM permit UT-0014, 1/86 and the conditions appended hereto as Attachment A.

The above conditions (Secs. 1-15) are also imposed upon the permittee's agents and employees. The failure or refusal of any of these persons to comply with these conditions shall be deemed a failure of the permittee to comply with the terms of this permit and the lease. The permittee shall require his agents, contractors and subcontractors involved in activities concerning this permit to include these conditions in the contracts between and among them. These conditions may be revised or amended, in writing, by the mutual consent of the grantor and the permittee at any time to adjust to changed conditions or to correct an oversight. The grantor may amend these conditions at any time without the consent of the permittee in order to make them consistent with any new federal or state statutes and any new regulations.

THE STATE OF UTAH

By: Denise R. Nelson

Date: January 6, 1986

I certify that I have read and understand the requirements of this permit and any special conditions attached.

\_\_\_\_\_  
Authorized Representative of  
the Permittee

Date: \_\_\_\_\_

APPROVED AS TO FORM:

By: Barbara W. Roberts  
Assistant Attorney General

Date: January 2, 1986

ATTACHMENT A

STIPULATIONS DOCUMENT

Kaiser Coal Corporation  
Sunnyside Mines  
ACT/007/007, Carbon County, Utah

January 3, 1986

Stipulation 817.43-(1)-JW

1. The applicant shall assure that during construction of outlet protection measures, shown on Plate III-35 of the MRP, that the edges of fabric liner are secured by burying with at least eight inches of soil.

Stipulation 817.44-(1, 2)-JW

1. The applicant shall not retain culverts shown as RC2-4 and RC3-1 on Plate III-28 of the mine plan as permanent culverts after mining unless these culverts are replaced at the termination of mining with adequately sized culverts as determined and approved by the regulatory authority.
2. The applicant shall install a well-graded riprap with a median size of 12 inches in the #2 Canyon channel in those areas which cross the reclaimed area during final reclamation or utilize other such measures approved by the regulatory authority to achieve a stable postmining channel configuration.

Stipulation 817.47-(1)-JW

1. The applicant shall install, no later than June 15, 1986, the proposed wire basket rock gabions at the outlets from the hoisthouse and manshaft sediment ponds.

Stipulation 817.91-.93-(1)-PGL

1. The applicant may not use the ESC until the Division approves the embankment configuration that meets the partial pool steady seepage saturation condition minimum safety factor of 1.5 and the seismic safety factor of at least 1.2.

Stipulation 817.116-.117-(1, 2, 3)-LK

1. The applicant shall not disturb the approved pinyon-juniper/grass reference area currently shown on Plate IX-1 until a revised Plate IX-1 showing the location of the proposed new reference area and vegetation sampling data are submitted to and approved by the Division.

2. The success standard for productivity on reclaimed areas shall be achievement of at least 90 percent of the productivity of the corresponding reference area for the last two years of the liability period, using statistically adequate samples at 80 percent confidence with a 10 percent change in the mean.

3. Kaiser Coal Corporation will monitor all permanently reclaimed areas as per the following schedule:

year 1: reconnaissance survey to determine initial species establishment and woody plant density;

years 2, 3, 5, and 7: sample for cover, woody plant density and determine diversity;

If year 3 equals at least 90 percent of and year 5 equals or exceeds the success standard for cover and woody plant density, year 7 monitoring may be waived.

Productivity monitoring is optional for years 1-8. However, no harvest methods (i.e., clipping) shall be used.

The results of monitoring permanently reclaimed areas shall be submitted to the Division by December 31 of each year monitoring is performed.

Stipulation 817.160-.166-(1)-PGL

1. The right-of-way from the BLM for the Water Canyon Road must be submitted to the Division within 30 days of permit approval (Section 8 is owned by the USA) (UMC 782.150).

MINE PLAN INFORMATION

Mine Name: Sunnyside Mines State ID: ACT/U07/007

Operator: Kaiser Coal Corporation County: Carbon

Controlled By: Kaiser Coal Corporation

Contact Person(s): Charles McGlothlin Position: President-Coal Group

Telephone: (303) 475-7005

New/Existing: Existing Mining Method: Longwall

Federal Lease No(s).: (1) Salt Lake-062966-063383-Utah-010140; (2) U-32083; (3) SL-068754

Legal Description(s): See attached sheets.

State Lease No(s).: None

Legal Description(s): \_\_\_\_\_

Other Leases (identify): Carbon County

Legal Description(s): See legal notice.

Ownership Data:

<u>Surface Resources (acres)</u>	<u>Existing Permit Area</u>	<u>Proposed Permit Area</u>	<u>Total Life Of Mine Area</u>
Kaiser Steel		13,031.8	13,031.8
Federal		991.5	991.5
State		- 0 -	- 0 -
Private		360.0	360.0
Other		1.7	1.7
TOTAL		14,385.0	14,385.0

Coal Ownership (acres):

Federal		2,022.0	2,022.0
State		- 0 -	- 0 -
Private		10,128.0	10,128.0
Other		1,160.0	1,160.0
TOTAL		13,310.0	13,310.0

<u>Coal Resource Data</u>	<u>Total Reserves (1981)</u>	<u>Total Recoverable Reserves (1981)</u>
Federal	18,545,500	10,200,000
State	- 0 -	- 0 -
Private	31,091,000	17,100,000
Other	11,454,500	6,300,000
TOTAL	61,091,000	33,600,000

<u>Recoverable Reserve Data</u>	<u>Name</u>	<u>Thickness</u>	<u>Depth</u>
Seam	Upper Sunnyside	4'-6.5'	0-3,000'
Seam	Lower Sunnyside	5'-11.5'	0-3,000'
Seam			

Mine Life: 25 years  
Average Annual Production: 2.0 million tons Percent Recovery: 55  
Date Projected Annual Rate Reached: 1986  
Date Production Begins: January 1 Date Production Ends: December 31  
Reserves Recoverable By: (1) Surface Mining: \_\_\_\_\_  
(2) Underground Mining: XX  
Reserves Lost Through Management Decisions: Unknown  
Coal Market: Japan, Korea, Western United States

<u>Modifications That Have Been Approved:</u>	<u>Date:</u>
<u>002 Discharge Pond</u>	<u>September 1, 1981</u>
<u>Slaughter Canyon Reclamation</u>	<u>May 12, 1983</u>
<u>No. 3 Mine Hoist House Pond</u>	<u>April 21, 1983</u>
<u>Coarse Refuse Toe Pond</u>	<u>March 23, 1983</u>
<u>Rail Cut Pond</u>	<u>July 15, 1983</u>
<u>Revegetation Test Plots</u>	<u>August 2, 1983</u>
<u>No. 2 Canyon Ponds</u>	<u>August 26, 1983</u>
<u>Pasture Pond</u>	<u>August 26, 1983</u>
<u>Old Coarse Refuse Road Pond</u>	<u>November 15, 1983</u>
<u>Manshaft Sediment Pond</u>	<u>January 9, 1984</u>
<u>Manshaft Mine Water Discharge Pond</u>	<u>July 9, 1984</u>
<u>Class I Haul Road</u>	<u>September 19, 1985</u>

## FINDINGS DOCUMENT

Kaiser Coal Corporation  
Sunnyside Mines  
ACT/007/007, Carbon County, Utah

November 7, 1985

1. The plan and the permit application are accurate and complete and all requirements of the Surface Mining Control and Reclamation Act (the "Act"), and the approved Utah State Program have been complied with (UMC 786.19[a]).
2. The applicant proposes acceptable practices for the reclamation of disturbed lands. These practices have been shown to be effective in the short-term; there are no long-term reclamation records utilizing native species in the western United States. Nevertheless, the Utah Division of Oil, Gas and Mining (DOGMI) staff has determined that reclamation, as required by the Act, can be feasibly accomplished under the Mining and Reclamation Plan (MRP) (see Technical Analysis [TA], Section UMC 817.111-.117) (UMC 786.19[b]).
3. The assessment of the probable cumulative impacts of all anticipated coal mining in the general area on the hydrologic balance has been made by the regulatory authority. The mining operation proposed under the application has been designed to prevent damage to the hydrologic balance in the permit area and in the associated off-site areas (UMC 786.19[c]). (See Cumulative Hydrologic Impact Analysis [CHIA] Section, attached to this Findings Document.)
4. The proposed permit area is:
  - A. not included within an area designated unsuitable for underground coal mining operations (MRP, Section 2.1; see attached memo from Bureau of Land Management [BLM] dated February 3, 1984;
  - B. not within an area under study for designated lands unsuitable for underground coal mining operations;
  - C. not on any lands subject to the prohibitions or limitations of 30 CFR 761.11(a) (national parks, etc.), 761.11(f) (public buildings, etc.) and 761.11(g) (cemeteries) (MRP, Section 2.5);
  - D. within 100 feet of the outside right-of-way line of a public road, however, the mine was in operation prior to August 3, 1977 (UMC 761.11);
  - E. not within 300 feet of any occupied dwelling (MRP, Section 2.5) (UMC 786.19[d]).

5. DOGM's issuance of a permit is in compliance with the National Historic Preservation Act and implementing regulations (36 CFR 800) (UMC 786.19[e]). See letter from State Historic Preservation Officer (SHPO) dated October 6, 1983, attached to TA.
6. The applicant has the legal right to enter and begin underground activities in the permit area through three federal leases, and one fee lease (see MRP, Section 2.4) (UMC 786.19[f]).
7. The applicant has shown that prior violations of applicable laws and regulations have been corrected or are being corrected (see August 20, 1985 letter from Ron Daniels, attached) (UMC 785.19[g]).
8. Kaiser Coal Corporation is not delinquent in payment of fees for the Abandoned Mine Reclamation Fund for its active mining operation (UMC 786.19[h]) (personal communication, Frank Atencio, OSM, Albuquerque, June 21, 1985).
9. The applicant does not control and has not controlled mining operations with a demonstrated pattern of willful violations of the Act of such nature, duration and with such resulting irreparable damage to the environment as to indicate an intent not to comply with the provisions of the Act (UMC 786.19[i]) (attached letter from Ron Daniels dated August 20, 1985).
10. Underground coal mining and reclamation operations to be performed under the permit will not be inconsistent with other such operations anticipated to be performed in areas adjacent to the proposed permit area (UMC 786.19[j]). The Sunnyside Mines property is centrally located in the Book Cliffs coal field. Kaiser's property is bordered on the northwest by Sunedco's proposed Sage Point-Dugout Mines and on the south by Kaiser Coal Corporation's Geneva Mine. Neither operation is currently active.
11. A detailed analysis of the proposed bond had been made. The bond estimate is attached to the TA. The DOGM has made appropriate adjustments to reflect costs which would be incurred by the State, if it was required to contract the final reclamation activities for the mine site. The bond shall be posted (UMC 786.19[k]) with DOGM prior to final permit issuance.
12. No lands designated as prime farmlands occur on the permit area (Figure IV-1, letter from Soil Conservation Service [SCS] to Marcia Wolfe, Kaiser, dated March 16, 1981). The applicant has satisfied the requirements of UMC 785.19, Alluvial Valley Floors.
13. The proposed postmining land-use of the permit area has been approved by the regulatory authority (see TA, Section UMC 817.133) (UMC 786.19[n]).

14. The regulatory authority has made all specific approvals required by the Act, and the approved State Program (UMC 786.19[n]).
15. The proposed operation will not affect the continued existence of any threatened or endangered species or result in the destruction or adverse modification of their critical habitats (MRP, Section 9.4, Section 10.3.3.1; letter from U. S. Fish & Wildlife Service dated July 23, 1984) (UMC 785.19[o]).
16. All procedures for public participation required by the Act, and the approved Utah State Program have been complied with (UMC 741.21[a][2][ii]).
17. All existing structures subject to the requirements of Utah Code Annotated 40-10 comply with UMC 700.11(e) and the applicable performance standards of UMC Subchapter K. No significant harm to the environment or public health or safety will result from the use of the structures.

Prior to the permit taking effect, the applicant must sign the permit committing to compliance with the special stipulations in the permit and post the performance bond for reclamation activities.

L.P. Beaton For John Whitehead  
DOGM Lead Reviewer

James P. Beaton  
Administrator, Mineral Resource  
Development and Reclamation Program

James E. May  
Associate Director, Mining

Dianne R. Nelson 11-8-85  
Director

STIPULATIONS DOCUMENT

Kaiser Coal Corporation  
Sunnyside Mines  
ACT/007/007, Carbon County, Utah

January 3, 1986

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2. The success standard for productivity on reclaimed areas shall be achievement of at least 90 percent of the productivity of the corresponding reference area for the last two years of the liability period, using statistically adequate samples at 80 percent confidence with a 10 percent change in the mean.

3. Kaiser Coal Corporation will monitor all permanently reclaimed areas as per the following schedule:

year 1: reconnaissance survey to determine initial species establishment and woody plant density;

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If year 3 equals at least 90 percent of and year 5 equals or exceeds the success standard for cover and woody plant density, year 7 monitoring may be waived.

Productivity monitoring is optional for years 1-8. However, no harvest methods (i.e., clipping) shall be used.

The results of monitoring permanently reclaimed areas shall be submitted to the Division by December 31 of each year monitoring is performed.

Stipulation 817.160-.166-(1)-PGL

1. The right-of-way from the BLM for the Water Canyon Road must be submitted to the Division within 30 days of permit approval (Section 8 is owned by the USA) (UMC 782.150).

## FINAL TECHNICAL ANALYSIS

Kaiser Coal Corporation  
Sunnyside Mines  
ACT/007/007, Carbon County, Utah

November 7, 1985

### Introduction

The Sunnyside Mines project is proposed by the Kaiser Coal Corporation (KCC) of Colorado Springs, Colorado. The project is located 120 miles southeast of Salt Lake City in the Book Cliffs Coal Field. The permit area encompasses 14,300 acres and includes Whitmore Canyon.

Underground mining in the permit area began in the late 1890's and has continued to the present. The expected life of mine is approximately 25 years. Most of the land in the permit area is owned by KCC, the remaining being Bureau of Land Management (BLM) or privately owned land.

Both the Upper and Lower Sunnyside seams are mined. Mine workings during the 80 year operation have advanced over an area approximately 6-1/2 by 2-1/2 miles. Presently, 65 to 80 percent of the coal is produced by longwall mining methods. The remaining production will be from continuous miner room and pillar methods.

About 55 million tons of coal have been produced in the past, and projected production is two million tons of coal per year during this permit period. Coal is washed at a preparation plant, conveyed to stockpiles and transported out by unit trains of the Denver & Rio Grande Western Railroad. Coarse refuse is trucked to the disposal area while fine refuse is slurried to slurry ponds for disposal and recovery of water.

At the conclusion of mining, anticipated to be 25 years from now, surface structures will be removed, the disturbed land surface will be recontoured and revegetated. Some roads are proposed to be left for access to grazing and recreational purposes.

### Existing Environment

Sandstone cliffs and colluvial slopes dominate the landscape of the mining area. Vegetation communities include sagebrush-grass, mountain brush, riparian, Douglas fir and aspen.

No threatened or endangered species have been found in the permit area.

The permit area lies within the Book Cliffs along the northern extent of the San Rafael Swell. The Book Cliffs form a south-facing escarpment and constitute the boundary between the Canyonlands and Uinta Basin section of the Colorado Plateau Physiographic Province.

Grassy Trail Creek generally flows year round except for periods of extremely low precipitation. The other creeks in the permit area are intermittent.

Floral communities within the permit area which have been previously disturbed include: (1) mountain brush; (2) pinyon-juniper; (3) pinyon-juniper/grass; (4) riparian; and, (5) sagebrush/grass. No threatened or endangered plants are known to exist within the permit area. One plant, Hedysarum occidentale canone, classified as a category one species by the Utah Native Plant Society, was found in a side canyon of the permit area; however, it is removed from potential disturbance.

The predominant land use is grazing, although mining has occurred since 1898. The land is also used for recreation and as wildlife habitat. By 1979, there were approximately 50 miles of underground tunnels covering an area of 15 square miles. Postmining land use will be a return to premining uses. In addition, no prime farmlands have been found within the permit area.

#### Historical Permitting Sequence

An application for a mining permit was received by the Utah Division of Oil, Gas and Mining (DOGGM) in March 1981. An Apparent Completeness Review (ACR) was sent to the applicant on June 21, 1983. KCC responded to the review with a supplemental submission to the application dated September 21, 1983. A Determination of Completeness (DOC) and Technical Deficiencies (TD) report was sent to KCC on October 17, 1983. KCC responded to the DOC by submitting additional material or replacement material for the ACR Supplement Submission to DOGM on November 17, 1983.

The Mining and Reclamation Plan (MRP) was determined complete on November 22, 1983. The Draft Technical Analysis (TA) was sent to the Office of Surface Mining (OSM) and KCC on January 31, 1984. It contained additional stipulations. Responses to the stipulations were received on March 6, 1984 and April 19, 1984 and a consolidated MRP was submitted on May 21, 1984. A draft Final TA was compiled by a contractor and sent to the Division on July 26, 1984. A review of the draft Final TA by the Division identified several additional deficiencies. Requests for additional information were sent to KCC on August 15, 1984 and November 5, 1984. A response was received on December 3, 1984. Additional deficiencies were identified in a letter to KCC dated January 15, 1985. Kaiser responded to these deficiencies on March 1, 1985.

Ownership of the Kaiser Steel Corporation changed to a new corporate entity of Kaiser Coal Corporation. Form 10K was filed with the Securities and Exchange Commission denoting this change on April 15, 1985. A second draft TA was compiled and routed to OSM and Kaiser on May 21, 1985. Numerous deficiencies identified in the stipulations were noted. On June 12, 1985, Kaiser Coal responded to the Draft TA deficiencies. The OSM apprised the Division by letter dated June 18, 1985 of items that were stipulated in the Draft TA that must be completed prior to permit approval. By letter of June 27, 1985, the Division apprised Kaiser Coal of the OSM concerns. On July 18, 1985, the Division transmitted a letter to Kaiser outlining deficiencies in the June 12 response submitted by Kaiser.

Starting on July 3 and running for four consecutive weeks, ending July 24, 1985, the applicant published notice in the Sun Advocate newspaper pursuant to the requirements of UMC 786.11 (this was necessitated by the change in ownership to Kaiser Coal Corporation).

Kaiser submitted responses to deficiencies identified in the June 27, 1985 and July 18 letters from the Division on July 26, August 9, September 3, September 25 and October 7, 1985.

#### UMC 785.19 Alluvial Valley Floors - JW

##### Existing Environment and Applicant's Proposal

The applicant's description of potential alluvial valley floors (AVFs) is contained in Section 7.3 and on Plate III-29 of the MRP. Grassy Trail Creek is the only potential AVF on the permit area. The lower portion of this creek as it reaches the mouth of Whitmore Canyon does support farming activities in the form of alfalfa and improved grass pasture areas.

##### Compliance

The Division has determined based on information provided in the MRP that Grassy Trail Creek from approximately five miles east of East Carbon City to the confluence of Grassy Trail Creek with Slaughter Canyon to be an AVF. This finding is based on the following:

1. the area thus designated an AVF is within and adjacent to the permit area;
2. unconsolidated streamlaid deposits holding the stream are present;
3. there is sufficient water to support agricultural activities as evidenced by the existence of flood irrigation.

Based on information provided in Chapter 7 of the MRP, the essential functions of the AVF in question are limited to surface water. The present day stream channel has cut 10 to 25 feet below the farmland. There are no subirrigated farmlands present.

Plate III-29 illustrates the extent of current and historical farming. The MRP notes that much of the farmland shown on Plate III-29 has been abandoned due to lack of water (page 22, Chapter 7, MRP).

The current amount of mine water discharged to Grassy Trail Creek is approximately 1,200 ac/ft per year (page 9, Chapter III, MRP). Over half of the acreage reported in alfalfa is irrigated with mine water. In addition, a significant portion (up to 23 percent) of the flow in Grassy Trail Creek is composed of mine water. If these values are correct, mine closure will result at least initially in a substantial reduction in flow of Grassy Trail Creek. Since the AVF will not be mined through or under, reduction in flow will be the only potential impact.

The applicant has researched historical records to determine the premining flow regime of Grassy Trail Creek. Based on the Supreme Court of Utah review of the Joseph R. Sharp vs. George C. Whitmore (Decree #3028) Grassy Trail Creek frequently dried up during the majority of years (Response to Technical Deficiencies received March 1, 1985).

Cessation of mining activities will, in effect, return Grassy Trail Creek to a hydrologic regime more typical of premining conditions. Historical court records indicate that very limited irrigated farming activities existed prior to the initiation of mining. Moreover, water supplies were previously piped in from Range Creek over Patmos Ridge to the Sunnyside Mines (page 17, Chapter 7, MRP). It is only since the construction of Grassy Trail Reservoir and the addition of mine water that perennial flow has been established in Grassy Trail Creek.

The Division thus makes the finding pursuant to UMC 785.19(c)(3) that the proposed operation will include neither the extraction of coal nor will significant physical disturbance of the surface or ground water regime associated with the AVF occur and that mining activities actually enhance farming activities on the AVF.

The Division thus waives the requirements of UMC 785.19(d) and (e) and UMC 822 which deal with additional technical information, findings, and performance standards required of operations affecting designated alluvial valley floors.

#### Stipulations

None.

UMC 817.11 Signs and Markers - SC

Existing Environment and Applicant's Proposal

Signs and markers required by the regulations are posted, maintained and will be removed by the operator at the termination of the bond. The signs are of uniform design, can easily be seen and read, and are made of plastic or steel (Section 3.3.5.1).

Identification signs showing the name, business address, and telephone number of the person who conducts underground coal mining activities and the identification number of the current regulatory program permit authorizing underground coal mining activities are posted at each point of access from public roads to areas of surface operations and facilities on permit areas for underground coal mining activities. Plate III-26 shows the location of identification signs.

Permit markers are posted and clearly show the perimeter of all areas affected by surface operations or facilities. The markers are 4 ft X 5/8 inch diameter steel roof bolts or four foot metal fence posts painted blaze orange. Plates III-20 through III-23 show the perimeter of the disturbed areas that the markers denote (Section 3.3.5.1).

Stream buffer zones markers are posted and clearly show the buffer zone along Grassy Trail Creek. Plate III-26 shows the location of buffer zone signs (Section 3.3.5.1).

Blasting signs will be posted prior to blasting at all entrances to areas of the surface operations and facilities in the permit area, from public roads or highways. The signs will say "Warning: Explosives in Use." The immediate areas of blasting activities will be flagged or posted with signs that say "Danger: Blasting Area" (Section 3.3.5.1).

Topsoil stockpile signs will be posted and maintained on all topsoil stockpiles. The signs will say "Topsoil Stockpile, Do Not Disturb" (Section 3.3.5.1).

Compliance

The applicant complies with this section.

Stipulations

None.

UMC 817.13-.15 Casing and Sealing of Exposed Underground Openings -  
RVS

Existing Environment and Applicant's Proposal

The applicant has committed to sealing all portal entries and shaft openings during final abandonment (MRP, Section 3.5.3.1). Seals will be located a minimum of 25 feet from the entryway, recessed into the rib and constructed in a single wall thickness with a "noncombustible material such as concrete blocks, bricks or tile" (MRP, Section 3.5.3.1, page 50 and Plate III-18). Pilasters will be located in the central portion of the seals and water and gas check pipes (two inch diameter) with valves will be installed at the bottom and top of the seals, respectively. Valves will be enclosed by a locked box at the surface (Plate III-18). Concrete structures located between the entryway and seal and concrete surface structures will be demolished and placed inside the entry against the seal. The remaining space will be backfilled with incombustible material. Shafts will be permanently sealed by placing a steel plate across the surface opening and covering the plate with a six inch thick concrete shaft cap (MRP, Section 3.5.3.1 and Plate III-18). Permanent shaft seals will incorporate vent pipes (two inch diameter) extending a minimum of 15 feet above the seal surface. Table III-42 gives a time framework of approximately three weeks for permanent sealing of mine portals and shafts.

The applicant has committed to following the U. S. Geological Survey (USGS) Stipulations Covering Surface Drilling Program for final borehole abandonment (MRP, Section 3.5.3.1 and Table III-4).

Temporary sealing of portal entries, shafts and boreholes is discussed under Section 3.3.5.2 of the MRP. Access to temporarily inactive portal entries will be denied by installing fencing. Signs will be posted warning unauthorized persons that entry into the portal is prohibited. Shafts will also be fenced and boreholes used for ground-water monitoring will be temporarily sealed with a metal cap.

Compliance

The applicant has provided adequate plans for posting signs and limiting access to temporarily inactive mine entries, shafts and boreholes. The applicant is in compliance with UMC 817.14.

The applicant's proposals for permanently sealing boreholes and shafts adequately address the requirements of UMC 817.13 and 817.15 by preventing access to mine workings and precluding toxic drainage from entering surface or ground waters.

Stipulations

None.

UMC 817.21-.25 Topsoil - EH

Existing Environment and Applicant's Proposal

An Order 3 soil survey was completed for the permit area and additional information was developed through a limited on-site study by the Soil Conservation Service (SCS) in 1980 (Chapter VIII, Volume 7 of the MRP). Additional soil sampling was conducted on the surface facilities in 1983 (Chapter VIII, Table VIII-5, of the MRP).

The majority of the soils on the proposed permit area are mollisols, though entisols are common on benches, canyon rims and side slopes. Alfisols, aridisols and entisols are represented by one soil series each. Soils are typically well drained and moderately permeable. The majority of soils formed in residuum and/or colluvium derived from sandstone, siltstone and shale. Depth to bedrock varies widely from shallow to very deep. Soils are typically calcareous and alkaline throughout all or a majority of the soil profile. Moderately to strongly calcareous and mildly to strongly alkaline horizons are common. One series exhibits a slightly acid profile. Coarse fragments in the form of gravels and stones are found in most soil horizons. Coarse fragment contents of the control sections can be as high as 35 to 60 percent (Chapter VIII, Volume 7 of the MRP).

The Sunnyside Mine was in operation before Public Law 95-87 was enacted and the removal and storage of topsoil for reclamation required. Therefore, the majority of the 287 acres of disturbance did not have topsoil stripped and stockpiled. Although, during the construction of additional sedimentation ponds and vegetative test plot sites soil material was removed and stockpiled. Approximately 14,296 yd<sup>3</sup> of soil has been stockpiled in five different locations (Chapter 3, page 48) and will not be disturbed until their use at reclamation. In order to meet reclamation requirements, the applicant has proposed to use the in-place fill soil material as a topsoil substitute for all areas except the coal seams, coarse refuse and slurry material (Chapter 3, page 46).

Soil samples of this in-place material have been taken and the results of chemical and physical analyses presented in Table VIII-5.

The operator has committed to cover the coal refuse and portal areas with four feet of nontoxic plant growth medium (page 55, Chapter 3). If the proposed coal refuse test plots indicate that a lesser depth of soil can be used and successfully reclaim the coarse refuse material, then the operator will request a reduction in the four foot depth (page 40, Chapter 3, MRP). The total volume of soil

necessary to cover the areas of coal refuse, slurry and the coal seams in the portal areas is approximately 449,643 yd<sup>3</sup>. Table III-44 lists a breakdown of each area of reclamation and the volume of soil substitute necessary. Plate III-1 through III-3 outlines the areas 1 through 10 listed in Table III-44.

A large soil borrow area has been located and sampled to a depth of 12 feet, the depth necessary to produce 449,643 yd<sup>3</sup> of soil material. Three soil pits on the site were dug and sampled at 12 inch intervals. Results of the analyses are shown in Table 1, Appendix VIII-4.

At the time of reclamation, soil material will be replaced by the use of scrapers, front-end loaders and graders (page 55 and 57, Chapter 3, MRP). Four feet of topsoil substitute material will be placed on the 83 acres of course refuse and portal areas as listed in Table III-44. The topsoil that was removed during the construction of facilities listed on page 48, Chapter 3, will be replaced on the area from which it was removed.

After soil redistribution, the backfilled and regraded areas will be ripped to a depth of 18 to 20 inches. Soil samples of the entire reclaimed area will be taken (approximately three samples per acre) for the purpose of fertilizer recommendation (page 55, Chapter 3, MRP). Fertilizer will be applied at a rate recommended by the interpretation of chemical analyses conducted on these samples.

After the backfilling, grading and fertilization has taken place, the area will be reseeded as per the revegetation plan of the MRP.

#### Compliance

The analytical data presented in Table VIII-5 and Table 1, Appendix VIII-4, along with the applicant's commitment of further soil testing at time of reclamation places them in compliance with UMC 817.21-.25.

#### Stipulations

None.

UMC 817.41 Hydrologic Balance: General Requirements - JW, RVS

#### Existing Environment and Applicant's Proposal

##### Surface Water - JW

The regional surface water hydrology of the permit area and adjacent lands is described in Section 7.2 and following of the MRP. The permit area is drained primarily by Grassy Trail Creek, the only perennial stream within the permit area. Several

intermittent streams intersect Grassy Trail Creek, primarily from the east, within the mine plan area. The Icелander drainage collects surface flow from part of the southern section of the permit area. This drainage intersects Grassy Trail Creek 11 miles off the permit area.

The MRP characterizes the baseline water quality and quantity of surface waters in and adjacent to the permit area in Table VII2-A, Table VII-5, Appendix VII-2 and Table III-40. Appendix VII-2 contains flow data for Grassy Trail Creek which was generated from the U. S. Geological Survey (USGS) gaging station 0931430 near the mouth of Whitmore Canyon.

The applicant proposes to minimize changes to the prevailing hydrologic balance both in the mine plan and adjacent areas through the use of a combination of structures. Diversion ditches and culverts are proposed to route undisturbed drainage around or through the disturbed area. A disturbed area ditch collection system routes disturbed drainage to one of nine sediment ponds for treatment. Details of the location and design calculations of surface water control structures are contained in Appendix III-1 and Plate III-5 through III-12 in the MRP.

Other measures proposed to minimize changes to the hydrologic balance involve seeding of reclaimed areas, maintaining roads and berms to prevent erosion and stabilizing disturbed land areas through land shaping (MRP, Section 7.2.5).

Reclamation measures for postmining drainage patterns are discussed briefly in Section 3.5.4 and in specific detail in Appendix III-12.

### Compliance

#### Surface Water - JW

Methods proposed during the operational phase of mining are acceptable practices to minimize changes to the surface hydrologic balance in and adjacent to the permit area. Specific descriptions and analyses of the detail design measures proposed are contained in the following sections (UMC 817.42-.57).

The MRP delineates in adequate detail the reclamation techniques which will be used to establish postmining drainage patterns. Analysis of restoration of ephemeral stream channels is discussed in UMC 817.44

The applicant is in compliance with this section.

### Stipulations

None.

Ground Water - RVS

Existing Environment and Applicant's Proposal

The applicant provides information about aquifers, springs and mine inflows in Section 7.1 of the MRP. Supplementary ground-water data are given in Plate III-3, Plate VI-1, Table VII-1, Table VII-5, Appendix VII-2, Appendix VII-3, Plate VII-3, Figure VII-3 and Figure VII-4.

The applicant describes the Kenilworth Member, Sunnyside Member, Upper Mudstone Member, Castlegate Sandstone, Bluecastle Sandstone Member, Colton Formation, Green River Formation and Quaternary deposits as "potential water-bearing strata in and near the mine plan area" (Section 7.1.2, pages 2-5). Moreover, the applicant indicates that additional hydrologic data such as transmissivity (permeability) and porosity are lacking for nearly all of the above stratigraphic units. The applicant commits to deriving further ground-water data from surface and underground boreholes. Plate III-3 shows proposed locations for two surface and three underground boreholes. A generalized piezometric surface is given on Plate VI-1.

Plate VII-3 shows 22 springs and four surface seeps as occurring within and adjacent to the permit area. Springs are used by wildlife and for stock watering. Twenty springs are listed as discharging from Quaternary alluvium associated with the Colton Formation or undifferentiated Flagstaff/North Horn formation (Table VII-5). Two springs are given as discharging from the Green River Formation. Three springs, PC-1, WR-1 and WR-2, occur within the permit area (Plate VII-3). Only the area beneath Spring WR-1 has been mined. Plate II-3 indicates mining will not occur beneath the other two springs during this five year permit term (1984-1989).

Generalized flow data for 10 springs are given in Table VII-5. Two of these springs (WR-1 and WR-2) were also sampled to derive water quality information. Values for iron, manganese, oil and grease, pH, total dissolved solids (TDS), total suspended solids (TSS) and sulfate are listed in Appendix VII-2.

Total mine inflow is shown to be 740 gpm on Figure VII-3. Sources of inflow include mine shafts (245 gpm), boreholes (300 gpm), paleochannels (10 gpm) and gobs, faults and fractures (185 gpm). Flow meters are installed in the No. 1 Mine, B Canyon air return entry and No. 3 Mine to record the volume of discharged mine water. A small portion of mine water is accessed for underground dust suppression and fire control. Excess water is collected in sumps and discharged to surface irrigation, Grassy Trail Creek and the coal preparation plant.

The applicant provides two sets of data for mine water quality. Table VII-1 gives "overall mine water analyses from December 1976 through December 1980" and reports values for TDS, TSS, acidity, alkalinity, As, Fe, Mn, Se, Ag, oil and grease, and pH. Appendix VII-3 compiles monthly data from two monitoring stations (002 and 004) for 1980 through 1982 according to requirements of the applicant's NPDES permit. These data include values for parameters as given above, with the exception of acidity, alkalinity, As, Se and Ag.

### Ground Water

#### Compliance - RVS

Division technical staff inspected, on January 21-22, 1985, the mine workings to provide the applicant with assistance in developing an expanded underground water monitoring plan. The applicant has committed to an inflow monitoring plan that derives data from the following locations (see Plate III-3):

1. Mine No. 2
  - \* 12th right
  
2. Mine No. 3
  - \* Drill Hole 25
  - \* Water Canyon bleeders
  - \* 18th right sump
  
3. Mine No. 1
  - \* Pole Canyon Shaft
  - \* 18th left outside
  - \* 19th left outside
  - \* Twin Shafts
  - \* Manshaft
  - \* 18th left outside
  - \* 18th left inside seal
  - \* 19th left inside sump

The applicant commits to providing two years of additional water data for the three springs within the mine plan area at monthly intervals between May and October (Section 7.1.6, page 9). Monitoring will encompass the parameters given in Table III-23 and baseline data will be generated and submitted prior to mining beneath Spring PC-1 and Spring WR-2. Monitoring frequency will increase and commence when mining comes within 1,500 feet of the water source (Section 7.1.5, page 10).

The applicant commits to acquiring borehole data to further ascertain the occurrence of water above and below the mine workings. Data derived from the drilling program will be submitted by September 1986 (Section 7.1.6, page 10). Two years of water quality data will be submitted for boreholes that encounter water.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.42 Water Quality Standards and Effluent Limitations - JW

Existing Environment and Applicant's Proposal

During the operational phase of the Kaiser Sunnyside Mine, four different sources of effluent will be generated. These are as follows:

1. disturbed area runoff;
2. slurry water from the coal cleaning process;
3. mine water discharges;
4. water discharged from the coarse refuse toe seep.

Disturbed area runoff will be routed to one of nine sediment ponds located on the permit area. Design calculations for each pond are in Appendix III-1. A detailed analysis of sediment ponds is contained in UMC 817.46 of this TA.

Plate III-33(1-7) notes seven small areas which are equipped for sediment control with silt fences, berms and in one case a rock gabion with a silt fence. These areas are small (.36 to 2.78 acres) and remote from a sediment pond. Natural vegetative filters are being established in most of these areas due to a low level of activity associated with each area.

Slurry water from the coal cleaning process is routed to one of two slurry ponds for treatment then to a clear water pond for additional detention prior to discharge. The clear water pond discharge is NPDES discharge point 004 (Section 3.2.9, MRP). A third area, the east slurry cell, is used as an alternate evaporation pond when both of the regular slurry ponds are full.

Two mine water ponds provide treatment for mine water discharges. Water is pumped from underground sump areas to the ponds. The ponds act to settle out suspended solids and provide for separation of oil and grease via skimmers. Detail designs for the Twinshaft Mine Water Pond (NPDES discharge point 001) are found on Plate III-14. Plate III-15 notes the design detail for the mine water pond at the intersection of Pole Canyon and Whitmore Canyon (hereafter referred to as the Whitmore Canyon fan mine water pond). The discharge from this pond is NPDES discharge point 002.

A seep emanating from the base of the coarse refuse disposal area is treated for total iron content with a loose straw and rock gabion and flocculent (Section 3.2.9, MRP).

### Compliance

#### Sedimentation Pond System

The treatment methods proposed for disturbed area runoff which include sediment ponds, silt fences and a silt fence rock gabion in combination for one small area are acceptable measures and comply with the requirements of this section.

The NPDES permit has recently been modified to cover discharges from the sedimentation ponds (Figure III-8, Environmental Protection Agency [EPA] approval letter of August 2, 1985).

#### Mine Water

Data contained in the MRP and Division water quality files on the Sunnyside Mine suggest that the discharge system for mine water consistently produces water quality values which are within effluent limitations with the exception of oil and grease.

The applicant's NPDES permit #UT 0022942 has a maximum effluent limit for oil and grease of 10 mg/l. Instances where the NPDES limit for oil and grease has been exceeded in 1980 are evident. However, since 1980, no instances of exceeding the oil and grease limit were observed. Therefore, the applicant is currently in compliance on this issue.

#### Coarse Refuse Seep

In 1982, a seep was observed by Division staff emanating from the toe of the coarse refuse disposal area. Subsequent sampling revealed total iron values which were in excess of the effluent limitations (7.0 mg/l maximum and 3.5 mg/l for an average of daily values). In addition, high sulfate and total dissolved solid values ranging from approximately 1,200 to 3,000 mg/l and 4,400 to 5,700 mg/l, respectively are present.

Near the location of the coarse refuse seep what appears to be a natural seep occurs. Sample data from January 5, 1983 show higher sulfate and TDS values from the natural seep than from the seep at the coarse refuse toe. This suggests that the contact with the Mancos shale which generally occurs in this vicinity is the source of high sulfate and TDS values. Iron values from the natural seep were 0.2 mg/l.

A review of monthly sample data from April 1983 to June 1984 show total iron values at the seep outlet ranging from 11.2 mg/l to 2.68 mg/l. Values of total iron from the seep at the permit boundary (after treatment) ranged from 3.86 mg/l to 0.19 mg/l. One value on May 31, 1984 was 8.10 mg/l, but this was anomalous from the rest of the data and, therefore, was not considered as representative. The data analyzed here suggest that the applicant's treatment method for this seep is adequately meeting effluent requirements. The average value of the data noted above for total iron at the permit boundary, excluding the 8.0 value, is 1.17 mg/l.

The applicant is in compliance with this section.

#### Stipulations

None.

UMC 817.43 Diversions and Conveyance of Overland Flow, Shallow  
Ground Water Flow and Ephemeral Streams - JW

#### Existing Environment and Applicant's Proposal

The applicant has proposed a diversion system to intercept and divert runoff from undisturbed areas around and away from disturbed areas. In addition, a disturbed area collection system is proposed to route runoff from disturbed areas to one of the nine sediment ponds. The design details for the undisturbed diversions and disturbed runoff collection system are contained in Appendix III-1 and on Plates III-5 through III-13 in the MRP.

The peak flow methodology described as SCSTR55 was used by the applicant. The method, developed by the Soil Conservation Service, relates time of concentration to peak discharge in cubic feet per second per square mile per inch of runoff.

The time of concentration formula utilized in the MRP calculations is referred to as Kent's formula described in USDA SCS-TP-140 (revised April 1973).

Protection measures for prevention of erosion in disturbed and undisturbed ditches are noted on Plate III-35. The applicant shows velocity calculations for each ditch on the summary of ditch and riprap design calculations near the end of Appendix III-1. Based on velocity calculations for undisturbed diversions, the applicant commits to install protective measures where needed (Section 3.4.3.2, MRP). Plate III-40 depicts outlet protection measures for Culvert C-6 of the Course Refuse Drainage System.

An inspection program for all disturbed area ditches is proposed to assess any erosion problems which may occur. Based on an inspection three times annually, the applicant proposes to install one of the protective measures on Plate III-35 if erosion is evident (Section 3.4.3.2, MRP).

### Compliance

The SCSTR55 methodology utilized by the applicant to generate peak flow predictions generally gives higher values than predictions from the Sedimot II and the "PEAK" computer models used by the Division. Utilizing either peak flow prediction, the sizing of ditches and culverts (including road culverts) in the MRP are adequate.

The erosion protection measures proposed on Plate III-35 are acceptable measures to address this problem. One item of concern which must be emphasized is the installation method for fabric liner. The edges of the fabric should be securely buried at least eight inches. This should avoid the problem of the edges being uncovered and eventually causing the fabric installation to wash out (see Stipulation #1).

Division analysis of disturbed and undisturbed ditches verified projected velocities for each ditch. Five ditches indicate projected velocities which will require protection measures as outlined on Plate III-35. These ditches are:

1. Coarse Refuse Toe Ditch (existing)
2. Sunnyside Surface Facilities Ditch D-1 (proposed)
3. West Slurry Cell Ditch #1 (proposed)
4. Sunnyside Surface Facilities Ditch D-4 (existing)
5. Sunnyside Surface Facilities Ditch D-2a (proposed)

The MRP is unclear in designating which ditches will be protected and thus Stipulation #2 identifies the five ditches which require protection.

The inspection program proposed to assess ditch and culvert outlets is a good methodology to maintain compliance. The Division concurs with this procedure.

The rail cut area ditches which drain the coarse refuse pile are routed downslope to the rail cut sediment pond via a concrete culvert system. The outlet velocity from the culvert system is dissipated by a discharge apron of adequately sized riprap stabilized by mortar.

Stipulation 817.43-(1, 2)-JW

1. The applicant shall assure that during construction of outlet protection measures, shown on Plate III-35 of the MRP, that the edges of fabric liner are secured by burying with at least eight inches of soil.
2. The applicant shall, within 180 days of permit approval, install erosion protection measures, outlined on Plate III-35 of the permit application, for the Coarse Refuse Toe Ditch and Sunnyside Surface Facilities Ditch D-4. The applicant shall install erosion protection measures, as outlined on Plate III-35, within 30 days of completion of construction of the West Slurry Cell Ditch #1, Sunnyside Surface Facilities Ditches D-1 and D-2a.

UMC 817.44 Hydrologic Balance: Stream Channel Diversions - JW

Existing Environment and Applicant's Proposal

The applicant does not propose to divert any drainage areas greater than one square mile with the exception of culverts for road crossings. Plate III-28 notes 12 road culverts with drainage areas greater than one mile square. Calculations for each culvert for peak flows from the 10-year and 25-year, 24-hour event are contained in Appendix III-1. Locations of the culverts are shown on Plate III-28.

Plate III-11 shows detail installation measures for culvert RC7-3.

The applicant has included design measures for restoration of ephemeral channels which will cross the reclaimed area upon final reclamation (Appendix III-12). The design incorporates approximation of similar undisturbed drainages in the area.

Compliance

The road culverts with drainage areas greater than one square mile are proposed as permanent culverts (Plate III-28). UMC 817.44(b)(2) requires permanent diversions to pass the 100-year, 24-hour peak runoff.

Using the data inputs in Appendix III-1 for each permanent culvert with a one square mile or larger drainage area the SCS TR55 method and a 100-year, 24-hour storm depth of 2.74 inches (see Richardson 1971 at Price Station) predicted most of the culverts cannot pass the predicted peak flow. The TR55 methodology used by the applicant produces peak flow predictions which are often exaggerated. Division calculations of 100-year peak runoff values using a unit hydrograph based computer model produced values three to five times smaller than the SCS TR55. The unit hydrograph approach used by the Division in this analysis are felt to be more accurate than the applicant's method. These results indicate that two culverts (RC2-4, RC3-1) cannot adequately pass the 100-year, 24-hour storm.

The Division thus determines that the road culverts with the exception of Culverts RC2-4 and RC3-1 are adequate for permanent use after reclamation. Road culverts RC2-4 and RC3-1 are not approved for permanent use after reclamation.

The applicant's postmining drainage designs (Appendix III-12) for restoration of three ephemeral drainages which will cross the reclaimed area during final reclamation incorporate measures to achieve conditions which approximate premining conditions. Premining data do not exist, thus, comparable channels were utilized to arrive at restored configurations.

The proposal incorporates adequate measures to minimize slope and prevent any potential for headcutting to occur in the restored channels. Based on Division calculations, the #2 Canyon channel will flow at velocities approximating eight feet per second. This velocity necessitates additional stabilization measures. Installation of riprap with a D<sub>50</sub> size of 12 inches (EPA 625/3-76-006, October 1978) would provide the stability measures needed for this channel. The calculated velocities for the other two channels are not erosive and thus do not warrant any additional protection measures.

The applicant is in compliance based on the following stipulations.

Stipulation 817.44-(1, 2)-JW

1. The applicant shall not retain culverts shown as RC2-4 and RC3-1 on Plate III-28 of the mine plan as permanent culverts after mining unless these culverts are replaced at the termination of mining with adequately sized culverts as determined and approved by the regulatory authority.

2. The applicant shall install a well-graded riprap with a median size of 12 inches in the #2 Canyon channel in those areas which cross the reclaimed area during final reclamation or utilize other such measures approved by the regulatory authority to achieve a stable postmining channel configuration.

UMC 817.45 Sediment Control Measures - JW

Existing Environment and Applicant's Proposal

In addition to sediment ponds which are discussed under UMC 817.46, the applicant proposes the diverting of undisturbed runoff away from disturbed areas, stabilizing disturbed land through shaping and seeding, regulating channel velocities and maintaining roads and berms (Section 7.2.5, MRP).

Additionally, seven small areas are equipped with sediment control via berms and silt fences. Plate III-34 and Plate III-33 show the installation configuration for silt fences and their proposed locations. Berms and silt fences are utilized as an alternative sediment control measure for small areas of disturbance which are distant from larger active areas.

Erosion protection measures proposed for culvert outlets and ditches are shown on Plate III-35 of the MRP. These measures are discussed under UMC 817.43 and 817.47.

Compliance

The applicant's proposals for sediment control measures for the disturbed areas will result in minimizing to the extent possible additional contributions of sediment to stream flow or to runoff outside the permit area. The methods proposed utilize the best technology currently available to address sediment control. The applicant is in compliance with this section.

Stipulations

None.

UMC 817.46 Hydrologic Balance: Sediment Ponds - JW

Existing Environment and Applicant's Proposal

The MRP describes the sediment ponds proposed for control of runoff from disturbed areas in Section 3.2.9, Appendix III-1 and on Plates III-5 through III-12. Eight sediment ponds have been approved by the Division and constructed by Kaiser. These are as follows:

1. Coarse Refuse Toe Sediment Pond (Plate III-5) (approved March 23, 1983, TM).
2. Railcut Area Sediment Pond (Plate III-6) (approved July 15, 1983, TM).
3. Pasture Sediment Pond (Plate III-7) (approved August 26, 1983, TM).
4. Old Coarse Refuse Road Sediment Pond (Plate III-8) (approved November 15, 1983, TM).
5. Hoist House Area Sediment Pond (Plate III-9) (approved April 26, 1983, TM).
6. #2 Canyon Upper Sediment Pond (Plate III-10) (approved August 26, 1983, TM).
7. #2 Canyon Lower Sediment Pond (Plate III-10) (approved August 26, 1983, TM).
8. Manshaft Area Sediment Pond (Plate III-11) (approved January 9, 1984, JW).

The first four ponds noted discharge into Icelander Drainage. The last four ponds noted discharge into Grassy Trail Creek.

The only remaining sediment pond to be constructed is the Sunnyside Surface Facility Pond. Design calculations for this pond are in Appendix III-1 and on Plate III-12. The applicant has committed to construct this pond within 90 days of permit approval (MRP, Section 3.4.3.2).

The specific operational plan for the sedimentation ponds is described on page 5 of Chapter III. Ponds are designed to contain the 10-year, 24-hour storm event. Water accumulations in ponds are decanted after at least a 24-hour settling time. Water discharged from sediment ponds is to be sampled on an individual basis as the ponds are decanted (Section 3.4.3.3, MRP).

The MRP notes that the maximum sediment level is marked on the vertical standpipe spillway or on a stake. The ponds will be cleaned when sediment accumulations reach the predetermined design levels. Sediment accumulations are to be disposed of in the industrial waste dump or used as borrow material if approved as such by the Division (Section 3.2.9, MRP).

The applicant has committed to quarterly inspection of all ponds to assess structural integrity, erosion, proper function, sediment levels and other hazards. A written record of inspections is to be maintained by the applicant (Section 3.2.9, MRP).

All sediment ponds are scheduled to be removed during final reclamation when no longer needed (page 48, Chapter III; page 19, Chapter VIII).

### Compliance

The applicant's design methods accommodate the 10-year, 24-hour runoff volume plus three years of sediment storage capacity. The curve number methodology and Universal Soil Loss Equation (USLE) utilized by the applicant are acceptable methods for the design criteria.

The effectiveness of the sediment ponds will be assessed in the applicant's commitment to monitor ponds when discharging (Section 3.4.3.3, MRP).

Since the ponds are designed to contain the 10-year, 24-hour event plus sediment accumulations, short-circuiting cannot occur.

The plan to mark sediment cleanout levels and dispose of sediment accumulations is in compliance with the regulations.

The spillway devices have been sized to pass the 25-year, 24-hour peak runoff. Given the methodology the applicant used to predict peak flows the discharge devices are probably larger than needed.

Seven of the nine sedimentation ponds have at least one embankment side. Based on Plates III-5 through III-10, the 1v:2h slopes shown for embankments do not comply with UMC 817.46(m). The combined upstream and downstream side slopes of the embankment cannot exceed 1v:5h. The following ponds which are existing structures appear to be out of compliance with this regulation.

1. Coarse Refuse Toe Sediment Pond (Plate III-5)
2. Railcut Area Pond (Plate III-6)
3. Pasture Pond (Plate III-7)
4. Old Coarse Refuse Road Pond (Plate III-8)
5. Hoist House Pond (Plate III-9)
6. Lower #2 Canyon Pond (Plate III-10)

In response to this concern, the applicant contracted an engineering firm to assess the stability of the previously noted ponds. The stability analysis is contained in Appendix III-5 of the MRP. It should be noted that the study is entitled "Kaiser Coal Refuse Pond Embankment Stability Analysis." The study is not for

refuse ponds, but the sedimentation ponds in question. Based on the results of the study, all ponds but the Coarse Refuse Toe Sediment Pond have a static safety factor for the outslope of the embankment which equals or exceeds 1.5. The applicant subsequently submitted revised plans and drawings for the Coarse Refuse Toe Sediment Pond. The revised plans are in compliance with the requirements of UMC 817.46.

Pursuant to UMC 786.21 (Existing Structures), the Division determines that the Railcut Pond, Pasture Pond, Old Course Refuse Road Pond, Hoist House Pond and Lower #2 Canyon Pond, all existing structures, comply with UMC 700.11(e) and the applicable performance standards of UMC Subchapter K. No significant harm to the environment or public health or safety will result from use of these structures.

The applicant is in compliance with this section.

#### Stipulations

None.

#### UMC 817.47 Hydrologic Balance: Discharge Structures - JW

#### Existing Environment and Applicant's Proposal

The Sunnyside Mine will have, when the Sunnyside Surface Facilities Sediment Pond and associated collection ditches are completed, 34 culverts associated with the disturbed and undisturbed drainage system, 18 culverts associated with the road system and 12 culvert outlets associated with the sediment, slurry and mine water pond systems. Velocity calculations are contained for all culvert outlet points near the end of Appendix III-1 in a table format.

The applicant has indicated that 13 of the 34 culverts associated with the drainage system and five of the pond outlets will need outlet erosion protection based on velocity calculations (Appendix III-1). The erosion protection measures proposed are shown on Plate III-35. The applicant committed in the June 11, 1985 response to the Draft TA to install culvert outlet protection measures within 180 days of permit approval.

Six of the culverts associated with the disturbed area drainage system appear to have erosive velocities at the outlet based on calculations in the MRP. The applicant indicates that field inspections at this time do not show signs of erosion at these culvert outlets (Section 3.4.3.2, MRP).

While field checks to date don't reveal erosion, an inspection program is proposed in Section 3.4.3.2 of the MRP. Each outlet will be checked three times annually (spring, summer and fall). Where erosion problems are noted, protection measures will be installed within 30 days (Section 3.4.3.2, MRP).

### Compliance

The applicant's proposed protection measures for culvert outlets as shown on Plate III-35 are acceptable measures. The measures proposed will assure a scour hole does not form at the immediate culvert outlet. The dissipation of outlet velocities will be greatly improved if the bottom portion of the outlet structure is quite rough. The inclusion of three to five inch rocks covered with shot crete or under the wire mesh on the bottom as Plate III-35 suggests will help assure that outlet velocities are dissipated prior to the point where the outlet structure stops and the natural channel starts.

The calculations and erosion protection measures proposed by the applicant for culvert outlets are acceptable. The MRP contains the calculations and identifies which culvert outlets will receive erosion protection measures in the summary table in Appendix III-1 of Chapter 3.

The Hoisthouse and Manshaft sediment pond discharge culverts traverse a steep side slope before discharging into the undisturbed drainage channel. The applicant's proposed outlet culvert protection measure of wire basket gabions filled with rock underlined by a filter blanket with the gabions excavated so that the top of the baskets are flush with the existing streambank and bottom is an acceptable measure to assure the outlet points are protected from erosion. Since outflows from sediment ponds will occur as a result of summertime convective storms installation of these will be needed prior to June 15, 1986 (see Stipulation #1).

The inspection program proposed to monitor disturbed area culvert outlets is a good method to maintain compliance. Calculations indicate that the Pasture Haul Road, SF1, SF2, SF3, SF4 and SF5 culvert outlets will have erosive velocities during the design event. Thus, these culvert outlets must be protected with measures shown on Plate III-35 (see Stipulation #2).

### Stipulation 817.47-(1, 2)-JW

1. The applicant shall install, no later than June 15, 1986, the proposed wire basket rock gabions at the outlets from the hoisthouse and manshaft sediment ponds.

2. The applicant shall install, within 180 days of permit approval, erosion protection measures outlined on Plate III-35 of the permit application for the Pasture Haul Road, SF1, SF2, SF3, SF4 and SF5 culvert outlets.

UMC 817.48 Hydrologic Balance: Acid-forming and Toxic-forming Material - EH

Existing Environment and Applicant's Proposal

Before disposal each geological horizon will be tested for SAR, pH, boron and acid-base potential. If adverse levels of SAR, pH, boron or acid-base potential are found, the rock will be mixed with other waste rock to achieve acceptable levels of acidity or toxicity. Adverse levels in SAR, pH, boron and acid-base potential are defined as, SAR values greater than 10, pH less than 5 or greater than 9, boron greater than 5 ppm and acid base potential less than -5 tons CaCO<sub>3</sub> equivalent per 1,000 tons material. If all the rock to be disposed show unacceptable levels of acidity or toxicity, the rock will be disposed in an area that will be hydrologically isolated from the rest of the mine with solid block seals or it will be disposed in the coarse refuse pile along with the coal processing waste. There is no separate disposal structure for the underground development waste on the surface (MRP, Chapter III, pages 42 and 43).

Prior to disposal of mine development waste material that exhibits acid or toxic drainage characteristics, the operator will submit a map to the Division showing where the material will be placed and the locations of the block seals (MRP, Chapter III, page 42).

A chemical analysis of coarse refuse material is shown in Appendix VI-1 of the MRP. Values for pH, conductivity, sodium adsorption ratio and texture are given.

Compliance

The applicant's proposal for testing and handling of underground development waste is acceptable. The applicant is in compliance with this section.

Stipulations

None.

UMC 817.49 Hydrologic Balance: Permanent and Temporary  
Impoundments - JW

Existing Environment and Applicant's Proposal

The MRP describes one permanent impoundment and six temporary impoundments which currently exist on the Sunnyside permit area.

Grassy Trail Reservoir, formed by the Whitmore Canyon Dam, is described in Section 3.2.8 of the MRP. The dam was constructed in 1952 and serves to provide culinary water for the towns of Sunnyside and East Carbon as well as the mine facilities (Section 3.5.3.3, MRP).

The yearly inspection program is outlined on page 4 of Chapter 3 of the MRP, which will report among other items:

1. design, depth and elevation of impounded waters or historical information for the past year on water depths and elevations;
2. existing storage capacity;
3. other aspects affecting stability.

The reservoir is shown on Plate III-1 and in a photograph in Section 3.7.1 of the MRP.

Temporary impoundments existing onsite consist of two mine water ponds, two slurry ponds, one clear water pond associated with the slurry ponds and the east slurry cell.

The mine water ponds currently treat water pumped from the mine workings. The Twinshaft mine water pond is NPDES discharge point 001. The Whitmore Canyon pond is NPDES discharge point 002. These ponds are shown on Plates III-14 and III-15.

The slurry system utilizes the number 1 and number 2 pond to settle out coal fines and passes the water through a dike of coal refuse into the clear water pond prior to discharge. The east slurry cell is used when the number 1 and 2 ponds are filled. Section 3.4.9 describes in more detail the slurry pond system.

Compliance

Based on the MSHA hearing and review; Docket No. West 80-301-R and West 80-483-RM before Judge Jon D. Boltz, April 21, 1981, it has been determined that Grassy Trail Reservoir is not under the jurisdiction of 30 CFR 77.216. Thus, this facility does not require MSHA approval.

The MRP notes that the reservoir is a joint venture between Kaiser Steel and SOHIO, who holds the majority interest. The water supply facilities will remain after mining as the primary users of the water system are the two towns of East Carbon and Sunnyside.

UMC 817.49(g) requires ponds to have slopes no steeper than 2h:1v. Based on a letter dated May 3, 1985 from Kaiser (response to Notice of Violation N85-4-1-4), the embankment slopes on the Twinshaft mine water pond are between 1.5:1 and 1.75:1. Additionally, onsite inspections have shown that erosion and sloughing have begun to occur on the inside side slope.

The applicant has committed in the June 11, 1985 response to the TA to rebuild, within 120 days of permit approval, the twinshaft mine water pond embankments to meet the 2:1 slope requirements.

The MRP states that upon completion of mining activities, slurry ponds will be filled, graded, topsoiled, if needed, and revegetated (page 48, Chapter III).

Table III-38 shows mine water ponds will be regraded and reclaimed during final reclamation.

The applicant is in compliance with this section.

#### Stipulations

None.

UMC 817.50 Hydrologic Balance: Underground Mine Entry and Access Discharges - RVS

#### Existing Environment and Applicant's Proposal

Rocks in the mine plan and adjacent area strike north to northwest and dip an average of eight degrees to the east-northeast (MRP, Sections 6.3, page 2 and 6.4.2, page 4). Mine water is collected in a system of downdip sumps and currently discharged at an average rate of 740 gpm (Table VII-3 and Section 7.1.4, page 8).

The applicant states, in Section 3.4.3.1 of the MRP, that unplanned discharges from portals will be sampled quarterly for water quality (Table III-23). If necessary, appropriate mitigation to address undesirable water quality will be developed and implemented in consultation with the Division.

Portals are updip from the workings and located at elevations ranging from 6,800 to 7,200 feet. The Number Two Canyon Portal and Water Canyon Portal are at lower elevations (approximately 6,800 feet) than all other shafts and portals. Portal seals incorporate

two inch diameter water check pipes with valves (Plate III-18) to accommodate the flooding of workings and associated build-up of hydraulic head after mine closure.

Unplanned discharges from sealed portals will be sampled quarterly, until bond release, to ensure compliance with state and federal effluent standards (Section 3.4.3.1, page 24). The applicant also commits to providing treatment, if necessary, to achieve compliance with applicable effluent standards.

#### Compliance

The applicant has provided a program for sampling unplanned portal discharges during and following mining. Moreover, the applicant has committed to developing and implementing mitigation for undesirable water quality associated with these discharges.

The applicant is in compliance with this section.

#### Stipulations

None.

UMC 817.52 Hydrologic Balance: Surface and Ground Water Monitoring  
- RVS and JW

#### Existing Environment and Applicant's Proposal

The applicant commits to quarterly water-level monitoring of surface and underground boreholes (MRP, Section 7.1.6, page 10). These data will be submitted annually.

Water discharged from the mine will be monitored for the parameters and according to the schedule given in Table III-23 (Section 3.4.3.3, page 27). These data are submitted quarterly to the Division.

The applicant commits to monitoring the three springs within the mine plan area four times a year for quality and flow (Section 3.4.3.3, page 27). Water quality information will be derived as shown on Table III-23. Temperature, pH, EC and flow will be measured in the field. A yearly report on springs will be submitted.

Inflows greater than three gpm will be monitored quarterly for quantity and quality (Section 3.4.3.3, page 28). Field measurements will include temperature, pH, EC and flow. A map of observed inflows and geologic sources will be submitted annually with the water quality data.

The applicant's surface water monitoring program is described in Section 3.4.3.3 of the MRP. Plate III-1 identifies surface water monitoring points. Stations are monitored monthly for flow and field measurements and either monthly or quarterly according to the operational parameters on Table III-23 of the MRP.

#### Compliance

The applicant has provided an adequate operational water monitoring plan for springs, mine inflows and boreholes.

It should be noted that the locations of in-mine sampling points will be adjusted to include new points as they are encountered and to delete old points which can no longer be accessed due to mined out sections.

The applicant's surface water monitoring plan complies with the requirements of this section. The stations on the intermittent tributaries to Grassy Trail Creek will enable the impacts from disturbed areas to be isolated. The parameters to be sampled are consistent with Division recommendations.

#### Stipulations

None.

#### UMC 817.53 Hydrologic Balance: Transfer of Wells - RVS

#### Existing Environment and Applicant's Proposal

Boreholes have been completed for coal exploration and will be completed for water monitoring. All boreholes will be plugged following final abandonment (MRP, Section 3.5.3.1 and Table III-4).

#### Compliance

The applicant does not propose the transfer of boreholes for use as water wells. The applicant is in compliance with this section.

#### Stipulations

None.

#### UMC 817.54 Water Rights Replacement - JW

#### Existing Environment and Applicant's Proposal

The applicant commits to replacing the water supply of an owner of interest in real property who obtains all or part of the water supply which is affected by underground or surface operations (Section 3.4.3.1, MRP).

Additionally, the applicant has included a listing of water rights which could be potentially affected by mining activities (Figure III-3, Chapter III) in order to approximate water use which might be impacted. On page 7 of Chapter 7, the MRP notes that there are no wells in or adjacent to the mine plan area.

#### Compliance

The applicant's commitment to replace water impacted by mining satisfies the requirements of this regulation. Further, Kaiser owns water rights for a portion of Grassy Trail Creek (see Figure III-3), 2,000 ac/ft annually on Range Creek and 1,000 ac/ft per year of water on the Price River (Section 7.2.3.1, MRP). These can feasibly be used to replace affected water.

#### Stipulations

None.

#### UMC 817.55 Discharge of Water Into An Underground Mine - JW

#### Existing Environment and Applicant's Proposal

No water from surface sources is utilized in the underground mine workings at the Sunnyside Mines. Sufficient water from natural ground water inflows is encountered within the mine for dust suppression, with excess water being pumped to the surface (page 17, Chapter 7, MRP).

#### Compliance

A review of the surface water drainage plan does not indicate any diversion of water into underground workings. The applicant is in compliance with this section.

#### Stipulations

None.

#### UMC 817.56 Postmining Rehabilitation of Sedimentation Ponds, Diversions, Impoundments and Treatment Facilities - JW

#### Existing Environment and Applicant's Proposal

Section 3.5.3.3 of the MRP describes the disposition of dams, ponds and diversions. The only impoundment proposed to remain after reclamation is Grassy Trail Reservoir. The reservoir supplies culinary water to two municipalities and will continue to do so after mining. The MRP notes that if the reservoir is not transferred to the municipalities using it, that Kaiser will

maintain ownership and liability of the reservoir. Culverts and diversions proposed to remain after mining are described in Chapter 3, Appendix III-1 and Appendix III-12.

#### Compliance

The applicant's commitment to reclaim all ponds and diversions while maintaining the liability for Grassy Trail Reservoir is in compliance with this section. Should the ownership of the reservoir be transferred to the municipalities currently using reservoir water before bond release, Kaiser has committed to renovate, if needed, the dam and reservoir to the specifications for the dam previously approved by the Dam Safety Division of the state of Utah (Section 3.5.3.3, MRP).

The applicant is in compliance with this section.

#### Stipulations

None.

#### UMC 817.57 Stream Buffer Zones - JW

#### Existing Environment and Applicant's Proposal

Grassy Trail Creek is the only stream that supports a biological community within the permit area. The Reservoir Road parallels Grassy Trail Creek for several miles and at several locations is less than 100 feet from the stream. The Reservoir Road was built prior to SMCRA, as is the case with most roads within the mine permit area.

Stream buffer zone markers are posted along Grassy Trail Creek. Due to pre-Law disturbances the buffer zone is less than 100 feet in some locations. Plate III-26 shows locations of buffer zone signs.

#### Compliance

The applicant has encroached upon the 100-foot buffer zone required by UMC 817.57. This encroachment initially occurred prior to enactment of SMCRA and still occurs because of the need to utilize the reservoir road. In the areas of encroachment, the applicant has complied with UMC 817.57(b) by posting signs designating the area as a stream buffer zone.

The Winget report (1980) states that some degradation to Grassy Trail Creek has occurred. This degradation of water quality and stream bed sediment may be due to untreated mine water discharge. It is also possible that some degradation may have resulted from runoff from the Reservoir Road. However, no data exist to determine

what the exact source of the degradation was. It cannot be concluded that the Reservoir Road has not adversely affected Grassy Trail Creek. It should be noted that the Reservoir Road is a public road.

The applicant has taken prudent measures to control mine water via a pond system. Present data do not suggest degradation is occurring. The surface water monitoring program will detect if any further degradation is occurring.

Based on the above measures which the applicant has taken, the Division authorizes the applicant's activities which presently occur within 100 feet of Grassy Trail Creek.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.59 Coal Recovery - RVS

Existing Environment and Applicant's Proposal

Mining will occur in the Upper Sunnyside coal seam (four to seven feet thick) in the No. 3 Mine and Lower Sunnyside coal seam (5.5-12 feet thick) in the No. 1 Mine and No. 2 Mine (MRP Section 3.3.1.1, page 9). Sixty-five to eighty percent of coal will be produced by longwall mining methods (Section 3.3.1.3, page 10). The remaining production will be from continuous miner entry development and pillaring in areas unsuitable for longwall methods.

Compliance

The applicant proposes to conduct underground activities to maximize the utilization and conservation of coal resource while utilizing current technology to maintain environmental integrity. The applicant is in compliance with this section.

Stipulations

None.

UMC 817.61-.68 Use of Explosives - RVS

Existing Environment and Applicant's Proposal

The applicant states that the "Storage, handling and use of explosives are all in compliance with Mine Safety and Health Administration's (MSHA) rules and regulations" (MRP, Section 3.3.5.4, page 19). Furthermore, the applicant declares that

"Explosives are used only sparingly at the Sunnyside operation." Surface blasting is utilized to free blocked shutes and storage bins and clear foundations, walls and rocks. Section 3.3.5.4 of the MRP outlines the applicant's surface blasting plan.

Compliance

The applicant has indicated that surface blasting may occur during this five year permit term. The measures described in Section 3.3.5.4 address the requirements of this section.

Stipulations

None.

UMC 817.71-.74 Disposal of Excess Spoil and Underground Development Waste - PGL

Existing Environment and Applicant's Proposal

The MRP states on page 41 (Chapter III) that "the bulk of underground development waste generated by the mining operation at Sunnyside Mines is disposed of in mined-out areas underground." There is no separate disposal structure for the underground development waste on the surface.

Compliance

The applicant will dispose of underground development waste in mined-out areas underground. There are no plans for disposal of underground development waste on the surface. The percent of the mine void that may be filled will not exceed 0.02 percent of areas mined. Applicant's proposal is in compliance with this section.

Stipulations

None.

UMC 817.81-.85 Coal Processing Waste Banks - PGL

Existing Environment and Applicant's Proposal

The applicant states on page 39 (Chapter III) "Coarse refuse or reject from the preparation plant is disposed of in a waste bank. The refuse is hauled by truck from the refuse loadout at the preparation plant to the coarse refuse pile (Plate III-1) where it is end dumped in piles." The refuse is then spread out in layers 24 inches thick by a large dozer. "The outer slope of the refuse pile is maintained at a 27 degree slope." At 50-foot vertical increments, a 20-foot wide terrace is constructed for water runoff and erosion control. Construction of the pile was started in 1977,

therefore, no subdrainage was installed. A 24-inch perforated culvert was placed in the drainage bottom to collect ground water seepage. Rollins, Brown and Gunnell conducted an exploratory drilling study in 1984 that provided information indicating that no water table exists in the refuse pile. A geotechnical analysis by Rollins, Brown and Gunnell provided a long-term configuration with a long-term static safety factor of 2.31 (Appendix III-7, MRP).

Surface drainage from the area above the waste bank and from the crest and face of the final structure will be diverted away from the fill into stabilized diversion channels designed to safely pass a 100-year, 24-hour precipitation event (MRP, page 40, Chapter III).

The applicant proposes to cover the coarse refuse disposal site with four feet of nontoxic and noncombustible borrow material (from currently used borrow pits). Vegetation will be planted to minimize surface erosion. Test plots installed in 1980 are being used to determine if less than four feet of soil material could be used to revegetate the refuse pile.

The coarse refuse pile will be inspected quarterly by a qualified, certified engineer or other qualified person to detect hazards that may lead to a potential failure. The results of the inspection will be maintained on site. If a potential hazard exists, the Division will be informed (page 41, Chapter III, MRP).

#### Compliance

The applicant has provided plans for the design, construction and maintenance of the coal processing waste banks. The applicant has provided construction plans certified by a registered professional engineer. The applicant has committed to inspection of the site by a "qualified registered engineer or other person approved by the Division."

Maintenance of the embankments will consist of grading failure features discovered during inspection (Chapter III, page 41, Volume 1).

The applicant is in compliance with this section.

#### Stipulations

None.

UMC 817.86-.87 Burning and Burned Waste Utilization - PGL

#### Existing Environment and Applicant's Proposal

The applicant has proposed to extinguish any fires which might occur in the coal refuse pile with methods that meet the requirements of MSHA's rules and regulations (Chapter III, page 18,

Volume 1 of the MRP). Specific plans have been provided and provisions have been supplied to ensure that only those persons authorized by the operator will be involved in the extinguishing operations.

A fire extinguishing plan for the slurry impoundment as approved by MSHA is included in the MRP (Figure III-1).

#### Compliance

The applicant's proposal to extinguish fires in the coal refuse pile is in compliance with the requirements of this section.

#### Stipulations

None.

#### UMC 817.88 Coal Processing Waste: Return to Underground Workings - PGL

The requirements of this section do not apply because no coal processing waste is proposed to be returned to underground workings.

#### UMC 817.89 Disposal of Noncoal Wastes - PGL

#### Existing Environment and Applicant's Proposal

The applicant proposes to dispose of material removed from sediment ponds in the industrial waste disposal site or use as borrow material (Chapter III, page 43 of the MRP). Noncoal wastes such as grease, oil and timbers are disposed of in the industrial waste disposal site. The site has been approved by the State Board of Health by letter dated June 27, 1980 from the Department of Health, Division of Environmental Health. Nonindustrial wastes such as paper and other domestic solid wastes are disposed of in East Carbon City's landfill (authorization letter, Figure III-7, MRP). Sewage is piped to the town of Sunnyside treatment facilities.

#### Compliance

The applicant's proposal for disposal of noncoal wastes is in compliance with the requirements of this section.

#### Stipulations

None.

UMC 817.91-.93 Coal Processing Waste Banks - PGL

Existing Environment and Applicant's Proposal

The applicant has constructed four coal slurry impoundments according to Plates III-1, III-2 and III-3 (Chapter III, page 37, Volume 1): West Slurry Cell (WSC); East Slurry Cell (ESC); Slurry Pond #1 (SP1); and, Slurry Pond #2 (SP2). SP1 and SP2 are depressions without any major embankment structures.

The WSC was the first impoundment to be constructed for the disposal of slurry and refuse material (see Appendix III-5). Plate III-1 states that the WSC was last used in 1975. Coarse refuse material and other waste was used as fill material to block a wash in the pediment material at the mouth of Whitmore Canyon overlooking the Icelander Drainage. Slurry from the preparation plant was transported to the impoundment by ditch for disposal. As the level of the slurry bank increased, additional coarse refuse was added to the top and sides of the impoundment. The present level of the slurry in the impoundment is over 200 feet above the bottom of the wash. Present use of the impoundment is as a disposal area for dried slurry material from SP1 and SP2.

Construction of the ESC on the east side of WSC was completed in 1974. Coarse refuse was placed and compacted in dikes to contain the refuse. After the dikes were completed and covered with soil material, the impoundment was filled with slurry. Disposal of slurry continued until 1983. Presently, the impoundment is used as an overflow for SP1 and SP2.

SP1 and SP2 were constructed in 1978 north of the other slurry cells. These ponds were constructed by excavating a depression in the colluvium on a gentle slope. Material from the depression was spread downslope of the ponds for 50 to 100 feet. SP1 and SP2 are used in rotation. Slurry is introduced into a pond where it settles and is filtered (see Plate III-13). During the use of the first pond, the second pond is decanted and the dried slurry removed by truck to the WSC. After the second pond is cleaned, the cycle is reversed. If both ponds are in the drying and cleaning cycle, the slurry will be diverted to the ESC. Water from SP1 and SP2 (NPDES 004) is used to irrigate alfalfa fields or discharged into Icelander Drainage. Discharge water meets all state and federal water quality standards (see Chapter VIII).

The applicant provided an evaluation of the stability of the embankment structures in Appendix III-5. Testing of the refuse material was conducted (March 1984) in two drill holes, and three trenches were excavated. The material was tested to determine cohesive strength, angle of internal friction and density. No saturated conditions were identified in waste embankments during

drilling. Based upon this information, the stability of the embankments was determined. All of the existing slopes meet the requirements of the regulations except for the existing slope above the west side dike extension. The safety factor for this slope in its current configuration was determined to be 1.03. If the slope angle was reduced, the safety factor for the slope could be increased to 1.47 (see Appendix III-5). The final configuration of the slope will have a safety factor of 2.31. The applicant committed to not use the WSC until the west side dike configuration meets a static safety factor of at least 1.5 (page 38, Chapter III).

Evaluation of the ESC embankment under saturated conditions showed a safety factor of 0.5. Actual soil conditions encountered during soil testing in 1984 showed that the embankment was not saturated. Soil conditions encountered during installation of three piezometers, in August 1985, showed that the coarse refuse material in the embankment was not saturated.

All surface drainage from the areas above the slurry ponds is diverted away from the embankments by diversion ditches designed to carry the peak runoff from a 100-year, 24-hour precipitation event (Plate III-24, Appendix III-1). The diversions will be maintained to prevent blockage (postmining map).

Visual inspections by a qualified registered professional engineer will be conducted on a weekly basis to assess the stability of the impoundments and determine the amount of seepage, if any (Chapter III, page 39, Volume I). Records of the inspection findings and recommendations will be maintained at the mine site. If the inspection discloses that potential hazards exist, the Division will be informed promptly of the findings and of the emergency procedures formulated for public protection and remedial action to be taken.

The applicant states on page 39, Chapter III, MRP, that reclamation of the ESC should pose little or no problem due to potentially saturated slurry material. "Past experience has shown that vehicles can travel over the pond surface after the pond has dried for a year. The period of time before reclamation occurs could be shortened by dewatering the slurry with a trench and pump system."

### Compliance

The applicant has provided design information on the embankment structures to show that the stability requirements have been met for the final configuration of the structures under unsaturated conditions. This design was certified by a registered professional engineer as required by UMC 817.49(h) as referenced in UMC 817.93(a). Since the ESC acts as an overflow pond for SP1 and SP2 (and has been actively used for over six months, presently), saturated conditions in embankments may occur at some time in the

future. The applicant addressed the effects of water saturation on the stability of this embankment and committed to discontinue its use if seeps occur. The west side dike does not currently meet the safety factor requirements of the regulations. The applicant states that this dike will become stable as the current coarse refuse pile level reaches the level of the west dike. The current coarse refuse pile is being specifically constructed to meet MSHA requirements.

A weekly inspection plan by a qualified registered professional engineer has been proposed. The inspection plan will meet the requirements of 30 CFR 77.216-3 as stated in UMC 817.49(f) as referenced in UMC 817.93(a).

UMC 817.93(c) requires that dams or embankments constructed of or impounding waste materials must be designed to dewater 90 percent of the water stored during a design precipitation event within 10 days. The East Slurry Cell is a pre-SMCRA structure designed as a total containment evaporation pond. Based on evaporation rates for the time of year when the design storm would occur it would take about 40 days to evaporate the design storm.

The applicant has provided runoff calculations from the design storm in Appendix III-1 which demonstrate that sufficient capacity is present in the East Slurry Cell to contain 10 design events without overtopping the structure. Therefore, the Division determines that the East Slurry Cell, as an existing structure, meets the requirements of UMC 786.21 and 700.11(e) in order to exempt it from the requirements for 10 day dewatering in UMC 817.93(c).

The applicant addressed the feasibility of reclamation and the feasibility of dewatering the ESC to allow covering of the site with one foot of nontoxic cover material.

The stability analysis for the embankment of the ESC presently does not meet the requirements of UMC 817.93(a)(2) which is 1.5 for the partial pool steady seepage condition. The applicant will be in compliance when the following stipulation is met.

Stipulation 817.91-.93-(1)-PGL

1. The applicant may not use the ESC until the Division approves the embankment configuration that meets the partial pool steady seepage saturation condition minimum safety factor of 1.5 and the seismic safety factor of at least 1.2.

UMC 817.95 Air Resources Protection - SC

Existing Environment and Applicant's Proposal

Most of the region around the Sunnyside Mines permit area has been designated a Class II area for purposes of determination of significant air quality deterioration. Deterioration of the air quality is not expected during the permit period with the exception of short high wind periods when sand and smaller grained particles are picked up outside of the permit area and added to the air in the permit area (Section 11.4).

The Sunnyside Mines is an underground mining operation. The coal is cleaned in a washing plant and no thermal drying of the coal is used. Any effect of the mining operation on air quality would be minimal and would be confined primarily to the surface facilities (see Plate III-1).

Most of the parking areas and roads are paved. The main road through the property, the one most used, is a public road owned and maintained by the county. This road is partially paved. The haul road used by the refuse trucks is paved to the beginning of the disposal area. There are several access roads to portal and/or fan locations which receive limited usage, mainly for inspection purposes. Roads around the main complex are treated with calcium chloride, potassium chloride or sprayed with water to control fugitive dust as required during dry periods. All land that is disturbed shall be reclaimed as contemporaneously as practicable with mining operations (see TA, UMC 817.100) (Section 11.4).

Three units of coal-fired equipment (Section 11.4) are inspected periodically by the Utah State Department of Health, Bureau of Air Quality. However, air quality permits are not needed for old sources according to Monte Keller of the Bureau of Air Quality, Division of Environmental Health, Utah State Board of Health (Section 11.5). There has not been any violation of air quality laws at the Sunnyside Mines to date (Section 11.1).

Compliance

The necessary fugitive dust control measures will be implemented as part of the coal mining and reclamation operations as outlined.

The applicant complies with this section.

Stipulations

None.

UMC 817.97 Protection of Fish, Wildlife and Related Environmental Values - SC

Existing Environment and Applicant's Proposal

Habitats within and adjacent to the permit area support a wide variety of wildlife species. Several of these species are designated as economically important or high-interest species. Mule deer, bobcat, black bear, cottontail, beaver, muskrat, waterfowl, raptors and Utah milk snake are representative of those species requiring special consideration because of their legal or economic status.

The lower portions of Whitmore Canyon and the benches and lower slopes west of West Ridge are designated by the Utah Division of Wildlife Resources (DWR) as "high-priority" mule deer winter range. Continued operation of the Sunnyside Mine will likely preclude mule deer use of small portions of winter range in Whitmore Canyon. The duration of this unavoidable impact will be for the life of the mine and until reclamation is successful. The applicant has submitted designs for fencing to prevent livestock access to reclaimed areas while permitting mule deer to enter (Section 10.3.2).

The rimrock cliffs along the eastern boundary of the permit area represent important nesting habitat for cliff-nesting raptor species. Nesting by golden eagle, red-tailed hawk, and prairie falcon has been documented on or in the vicinity of the permit area (Figure X-1). The golden eagle and prairie falcon are species of "high federal interest." Only one identified nest (an inactive golden eagle nest) occurs within one kilometer of the main mine facilities area (Plate X-1).

Another important wildlife habitat in the permit area is Grassy Trail Creek and its associated riparian vegetation. The DWR considers riparian habitat critical to many species of wildlife in this region. A put-and-take rainbow (Class 3) fishery exists in a three-mile stretch of Grassy Trail Creek immediately below Grassy Trail Reservoir. The remainder of Grassy Trail Creek and other streams in the permit area represent lower quality aquatic habitat and are designated as Class 5 or 6 by the DWR (Section 10.3.2.1).

Information presented in Chapter X, Section 10.4 of the MRP indicates that considerable degradation of stream water quality has occurred in Grassy Creek below the point of mine water discharge. This degradation was primarily the result of fine sediments, oil and grease. The applicant has installed sediment ponds which will allow settling of suspended particles and separation of oil and grease (Section 7.2.3.1).

The applicant has purchased the DWR fish and wildlife educational program for coal employees and is using it in its training program for mine personnel. This education series is being presented to educate employees on the potential for wildlife impacts associated with human presence and harassment (Section 10.5).

No threatened or endangered species or critical habitats for these species has been documented for the permit area (Section 10.3.3, TA Section UMC 817.111-.117).

### Compliance

No additional surface disturbances are proposed for the current permit term, therefore, the primary impacts to wildlife will result from: (1) the continued loss of habitat previously disturbed by mining activities; (2) continued degradation of Grassy Trail Creek by mine discharge waters; and, (3) the effects of human presence and activities on wildlife in adjacent undisturbed habitats.

To reduce the degradation of water quality in Grassy Trail Creek by mine water discharge, the applicant has installed ponds to treat water before it is released into the creek. A detailed description of the sediment control plan and other water treatment facilities is provided in Chapter VII of the MRP. Various water quality parameters are being monitored by the applicant on a monthly, quarterly and semiannual basis at several points along Grassy Trail Creek to check the effectiveness of water quality control measures. In addition, four signs denoting a 100-foot buffer zone have been placed along undisturbed portions of Grassy Trail Creek in the vicinity of the mine workings (Section 10.5).

The applicant has committed to mitigate damage to springs and seeps, grazing lands, raptor nesting areas, and Grassy Trail Creek from subsidence if it occurs (Section 3.4.8).

A U. S. Fish & Wildlife Service (USFWS) letter (dated October 9, 1981) to DOGM indicates that the transmission line servicing the Sunnyside Mine does not pose a significant electrocution hazard to raptors and does not need to be modified.

The applicant has committed to avoid the use of persistent pesticides in the permit area unless approved by the Division (Section 10.5) and to notify the Division of any future occurrence of threatened or endangered species or golden eagles on the permit area (Section 10.3.3.1).

Following cessation of mining, the applicant will reclaim and revegetate disturbed sites. Plant species selection and planting patterns proposed by the applicant were designated to restore wildlife habitat and livestock grazing as the principal postmining land use (see TA, UMC 817.111-.117).

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.99 Slides and Other Damage - EH

Existing Environment and Applicant's Proposal

The applicant has provided for reporting of potential slides to the Division and commits to comply with any remedial measures required by the Division (Chapter III, page 23, Volume 1 of the MRP).

Compliance

The applicant's commitment to report slides and comply with any remedial measures required by the Division is in compliance with this regulation.

Stipulations

None.

UMC 817.100 Contemporaneous Reclamation - SC

Existing Environment and Applicant's Proposal

Contemporaneous reclamation which will occur at the Sunnyside Mine is primarily on the coarse refuse disposal site (Section 3.5.1). Revegetation on the refuse will begin as soon as revegetation test plot data are available and the most efficient and economical techniques and species shown. Contemporaneous reclamation has been conducted at the Slaughter Canyon Portal, storage area and associated access road since these facilities were no longer required for coal production (Section 3.5.1). Areas adjacent to any future disturbances will be revegetated as part of contemporaneous reclamation (Section 3.5.1).

Compliance

The applicant's plans for contemporaneous reclamation complies with this section.

Stipulations

None.

UMC 817.101 Backfilling and Grading Plan - PGL and EH

Existing Environment and Applicant's Proposal

The backfilling and grading plan proposed at the Sunnyside Mine will entail very minor handling of material with the exception of covering of the coal waste material (Chapter III, pages 42-43, Volume 1 of the MRP). The applicant has stated that at several portal and shaft locations small highwalls have been created. "These highwalls will be regraded to blend with adjacent surroundings" as stated by the applicant. The geotechnical analyses of these highwalls are found in Appendix III-5. The location of highwalls is shown on Plates III-20, III-21, III-22 and III-23. The applicant stated that any coal seam exposed near a portal will be backfilled and graded (page 54, Chapter III, Volume 1).

The applicant has committed to using borrow material to cover the coarse refuse disposal site and the slurry impoundment (Chapter III, pages 42 and 43, Volume 1 of the MRP). The applicant has identified on maps the location of borrow sites.

Compliance

The applicant has given a specific explanation and justification for each road that will not be regraded and reclaimed.

The applicant's proposal has shown that highwalls will be regraded and reclaimed "to closely resemble the general surface configuration of surrounding terrain." Coal seams exposed near a portal will be backfilled and regraded.

Coal refuse and slurry impoundments will be covered using borrow material.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.103 Backfilling and Grading: Covering Coal and Acid- and Toxic-forming Materials - EH

Existing Environment and Applicant's Proposal

The material classified as being toxic includes the entire coarse refuse disposal site and any other toxic materials found during regrading. Further, the applicant has stated that all mine development waste rock that shows unacceptable levels of acidity or toxicity as described on pages 42 and 43, Chapter 3, will either be disposed of underground in areas that will be hydrologically

isolated with solid block seals or disposed of in the coarse refuse disposal site. Before any underground disposal of waste rock is undertaken, the applicant will submit a map indicating the location of the waste material and block seals (pages 42 and 43, Chapter 3).

The applicant has committed to covering the entire refuse disposal site and portals with four feet of nontoxic soil material (page 42, Chapter 8). To do so will require approximately 449,000 yd<sup>3</sup>. The source of the nontoxic material is a borrow site located within the permit area (Plate III-23, VIII-1). Samples of the borrow material have been taken and the results of chemical and physical analysis will be submitted within 30 days of permit approval. The applicant has further committed to the establishment of vegetative test plots to evaluate the actual depth of nontoxic soil material required to reclaim the coarse refuse pile. If the required depth of cover material can be shown to be less than four feet, the applicant will request a variance to UMC 817.103(a) at that time (page 40, Chapter 3).

#### Compliance

The applicant is in compliance at this time.

#### Stipulations

None.

#### UMC 817.106 Regrading or Stabilizing Rills and Gullies - EH

##### Existing Environment and Applicant's Proposal

The applicant has provided plans for the repair of rills and gullies which might form when they become greater than nine inches in depth (Chapter III, page 55, Volume 1 of the MRP).

#### Compliance

The applicant's plans to repair rills and gullies are in compliance with this section of the regulations.

#### Stipulations

None.

#### UMC 817.111-.117 Revegetation - SC

##### Existing Environment and Applicant's Proposal

Chapter IX of the MRP describes the 18 vegetation community types which have been identified within the permit area. These vegetation types include: (1) aspen; (2) Douglas fir; (3) Douglas fir/aspen; (4) Douglas fir/mountain brush; (5) Douglas

fir/aspen/mountain brush; (6) Douglas fir/pinyon-juniper; (7) Douglas fir/sagebrush; (8) mountain brush; (9) pinyon-juniper; (10) pinyon-juniper/grass; (11) pinyon-juniper/mountain brush; (12) pinyon-juniper/sagebrush; (13) riparian/bullrush/sedge; (14) riparian/cottonwood grove; (15) riparian willow; (16) sagebrush/grass; (17) sagebrush/mountain brush; and, (18) agriculture hay field. Of these communities, only four (underlined above) have been or will be disturbed by surface facilities of the mine.

A total of 287.36 acres have been disturbed since SMCR. These are mountain brush (13.88 acres), pinyon-juniper (13.16 acres); pinyon-juniper/grass (175.42 acres), and sagebrush/grass (84.9 acres).

Undisturbed portions of each community which has been disturbed were sampled for total ground cover, canopy cover, cover by species, tree density and shrub density. Productivity estimates were obtained from the SCS (Figure IX-1 and IX-8). Statistical adequacy was achieved for all parameters with the exception of ground cover in the pinyon-juniper community and shrub density in the pinyon-juniper/grass community. These parameters met minimum sample requirements (Table IX-1). Descriptions of each disturbed community follow:

The mountain brush community is dominated by true mountain mahogany (Cercocarpus montanus) and Saskatoon serviceberry (Amelanchier alnifolia) with respective densities of 520 and 265 stems per acre. Shrub cover was estimated at 26 percent while herbaceous cover was estimated at 10 percent, with Salina wildrye (Elymus salina) comprising the majority of this understory cover. The SCS estimates production at 800 pounds per acre (air dry).

The pinyon-juniper community is dominated (78 percent of the relative vegetation cover) by Utah juniper (Juniperus osteosperma) and pinyon pine (Pinus edulis), with 125 and 132 stems per acre, respectively. A variety of shrubs is found in the understory (over 300 per acre) with true mountain mahogany, curlleaf mountain mahogany (Cercocarpus ledifolius), and Stansbury cliffrose (Cowania mexicana) most dominant. Herbaceous cover was estimated at less than two percent. SCS estimated production was 200 pounds per acre.

The pinyon-juniper/grass community is again dominated by Utah juniper and pinyon pine with 149 and 102 stems per acre, respectively. True mountain mahogany is the dominant shrub in the understory while the herbaceous stratum (nine percent cover) is dominated by Indian ricegrass (Oryzopsis hymenoides), penstemon (Penstemon subglaber) and lobeleaf groundsel (Senecio multilobatus). SCS estimated productivity is 300 pounds per acre.

The pinyon-juniper/sagebrush community is dominated by Utah juniper (8.7 percent cover), pinyon pine (7.4 percent cover) and big sagebrush (Artemisia tridentata) (11.2 percent cover). Total herbaceous cover (4.4 percent) is dominated by bluebunch wheatgrass (Agropyron spicatum) and Salina wildrye.

The riparian community is dominated by willows (64 percent of total vegetation cover and 18,124 stems per acre) with big sagebrush dominating the shrub stratum (1,013 stems per acre). The overstory is dominated by narrow leaf cottonwood (Populus angustifolia) and box elder (Acer negundo) with 41 and 36 trees per acre, respectively. The herbaceous stratum, except at the stream edge, is sparse with only 4.4 percent cover. SCS estimated productivity is 3,000 pounds per acre.

The sagebrush/grass community has historically received heavy grazing pressure and is dominated by big sagebrush with 3,477 stems per acre. Herbaceous cover averages 36 percent and is comprised mainly of grasses (93 percent). SCS estimated production is 1,000 pounds per acre.

Permanent seed mixtures (Tables III-15 through III-18, Chapter III, Volume 1 of the MRP) are included in the permit application. The tables contain mixtures for the mountain brush, pinyon-juniper, pinyon-juniper/grass and sagebrush-grass vegetation types. The seed mixtures have been designed to provide a diverse, permanent and effective cover of vegetation for stabilization, range and wildlife use. The wildlife value of each species is contained in Table IX-39 and cultural characteristics in Table III-19. No seedling transplanting will be accomplished. However, if natural invasion and seeding do not produce the required stem densities, transplants will be used (Chapter 3, Section 3.5.5.2).

### Compliance

#### UMC 817.111 Revegetation: General Requirements

No threatened or endangered plants are known to exist within the permit area. One plant, Hedysarum occidentale canone, classified as Category 1 (plants for which sufficient data exist for listing) by the Utah Native Plant Society, was found in a side canyon of the permit area; however, it is removed from potential disturbance.

Following mine closure, all mine openings will be sealed, facilities dismantled (with the exception of a number of permanent buildings in the main complex), and the disturbed areas will be graded on the contour where possible to blend with the surrounding terrain. The coarse refuse disposal site will remain above general grade following revegetation since it is in this position at the

present time and grading will not lower the elevation. All roads to be reclaimed as well as sites where no seedbed material is applied will be ripped to relieve compaction. Plans for revegetation of disturbed areas are discussed in Sections 3.5.5 and 9.7 of the MRP.

The applicant is in compliance with this section.

UMC 817.112 Revegetation: Use of Introduced Species

All but two of the species included in the mixtures are natives. Non-natives include Kentucky bluegrass (Poa pratensis) and redtop (Agrostis alba) which are widely naturalized in the western United States and are a common component of the present vegetation at Sunnyside (Section 9.7).

The applicant complies with this section.

UMC 817.113 Revegetation: Timing

The proposed schedule for revegetation conforms to normal guidelines. Fertilizer will be spread prior to planting. Phosphorous fertilizer will be disked into the soil surface. Disking or surface roughening will be applied to all areas where a surface crust has developed. Seeding will generally occur during late fall. However, grasses and forbs may also be seeded in the spring (Section 9.7).

The applicant complies with this section.

UMC 817.114 Revegetation: Mulching

All disturbed areas will be mulched with two tons of native hay per acre. Mulch on gently sloping areas will be crimped or chemically tacked. Mulch on steeper slopes will be chemically tacked. Jute matting or excelsior blankets will be used to mulch in planned drainage areas (Section 3.5.5.3).

Replanted sites will be protected from livestock grazing by fencing (Section 10.3.2). Plastic netting will be used on tree and shrub seedlings, if necessary, to prevent wildlife browse damage. Weed and rodent control programs will be adopted as appropriate. No irrigation is planned (Section 3.5.5.4).

The applicant complies with this section.

UMC 817.116-.117 Revegetation: Standards for Success and Stocking

Reference areas have been chosen for each disturbed community and their locations are shown on Plate IX-1. These areas were confirmed as valid representations of disturbed communities by the Division (Figures IX-6 and IX-7). Quantitative comparison is given

on Tables IX-40 through IX-46 of the MRP. The applicant has committed to permanently mark and protect these areas from mining disturbances throughout the life of the mine (Section 9.3.2.8 of the MRP). However, the location of the pinyon-juniper/grass reference area is proposed to be relocated based on the expansion of Reclamation Borrow Area #1. The applicant has committed to provide details on location and vegetative sampling data to show similarity with the previously established pinyon-juniper/grass reference area within 30 days of permit approval (Section 9.3.2.8 of the MRP). Since the adequacy of the proposed reference area can only be evaluated based on the applicant's submittal, the Division cannot approve the new pinyon-juniper/grass reference area at this time (see Stipulation #1).

It is proposed that success of revegetation be determined using statistically adequate samples (for cover and woody plant density, 90 percent and 80 percent confidence, respectively, with a 10 percent change in the mean) and comparing reclaimed areas with the appropriate reference area for the last two years of the liability period. Revegetation will be considered successful if, for the last two years of the liability period, cover and woody plant density on reclaimed areas is at least 70 percent and 90 percent of the reference area cover and woody plant density, respectively (Section 3.5.7.2 of the MRP). This proposal is acceptable for cover and woody plant density. However, the applicant has not identified a success standard for productivity (see Stipulation #2).

Except for the last two years of the liability period for which vegetation sampling will be done to determine revegetation success, the applicant has proposed to monitor reclaimed areas as per Division recommendations (Section 9.8 of the MRP). Stipulation #3 below identifies Division requirements for monitoring revegetated areas for years 1-8 of the liability period.

The applicant is in compliance with this section in light of the following stipulations.

Stipulation 817.116-.117-(1, 2, 3)-LK

1. The applicant shall not disturb the approved pinyon-juniper/grass reference area currently shown on Plate IX-1 until a revised Plate IX-1 showing the location of the proposed new reference area and vegetation sampling data are submitted to and approved by the Division.
2. The success standard for productivity on reclaimed areas shall be achievement of at least 90 percent of the productivity of the corresponding reference area for the last two years of the liability period, using statistically adequate samples at 80 percent confidence with a 10 percent change in the mean.

3. Kaiser Coal Corporation will monitor all permanently reclaimed areas as per the following schedule:

year 1: reconnaissance survey to determine initial species establishment and woody plant density;

years 2, 3, 5, and 7: sample for cover, woody plant density and determine diversity;

If year 3 equals at least 90 percent of and year 5 equals or exceeds the success standard for cover and woody plant density, year 7 monitoring may be waived.

Productivity monitoring is optional for years 1-8. However, no harvest methods (i.e., clipping) shall be used.

The results of monitoring permanently reclaimed areas shall be submitted to the Division by December 31 of each year monitoring is performed.

Feasibility of Reclamation. The Sunnyside Mine site receives approximately 12 to 16 inches of rainfall annually. This amount is clearly sufficient for the establishment of the majority of the species included in the planting mixtures. Seedbed materials, although composed primarily of spoil and cut-and-fill material, should provide an acceptable growth medium. Reclamation of the coarse refuse disposal site is considered feasible at this time (prior to revegetation tests being conducted on coarse refuse) only if covered by a sufficient depth of borrow material. The proposed method for determining revegetation success is sufficiently stringent so as to ensure successful revegetation efforts before any bond monies are released to the applicant.

UMC 817.121-.126 Subsidence Control - RVS

Existing Environment and Applicant's Proposal

The applicant provides information about subsidence in Sections 3.4.8 and 6.6.3.3 of the MRP. Supplementary subsidence data are given in Tables III-21A through III-21E, Plate III-3 and Plate III-4.

Mining will occur in the Upper Sunnyside coal seam in the No. 3 Mine and Lower Sunnyside coal seam in the No. 1 Mine and No. 2 Mine (MRP, Section 3.3.1.1, page 9). Coal extraction will occur primarily by longwall methods (Section 3.3.1.3, page 10).

The applicant states that subsidence cracks occur over a 35 acre area along the east wall of Whitmore Canyon, between the office complex and Pasture Canyon (Section 3.4.8, page 32). Five subsidence monuments were installed along Bear Canyon (Plate III-4). Vertical monuments were initially surveyed in May 1982 (Table III-21). During August 1983, longwall mining took place

beneath monuments S1 and S2. Measurements during the following year indicated active subsidence with the maximum subsidence value exceeding one foot (Tables III-21A and III-21B). The applicant indicates subsidence monitoring will continue and that an additional net of permanent monuments will be installed along Whitmore Canyon below Grassy Trail Reservoir (Section 3.4.8, page 33).

The applicant suggests vertical movement will be minimized by the Castlegate Sandstone acting as a "monolithic slab" that reduces caving and subsequent surface subsidence impacts (Section 3.4.8, page 32).

Mining will not occur beneath Grassy Trail Reservoir (Section 3.4.8, page 36). A subsidence barrier based on a 20 degree angle-of-draw has been established under Grassy Trail Reservoir, Left Fork and Right Fork of Whitmore Canyon (Section 3.4.8, page 36 and Plate III-3).

The applicant provides a survey of renewable resource lands that includes discussion of aquifers, areas for the recharge of aquifers and grazing lands. Surveys of raptor nesting areas and cultural resources are also incorporated in the MRP. The applicant concludes that subsidence will result in minimal impact to the above resources (Section 3.4.8, page 33-35). However, should material damage or diminution occur the applicant commits to restoring or rehabilitating (to the extent technologically and economically feasible) aquifers, recharge areas, spring flow and grazing lands. Moreover, the applicant commits to replacing water rights, complying with Division of Oil, Gas and Mining (DOGM)/U. S. Fish & Wildlife Service (USFWS)/Division of Wildlife Resources (DWR) raptor nest mitigation and consulting with DOGM/DWR to formulate fishery restoration.

The applicant commits to notifying property owners and residents of areas that could be affected by subsidence as described under UMC 817.122 (Section 3.4.8, page 36).

### Compliance

The applicant has provided information about mining methods, overburden thickness and vertical movement that indicate activities have been planned and will be conducted to prevent subsidence from causing material damage. Moreover, the applicant has adequately committed to public notification and surface owner protection.

The applicant will not mine beneath Grassy Trail Reservoir or the Left and Right Fork of Whitmore Canyon. Permanent subsidence monuments have been installed in Bear Canyon and will be installed in Whitmore Canyon below the reservoir. Annual subsidence monitoring will be conducted during August and submitted within 30 days (Section 3.4.8, page 33).

The applicant indicates on Plate III-3 and Plate III-4 that a longwall panel is currently being developed and two longwall panels will be developed beneath Grassy Trail Creek, a perennial stream. Plate III-38 indicates subsidence impacts will be minimized along Grassy Trail Creek due to the presence of approximately 200 feet of Castlegate Sandstone.

The applicant has committed to providing, within 30 days of approval, a subsidence monitoring plan that includes the number and installation schedule for monuments in Whitmore Canyon.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.131 Cessation of Operations: Temporary - PGL

Existing Environment and Applicant's Proposal

The applicant commits to notifying the Division before, or as soon as it is known, that a temporary cessation of operations will extend beyond 30 days. The notice will contain all requirements of UMC 817.131 (Section 3.3.6.2, page 21, Chapter III, MRP).

Compliance

The applicant's commitment is in compliance with this regulation.

Stipulations

None.

UMC 817.132 Cessation of Operations: Permanent - PGL

Existing Environment and Applicant's Proposal

Upon permanent cessation of operations, permanent reclamation will commence. Mine openings will be sealed, all surface equipment, structures and facilities associated with the operation, except those approved by the regulatory authority as suitable for the postmining land use or environmental monitoring, will be removed, and all affected areas permanently reclaimed. A complete reclamation plan and schedule can be found in Chapter III of the MRP.

Compliance

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.133 Postmining Land-Use - SC

Existing Environment and Applicant's Proposal

In the area of the active mine, underground coal mining has historically been the dominant land use while undisturbed grounds within the permit area were predominantly wildlife habitat or rangeland for domestic livestock grazing. Less significant uses of the land include recreation and a very small (four-acre) area of agriculture (alfalfa field) (Section 4.4.2).

Coal mining has occurred on the permit area continuously since the turn of the century. Mining occurred within both the lower and upper Sunnyside seams, and approximately 60 million tons of coal have been removed (Appendix IV-2).

The applicant proposes (Section 4.5) to return the areas designated for reclamation to the premining land uses of wildlife habitat/rangelands/recreation.

KCC proposes to leave most of the existing road system in place as access to rodeo grounds, Grassy Trail Reservoir and other facilities and for future grazing and recreational uses (TA Section UMC 817.150-.176).

Compliance

Reclamation and revegetation practices outlined in Chapter III appear feasible and sufficient to return the premining land uses.

The applicant complies with this section.

Stipulations

None.

UMC 817.150-.176 Roads - PGL

Existing Environment and Applicant's Proposal

Class I Roads - UMC 817.150-.156

The applicant states that plans for Class I Haul Roads will be placed in Appendix III-11 within 30 days of permit approval on page 3-6, Chapter III, Volume 1.

Compliance

The Class I Haul Road plans have been approved by the Division (see September 19, 1985 letter to Doug Pearce). The applicant is in compliance with this regulation.

Stipulations

None.

Class II Roads - UMC 817.160-.166

Existing Environment and Applicant's Proposal

The mine area has a total of six Class II Roads within the permit area. These roads were all constructed prior to enactment of SMCRA. No new roads during this permit period are planned (Chapter III, page 6 of the MRP). The six Class II Roads within the permit area are:

1. Refuse Road. The refuse road is used to haul coal refuse from the coarse refuse bin to the coarse refuse disposal area and as access to the Water Canyon Road.
2. Water Canyon Road. The Water Canyon Road is used as an access road for the No. 2 Mine fan and associated outcrop portals.
3. Number Two Canyon Road. The Number Two Canyon Road is used as an access for the No. 3 Mine fan in Number Two Canyon.
4. Slaughter Canyon Road. The Slaughter Canyon Road was used as an access for the Slaughter Canyon Portal. This road was reclaimed in 1982.
5. Man Shaft Road. The Man Shaft Fan Road is used as an access for the upper bathhouse and man shaft.
6. Complex Roads. The Complex Roads are used as an access around the mine offices, shop, bathhouse and preparation plant.

The Reservoir Road is a Carbon County road and is an extension of State Highway 123.

KCC has provided a profile and plan view of the Refuse Road (Haul Road, Plate III-25). Typical cross-sections of each road are provided on Plate III-17. Basic road specifications consisting of length, average grade, maximum grade and average width are provided in Table III-3. Road culverts are identified on Plate III-1 with specifications provided in Table III-22. Appendix III-1 provides design calculations for culverts.

KCC proposed to leave most of the existing road system in place as access to rodeo grounds, Grassy Trail Reservoir, and other facilities and for future grazing and recreational uses (Chapter III, page 7 of the MRP).

"The roads in Fan Canyon, lower Water Canyon and Slaughter Canyon, and short access roads to the raise holes, manshaft, fans and ponds will be removed after the mine life," as stated on page 6, Chapter III, Volume 1.

### Compliance

The roads will be reclaimed in an environmentally sound manner.

The applicant proposes to maintain and reclaim the pre-Law Class II Roads according to the permanent program performance standards. The justification for retention of Pole Canyon Road, Reservoir Road and the No. 2 Canyon Road are stated on Table III-3.

The applicant did not include the ROW from the BLM for the Water Canyon Road (Section 8, owned by the USA).

Applicant will be in compliance when the following stipulation is met.

### Stipulation 817.160-.166-(1)-PGL

1. The right-of-way from the BLM for the Water Canyon Road must be submitted to the Division within 30 days of permit approval (Section 8 is owned by the USA) (UMC 782.150).

### UMC 817.170-.176 Roads: Class III - PGL

### Existing Environment and Applicant's Proposal

The applicant states that there are five Class III Roads on Table III-3. Roads will be maintained according to the permanent performance standards. These roads will be maintained and restored at the end of the mine life to prevent damage to fish, wildlife and related environmental values as well as to prevent additional contributions of suspended solids to stream flow or runoff outside the permit area (page 3-7, Chapter III, Volume I).

The roads are:

1. R-4 Fan Canyon Road. The road is used as an access road to the No. 1 Mine fan.
2. R-6 Pole Canyon Road. The road is used as an access for the Pole Canyon exhaust shaft.

3. R-8 Reservoir Road. The road is used as an access for the Whitmore Canyon Dam and as an access for private lands above the dam.
4. R-9 Railroad Access Road. The road is used for access to the railroad storage shed outside the permit area.
5. R-11 Coarse Refuse Toe Road. The road is used for access to the Coarse Refuse Toe Sediment Pond, seep and sampling areas.

#### Compliance

The applicant will maintain and reclaim the Class III Roads in an environmentally sound manner. The applicant complies with this section.

#### Stipulations

None.

#### UMC 817.180 Other Transportation Facilities - PGL

#### Existing Environment and Applicant's Proposal

Transportation facilities at the Sunnyside Mines include a spur of the Denver and Rio Grande. Forty-inch gage tracks link the surface and underground, and 10 conveyor belts transfer coal and coarse refuse (Chapter III, page 7, Volume 1). These transportation facilities are all located in the main surface facilities area (Plate III-2). The applicant has stated that the facilities will be removed on page 47, Chapter III, Volume 1.

#### Compliance

The majority of the conveyor belt system and railroad spur are located in the surface facilities area. Consequently, drainage will be passed through the surface facilities sediment pond. A smaller portion of the drainage from along the railroad spur enters the slurry ditch. It is treated and settled in the slurry ponds and clear water pond.

The applicant commits to the maintenance and restoration of the transportation facilities area to prevent damage to fish, wildlife and related environmental values and to prevent additional contributions of suspended solids to streamflow or runoff outside the permit area (page 3-7, Chapter III, Volume 1). The applicant's proposal is in compliance with this section.

Stipulations

None.

UMC 817.181 Support Facilities and Utility Installations - PGL

Existing Environment and Applicant's Proposal

The main support facilities are located in the surface facilities area (Table III-1). Other support facilities occupy small areas of several acres or less and consist of fan buildings and hoist houses. The applicant has constructed sediment ponds to control runoff from all facility areas with significant disturbances. The sediment ponds control suspended solids and have skimmers to control oil and grease. Runoff from undisturbed areas above support facilities are diverted around the facilities to help prevent degradation of water quality. In locations where the disturbance area is small around support facilities, silt fences have been used to control suspended solids runoff (Chapter III, page 2-3).

Compliance

The applicant has presented measures to control erosion and prevent additional contributions of suspended solids to streamflow or runoff outside the permit area. A commitment is given by the applicant to maintain and restore the area to prevent damage to fish, wildlife and related environmental values and to prevent additional contributions of suspended solids to streamflow or runoff outside the permit area (page 2-3, Chapter III, Volume 1). The applicant is in compliance with this section.

Stipulations

None.

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KAISER BOND SUMMARY

1. Structure Removal	\$ 568,522.00
2. Mine Sealing	\$ 82,286.00
3. Ripping, Pushing, Regrading and Borrow Soils (including inby portals)	\$1,402,157.00
4. Soil Testing, Fertilizer and Seed Bed Preparation	\$ 56,705.00
5. Revegetation	\$ 168,917.00
6. Pond Reclamation (14 ponds)	\$ 64,828.00
7. Field Supervisor	\$ 17,054.00
8. Project Manager	\$ 34,003.00
9. Monitoring	<u>\$ 169,834.00</u>
	\$2,564,306.00
10% Contingency	<u>\$ 256,431.00</u>
	\$2,820,737.00 (1985 dollars)

Inflated @ 3.79%

1986 -	\$2,927,643.00
1987 -	\$3,038,601.00
1988 -	\$3,153,764.00
1989 -	\$3,272,291.00
1990 -	\$3,397,349.00

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3.5.5.5 Monitoring

Revegetated areas will be monitored on a schedule recommended by DOGM. Revegetated sites not subject to final reclamation will not be monitored until after final revegetation. Revegetation monitoring is discussed in Section 9.8.

3.5.6 Schedule of Reclamation

3.5.6.1 Detailed Timetable

Contemporaneous reclamation is discussed in Section 3.5.1; these activities will continue until mine closure. Upon completion of mining, reclamation will be performed as described in Sections 3.5.3, 3.5.4 and 3.5.5. Table III-10 presents the proposed reclamation and revegetation time schedule.

The Soil Conservation Service recommends autumn seeding (George Cook, personal communication). Many native shrub seeds have a stratification requirement and autumn planting will allow these seeds to overwinter (Monson and Christensen, 1975). However, spring plantings of grasses and forbs will also be done. If any transplanting becomes necessary, it will be in early spring to allow the trees and shrubs to naturally break dormancy.

Reclamation success of post 1977 disturbed areas will be determined by comparing data from DOGM approved reference areas with the corresponding reclaimed sites, in accordance with UMC 817.116 and 817.117. The parameters to be compared include vegetation cover and stem density.

Following the final seeding and mulching of the reclaimed areas, the monitoring will begin. According to UMC 817.116(b)(1), the 10-year responsibility period cannot begin until ground cover in the reclaimed site equals (within 70%) that in the reference area. For bond purposes we will assume it will take ten years for ground cover and stem densities to achieve approved standards. During this 10-year period, biennial sampling will be conducted on the reclaimed sites and the reference areas, resulting in five sampling seasons. Cost calculations for this sampling are shown in Table III-35.

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Reclamation and revegetation are generally inspected and monitored by OSM and DOGM. Revegetation monitoring is discussed in Section 9.8. On federal lands, disturbed acreage and reclaimed areas will be surveyed regularly and reports submitted according to CFR 211.62. Reclaimed site productivity will be determined during the last two years of the 10 year responsibility period prior to bond release.

### 3.5.7 Cost Estimate for Reclamation

The reclamation bond has been computed for post-law disturbances and pre-law disturbed areas which have been used since 1977. No bond is calculated for areas disturbed and revegetated prior to 1977, (Plates III-20-23).

Approximately 4.81 acres have been reclaimed contemporaneously during the permit term. This acreage in Slaughter Canyon represents final reclamation. Other minor revegetation work, such as on topsoil stockpiles is not computed in these figures. No additional final revegetation or reclamation is planned for this permit term, outside of the ongoing regrading during refuse pile construction.

At this time, the remaining 282.55 acres (287.36 reclaimable acres minus 4.81 acres in Slaughter Canyon) designated in Table III-24, will be final reclaimed at the end of the life of the mine. Certain roads and bridges, providing access to the canyons and high country will not be reclaimed. These roads are considered by Kaiser Steel Corporation to be necessary and appropriate for the post-mine land uses and include Whitmore Canyon, including the Left and Right Forks; Pasture Canyon; Number Two Canyon, Water Canyon and Bear Canyon. These are not included in the reclaimable disturbed acreage figures.

There will be additional revegetation of unbonded pre-law areas in the future. These areas have been mapped (Plates III-20 through III-23) illustrating the current condition of the pre-law disturbances. In Appendix III-10 these areas are described and the acreages are listed in Table 2. About 50% of these pre-law disturbances were revegetated in the 1960's and about 33% remains in a completely disturbed condition.

Cost estimates for each task in the bond were taken from the Means Site Work Cost Data (1985) when available. For those pieces of equipment not in the Means Site Work Cost Data Book, actual cost experience, depreciation, repair frequency, and cost of operating similar size pieces of equipment were used to estimate ownership and operating costs.

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As the disturbed areas of the underground mine within any wooded area are very small relative to the surrounding woodlands, natural regeneration of trees will be depended on rather than transplanting. The exception being the coarse refuse area which will be reseeded to pinyon-juniper/grass. However successful methods for transplants are pending the results of transplanting on experimental refuse plots. Therefore, costs will not be included in the bond at this time. Table III-45 outlines the various separate steps considered in reclamation cost development. Each step is considered separately on the following pages. Every step of reclamation will not always be necessary at each site. For example, some areas will require little regrading. The refuse pile is generally graded to shape during construction. In other cases, minor regrading may be accomplished by finishing. Derivation of these costs are found in the following pages.

### 3.5.7.1 Cost Estimate of Each Step of Reclamation

The cost estimate is divided into four sections: Structure Demolitions, Portal Sealing, Earth Work, and Revegetation and Soil Testing.

#### Removal of Buildings., Facilities and Foundations

The cost of facilities removal was derived from the Means Site Work Cost Data (1985). These costs include facility dismantling and removal from the site. There are cost estimates for the dismantling of the mine warehouse, office, shop and bathhouse. However, these brick buildings are more valuable if left in place where they could then be used by the city or some future owner. Table III-28 is the breakdown and cost estimate for facility removal.

#### Power lines

##### Assumptions:

- 1) Poles will be cut off at ground level
- 2) 1000 ft/hr cable winding (\$5.00/hr)
- 3) 4 poles per hour can be cut down (2 men)
- 4) Poles are 300 feet apart
- 5) 2 Hours per pole to strip and load poles
- 6) 26,400 ft power line (79,200 ft cable)

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	<u>Labor Cost</u>	<u>Equipment Cost</u>
Cutting Poles	2 men 22 hours (\$22.40/hr) \$985.60	2 chain saws \$300.00 Maintenance \$2/hr \$88.00
Pole Striping and Removal	2 men 2 hr/pole 88 poles \$7,884.80	
Cable Winding	2 men 1000 ft/hr \$3,548.60	
Subtotal	\$12,419.00	\$1,172.00
Total Cost	<u>\$13,591.00</u>	

Mine Sealing Cost

The typical entry dimension is about 20' x 8' - 22' x 9' wall (Plate III-18). The seal will be constructed of a double wall of 8" x 8" x 16" solid cinder blocks with pilasters in the middle when the height exceeds 10' or width exceeds 16'. A 2" diameter vent pipe will be installed near the top of the seal and a 2" diameter water check pipe will be installed 12" from the base per MSHA regulations. Both pipes will be fitted with locking valves. These pipes will extend through the fill material (see Plate III-18) to the surface.

Materials

Volume of blocks required per seal:

$$22' \times 9' = 198 \text{ ft}^2 \quad (\text{wall area})$$

$$2' \times 1.33' \times 9' \quad (\text{pilaster area})$$

$$\text{Total} = 222 \text{ ft}^2/\text{wall}$$

$$444 \text{ ft}^2/\text{seal}$$

Cost

$$444 \text{ ft}^2 \times \$4.56 = \$2,025/\text{seal} + \$410 \text{ (pipes and valves)} = \$2,435$$

(Means Site Work Cost Data 1985 4.3-270-1600)

Total - all seals

Cost

$$29 \text{ seals} \times \$2,435 / \text{seal} = \underline{\underline{\$70,615}}$$

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Shaft seals Estimated Quantities Involved

8' diameter shafts  
 steel plate 1/4" thick 8" collar thickness  
 10' x 10' = 100 sq ft  
 weight = 10.47/ft  
 weight plate = 100 x 10.46/2000lb = 0.52 tons  
 concrete cover 6" thick  
 10' x 10' = 100 sq ft.  
 100 x 0.5/27 = 1.8 cu yds  
 vent pipe, 2" = 25' in length

16' diameter shafts  
 steel plate 1/4" thick, 8" collar thickness  
 18' x 18' = 324 ft.  
 weight 10.46/ft  
 weight plate = 324 x 10.46/2000lb = 1.69 tons  
 concrete cover 6" thick  
 18" x 18" = 324 ft  
 324 x 0.5/27 = 6.00 cu yds  
 vent. pipe 2" in length

Shaft seals estimate of cost

Unit costs - installed  
 steel plate \$400/ton  
 concrete \$100/cu yd  
 2" pipe \$5/ft

Estimated costs:

Shaft diameter	8'		16'	
	Quantity	Cost	Quantity	Cost
steel plate at \$400/ton	0.52 T	\$208.00	1.69	\$676.00
concrete at \$100/cuyd	1.80cuyd	180.00	6.00	600.00
2" steel pipe at \$5/ft	25 ft	125.00	25	125.00
Total		\$513.00		\$1,401.00

Material Costs for all Shafts:

8'd 5 x \$513.00 = \$2,565.00  
 16'd 3 x \$1401.00 = 4,203.00  
 \$6,768.00

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Labor Costs for all Shafts:

(2 laborers)x(\$29.25/hour)x(6 hours/shaft)x(8 shafts) = \$ 2,808.00

Total Cost of Sealing Shafts:

Material:	\$6,768.00
Labor:	<u>2,808.00</u>
	\$9,576.00

Pond Reclamation Costs

There are fourteen ponds on the Sunnyside permit that will require filling and leveling during abandonment. These ponds range in size from a 53,000 gallon capacity Pasture Sediment Pond, to an 11.8 million gallon Coal Slurry Sediment Pond system. The total combined capacity of the fourteen ponds is over 17 million gallons.

The ponds will be filled in and leveled to blend with the surrounding topography. A D9L Cat dozer will rip and push the pond embankments to achieve this. In flat areas, the dozer will maintain a minimum 1% grade to prevent ponding.

The volume of material required to fill these ponds is calculated in Table III-38. The total volume to be pushed is 78,200 bank cubic yards (BCY). This compacted embankment material has a density of 2400 lb/yd<sup>3</sup>. Therefore, the estimated loose cubic yards (LCY) of material is (78,200) x (2400/2200) = 85,300 LCY.

Assumptions:

- 1) Average push distance ... 150 feet
- 2) Volume ... 85,300 LCY
- 3) Unit Cost Rate ... \$0.76/cy, 300 H.P. (Means Site Work Cost Data, 1985, 2.3-163-5220).
- 4) Total Cost  
85,300 LCY x \$0.76 = \$64,828

Regrading Costs

Mode of Operation

For the purposes of this estimate, the following mode of operation is generally assumed. After final facility removal,

### CHAPTER III

a 300 H.P. dozer will regrade the areas to blend with the typical surrounding contours. Holes from foundation removal (removal assumed to extend about two feet below ground surface) will be filled. Berms and railroad track beds will be graded to match surrounding topography. Refuse piles are assumed to be previously constructed to their final grade. It is assumed that the remaining acreage may require at least some regrading, resulting in a maximum estimate of regrading costs. A scraper will be used to redistribute and level berms and soil stockpiles.

#### Soil Ripping

Ripping will be required on the sites. There are 287.36 acres which require ripping and disking to reduce compaction and prepare a seedbed. There are 50.77 acres of refuse and 71.49 of slurry that will be covered by 4' and 1', respectively of borrow material unless test plot results indicate that reclamation success will be achieved using less material, or an alternative method. A D-9 dozer will be used to rip the ground. In canyon areas where the scraper becomes immobile, the D-9 dozer will regrade the area by ripping and pushing.

#### Material to be Moved - Regrading and Ripping Costs

The volume of material to be moved was determined using the cross-sections from the respective areas. These cross-sections are found on Plates III-32 (1 & 2). The Means Site Work Cost Data (1985) was used for cost estimations. These costs include overhead and profit. Portal sealing and covering costs are addressed in the Mine Portal Sealing section. Below is the computed volumes and grading costs by area.

#### AREA 1

Acreage	
Plate III-22	
Facilities Area	
Prelaw Exclusion (No. 2 Wash Above Prep. Plant)	64.39 ac
Railroad Right-of-Way Exclusion	<2.84 ac>
Post Mine Road to Upper No. 2 Canyon Exclusion	<4.50 ac>
	<2.78 ac>
Total	54.27 ac

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A. Regrading - Unit Train Loadout Highwall

Material  
 513.20 ft. x 207.4 yd<sup>2</sup> = 106,438 yd<sup>3</sup>

Unit Rate  
 300' haul, 300 H.P.  
 Dozer with ripper \$ 1.37  
 Rate 0.24  
 \$ 1.61

Cost  
 106,438 yd<sup>3</sup> x \$1.61 =

\$171,365

B. Regrading - Preparation Plant Highwall

Material  
 2,854' x 34.8 yd<sup>2</sup>/ft = 99,319 yd<sup>3</sup>

Unit Rate  
 120' haul actual; use 150' haul, 300 H.P. \$ 0.76  
 Dozer with ripper 0.24  
 Rate \$ 1.00

Cost  
 99,319 yd<sup>3</sup> x \$1.00 =

\$99,319

C. Portal - No. 3 Mine

Material 920 yd<sup>3</sup> for 4 portals

Haul Distance 2 mi round trip

Equipment 20 cy truck  
 Rate \$1.93/yd<sup>3</sup>

Cost  
 920 yd<sup>3</sup> x \$1.93 =

\$1,776

D. Regrading - Area Not Included in Highwall Reduction

Material  
 1' x 54.27 ac x 43,560 / 27 = 87,556 yd<sup>3</sup>

Unit Rate  
 150' haul, 300 H.P. (2) \$0.76  
 Dozer with ripper (4) 0.24  
 Rate \$1.00

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Cost  
 87,556 yd<sup>3</sup> x \$1.00 =

\$87,556

D. Total Cost Area 1 =

\$360,016

AREA 2

Acreage  
 No. 2 Mine Fan - Fan Canyon  
 Road

0.93 ac  
 2.02 ac

Total

2.95 ac

A. Portal - Fan Canyon

Material

690 yd<sup>3</sup> for 3 portals

Haulage Distance

3 mi round trip

Equipment

20 cy truck  
 \$2.29/cy

Rate(7)

Cost  
 690 yd<sup>3</sup> x \$2.29 =

\$1,580

B. Regrade - No. 2 Mine Fan

Material

400' x 9.25 yd<sup>3</sup>/ft = 3,700 yd<sup>3</sup>

Unit Rate

150' haul, 300 H.P.(2)

\$ 0.76

Dozer with ripper(4)

0.24

Rate

\$ 1.00

Cost  
 3,700 yd<sup>3</sup> x \$1.00 =

\$3,700

B. Regrading - Area Not Included in Highwall Reduction

Material

1' x 2.95 ac x 43,560 / 27 = 4,759 yd<sup>3</sup>

Unit Rate

50' haul, 300 H.P.(3)

\$ 0.35

Dozer with ripper(4)

0.24

Rate

\$ 1.61

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Cost  
4,759 yd<sup>3</sup> x \$0.59 =

\$2,808

C. Total Cost Area 2 =

\$8,088

AREA 3

Acreage

Whitmore Fan

2.87 ac

Whitmore Return

0.56 ac

Total

3.43 ac

A. Regrade - Whitmore Canyon Fan

Material

130' x 7.11 yd<sup>3</sup>/ft = 924 yd<sup>3</sup>

Unit Rate

150' haul, 300 H.P. (2)

\$ 0.76

Dozer with ripper (4)

0.24

Total

\$ 1.00

Cost

924 yd<sup>3</sup> x \$1.00 =

\$924

B. Regrade - Area Not Included in Highwall Reduction

Material

1' x 3.43 ac x 43,560 / 27 = 5,534 yd<sup>3</sup>

Unit Rate

50' haul, 300 H.P. (3)

\$ 0.35

Dozer with ripper (4)

0.24

Total

\$ 0.59

Cost

5,534 yd<sup>3</sup> x \$0.59 =

\$3,265

C. Total Cost Area 3 =

\$4,189

AREA 4

Acreage

No. 2 Canyon

14.07 ac

Road Exclusion

<6.25 ac>

Total

7.82 ac

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A. Regrading - No. 2 Canyon Mine Fan

Material  
 360 ft x 46.10 yd<sup>3</sup>/ft = 16,596 yd<sup>3</sup>

Unit Rate  
 120' haul, use 150' haul, 300 H.P.(2) \$ 0.76  
 Dozer with ripper(4) 0.24  
 Rate \$ 1.00

Cost  
 16,596 yd<sup>3</sup> x \$1.00 =

\$16,596

B. Portal - No. 2 Mine Portal

Material 460 yd<sup>3</sup> for 2 portals

Haulage Distance 2 mi round trip

Equipment 20 cy truck  
 Rate(6) \$1.93/cy

Cost  
 460 yd<sup>3</sup> x \$1.93 =

\$888

C. Regrading - No. 2 Mine Portal

Material  
 1,134 ft x 55.93 yd<sup>3</sup>/ft = 63,425 yd<sup>3</sup>

Unit Rate  
 150' haul, 300 H.P.(2) \$ 0.76  
 Dozer with ripper(4) 0.24  
 Total \$ 1.00

Cost  
 63,425 yd<sup>3</sup> x \$1.00 =

\$63,425

D. Regrading - Area Not Included in Highwall Reduction

Material  
 1' x 7.82 ac x 43,560 / 27 = 12,616 yd<sup>3</sup>

Unit Rate  
 150' haul, 300 H.P.(2)  
 Dozer with ripper(4) \$ 0.76  
 Rate 0.24  
\$ 1.00

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Cost  
12,616 yd<sup>3</sup> x \$1.00 =

\$12,616

E. Total Cost Area 4

\$93,525

AREA 5

Acreage

Water Canyon Portals

5.29 ac

Road

5.42 ac

Total

10.71 ac

A. Portals - Water Canyon

Material 1,380 yd<sup>3</sup> for 6 portals

Haulage Distance 4 mi round trip

Equipment 20 cy truck  
Rate(8) \$2.58/yd<sup>3</sup>

Cost  
1,380 yd<sup>3</sup> x \$2.58 =

\$3,560

B. Regrading - Water Canyon Highwalls

Material  
380' x 14.44 yd<sup>3</sup>/ft = 5,487 yd<sup>3</sup>

Unit Rate  
50' haul, 300 H.P.(3) \$ 0.35  
Dozer with ripper(4) 0.24  
Rate \$ 0.59

Cost  
5,487 yd<sup>3</sup> x \$0.59 =

\$3,237

C. Haulage of Borrow Material - Water Canyon Refuse

Borrow Material Required  
3.73 ac x 4' x 43,560 / 27 = 24,071 yd<sup>3</sup>  
Distance of Haul 4 mi round trip

Equipment Front End Loader, 5 yd cap.  
Rate(5) \$0.84/yd<sup>3</sup>

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Cost  
 24,071 yd<sup>3</sup> x \$0.84 =

\$20,220

Equipment

Rate(8)

20 cy Dump Truck  
 \$2.58 cy

Cost  
 24,071 yd<sup>3</sup> x \$2.58 =

\$62,103

Total Cost for Borrow Haulage

\$82,323

D. Regrading - Water Canyon Refuse

Material 24,071 yd<sup>3</sup>

Unit Rate  
 50' haul, 300 H.P.(3) \$0.35  
 Dozer with ripper(4) 0.24  
 Rate \$0.59

Cost  
 24,071 yd<sup>3</sup> x \$0.59 =

\$14,202

E. Regrading - Areas Not Included by Highwall Reduction or by Refuse Pile (5.91 ac)

Material  
 1' x 5.91 ac x 43,560 / 27 = 9,535 yd<sup>3</sup>

Unit Rate  
 50' haul, 300 H.P.(3) \$ 0.35  
 Dozer with ripper(4) 0.24  
 Rate \$ 0.59

Cost  
 9,535 yd<sup>3</sup> x \$0.59 =

\$5,626

F. Total Cost Area 5

\$108,948

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AREA 6

Acreage	
Roads west ridge and manshaft sediment pond	1.66 ac
West ridge road exclusion	<1.26 ac>
Whitmore Canyon road (Public) exclusion	<1.09 ac>
Methane vent and road	4.45 ac
Manshaft minewater discharge pond	1.67 ac
Manshaft sediment pond road	0.20 ac
Reclamation test plot	0.09 ac
Total	5.72 ac

A. Regrading - Total Area

Material	
1' x 5.72 ac x 43,560 / 27 =	9,228 yd <sup>3</sup>
Unit Rate	
50' haul, 300 H.P. (3)	\$ 0.35
Dozer with ripper (4)	0.24
Rate	<u>\$ 0.59</u>

Cost	
9,228 yd <sup>3</sup> x \$0.59 =	

\$5,445

B. Total Cost Area 6

\$5,445

AREA 7

Acreage	
Plate III-22	8.36 ac
Railroad Exclusion	<2.14 ac>
Plate III-23	169.20 ac
Total	175.42 ac

A. Portal - Columbia Bleeders

Material	690 yd <sup>3</sup> for 3 portals
Haulage Distance	6 mi round trip; use 10 mi
Equipment	20 cy truck
Rate (10)	\$4.55/yd <sup>3</sup>

Cost	
690 yd <sup>3</sup> x \$4.55 =	

\$3,140

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CHAPTER III

B. Haulage of Borrow Material, Coarse Refuse

Borrow Material Required		
4' x 47.04 x 43,560 / 27 =	303,565 yd <sup>3</sup>	
Distance of Haul	3,000'	
Equipment	Scraper, 21 cy	
Rate(11)	\$1.01/yd <sup>3</sup>	
Cost		
303,565 yd <sup>3</sup> x \$1.01 =		<u>\$306,601</u>

C. Regrade - Coarse Refuse Borrow Material

Material	303,565 yd <sup>3</sup>	
Unit Rate		
50' haul, 300 H.P.(3)	\$ 0.35	
Dozer with ripper(4)	0.24	
Rate	<u>\$ 0.59</u>	
Cost		
303,565 yd <sup>3</sup> x \$0.59 =		<u>\$179,103</u>

D. Haulage of Slurry Borrow Material

Borrow Material Required		
1' x 71.49 ac x 43,560 / 27 =	115,337 yd <sup>3</sup>	
Distance of Haul	1,900' use 3,000'	
Equipment	Scraper, 21 cy	
Rate(11)	\$1.01/yd <sup>3</sup>	
Cost		
115,337 yd <sup>3</sup> x \$1.01 =		<u>\$116,490</u>

E. Regrade - Slurry Borrow Material

Material	115,337 yd <sup>3</sup>	
Unit Rate		
50' haul, 300 H.P.(3)	\$ 0.35	
Dozer with ripper(4)	0.24	
Rate	<u>\$ 0.59</u>	
Cost		
115,337 yd <sup>3</sup> x \$0.59 =		<u>\$68,049</u>

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F. Regrade - Areas Not Covered by Borrow Material

Material  
1' x 56.89 ac x 43,560 / 27 = 91,783 yd

Unit Rate  
50' haul, 300 H.P. (3) \$ 0.35  
Dozer with ripper (4) 0.24  
Rate \$ 0.59

Cost  
91,783 yd<sup>3</sup> x \$0.59 =

\$54,152

F. Total Cost Area 7 =

\$727,535

AREA 8

Acreage  
Outcrop Fan Road Plate III-1, 1 of 3 3.11 ac  
Outcrop Fan Road Plate III-1, 2 of 3 3.29 ac  
Fan Pad 1.95 ac  
  
Total 8.35 ac

A. Portal - No.1 Mine

Material 1,610 yd<sup>3</sup> for 7 portals  
Haulage Distance 5 mi round trip  
Equipment 20 cy truck  
Rate (9) \$3.60/yd<sup>3</sup>

Cost  
1,610 yd<sup>3</sup> x \$3.60 =

\$5,796

B. Portals - Outside Raise

Material 460 yd<sup>3</sup> for 2 portals  
Haulage Distance 10 mi round trip  
Equipment 20 cy truck  
Rate (10) \$4.55/cy

Cost  
460 yd<sup>3</sup> x \$4.55 =

\$2,093

CHAPTER III

C. Regrade Area

Material  
 1' x 8.35 ac x 43,560 / 27 = 13,471 yd<sup>3</sup>  
 Unit Rate  
 50' haul, 300 H.P.(3) \$ 0.35  
 Dozer with ripper(4) 0.24  
 Rate \$ 0.59

Cost  
 13,471 yd<sup>3</sup> x \$0.59 =

\$7,948

D. Total Cost Area 8 =

\$15,837

AREA 9

Acreage

Pole Canyon Pad Plate III-21 3.11 ac  
 Pole Canyon Road Exclusion <1.78 ac>  
 Manshaft - Twinshaft 12.55 ac  
 Total 13.88 ac

A. Regrade - Twinshaft Highwall

Material  
 220' x 99.63 yd<sup>3</sup>/ft = 21,919 yd<sup>3</sup>  
 Unit Rate  
 150' haul, 300 H.P.(2) \$ 0.76  
 Dozer with ripper(4) 0.24  
 Rate \$ 1.00

Cost  
 21,919 yd<sup>3</sup> x \$1.00 =

\$21,919

B. Regrade - Manshaft Highwall

Material  
 900' x 36.14 yd<sup>3</sup>/ft = 32,526 yd<sup>3</sup>  
 Unit Rate  
 150' haul, 300 H.P.(2) \$ 0.76  
 Dozer with ripper(4) 0.24  
 Rate \$ 1.00

Cost  
 32,526 yd<sup>3</sup> x \$1.00 =

\$32,526

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C. Regrade - Pole Canyon Shaft Highwall

Material  
 330' x 28.24 yd<sup>3</sup>/ft = 9,319 yd<sup>3</sup>

Unit Rate  
 150' haul, 300 H.P.(2) \$ 0.76  
 Dozer with ripper(4) 0.24  
 Rate \$ 1.00

Cost  
 9,319 yd<sup>3</sup> x \$1.00 =

\$9,319

D. Regrade - Area Not Included by Highwall Reduction

Material  
 1' x 9.88 ac x 43,560 / 27 = 15,939 yd<sup>3</sup>

Unit Rate  
 50' haul, 300 H.P.(3) \$ 0.35  
 Dozer with ripper(4) 0.24  
 Rate \$ 0.59

Cost  
 15,939 yd<sup>3</sup> x \$0.59 =

\$9,404

E. Portal - B Canyon

Material 230 yd<sup>3</sup>  
 Haulage Distance 5 mi round trip  
 Equipment 20 cy truck  
 Rate(9) \$3.60

Cost  
 230 yd<sup>3</sup> x \$3.60 =

\$828

F. Total Cost Area 9

\$73,996

AREA 10

Acreage  
 Slaughter Canyon Road Plate III-1, 1 of 3 2.53 ac  
 Slaughter Canyon Road Plate III-1, 2 of 3 1.03 ac  
 Slaughter Canyon Pad/Portal 1.25 ac

Total 4.81

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CHAPTER III

A. Portal - Slaughter Canyon

This portal has been closed and no costs are presented.

B. Regrade Area

Material

1' x 4.81 ac x 43,560 / 27 = 7,760 yd<sup>3</sup>

Unit Rate

50' haul, 300 H.P. (3)

Dozer with ripper (4)

\$ 0.35

Rate

0.24

\$ 0.59

Cost

7,760 yd<sup>3</sup> x \$0.59 =

\$4,578

Total Cost Area 10

\$4,578

Soil testing

The soil testing will be done following the removal of facilities and after ripping and regrading. For bond purposes it was assumed that soil tests would be needed for all areas. It was estimated that an average of three samples per acre would be needed to determine soil quality and fertility. Each of the three samples would be from a different depth to obtain soil profile information. The number of samples is an estimate and could vary from site to site depending on severity of the disturbance. The bonding costs are based on three soil samples per acre (287.36 acres) multiplied by the average cost per sample at the Bookcliffs/ACZ Laboratory (\$45.00 per sample). The cost of soil sampling and testing is summarized by area shown in Table III-45.

Soil Testing and Fertilizer Cost

The soil testing will be done following the removal of the facilities, placement of borrow material, ripping and regrading. An average of three samples per acre will be taken on all disturbed areas to determine soil quality and fertility. Each of the sample sets will be from different depths to obtain soil profile information. The number of samples is an estimate and could vary from site to site depending on the severity of the disturbance.

Cost

3 samples/acre x \$45.00/sample = \$135.00/acre

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Phosphorus ( $P_2O_5$ ) will be applied to the entire area at the rate of 30 lb/acre (recommendation from Colorado State University Soils Laboratory). Nitrogen (ammonium nitrate) will be applied where necessary at rates indicated by the soils tests. Assuming the worst case, the current soil tests indicate that 40 lbs/ac should be applied. All areas will be disked after fertilization.

Fertilizer

Material

$P_2O_5$  at 30 lb/ac x \$175/ton = \$2.63/ac

Ammonium nitrate at 40 lb/ac x \$200/ton = \$4.00/ac

Labor

1.0 man hours/ac (Table III-26)

1 hour/ac x \$13.85/hr = \$13.85/ac

(Means Construction Cost Data 1985 Equip. Oper. Crew B-10)

Equipment

Tractor with fertilizer spreader \$14/hr (Table III-25)

1 hour/ac x \$14.00/ac = \$14.00/ac

Total = \$27.85/ac

Seed Bed Preparation

Equipment

Tractor and disk, 1.0 man hours/acre (Table III-25)

1.0 hr/ac x \$14.00 = \$14.00/ac

Labor

1.0 hr/ac x \$13.85/hr = \$13.85/ac

Total = \$27.85

Total Testing, Fertilizer, and Seed Bed Preparation

Rate of \$197.33/ac *pk*

Cost

\$197.33/ac x 287.36 reclaimable acres = \$56,704

*135/ac*

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### Revegetation

Total costs for revegetation have been calculated separately (Table III-29). Equipment costs were obtained from Table III-25. Table III-30 sets forth a breakdown of estimated costs for soil supplements for each vegetation type. The equipment and soil supplement costs are based on the assumption that most level slopes will be drilled and all steep slopes hydroseeded. All areas will have hay mulch and tackifier applied. The cost of the seed mix for each vegetation type is presented in Tables III-31-34. The estimated weighted average cost of revegetation is found in Table III-29.

#### 3.5.7.2 Statistical Methodology

Any sampling on reclaimed areas or reference areas will be sampled to statistically adequate levels. To determine the number of samples that will be required to obtain an adequate sample, a two-tailed t-test (Snedecor and Cochran, 1976)  $(t^2 s^2) / (d_x)^2$  will be used at the 80% confidence level with a 10% (d=1.05) change in the mean. The 80% confidence level is used because all vegetation types at Sunnyside are either shrublands or woodlands (shrub cover greater than 20% of total cover).

Once adequate samples are obtained for cover and stem density, these parameters will be compared between reference areas and the corresponding reclaimed sites. These parameters will be compared using a one tailed t-test (Larsen, 1980). Since the primary land use is wildlife, under Section UMC 817.116 the revegetation will be considered successful when ground cover of a reclaimed site is 70% of the ground cover in the reference area within 90% statistical confidence. The stem densities on the reclaimed areas must be within 90% of densities on the reference areas with an 80% statistical confidence.

#### Sampling Methodology

Ground cover will be estimated using the point line method, where a pin is dropped through a frame every 1/2 meter on a 25 meter transect. The first object encountered by the pin will be recorded as cover for that point. However, only understory cover will be estimated and this will not include canopy cover provided by trees or tall shrubs (shrubs over five feet tall). It would not be reasonable to expect after only ten years' growth in the reclaimed sites to achieve tree and shrub canopy cover found in the reference area.

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## CHAPTER III

Table III-24

## Identification and Size of Disturbed Areas

Area	Proposed Vegetation Type	Area to be Reclaimed	Acres
1	Sagebrush Grass	Main Complex, including offices, warehouse, parking lot, shop, prep. plant, No.3 Mine fan, unit train loadout, water tanks, mine portals and substations.	54.27
2	Sagebrush Grass	No. 2 Mine fan, substations, portals, and roads.	2.95
3	Sagebrush Grass	No. 1 Mine Whitmore Canyon fan and shafts, substations.	3.43
4	Sagebrush Grass	Storage yard, No. 2 Canyon fan and portal.	7.82
5	Sagebrush Grass	No. 2 Mine Water Canyon portals and road	10.71
6	Sagebrush Grass	Test plot, camp, manshaft pond road, methane vent, sediment pond, and mine discharge pond.	5.72
		Subtotal	84.90
7	Pinyon-Juniper/Grass	Refuse disposal areas including coarse refuse, industrial waste, borrow areas, slurry ponds, Sunnyside Mines area, and Columbia Bleeders.	175.42
8	Pinyon-Juniper	No. 1 Mine outcrop fan, portals, substations and roads, and outside raise.	8.35
9	Mountain Brush	Upper changehouse, twin shaft fan, manshaft, hoisthouse, Pole Canyon shaft, and B Canyon portal.	13.88

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CHAPTER III

Table III-24 (continued)

Identification and Size of Disturbed Areas

Area	Proposed Vegetation Type	Area to be Reclaimed	Acres
10	Pinyon- Juniper	Slaughter Canyon storage area, portal, and road.	4.81
TOTAL			287.36

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Table III-28

Estimated Cost of Dismantling and Removing Facilities

Facility	Building Material	Size cu ft	Unit Cost*	Cost (\$)
Preparation Plant	Steel	706,000	0.15	105,900✓
Blending Bin	Concrete	250,000	0.21	52,500✓
Milkshed	Block	5,600	0.16	896✓
Main Office	Brick	30,000	0.16	4,800✓
Shop	Block	474,000	0.16	75,840✓
Main Bathhouse	Block	178,000	0.16	28,480✓
Training Building	Block	60,000	0.16	9,600✓
Warehouse	Block	90,000	0.16	14,400✓
Engineering Office	Wood	25,900	0.16	4,144✓
Manshaft Bathhouse	Steel	179,000	0.15	26,850✓
Stockpile Hardware	Steel	550,000	0.15	82,500✓
Head Frame	Steel	32,000	0.15	4,800✓
Hoist Houses (2)	Steel	7,000	0.15	1,050✓
Materials Track	Steel	5,250'	11.90	62,475✓
Power Lines**		5 miles		13,591✓
Water Tanks	Steel	133,690	0.15	20,053✓
Fans (5)	Steel	25,000	0.15	3,750✓
Mine Substations (4)***	Steel	200,000	0.15	30,000✓
Parking Lot Removal yd <sup>3</sup>	Asphalt	17,777	1.41	25,066✓
Portal Collars	Concrete	8,700	0.21	1,827✓
TOTAL				568,522 <i>82</i>

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\* These costs include overhead, profit, and disposal.  
 \*\* Costs are calculated in 3.5.7.1  
 \*\*\* Assume that the substations are 50' x 50' x 20' steel structures.

CHAPTER III

Table III-29 (cont.)  
Revegetation Costs

<u>Drilled</u>					
<u>Equipment (1) and Labor (2) Costs</u>					
<u>Equipment</u>	<u>Time</u>	<u>Men</u>	<u>Labor</u>	<u>Equip.</u>	<u>Total/Ac</u>
Seed Drill	0.5	1	13.85	14.00	13.93
Hay Blower	0.5	2	13.85 10.10	18.90	21.42
Hay Crimper	0.5	1	13.85	13.75	13.80
<u>Material Costs (3)</u>					
Hay	2 T/ac x \$95.00/T =				\$190.00
<u>Vegetation Type</u>	<u>Seed Costs</u> (per acre)		<u>Normal Slopes</u> <u>Equip., Labor,</u> <u>Mater., Total</u> (per acre)		
Pinyon-Juniper	\$232.87		\$472.02		
Mountain-Brush	406.31		645.46		
Pinyon-Juniper/Grass	329.56		568.71		
Sagebrush-Grass	212.76		451.91		

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CHAPTER III

Table III-29

Revegetation Costs

Hydroseeded Slopes

Equipment (1) and Labor (2) Costs

<u>Equipment</u>	<u>Time</u>	<u>Men</u>	<u>Unit Costs</u>		
			<u>Labor</u>	<u>Equip.</u>	<u>Total/Ac</u>
Hydroseeder (seed)	0.5	2	13.85 10.10	19.50	16.67
Hay Blower	0.5	2	13.85 10.10	18.90	21.43
Hydroseeder (mulch & tackifier)	0.5	2	13.85 10.10	19.50	16.67

Material Costs (1)

Hay	2 T/ac x \$95.00/T = \$190.00/ac
Tackifier - Normal Slopes	80 lb/ac x \$0.90/lb = \$72.00/ac
Tackifier - Steep Slopes	120 lb/ac x \$0.90/lb = \$108.00/ac
Wood Fiber	0.15 T/ac x \$220.00/T = \$33.00/ac

<u>Vegetation Type</u>	<u>Seed Costs (per acre)</u>	<u>Steep Slopes Equip., Labor Mater. Total (per acre)</u>	<u>Normal Slopes Equip., Labor Mater. Total (per acre)</u>
Pinyon-Juniper	\$335.53	\$685.30	\$721.30
Mountain Brush	559.32	909.09	945.09
Pinyon-Juniper/Grass	473.11	822.88	858.88
Sagebrush/Grass	256.30	606.07	642.07

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CHAPTER III

Table III-29 (cont.)

Revegetation Costs

Weighted Cost per Acre - Steep and Normal Slopes

<u>Vegetation Type</u>	<u>Percent of Steep Slopes</u>	<u>Cost/Acre</u>
Pinyon-Juniper	36	\$561.76
Mountain-Brush	100	949.89
Pinyon-Juniper/Grass	20	626.74
Sagebrush/Grass	0	451.91

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- 
- (1) Tables III-25, III-26
  - (2) Means Construction Cost Data 1985, Crew B-3 and A-1
  - (3) Table III-30
  - (4) 40 lbs. of tackifier was added for steep slopes

CHAPTER III

Table III-31

Seed Costs for Sagebrush-Grass Type

Seed	Cost/ PLS lb	DRILLING		BROADCAST	
		Drill	Cost/ Acre	Rate	Cost/ Acre
<b>GRASSES</b>					
<u>Agropyron smithii</u>	2.70	3.0	8.10	5.9	15.93
<u>Agropyron spicatum</u>	3.80	1.5	5.70	2.2	8.36
<u>Bouteloua gracilis</u>	3.80	0.2	0.76	0.2	0.76
<u>Oryzopsis hymenoides</u>	6.00	3.2	19.20	4.9	29.40
<u>Sitanion hystrix</u>	21.00	0.2	4.20	0.3	6.30
<u>Sporobolis cryptandrus</u>	2.50	0.1	0.25	0.1	0.25
<u>Stipa comata</u>	50.00	1.9	95.00	2.8	140.00
<b>FORBS AND SHRUBS</b>					
<u>Artemesia ludoviciana</u>	70.00	0.1	7.00	0.1	7.00
<u>Balsamorhiza sagittata</u>	20.00	0.2	4.00	0.3	6.00
<u>Hedysarum boreale</u>	45.00	0.7	31.50	1.0	4.50
<u>Penstemon palmeri</u>	22.00	0.1	2.20	0.1	2.20
<u>Petalostemon purpureum</u>	37.00	0.1	3.70	0.1	3.70
<u>Solidago canadensis</u>	24.00	0.1	2.40	0.1	2.40
<u>Sphaeralcea coccinea</u>	45.00	0.1	4.50	0.1	4.50
<u>Amelanchier alnifolia</u>	60.00	0.1	6.00	0.1	6.00
<u>Artemisia tridentata</u>	25.00	0.1	2.50	0.1	2.50
<u>Chrysothamnus nauseosus</u>	45.00	0.1	4.50	0.1	4.50
<u>Eurotia lanata</u>	7.50	0.3	2.25	0.4	3.00
<u>Symphoricarpos oreophilis</u>	45.00	0.2	9.00	0.2	9.00
<b>TOTAL</b>			<b>212.76</b>		<b>256.30</b>

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CHAPTER III

Table III-34

Seed Costs for Pinyon-Juniper/Grass Vegetation Type

Seed	Cost PLS#	DRILLING		BROADCAST	
		Rate	Cost/ Acre	Rate	Cost/ Acre
<b>GRASSES</b>					
<u>Agropyron smithii</u>	2.70	5.9	15.93	8.9	24.03
<u>Bouteloua gracilis</u>	3.80	0.3	1.14	0.5	1.90
<u>Elymus salina</u>	50.00	0.3	15.00	0.4	20.00
<u>Hilaria jamesii</u>	20.00	0.7	14.00	1.0	20.00
<u>Oryzopsis hymenoides</u>	6.00	2.3	13.80	3.5	21.00
<u>Sitanion hystrix</u>	21.00	0.6	12.60	0.9	18.90
<b>FORBS AND SHRUBS</b>					
<u>Gilia aggregata</u>	95.00	0.1	9.50	0.1	9.50
<u>Artemisia ludovicina</u>	70.00	0.1	7.00	0.1	7.00
<u>Hedysarum boreale</u>	45.00	1.3	58.50	1.9	85.50
<u>Oenothera pallida</u>	48.00	0.1	4.80	0.1	4.80
<u>Penstemon bridgesii</u>	22.00	0.1	2.20	0.1	2.20
<u>Penstemon palmeri</u>	22.00	0.1	2.20	0.1	2.20
<u>Petalostemon purpureum</u>	37.00	0.1	3.70	0.2	7.40
<u>Sphaeralcea coccinea</u>	45.00	0.1	4.50	0.1	4.50
<u>Artemesia nova</u>	42.00	0.1	4.20	0.1	4.20
<u>Cercocarpus ledifolius</u>	20.00	0.4	8.00	0.6	12.00
<u>Cercocarpus montanus</u>	25.00	1.8	45.00	2.8	70.00
<u>Cowania mexicana</u>	15.00	1.0	15.00	1.5	22.50
<u>Ephedra viridis</u>	7.00	0.4	2.80	0.7	4.90
<b>TOTAL</b>			232.87		335.53

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CHAPTER III

Table III-33

Seed Costs for Mountain Brush Vegetation Type

Seed	Cost PLS#	DRILLING		BROADCAST	
		Rate	Cost/ Acre	Rate	Cost/ Acre
<b>GRASSES</b>					
<u>Agropyron smithii</u>	2.70	1.9	5.13	2.8	7.56
<u>Bouteloua gracilis</u>	3.80	0.6	2.28	0.2	0.76
<u>Elymus salina</u>	50.00	2.6	130.00	3.9	195.00
<u>Koeleria cristata</u>	50.00	0.8	40.00	1.2	60.00
<u>Oryzopsis hymenoides</u>	6.00	0.4	2.40	0.6	3.60
<u>Poa pratensis</u>	2.00	0.1	0.20	0.2	0.40
<b>FORBS AND SHRUBS</b>					
<u>Achillea lanulosa</u>	20.00	0.1	2.00	0.1	2.00
<u>Artemesia ludoviciana</u>	70.00	0.1	7.00	0.1	7.00
<u>Balsamorhiza sagittata</u>	20.00	0.2	4.00	0.2	4.00
<u>Castilleja chromosa</u>	170.00	0.1	17.00	0.1	17.00
<u>Gaillardia aristata</u>	100.00	0.1	10.00	0.1	10.00
<u>Gilia aggregata</u>	95.00	0.1	9.50	0.1	9.50
<u>Hedysarum boreale</u>	45.00	0.7	31.50	1.0	45.00
<u>Penstemon strictus</u>	22.00	0.1	2.20	0.1	2.20
<u>Petalostemon purpureum</u>	37.00	0.1	3.70	0.1	3.70
<u>Solidago canadensis</u>	24.00	0.1	2.40	0.1	2.40
<u>Amelanchier alnifolia</u>	60.00	1.3	78.00	2.0	120.00
<u>Cercocarpus ledifolius</u>	20.00	0.2	4.00	0.2	4.00
<u>Cercocarpus montanus</u>	25.00	1.1	27.50	1.7	42.50
<u>Potentilla fruticosa</u>	45.00	0.1	4.50	0.1	4.50
<u>Rhus trilobata</u>	14.00	0.5	7.00	0.5	7.00
<u>Rosa woodsii</u>	14.00	0.5	7.00	0.5	7.00
<u>Symphoricarpos oreophilis</u>	45.00	0.2	9.00	0.2	9.00
<b>TOTAL</b>			<b>406.31</b>		<b>564.12</b>

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CHAPTER III

Table III-34

Seed Costs for Pinyon-Juniper/Grass Vegetation Type

Seed	Cost PLS#	DRILLING		BROADCAST	
		Rate	Cost/ Acre	Rate	Cost/ Acre
<b>GRASSES</b>					
<u>Agropyron smithii</u>	2.70	3.0	8.10	4.5	12.15
<u>Bouteloua gracilis</u>	3.80	0.2	0.76	0.2	0.76
<u>Elymus salina</u>	50.00	0.3	15.00	0.4	20.00
<u>Hilaria jamesii</u>	20.00	0.7	14.00	1.0	20.00
<u>Oryzopsis hymenoides</u>	6.00	3.2	19.20	4.9	29.40
<u>Sitanion hystrix</u>	21.00	1.1	23.10	1.7	35.70
<u>Stipa comata</u>	50.00	1.9	95.00	2.8	140.00
<b>FORBS AND SHRUBS</b>					
<u>Artemisia ludovicina</u>	70.00	0.1	7.00	0.1	7.00
<u>Gilia aggregata</u>	95.00	0.2	19.00	0.2	19.00
<u>Hedysarum boreale</u>	45.00	1.9	85.50	2.9	130.50
<u>Penstemon palmeri</u>	22.00	0.1	2.20	0.1	2.20
<u>Petalostemon purpureum</u>	37.00	0.1	3.70	0.1	3.70
<u>Sphaeralcea coccinea</u>	45.00	0.1	4.50	0.1	4.50
<u>Artemesia nova</u>	42.00	0.1	4.20	0.1	4.20
<u>Atriplex canescens</u>	6.00	1.3	7.80	2.0	12.00
<u>Cercocarpus montanus</u>	25.00	0.7	17.50	1.1	27.50
<u>Eurotia lanata</u>	7.50	0.4	3.00	0.6	4.50
<b>TOTAL</b>			<b>329.56</b>		<b>473.11</b>

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CHAPTER III

Table III-36

Portal Sealing and Abandonment

Portal Location	Number of Portals	Travel Distance (1)	Area	Fill Material Required (yd <sup>3</sup> )
Columbia Bleeders	3	15,000	7	690
Fan Canyon	3	8,400	2	690
Water Canyon	6	9,400	5	1,380
No. 3 Mine	3	5,000	1	690
No. 2 Mine	2	5,000	4	460
No. 1 Mine	1	5,000	1	230
No. 1 Mine	1	8,000	10	230
No. 1 Mine	7	15,000	8	1,610
No. 1 Mine	2	18,000	8	460
B Canyon	<u>1</u>	36,000	9	<u>230</u>
Total	29			<u>6,670</u>

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(1) Average travel distance between borrow pit and portal locations.

KAISER BOND SUMMARY

1. Structure Removal	\$ 568,522.00
2. Mine Sealing	\$ 82,286.00
3. Ripping, Pushing, Regrading and Borrow Soils (including inby portals)	\$1,402,157.00
4. Soil Testing, Fertilizer and Seed Bed Preparation	\$ 56,705.00
5. Revegetation	\$ 168,917.00
6. Pond Reclamation (14 ponds)	\$ 64,828.00
7. Field Supervisor	\$ 17,054.00
8. Project Manager	\$ 34,003.00
9. Monitoring	<u>\$ 169,834.00</u>
	\$2,564,306.00
	10% Contingency
	<u>\$ 256,431.00</u>
	\$2,820,737.00 (1985 dollars)

Inflated @ 3.79%

1986 - \$2,927,643.00
1987 - \$3,038,601.00
1988 - \$3,153,764.00
1989 - \$3,272,291.00
1990 - \$3,397,349.00

0292R-2

CHAPTER III

Table III-35

Monitoring During Ten Year Responsibility Period

A. Erosional

1. Assume 2 mandays/month at \$29.25/hr (1)
2. Cost  
 $10 \text{ yr} \times 12 \text{ month/yr} \times 8 \text{ hr/day} \times 2 \text{ days} \times$   
 $\$29.25/\text{hr} = \underline{\$56,160.00}$

B. Hydrologic

1. Sample each discharge pond on a ten year, 24 hour storm frequency basis. Assumed that each pond will require sampling one time during the ten year responsibility period.

$$8 \text{ hrs} \times \$29.25/\text{hr} = \$234$$

2. Sample stream channels each quarter.

$$2 \text{ hr/sample} \times 8 \text{ samples/year} \times 10 \text{ years} \times$$

$$\$29.25/\text{hr} = \$4,680$$

3. Laboratory costs at \$200/sample (see Table III-23, Surface Water Operational).

$$88 \text{ samples} \times \$200/\text{sample} = \$17,600$$

4. Total Hydrologic Cost = \$22,514.

C. Vegetation

1. Biannual sampling of vegetation reference areas and revegetated areas prior to responsibility period. Assume 5 years of sampling at 15 days/year.

$$75 \text{ days} \times 2 \text{ men} \times \$29.25/\text{hr} = \$35,000$$

2. Final vegetation survey for reclamation bond release.

$$30 \text{ days/yr} \times 2 \text{ men} \times 4 \text{ years} \times 8 \text{ hrs/day} \times$$

$$\$29.25/\text{hr} = \$56,160$$

3. Total Vegetation Cost =

\$91,160

4. TOTAL MONITORING COST =

\$169,834

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CHAPTER III

Table III-36

Portal Sealing and Abandonment

Portal Location	Number of Portals	Travel Distance (1)	Area	Fill Material Required (yd <sup>3</sup> )
Columbia Bleeders	3	15,000	7	690
Fan Canyon	3	8,400	2	690
Water Canyon	6	9,400	5	1,380
No. 3 Mine	3	5,000	1	690
No. 2 Mine	2	5,000	4	460
No. 1 Mine	1	5,000	1	230
No. 1 Mine	1	8,000	10	230
No. 1 Mine	7	15,000	8	1,610
No. 1 Mine	2	18,000	8	460
B Canyon	<u>1</u>	36,000	9	<u>230</u>
Total	29			<u>6,670</u>

6,670

*6670x varied  
travel distance*

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(1) Average travel distance between borrow pit and portal locations.

Chapter III

Table III-41

Costs for Cementing Drill Holes

---

Using a 6" diameter drill hole:

$$\text{Area} = \pi D^2 / 4 = 0.196 \text{ ft cu/ ft of depth}$$

4,000 psi Ready Mix Concrete at \$52.50 / yd<sup>3</sup>

Pasture Canyon

$$1250' \times 0.196 / 27 = 9.1 \text{ yd}^3$$
$$9.1 \times \$52.50 / \text{yd}^3 = \$447.75$$

Water Canyon

$$2500' \times 0.196 / 27 = 18.2 \text{ yd}^3$$
$$18.2 \times \$52.50 / \text{yd}^3 = \$955.50$$

Methane Drainage

$$1750' \times 0.196 / 27 = 12.7 \text{ yd}^3$$
$$12.7 \times \$52.50 / \text{yd}^3 = \$666.94$$

Labor

1 man for 2 days

$$2 \text{ days} \times 8 \text{ hr.} \times \$29.25 / \text{hr} = \$468.00$$

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CHAPTER III

Table III-43

Available Industrial and Reclamation Borrow Material

<u>Borrow Area</u>	<u>Acres</u>	<u>Depth (ft)</u>	<u>Cu. Yds. Available</u>
Industrial 1	3.42	8.5'	46,899
Industrial 2	3.25(1)	0.0'	0
Industrial 3	3.36(2)	12.0	32,525
Reclamation 1	30.14	12.0	550,726
Grassy Trail Borrow(3)	-----	-----	8,500
Total			638,650

1. Borrow area 2 has been used for industrial purposes; e.g., roads, etc. and is substantially gone.
2. Approximately 10 ft of this material has been used, however, about 6 ft. of material remains in place.
3. Grassy Trail Dam Borrow Area is a slide area, and acres and depth have not been determined. This area was approved by DOGM, letter November 27, 1984 (Figure III-4).

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CHAPTER III

TABLE III-44

Borrow Material Required for Reclamation

Area	Type of Disturbance	Borrow Material Required (cu yd)
Area 1	4 Portals <sup>1</sup>	920
Area 2	3 Portals	690
Area 3	None	0
Area 4	2 Portals <sup>1</sup>	460
Area 5	6 Portals, Refuse	25,451
Area 6	None	0
Area 7	Refuse, Slurry, etc., 3 Portals	419,592
Area 8	9 Portals	2,070
Area 9	1 Portal	230
Area 10	1 Portal	230
Total		<u>449,643</u>

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- 1 Portals will be sealed and covered with four feet of borrow material.
- 2 Coarse refuse material will be covered with four feet of borrow material; fine coal slurry material will be covered with one foot of borrow material.

TABLE III-45

## COSTS (\$)

Area Number	Area Description	Vegetation Type	Acres	Structure Removal (a)	Mine Sealing (b)	Ripping, Pushing, Regrading, and Borrow Soils	Soil Testing, Fertilizer, and Seed Bed Preparation	Revegetation (f)	Total	Total /Acre
1	Main complex, including offices, shop, warehouse, parking lot, preparation plant, No. 3 Mine fan, unit train, industrial water tanks, mine portals, and substations.	Sagebrush grass	54.27	502,197	4 portals 1 shaft 1 drill hole \$9,458	\$360,016	\$10,709	\$24,525	\$906,905	\$16,711
2	No. 2 Mine fan, substations, portals, and road.	Sagebrush grass	2.95	8,439	3 portals \$5,802	\$8,088	\$582	\$1,333	\$24,244	\$8,218
3	No. 1 Mine Whitmore Canyon shafts and road.	Sagebrush grass	3.43	8,250	2 shafts 2,394	\$4,189	\$677	\$1,550	\$17,060	\$4,974
4	Storage yard, No. 2 Canyon fan and portal.	Sagebrush grass	7.82	876	2 portals 1 shaft \$5,065	\$93,525	\$1,543	\$3,534	\$104,543	\$13,369
5	No. 2 Mine Water Canyon portals and road.	Sagebrush grass	10.71	-	6 portals 1 drill hole \$12,560	\$108,948	\$2,113	\$4,840	\$128,461	\$11,994
6	Test plot, camp, manshaft pond road, methane vent, sediment pond, and mine water discharge pond.	Sagebrush grass	5.72	-	1 drill hole \$667	\$5,445	\$1,129	\$2,585	\$9,826	\$1,718
7	Refuse disposal areas, including coarse refuse, industrial waste borrow areas, slurry ponds, Sunnyside Mine area, and Columbia bleeders	Pinyon-juniper & grass	175.42	13,280	3 portals \$5,802	\$727,535	\$34,616	\$109,973	\$891,206	\$5,080
8	No. 1 Mine outcrop fan, substations, portals, roads, and Outside Raise	Pinyon-juniper	8.35	8,317	9 portals \$17,406	\$15,837	\$1,648	\$4,691	\$47,899	\$5,736
9	Upper changehouse, twin shaft fan, manshaft, hoisthouse, Pole Canyon shaft, and B Canyon portal	Mountain brush	13.88	27,100	1 portal & shafts \$6,722	\$73,996	\$2,739	\$13,184	\$123,741	\$8,915
10	Slaughter Canyon storage area, portal, and road.	Pinyon-juniper	4.81	63	1 portal \$1,934 30,694.51	\$4,578	\$549	\$2,702	\$10,226	\$2,688
<b>Total Costs</b>			<b>287.36</b>	<b>568,522</b>	<b>82,286</b>	<b>\$1,403,157</b>	<b>\$56,705</b>	<b>\$168,917</b>	<b>2,278,587</b>	<b>\$7,879</b>

Chapter III

Table III-48

1985 Means Site Work Cost Data

Dozing

(1)	300' haul, 300 H.P.	2.3-163-5420	\$1.37/cy
(2)	150' haul, 300 H.P.	2.3-163-5220	\$0.76/cy
(3)	50' haul, 300 H.P.	2.3-163-5020	\$0.35

Rip and Doze

(4)	300 H.P.	2.3-370-0300	\$0.24
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Front End Loader

(5)	5 cy, rubber tired	2.3-160-1650	\$0.84
-----	--------------------	--------------	--------

Truck, 20 cy

(6)	2 mi haul, round trip	2.3-300-1200	\$1.93/cy
(7)	3 mi haul, round trip	2.3-300-1220	\$2.29/cy
(8)	4 mi haul, round trip	2.3-300-1240	\$2.58/cy
(9)	5 mi haul, round trip	2.3-300-1245	\$3.60/cy
(10)	10 mi haul, round trip	2.3-300-1250	\$4.55/cy

Scraper, Self-propelled, 21 cy

(11)	3,000' haul	2.3-164-2350	\$1.01/cy
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Solid Block Wall - Demolition

1984 Means Site Work Cost Data	4.3-270-0550	\$4.97/cy
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Labor

1985 Means Open Shop Construction

Laborer	Crew A-1	\$10.10/hr
Equipment Operator	Crew B-10	\$13.85/hr

Skilled Worker, Means Building Construction Cost Data

Skilled Worker	\$29.25/hr
----------------	------------

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Chapter III

Table III-47 Disturbed Acreages within the Sunnyside Permit Area

<u>Area</u>	<u>Total Acreage</u>	<u>Exclusion</u>	<u>Reclamable Ac.</u>	<u>Cost</u>
Area 1	64.39	10.12	54.27	\$360,016
Area 2	2.95	2.95	0.00	8,088
Area 3	3.43	0.00	3.43	4,189
Area 4	14.07	6.25	7.82	93,525
Area 5	10.71	0.00	10.71	108,948
Area 6	8.07	2.35	5.72	5,445
Area 7	177.56	2.14	175.42	727,535
Area 8	8.35	0.00	8.35	15,837
Area 9	15.66	1.78	13.88	73,996
Area 10	<u>4.81</u>	<u>0.00</u>	<u>4.81</u>	<u>4,578</u>
Total	310.00	22.64	287.36	1,402,157

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(1) Exclusions consist of the D & RGW railroad tracks and right-of-ways, and post-mined land use roads.  
Chapter III

KAISER SELF BONDING AND INDEMNITY AGREEMENT

THIS SELF BONDING AND INDEMNITY AGREEMENT entered into by and between KAISER STEEL CORPORATION and KAISER COAL CORPORATION, both Delaware corporations (herein jointly referred to as "Kaiser"); the STATE OF UTAH, Department of Natural Resources, Division of Oil, Gas & Mining (herein "Division"); and the U.S. DEPARTMENT OF THE INTERIOR, OFFICE OF SURFACE MINING (herein "OSM").

W I T N E S S E T H

WHEREAS, the Division and OSM have approved Kaiser's application and reclamation plan for the Permanent Program Permit No. ACT/007/007 (herein Permit No. ACT/007/007 ) for the Sunnyside Mine in Carbon County, Utah under the Utah Coal Mining and Reclamation Act, Utah Code Ann. § 40-10-1, et seq., 1953, as amended ("ACT") and implementing regulations; concerning the permit area specifically described in Exhibit A; and

WHEREAS, Kaiser Steel Corporation assigned Permit No. ACT/007/007 to Kaiser Coal Corporation by agreement dated March 28, 1985; and

WHEREAS, Kaiser wishes to obtain a bond to operate underground coal mine Permit No. ACT/007/007 under Self Bonding Rule UMC 800.23; and

WHEREAS, Kaiser has entered into a separate SELF BONDING AND INDEMNITY AGREEMENT FOR THE GENEVA MINE, dated November 4, 1985, recorded in Carbon County, Utah on November 12, 1985 at Book 254, Page 633-40 and in Emery County, Utah on November 12, 1985 at Book 157, Page 369-76; and

WHEREAS, Kaiser, in compliance with UMC 800.23B.1. has designated Denise A. Dragoo, Esq., with the law firm of FABIAN & CLENDENIN, a Professional Corporation, 215 South State Street, Twelfth Floor, Salt Lake City, Utah 84111, as its agent for Service of Process in the State of Utah; and

WHEREAS, Kaiser Steel Corporation, in compliance with UMC 800.23B.2. has been in continuous operation as a business entity for the last five years; and

WHEREAS, Kaiser Coal Corporation meets the financial criteria for self bonding as set forth at UMC 800.23B.3.; and

WHEREAS, Kaiser Coal Corporation has submitted to the Division financial statements which meet the criteria set forth at UMC 800.23B.4. accompanied by a financial report by Touche Ross & Company.

NOW, THEREFORE, in consideration of the premises and other good and valuable consideration, the sufficiency and receipt of which is hereby acknowledged, Kaiser does hereby agree to be held and bonds to the Division and OSM for the sum of \$3,397,349.00 (1990 dollars) (such sum payable to one, but not both, of the above-named agencies) for the timely performance of reclamation responsibilities for underground mine Permit No. ACT/007/007 in lawful money of the United States. By the submission of this Self Bonding and Indemnity Agreement, Kaiser will and truly binds itself, its successors and assigns, jointly and severally, firmly by these presents.

The conditions of the above obligations are such that:

1. Kaiser shall perform all duties and fulfill all requirements applicable to reclamation as set forth in the Act, the regulations adopted pursuant to the Act and the conditions of Permit No. ACT/007/007 issued by the Division.

2. The liability under this Agreement is conditioned upon successful reclamation of the disturbed permit area set forth on Exhibit B as provided in the reclamation plan for Permit No. ACT/007/007 for a period of time and in the manner specified in the Act, regulations adopted pursuant thereto, and the conditions set forth in Permit No. ACT/007/007 issued by the Division. At no time shall the liability or responsibility of Kaiser hereunder exceed the sum of \$3,397,349.00 (1990 dollars). Provided, however, that the Division may adjust the amount of liability hereunder as provided in section 6 hereof.

3. Kaiser does hereby agree to indemnify and hold the Division harmless from any claim, demand, liability, cost, charge or suit brought by a third party, as a result of Kaiser's failure to abide by the terms and conditions of the Reclamation Plan as set forth in Permit No. ACT/007/007 and from any failure to comply with the terms of the Self Bond Agreement.

4. The Division shall give Kaiser notice of any claim and any legal proceedings within the scope of the indemnity set forth at section 3.

5. Upon successful completion of part or all of the obligations secured hereby, Kaiser may petition the Division for a final release of part or all of the obligations under this Agreement. Upon such petition, the Division shall timely conduct an inspection to ascertain whether the duties and obligations of Kaiser under the Act, regulations adopted pursuant thereto and Permit No. ACT/007/007 have been fulfilled. If such duties and obligations have been fulfilled, the Division shall release Kaiser from part or all of its obligations under this Agreement and shall file a notice of such release in the property records of Carbon County, Utah.

6. This Agreement shall be reviewed periodically by the Division, or reviewed upon petition by Kaiser, in accordance with the Act and implementing regulations and the amount of liability under this Agreement may be adjusted upon order by the Board of Oil, Gas & Mining or upon written agreement between Kaiser and the Division where it is clearly established that the cost of future reclamation has materially changed.

7. In the event that this Agreement is terminated as provided in paragraph 8 and Kaiser fails to provide a bond acceptable to the Division within ninety days of termination, Kaiser will cease operations and immediately commence reclamation in accordance with the Reclamation Plan.

8. This Agreement may be terminated upon 90 days prior written notice to the Division if terminated by Kaiser or upon 90 days prior written notice to Kaiser if terminated by the Division. Upon such written notification, Kaiser will have ninety days as

provided by UMC 800.23G to obtain an alternate form of bond to secure reclamation obligations for Permit No. ACT/007/007 in the same amount as the self bond.

SO AGREED this 26<sup>th</sup> day of Nov., 1985.

KAISER STEEL CORPORATION

11-26-85  
Date

By Marty W. Real  
Chairman + President

11-26-85  
Date

By Charles S. McNeil  
Vice Chairman

KAISER COAL CORPORATION

11-26-85  
Date

By Charles S. McNeil  
President

11-26-85  
Date

By [Signature]  
VICE PRESIDENTS, FINANCE

STATE OF UTAH, DEPARTMENT OF  
NATURAL RESOURCES, DIVISION OF  
OIL, GAS & MINING

1-6-86  
Date

By Dianne R. Nielson  
Director

APPROVED AS TO FORM:

12-19-85  
Date

By Barbara W. Roberts  
Assistant Attorney General

STATE OF Utah )  
COUNTY OF Salt Lake ) SS:

On the 26<sup>th</sup> day of November 1985, personally appeared before me Monty H. Kial and Charles S. McNeil who being by me duly sworn did say that he, the said Monty H. Kial is the Chairman & President of Kaiser Steel Corporation and said Charles S. McNeil is the Vice Chairman of Kaiser Steel Corporation and said instrument was signed in behalf of said corporation by authority of its bylaws or a resolution of its board of directors and said Monty H. Kial and Charles S. McNeil duly acknowledged to me that said corporation executed the same.

Julie S. Klein  
Notary Public  
Residing at: Davis County

My Commission Expires:

6-22-89

STATE OF Utah )  
COUNTY OF Salt Lake ) SS:

On the 26<sup>th</sup> day of November 1985, personally appeared before me Charles S. McNeil and Wes Emerson who being by me duly sworn did say that he, the said Charles S. McNeil is the President of Kaiser Coal Corporation and said Wes Emerson is the Vice President - Finance of Kaiser Coal Corporation and said instrument was signed in behalf of said corporation by authority of its bylaws or a resolution of its board of directors and said Charles S. McNeil and Wes Emerson duly acknowledged to me that said corporation executed the same.

Julie S. Klein  
Notary Public  
Residing at: Davis County

My Commission Expires:

6-22-89

STATE OF Utah )  
 ) ss:  
COUNTY OF Salt Lake )

On the 6<sup>th</sup> day of January, 1986<sup>MA</sup>, personally appeared before me Dr. Dianne R. Nelson, who being by me duly sworn did say for herself, that she, the said Dr. Dianne R. Nelson is the Director of the Division of Oil, Gas & Mining, Department of Natural Resources, State of Utah, and she duly acknowledged to me that said Division executed the foregoing document by authority of law on behalf of the State of Utah.

Marjorie L. Anderson  
Notary Public  
Residing at: Salt Lake City, Utah

My Commission Expires:

July 24, 1989

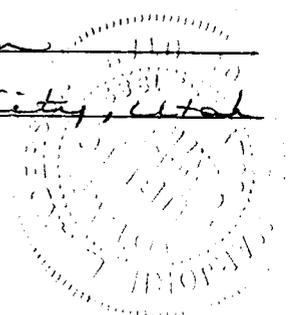


EXHIBIT A

LEASE DESCRIPTION

Kaiser Coal Corporation  
Sunnyside Mines  
ACT/007/007, Carbon County, Utah

January 6, 1985

Fee Land

(1) Deed dated February 28, 1951 through which Book Cliffs Corporation, a Nevada corporation, conveyed and warranted to Kaiser Steel Corporation, a Nevada corporation, title to tracts of land in Carbon County, Utah. It was recorded by the County Recorder of Carbon County, Utah, in Book 15D, pages 80 to 93 inclusive. Fee land included in the deed and within the permit area is described as follows:

Township 14 South, Range 14 East, SLB&M, Utah

Sec. 6: N1/2, S1/2 SW1/4, S1/2 SE1/4, NW1/4 SE1/4  
Sec. 7: NW1/4, SW1/4 NE1/4, E1/2 SW1/4, S1/2 SE1/4, NW1/4 SE1/4  
Sec. 17: NE1/4, SE1/4 NW1/4, SW1/4, S1/2 SE1/4  
Sec. 18: E1/2, S1/2 SW1/4, NE1/4 SW1/4, NW1/4 SW1/4, SW1/4 NW1/4  
less the following described area:

Beginning at the NW corner of SW1/4 NW1/4 of Section 18, Township 14 South, Range 14 East:

thence S 45° 05' E, 1,577.42 ft;  
thence S 39° 25' W, 1,759.22 ft;  
thence N 2,472.87 ft to point of beginning.

Sec. 19 and 20: All  
Sec. 21: W1/2  
Sec. 28 and 29: All  
Sec. 30: NE1/4, NE1/4 NW1/4, NW1/4 SE1/4  
Sec. 31: S1/2 NE1/4, NE1/4 NE1/4  
Sec. 32 and 33: All  
Sec. 34: W1/2

Township 15 South, Range 14, East, SLB&M, Utah

Sec. 3: W1/2  
Sec. 4: All  
Sec. 5: All  
Sec. 6: S1/2 SE1/4, SE1/4 SW1/4, portions of N1/2 SE1/4 and NE1/4 SW1/4, South of the D&RGW Railroad right-of-way.  
Sec. 7: N1/2 NE1/4, N3/4 NW1/4  
Sec. 8: NE1/4 NE1/4, N1/2 NW1/4, NW1/4 NE1/4  
Sec. 9: All  
Sec. 10: W1/2, SE1/4  
Sec. 15: W1/2, N1/2 NE1/4  
Sec. 16: E1/2, NW1/4, E1/2 SW1/4  
Sec. 17: E1/2 NE1/4

Federal Leases

Federal Coal Leases numbers Salt Lake 062966-063383-Utah 010140, Utah 32083 and SL-068754. Areas within both the leases and the permit area are described as follows:

Township 14 South, Range 13 East, SLB&M, Utah

Sec. 1: SE1/4, E1/4 SW1/4

Sec. 12: NW1/4, NE1/4, SE1/4, NE1/4 SW1/4 less the following described area:

Beginning at a point which bears S 1,320 ft from the NW corner of Section 12:

thence S, 1,320 ft;  
thence S 89° 55' 30" E, 1,327.01 ft;  
thence S, 1,320 ft;  
thence S 89° 53' 15" E, 1,327.22 ft;  
thence S, 1,320 ft;  
thence S 89° 51' E, 1,327.43 ft;  
thence N 45° 05' 07" W, 5,623.40 ft to the place of beginning.

Sec. 13: Portions of: NE1/4 NE1/4, E1/2 SE1/4, SW1/4 SE1/4, SE1/4 SW1/4, NE1/4 SW1/4, NW1/4 SW1/4, SW1/4 NW1/4 which are described as follows:

Beginning at a point which bears 2,850 ft S 89° 51' E from the SW corner of Section 13:

thence N 42° 30' W, 4,215 ft;  
thence N 610 ft;  
thence S 42° 30' E, 3,730 ft;  
thence N 47° 30' E, 100 ft;  
thence S 42° 30' E, 1,450 ft;  
thence N 89° 50' W, 710 ft to the point of beginning.

Beginning at the SE corner of Section 13:

thence N 1,487.13 ft;  
thence S 39° 25' W, 1,920.39 ft;  
thence S 89° 50' E, 1,219.36 ft to the point of beginning.

Less the following described area:

Beginning at a point which bears S 1,320 ft from the NE corner of Section 13:

thence N 89° 51' W, 1,327.76 ft;  
thence N 1,320 ft;  
thence S 45° 05' 33" E, 1,874 ft to the point of beginning.

Sec. 24: S1/2 SE1/4, Portions of: N1/2 NE1/4, SE1/4 NE1/4, N1/2 SE1/4 and NE1/4 SW1/4 which are described as follows:

Beginning at the NE corner of Section 24:

thence S 0° 07' W, 1,814.87 ft;  
thence S 57° 11' W, 430 ft;  
thence N 38° 23' W, 1,165 ft;  
thence N 42° 26' W, 860.51 ft;  
thence N 39° 5' E, 709.31 ft;  
thence S 89° 50' E, 1,219.36 ft;  
thence S 45.54 ft to the place of beginning.

Beginning at a point which bears N 0° 02' E, 1,294.59 ft from the SE corner of said Section 24:

thence N 0° 02' E, 1,294.59 ft;  
thence N 0° 07' E, 830.41 ft;  
thence S 57° 11' W, 3,905.58 ft;  
thence S 89° E, 3,280.00 ft to the place of beginning and containing 80 acres more or less.

Beginning at a point which bears N 89° 50' W 1,720 ft from the NE corner of Section 24:

thence N 89° 50' W, 750 ft;  
thence S 42° 30' E, 2,900 ft;  
thence N 57° 11' E, 100 ft;  
thence N 38° 23' W, 1,165 ft;  
thence N 42° 26' W, 860.51 ft;  
thence N 39° 25' E, 350 ft;  
thence N 42° 30' W, 400 ft to the point of beginning.

Sec. 14: Portions of: NE1/4 which is described as follows:

Beginning at a point which bears 1,915 ft N 89° 41' W from the NE corner of Section 14:

thence S 42° 30' E, 2,090 ft;  
thence S 600 ft;  
thence N 42° 30' W, 1,400 ft;  
thence S 48° 00' W, 1,525 ft;  
thence S 175 ft;  
thence N 89° 41' W, 315 ft;  
thence N 300 ft;  
thence N 48° 00' E, 1,775 ft;  
thence N 42° 30' W, 1,125 ft;  
thence S 89° 41' E, 500 ft to the point of beginning.

Sec. 11: Portions SW1/4 SE1/4 which is described as follows:

Beginning at a point which bears 1,915 ft N 89° 41' W from the SE corner of Section 11:

thence N 40° 30' W, 1,150 ft;  
thence S 48° 00' W, 380 ft;  
thence S 42° 30' E, 780 ft;  
thence S 89° 41' E, 520 ft to the point of beginning.

Sec. 25: NE1/4 NE1/4

Township 14 South, Range 14 East, SLB&M, Utah

- Sec. 6: N1/2 SW1/4
- Sec. 7: W1/2 SW1/4
- Sec. 8: SW1/4, SW1/4 SE1/4
- Sec. 17: W1/2 NW1/4, NE1/4 NW1/4, N1/2 SE1/4
- Sec. 18: E1/2 NW1/4, NW1/4 NW1/4
- Sec. 30: NW1/4 NW1/4, SE1/4 NW1/4, NE1/4 SW1/4, S1/2 SE1/4, NE1/4 SE1/4
- Sec. 31: NW1/4 NE1/4

Carbon County Lease

Coal lease, dated August 18, 1975, granted by Carbon County of the state of Utah, the lessor, to Kaiser Steel Corporation, the lessee. The lease embraces the following described lands in Carbon County, Utah, all of which are within the permit area:

Salt Lake Meridian, Utah

Township 14 South, Range 14 East

- Sec. 21: SE1/4
- Sec. 27: SW1/4, SW1/4 NW1/4
- Sec. 34: E1/2

Township 15 South, Range 14 East

- Sec. 3: E1/2
- Sec. 10: NE1/4

C247R

EXHIBIT B

See attached maps of disturbed permit area on file with the Utah Division of Oil, Gas & Mining.