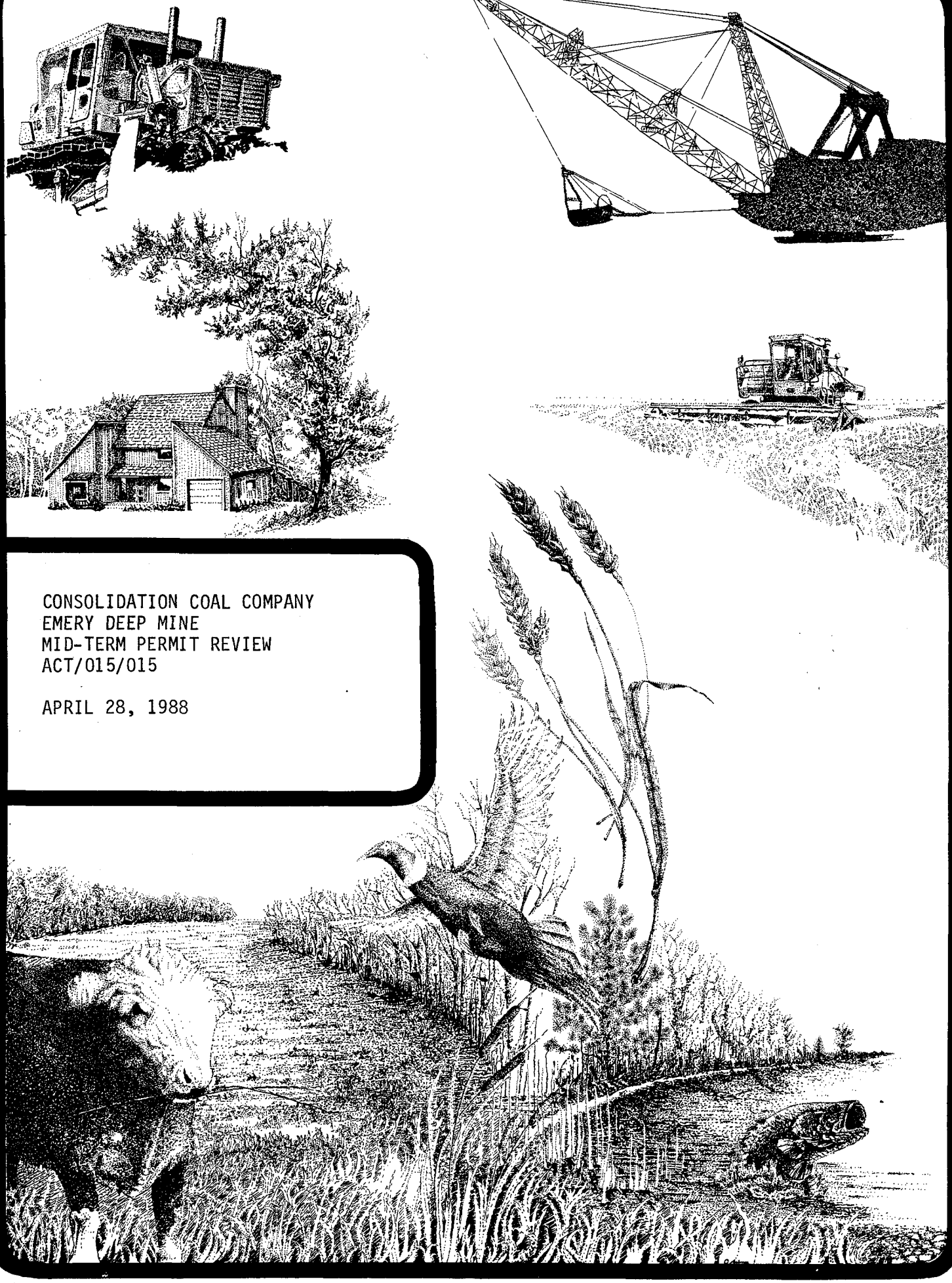
CONSOLIDATION COAL CO.

EMERY DEEP MINE
ACT/015/015

MID-TERM PERMIT REVIEW
APRIL 28, 1988



CONSOLIDATION COAL COMPANY
EMERY DEEP MINE
MID-TERM PERMIT REVIEW
ACT/015/015

APRIL 28, 1988

Consolidation Coal Company
Mid-Continent Region
12755 Olive Boulevard
St. Louis, Missouri 63141
(314) 275-2300

April 28, 1988

Mr. Lowell Braxton, Administrator
State of Utah, Natural Resources
Department of Oil, Gas and Mining
355 W. North Temple
3 Triad Center, Suite 350
Salt Lake City, Utah 84180-1203

Re: Mid-Term Permit Review, Emery Deep Mine, ACT/015/015

Dear Mr. Braxton:

Please find enclosed eight copies of the responses to Susan Linner's letter to Chris Jones, dated February 16, 1988. Included with this submittal are the following items:

1. Consol's written responses to the questions identified in Susan Linner's letter.

2. Revised Plates 3-2, 3-3, 13-3, 13-4, and 13-5.

3. Replacement Plates 7-8 and 8-2.

4. New Plates 13-26 and 15-9A.

5. Revised timetable for the Revegetation Demonstration Monitoring Plan.

If you have any questions, please contact me at your convenience at (314) 275-2322.

Sincerely,

Thomas H. Plate
Senior Engineer

/vms

Attachments (8 copies)

cc: w/attachments
R. Thompson
Emery File

Letter Only
T. Boutaugh
J. Hinz
V. Ordija
B. Paddock
D. Rowe
J. Shotton

Consolidation Coal Company
Emery Mine
Permit Mid-Term Review
ACT/015/015
April 28,1988

The Division has reviewed the permit, with conditions, and the current Mining and Reclamation Plan (MRP) on file, and determined that the MPTR will include the following: a requirement to submit a reorganized MRP; submittal of revised text and/or maps to bring the MRP into conformance with site conditions or current Division policy; and an on-site technical inspection to determine if there are technical problems on site which need to be remedied during the MPTR process.

1. The Division requires a written commitment from Consol that a complete reorganized Mining and Reclamation Plan (MRP) be submitted by September 9, 1990, and a schedule to achieve a reorganized MRP. The commitment and schedule should be submitted by April 29,1988.

   Consolidation Coal Company will submit a complete reorganized Mining and Reclamation Plan to the Division of Oil, Gas, and Mining by September 9, 1990.

2. Consol should notify the Division whether previously proposed disturbance, such as the preparation plant, will be included in the new MRP. If not, the Division will require reclamation of all unneeded disturbed areas in the next appropriate season.

   At this time, Consolidation Coal Company intends to include the previously proposed disturbances such as the prep plant and bathhouse in the reorganized MRP. These projects have not been constructed according to the original schedules due to market conditions.

3. All new areas of disturbance should be shown on Plate 3-3, Chapter 3, of the operator's MRP. This would include the northwest coal storage area, sediment ponds, and any areas disturbed for topsoil salvaging on proposed sites.

   Refer to revised Plates 3-2 and 3-3 enclosed with this submittal. Plate 3-2 shows changes to building and trailer locations in the mine yard area. Plate 3-3 shows the additional areas of disturbance.

4. The operator needs to designate all temporary and permanent waste storage areas on the mine site. The operator should come to a decision regarding a permanent disposal site for the underground waste material currently being stored at the northwest coal storage area, and address the issue with text and maps as appropriate.

Consolidation Coal Company is presently using an area in the northwest coal stockpile area for the temporary storage of underground development waste. Consol intends to construct a permanent storage area for this waste material in a borrow area east of the coal stockpile area (refer to Plate 13-26 enclosed). Consol will provide the Division the necessary information to approve this proposed permanent storage area as required in UMC 784.19. This information is not available at this time in this submittal.

5. New design plans need to be made of the operator's sedimentation control plan (Plates 13-3 and 13-4 of the MRP). The plans do not show current sediment control structures and drainage patterns as they exist on the site.
Included in this material should be the large settling basin, located between ponds #2 and #3. The basin collects water from the haul road and a portion of the mine yard.

Refer to revised Plates 13-3,13-4, and 13-5 enclosed with this submittal.

6. Reconstruction of pond #5 (preparation plant pond) was performed in the fall of 1987. Updated, certified, as-builts need to be provided for the pond.

Refer to Appendix A of this submittal for design calculations for the reconstructed inlets for pond 5. The certified drawing showing the new inlet structures is enclosed as Plate 15-9A.

7. The operator's surface and groundwater monitoring plan needs to be updated and consolidated into Chapter 7 of the MRP. At this time, the operator should consider reevaluating the current water monitoring program, in concert with the Division's Water Monitoring Guidelines, with the idea in mind of dropping unnecessary sample locations and parameters.

Refer to Appendix B of this submittal for the updated surface and groundwater monitoring plan.

8. The Division does not have Plate 8 (Volume 5) or Plate 8-2 (Volume 6). Please submit new copies.

Replacement Plates 7-8 and 8-2 are enclosed with this submittal.

Other information included with the Mid-Term Review Submittal.

1. Appendix C is a replacement page for the Revegetation Demonstration plans revising the vegetation monitoring schedule.

2. Plate 15-12 of the PAP (not included with this submittal) shows the design of the diversion ditch for the waste disposal site west of Quitchupah Creek. The design of this ditch shows a stilling basin and outlet channel downstream of the buried culvert. Both the stilling basin and channel are located in the floodplain of Quitchupah Creek and have been buried by flood sediments deposited during flooding events on Quitchupah Creek. When flow is present in the diversion ditch these sediments are then washed back into Quitchupah Creek.

AS-BUILT CERTIFICATION FOR POND #5 MODIFICATIONS

During the fall of 1987, repairs were initiated on sediment pond #5 (preparation plant pond) to correct instability around the existing rock gabion inlet. The construction consisted of replacing the rock gabion structure with 24" ADS polyethylene corrugated pipe. The drainage area to sediment pond #5 was unchanged and remains unaffected. For culvert sizing, the watershed was divided into two (2) areas (attached topographic map) and the pipes were sized using a 10 year-24 hour design storm. The following design calculations are presented.

	Area 1	Area 2
Drainage Area (A)	0.094 sq. mi.	0.045 sq. mi.
Precipitation	1.7 inches	1.7 inches
Curve Number	80	80
Length of Watercourse (L)	0.57 miles	0.62 miles
Elevation Difference (H)	136 feet	137 feet
Time of Concentration[1] $t_c = \frac{[11.9\ L^3]}{H}^{0.385}$	0.21 hours	0.23 hours
Direct Runoff[2] (Q)	0.4 inches	0.4 inches
Peak Discharge/Runoff[3] (qp')	790 csm/inch	760 csm/inch
Peak Flow[4] qp = (qp')AQ	29.7 cfs	13.7 cfs

ADS polyethylene corrugated pipes were installed at the location of the rock gabion inlet to pond #5. To determine the required pipe sizes, flow calculations were developed to safely pass the peak runoff discharge. A nomograph from the SCS Engineering Field Manual[5] for inlet control concrete culverts and a mitered headwall was used for flow determination. Manning's n for corregated plastic pipe and concrete pipe are very similar thus the selection of the concrete nomograph. At a headwater depth of 2 feet, a 24 inch pipe will carry 14 cfs and at 3 feet will discharge 23 cfs. The following is the culvert selection.

	qp	Culvert	Discharge @ 2' Depth
AREA 1	29.7 cfs	2-24"	46 cfs
AREA 2	13.7 cfs	1-24"	14 cfs

Each location has a minimum of two feet (2') of cover over the pipes and can pass the peak runoff from the design storm.

REFERENCES:

1. United States Department of the Interior, Bureau of Reclamation, Design of Small Dams (Washington D.C.: United States Government Printing Office, 1977), p. 67.

2. B. J. Barfield, R. C. Warner, and C. T. Haan, Applied Hydrology and Sedimentology for Disturbed Areas (Stillwater, Oklahoma: Oklahoma Technical Press, 1985), p. 85.

3. Barfield, p. 115.

4. Barfield, p. 114.

5. United States Department of Agriculture, Soil Conservation Service, Engineering Field Manual for Conservation Practices, (Washington, D.C.: 1979), p. 3-91.

Groundwater and Surface Water Monitoring Plans

Emery Mine

Consolidation Coal Company

Emery, Utah

April 19, 1988

Groundwater and surface water monitoring at the Emery Mine have been conducted according to plans contained in the original Permit Application Package (PAP) and as subsequently modified by responses to the Apparent Completeness Review (ACR), Consol correspondence (April 16, 1984 L. Meschede to D. Darby), and by monitoring modifications approved by the regulatory authority on January 23, 1985. In addition to these programs, Consol maintains and monitors four (4) wells developed in alluvial deposits at an area originally intended to be surface mined. Surface mining of this area is no longer a viable mining alternative and these coal reserves are now included in the deep mine reserves, to be mined when underground mining advances into this area. Accordingly these wells are proposed to be included in the deep mine groundwater monitoring plan. All monitoring plans are herein summarized with respect to sample location, parameters and frequency and modified in light of suggestions provided by the Utah Division of Oil, Gas and Mining's Guidelines for Establishment of Surface and Groundwater Monitoring Programs for Coal Mining and Reclamation Operations.

Groundwater Monitoring Plan

The current groundwater monitoring plan is addressed in the following documents:

1) PAP Chapter 7.1.6 (Deep Mine)

2) PAP Chapter 15.4.4 (Prep Plant - Refuse Disposal Area)

3) ACR Response - Feb. 2, 1984 Stipulation UMC 817.52-(1)-Biowest

4) Utah DOGM Correspondence - Jan. 23, 1985 D. Wayne Hedberg to L. Meschede

These plans require that for:

Deep Mine Wells - Quarterly static water level measurements be made for 35 wells with 9 wells tested bi-annually for water quality.

Refuse Disposal Wells - Quarterly static water level measurements be made for 6 wells with all wells tested quarterly for pH, TDS, Na, SO_4 and dissolved Fe and Mn and annually for a complete chemical analysis.

Springs - Quarterly flow readings be taken for 5 springs with the Christiansen spring tested bi-annually for water quality.

Plan Revision

Monitoring data and information submitted in the PAP and subsequent monitoring reports was recognized by DOGM correspondence (January 23, 1985) to satisfy the data requirements needed to define baseline conditions. In light of this, the groundwater monitoring plan proposes to provide operational data for all samples collected, by analyzing them according to the parameters listed on Table 1. All samples will be collected and preserved according to standard procedures listed in the PAP at Chapter 7.1.6.2.

Deep Mine Wells

Consol proposes to continue measuring static water levels quarterly at the 35 wells presently established plus the addition of four (4) Christiansen Creek alluvium wells which were developed for the surface mine permit application. In summary, Consol proposes to revise the monitoring plan to measure static water levels at the 39 wells shown below which are grouped according to completion unit.

TABLE 1
Groundwater Monitoring
Operational Water Qaulity Parameter List

Field Measurements:

- Water Levels or Flow
- pH
- Specific Conductivity (umhos/cm)
- Temperature (C°)

Laboratory Measurements: (mg/l) Major, minor ions and trace elements are to be analyzed in dissolved form only.

- Total Dissolved Solids
- Total Hardness (as $CaCO_3$)
- Carbonate (CO_3-2)
- Bicarbonate (HCO_3-)
- Calcium (Ca)
- Chloride (C1-)
- Iron (Fe)
- Magnesium (Mg)
- Manganese (Mn)
- Potassium (K)
- Sodium (Na)
- Sulfate (SO_4-2)

Emery Mine - Monitoring Wells
Static Water Level - Well Sites
Measurement Frequency - Quarterly

Kmbg
Bluegate Shale

AA-B	USGS3-1
H-B	USGS4-1
I-B	T1-B
R2-B	T2-B

Kmf(u)
Upper Ferron Sandstone

AA-U	R2-U
Bryant	USGS1-2
H-U	TP-U
I2-U	T1-U
Muddy #1	T2-U
Muddy #2	Lewis

Kmf (m)
Middle Ferron Sandstone

AA-M	I-M
H-M	R2-M

Kmf(l)
Lower Ferron Sandstone

AA-L	R1
H-L	ZZ
I-L	WW#1
Kemmerer	

Multiple Completion

Emria #1	Emria #3
Emria #2	FC346WW

CaL
Christiansen Alluvium

SM1-1	SM1-3
SM1-2	SM1-4

Water quality samples are collected and analyzed bi-annually during the May-June and September-October periods from 9 wells. Consol will continue this program for all wells with the exception of Emria #2, which it proposes to drop and the four (4) SM1 Christiansen alluvium wells which it proposes to add to the deep mine monitoring program. The water quality from Emria #2 represents a composite of various zones and therefore is unuseful for the purpose of monitoring the chemical effects of mining on groundwater. The SM1 Wells monitor a minor, shallow aquifer contained within the Quaternary alluvium of Christiansen Creek. This water is believed to be derived largely from seepage of applied irrigation water and analytical results show it to be of poor quality. These wells are being included in order to monitor any effects that the deep mine would have on these alluvial deposits and to better define their physical and hydrologic characteristics.

In summary, Consol proposes to revise the monitoring plan to sample twelve (12) wells for water quality as follows:

Emery Mine Monitoring Wells
Water Quality - Well Sites
Measurement Frequency - Bi-Annually During
May/June and September/October

Kmbg Bluegate Shale		Kmf(u) Upper Ferron Sandstone	
T1-B		Bryant	TP-U
		I2-U	USGS1-2
		Lewis	

Kmf(1) Lower Ferron Sandstone		Cal Christiansen Alluvium	
Kemmerer	ZZ	SM1-1	SM1-3
		SM1-2	SM1-4

Refuse Disposal Wells

The refuse disposal wells were approved to evaluate the effectiveness of liners at the proposed preparation plant slurry cells in minimizing seepage and to define and evaluate the nature of any laterally spreading seepage. Since sufficient baseline data has been collected and the slurry cells have not been constructed, Consol proposes to modify the monitoring wells according to the following:

Emery Mine - Refuse Disposal Area Wells
Well Identification

Qal Quitchupah Alluvium	
RDA1	RDA4
RDA2	RDA5
RDA3	RDS6

A) Monitoring Plan Prior to Slurry Cell Construction:

Static water level measurements - Quarterly;
Water samples - annually during May/June according to Table 1 parameters.

B) Monitoring Plan After Slurry Cell Construction:

Static water level measurements - Quarterly;
Water quality samples - quarterly for pH, TDS, Na, SO_4 and dissolved Fe and Mn. A chemical analysis according to Table 1 parameters will be taken annually during May/June.

Springs

Presently Consol monitors five springs which are identified and located as follows:

Spring	Location
Christiansen	NE¼, NE¼, NW¼, NW¼ Sec. 26, T22S, R6E
Emery Co. #1	NW¼, NE¼, NW¼, NW¼ Sec. 29, T22S, R6E
" #2	NE¼, SE¼, NE¼, NW¼ Sec. 29, T22S, R6E
Bryant #1	SE¼, SW¼, NW¼, NE¼ Sec. 29, T22S, R6E
" #2	NW¼, SE¼, NE¼, NW¼ Sec. 29, T22S, R6E

All springs will be measured quarterly for flow while the Christiansen Spring will be measured bi-annually during the May/June and September/October periods for the parameters listed in Table 1.

Surface Water Monitoring Plan

The current surface water monitoring plan is addressed in the following documents:

1. PAP Chapter 7.2.6.

2. Consol correspondence - April 16, 1984 - L. Meschede to D. Darby.

3. Utah DOGM correspondence - January 23, 1985 - D. Wayne Hedberg to L. Meschede.

Various surface water monitoring programs and amendments have been submitted to the Utah DOGM since 1979. These plans were summarized in Consol's submittal dated April 16, 1984. The following is a restatement of that monitoring plan updated with changes made since then.

The surface water monitoring plan is designed to monitor surface waters in, and point source discharges to, Quitchupah Creek and Christiansen Wash in the vicinity of the Emery Mine. In addition, water of Ivie Creek is monitored to acquire baseline data to establish premining conditions should mining extend further south.

Monitoring Sites

In October 1979, eight surface water monitoring sites were established.

These sites are as follows:

Site 1 - Quitchupah Creek above the confluence with the unnamed tributary into which mine water is discharged from sedimentation pond #1.

Site 2 - Christiansen Wash upstream of the proposed surface mine area.

Site 3 - Quitchupah Creek below the confluence with Christiansen Wash and downstream of the mine facilities area.

Site 4 - Quitchupah Creek below the unnamed tributary into which sedimentation pond #1 discharges and above the confluence with Christiansen Wash.

Site 5 - Christiansen Wash below the proposed surface mine area and above the confluence with Quitchupah Creek (USGS #09331950).

Site 6 - Outflow of sedimentation pond #1 (mine water discharge).

Site 7 - Outflow of sedimentation pond #2 (surface drainage from mine facilities area).

Site 8 - Unnamed tributary of Quitchupah Creek upstream of discharge from sedimentation pond #1.

In 1980, two additional sites were established as follows:

Site 9 - Ivie Creek upstream of the confluence with Quitchupah Creek.

Site 10 - Ivie Creek below Utah Highway 10 and upstream of the confluence with Oak Spring Creek.

In 1981, sedimentation pond #5 was constructed as part of the water management plan for the proposed preparation plant facilities. The outflow of this pond is designated Site 11 for inclusion in the surface water monitoring plan and discharges to a tributary of Quitchupah Creek.

Flow Measurement

Flow measurement at Sites 1, 2, 3, 4, 5, 8, 9, and 10 will be made quarterly using the velocity-area (current meter) method. Discharge from Site 6 will be determined continuously using a 9-inch throat-width Parshall flume. Discharge from Sites 7 and 11 will be measured using the California Pipe method.

Water Quality

Water samples from Sites 1 through 5, 8, 9, and 10 will be collected quarterly according to the parameters listed on Table 2.

Water quality samples at Sites 6, 7, and 11 will be taken and reported in accordance with NPDES permit requirements.

All samples will be collected and preserved according to standard procedures as described in the PAP at Chapter 7.2.6.3.

Reporting Procedures

Monitoring results will be submitted quarterly. In addition, a log book will be maintained at the mine office to document surface water monitoring as outlined above.

Table 2
Surface Water Monitoring
Operational Water Quality Parameter List

Field Measurements:

Water Level or Flow
pH
Specific Conductivity (umhos/cm)
Temperature (C°)

Laboratory Measurements: (Mg/l) Major, minor ions and trace elements are to be analyzed in total and dissolved forms.

Total Settleable Solids
Total Suspended Solids
Total Dissolved Solids
Total Hardness (as $CaCO_3$)
Acidity ($CaCO_3$)
Carbonate (CO_3-2)
Bicarbonate (HCO_3-)
Calcium (Ca)
Chloride (C1-)
Iron (Fe)
Magnesium (Mg)
Total Manganese (Mn)
Potassium (K)
Sodium (Na)
Sulfate (SO_4-2)
Oil, and Grease (Sites 1 and 4 only)
Cation - Anion Balance

Irrigation

Ten of the twenty sub-plots will be irrigated roughly every two weeks with two inches of supplemental water beginning in the Spring of 1987 when the plots are to be reconstructed and continuing through the growing season for the first year. The other ten sub-plots will receive no irrigation water. A small stationary sprinkler type irrigation system will be used. Irrigation will take place during later afternoon hours or at night.

MEASUREMENTS

Vegetation Monitoring

The vegetation on the demonstration sites (all 3 included) will be monitored annually starting in 1985 and continuing until the termination of the project in 1991. Parameters to be measured in the seeded plots will be:

1985 - Vegetative density and frequency
1986 - Vegetative density and frequency
1987 - Vegetative density and frequency
1988 - Vegetative density and frequency
1989 - Vegetative density and frequency
1990 - Vegetative density and frequency
1991 - Vegetative density, frequency, production and foliar cover

Survival rates and crown width will be measured on the transplants annually.

Soil Sampling

- Original Demo. Site -

Two core hole samples will be taken from the irrigated plots side and two from the non-irrigated plots side at the initiation time of the plots. Samples will again be taken at the same locations at the end of the project in 1991. Samples will be taken at 6" intervals from the surface down to 12". Parameters to be analyzed for in 1984 will be EC's, Na, Ca, Mg, pH, and N-P-K. SAR's will be calculated. The measurement parameters will be the same in 1990 except for the N-P-K analysis.

- Borehole Access Road Site and Flume Site Areas -

One core hole will be taken from each site prior to seeding. Samples will be taken from the 0 - 6" and 6" - 12" depths and analyzed for N-P-K, EC's, Na, Ca, Mg, pH, and SAR's. These sites will also be sampled again in 1991. Note: A core hole sample will also be taken from the topsoil embankment site prior to soil spreading.