APPENDIX XVII

BTCA INFORMATION

BTCA INFORMATION
CONTOUR DITCHES
TYPICAL CALCULATION METHODS

Spacing of the contour ditches will be determined for each individual slope. Spacing will be based on the volume of flow from a 10 year/24 hour precipitation event of 1.9 inches.

Runoff Volume Formulas:

$$S = \frac{100}{CN} - 10$$

Where:

S = Infiltration Depth

CN = Curve Number (From Table 7.1, Section 3 of PAP)

Then:

$$Q = \frac{(P-0.2S)^2}{P+0.8S}$$

Where:

Q = Runoff in Inches

P = Precipitation in Inches
(10 year/24 hour = 1.9 inches)

Then:

Q(in.) X 1 ft./12 in. X Area(sq. ft.) = Runoff Volume in Cu.Ft.

Typical volume design of the contour ditches is 1 cu. ft./linear ft. of ditch. Spacing will be determined from the relationship of total runoff volume to the length and width of the slope.

Additional ditch capacity will be provided to accommodate sediment storage. Sediment production and increased ditch capacity will be based on test plot sediment data.

$$S = \frac{1000}{CN} - 10$$

where:

S = Infiltration Depth

CN = Curve Number

and

$$Q = \frac{(P-.2S)^2}{P + 0.8S}$$

where:

Q = Runoff in Inches

P = Precipitation in Inches

Spacing of the contour ditches will be based on the total runoff volume (see BTCA information in Appendix XVII, Volume 7). A typical cross-section of the contour ditch design is shown on Drawing CM-10393-DS, BTCA Appendix XVII, Volume 7. An earthen berm will be placed at the toe of each cutslope area.

EAST MOUNTAIN ACCESS

The main road which serves the mine is also an access road for local cattlemen who, twice each year, herd cattle through the mine area to reach East Mountain.

As this road is an established cattle drive route and the only road to East Mountain on the east side, it is desirous to maintain this road independently from the mine's final reclamation plan.

Volume 6

APPENDIX XIV

Des-Bee-Dove/Wilberg Junction Road Plans & Written Text
Hydrologic Calculations for Road Drainage & Culverts (NOV N84-2-22-1)
Rollins, Brown & Gunnell, Inc. - Slope Stability Report, Junction Road Cut Slope at Station 125+00
Engineers Certification - Creamer & Noble Engineers

5-1	Utah Department of Transportation Road Plans (Sheets 1 thru 38)	CM-10584-DS

Volume 7

APPENDIX XIV (Cont.)

5-2	Junction Road Final Reclamation Maps (4 sheets)	CM-10601-DS
5-3	Haul Road - Final Reclamation	CS1130D
5-3A	Haul Road Reclamation - Ditch Design	CS1129C
5-3B	Haul Road Drainage Areas	KS1190C
5-4	Topography Drainage Location Map	CM-10607-DS
	Concrete Collection Box Detail	CM-10608-DS
5-5	Hydrologic Area Drainage Map	CM-10609-DS
5-6	Soil Sample Location Map	CM-10613-DS

APPENDIX XV

Sedimentation Pond Access Road Plans and Written Text

5-7	Detailed Permit Boundary Map Along the Junction Road & Sediment Pond Area	CM-10658-DS
5-8	Sediment Pond Access Road/Plan & Profile (EMC Drawing - 3 sheets)	CS806D
5-9	Sediment Pond Access Road Cross-Sections (EMC Drawing - 2 sheets)	CS805E

APPENDIX XVI

Haul Road Reclamation Study

APPENDIX XVII

BTCA Information

Volume 8

Geologic Section

Volume 9

Hydrologic Section

Volume 7

APPENDIX XIV (Cont.)

5-2	Junction Road Final Reclamation Maps (4 sheets)	CM-10601-DS
5-3	Haul Road - Final Reclamation	CS1130D
5-3A	Haul Road Reclamation - Ditch Design	CS1129C
5-3B	Haul Road Drainage Areas	KS1190C
5-4	Topography Drainage Location Map	CM-10607-DS
	Concrete Collection Box Detail	CM-10608-DS
5-5	Hydrologic Area Drainage Map	CM-10609-DS
5-6	Soil Sample Location Map	CM-10613-DS

APPENDIX XV

Sedimentation Pond Access Road Plans and Written Text

5-7	Detailed Permit Boundary Map Along the Junction Road & Sediment Pond Area	CM-10658-DS
5-8	Sediment Pond Access Road/Plan & Profile (EMC Drawing - 3 sheets)	CS806D
5-9	Sediment Pond Access Road Cross-Sections (EMC Drawing - 2 sheets)	CS805E

APPENDIX XVI

Haul Road Reclamation Study

APPENDIX XVII

BTCA Information

rests.

For the sake of organization and simplicity, we have decided to list the various structures by grouping of associated structures. Group I (Hydrological Association). This group association will list those facilities such as underground diversion, surface drainage systems and sedimentation ponds. Group II shall list and incorporated all surface facilities, building, conveyors, power lines, storage tanks, etc., and all facilities related with operations as they pertain to coal processing. Group III lists only earthen structures, i.e., fills, embankments, road and earthen berms.

GROUP I (HYDROLOGICAL)

SURFACE DRAINAGE

With the exception of the parking lot and bathhouse-warehouse-office facilities, the Des Bee Dove Mines are located within a narrow, steep, dry wash and are connected by a single access road (see Surface Drainage Map 3-8).

Because of the confined conditions created by the narrow canyon, no undisturbed diversions have been installed; therefore, all runoff reports to the sediment pond.

Runoff within the active surface area is controlled through grading of roads, yards and parking lots. Additionally ditches and culverts have been installed for operational convienence; however all runoff leaving the active area reports to four (4) CMP culverts. These culverts are identified on Drawing CM-10421-DS, Sheet 1 of 2, Volume 3, Packet 3-8.

Calculations for the culverts are found in Appendix VII and XII.

Historically, the mine area has controlled surface runoff for forty years.

SEDIMENTATION POND

To meet both State and Federal regulations governing clean water and effluent discharges a 19.8 acre foot sedimentation pond was constructed in 1979. Pond sizing is such as to collect the runoff waters from a 10 year/24 hour storm for the entire drainage area. Sediment storage volume was designed for .1 acre foot per acre disturbed by mining.

Design drawings, hydrological calculations, methodology and monitoring cross sections are included in Appendices VII and VIII.

Because of limited space and precipitous land forms surrounding the Des Bee Dove complex, the sedimentation pond was located away from the surface facilities area and placed at the mouth of the dry wash that drains the mine site. Sited on state lands under Utah State Land Lease #436 (reference, Drainage Map 3-8), this sedimentation pond has been assigned an UPDES permit whose identification number is UT-0023591. Only one discharge point is associated with the permit.

APPENDIX XII

ADDITION 2/18/92

CULVERT SIZING

REFERENCE DRAWING

CM-10421-DS, SHEET 1 OF 2

VOLUME 3, PACKET 3-8

DES BEE DOVE MINE DRAINAGE

CD-2

1. Area = 18.18 Acres or .028 Sq. Mi.

2. Time of Concentration = .03 Hr.

   A. Hydrologic Length = 1100'
   B. Average Slope = 75%
   C. Velocity = 90 fps (SCS National Engineering Handbook, Section 4, Hydrology, Figure 15.2 - Chart A)

3. Curve Number = 85 (Chart B)

4. Design Flow = 10.08 cfs (See Table CD-2)
   10 Yr./6 Hr. Storm Event (R645-301-743.300)

5. Culvert

   30" CMP W/Headwater Depth of 1.0
   Capacity = 105 cfs (Flowmaster Calculation, CD-2)
   Length = 65'
   Slope = 19%
   Trash Rack = None (Due to oversizing of culvert and lack of facilities downstream)

6. Erosion Protection

   Culvert Inlet - Metal End Section
   Culvert Outlet - Bedrock With Natural Cobble and Boulder

DES BEE DOVE MINE DRAINAGE

CD-3

1. Area = .71 Acres

2. Time of Concentration = .58 Hr.

   A. Hydrologic Length = 290'
   B. Average Slope = .01%
   C. Velocity = 1.4 fps (SCS National Engineering Handbook, Section 4, Hydrology, Figure 15.2 - Chart A)

3. Curve Number = 98 (Chart B)

4. Design Flow = .88 cfs (See Table CD-3)
   10 Yr./6 Hr. Storm Event (R645-301-743.300)

5. Culvert

   15" CMP W/Headwater Depth of 1.0
   Capacity = 26 cfs (Flowmaster Calculation, CD-3)
   Length = 40'
   Slope = 46%
   Trash Rack = None (Due to oversizing of culvert and lack of facilities downstream)

6. Erosion Protection

   Culvert Inlet - Metal End Section
   Culvert Outlet - Bedrock With Natural Cobble and Boulder

DES BEE DOVE MINE DRAINAGE

CD-4

1. Area = .55 Acres

2. Time of Concentration = .46 Hr.

   A. Hydrologic Length = 230'
   B. Average Slope = .01%
   C. Velocity = 1.4 fps (SCS National Engineering Handbook, Section 4, Hydrology, Figure 15.2 - Chart A)

3. Curve Number = 98 (Chart B)

4. Design Flow = 0.82 cfs (See Table CD-4)
   10 Yr./6 Hr. Storm Event (R645-301-743.300)

5. Culvert

   15" CMP W/Headwater Depth of 1.0
   Capacity = 25 cfs (Flowmaster Calculation, CD-4)
   Length = 180'
   Slope = 45%
   Trash Rack = None (Due to oversizing of culvert and lack of facilities downstream)

6. Erosion Protection

   Culvert Inlet - Metal End Section
   Culvert Outlet - Rip-Rap, D50 = 2.5' (See Rip-Rap Sizing Calculations CD-4)

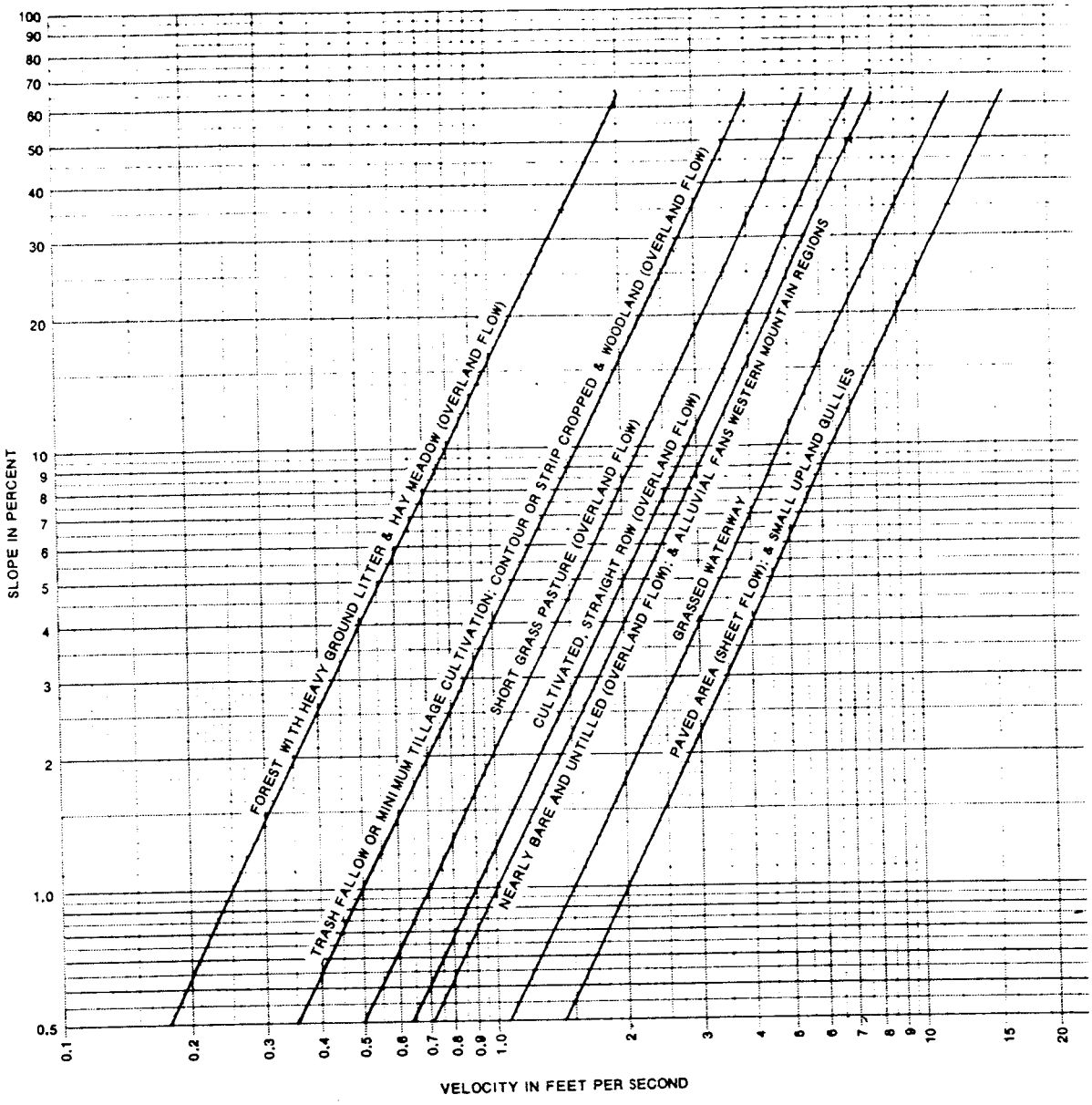


Figure 15.2.--Velocities for upland method of estimating T_c

FROM "NEH" SECTION 4

APPENDIX XII

ADDED 2/18/92

CHART A

Table 9.1.--Runoff curve numbers for hydrologic soil-cover complexes

(Antecedent moisture condition II, and I_a = 0.2 S)

Land use	Cover: Treatment or practice	Cover: Hydrologic condition	Hydrologic soil group: A	B	C	D
Fallow	Straight row	----	77	86	91	94
Row crops	"	Poor	72	81	88	91
	"	Good	67	78	85	89
	Contoured	Poor	70	79	84	88
	"	Good	65	75	82	86
	"and terraced	Poor	66	74	80	82
	" " "	Good	62	71	78	81
Small grain	Straight row	Poor	65	76	84	88
		Good	63	75	83	87
	Contoured	Poor	63	74	82	85
		Good	61	73	81	84
	"and terraced	Poor	61	72	79	82
		Good	59	70	78	81
Close-seeded legumes 1/ or rotation meadow	Straight row	Poor	66	77	85	89
	" "	Good	58	72	81	85
	Contoured	Poor	64	75	83	85
	"	Good	55	69	78	83
	"and terraced	Poor	63	73	80	83
	"and terraced	Good	51	67	76	80
Pasture or range		Poor	68	79	86	89
		Fair	49	69	79	84
		Good	39	61	74	80
	Contoured	Poor	47	67	81	88
	"	Fair	25	59	75	83
	"	Good	6	35	70	79
Meadow		Good	30	58	71	78
Woods		Poor	45	66	77	83
		Fair	36	60	73	79
		Good	25	55	70	77
Farmsteads		----	59	74	82	86
Roads (dirt) 2/		----	72	82	87	89
(hard surface) 2/		---	74	84	90	92

1/ Close-drilled or broadcast.
2/ Including right-of-way.

FROM "NEH" SECTION 4

APPENDIX XII

ADDED 2/18/92

CHART B

DBD DRAINAGE CD-2

INPUT SUMMARY:

DISTRIBUTION = SCS TYPE II	RUNOFF AREA = .028 SQ. MILES
RAINFALL DEPTH = 1.4 INCHES	RUNOFF CURVE NO. = 85
STORM DURATION = 6 HOURS	TIME OF CONCENTRATION = .03 HRS.

OUTPUT SUMMARY:

TOTAL RUNOFF DEPTH = .39 IN.	TIME TO PEAK = 2.999 HOURS
INITIAL ABSTRACTION = .353 IN.	RUNOFF VOLUME CHECK = .391 IN.
PEAK FLOW = 10.08 CFS	

6.06	1.40	0.3899	0.0000	0.0000	0.00

TABLE CD-2

APPENDIX XII

ADDED 2/18/92

Circular Channel Analysis & Design
Solved with Manning's Equation

Open Channel - Uniform flow

Worksheet Name: DBD MINE DRAINAGE

Comment: CD-2

Solve For Actual Depth

Given Input Data:

Diameter.....	2.50 ft
Slope.....	0.1900 ft/ft
Manning's n.....	0.022
Discharge.....	10.08 cfs

Computed Results:

Depth.....	0.52 ft
Velocity.....	13.57 fps
Flow Area.....	0.74 sf
Critical Depth....	1.06 ft
Critical Slope....	0.0123 ft/ft
Percent Full.....	20.87 %
Full Capacity.....	105.65 cfs
QMAX @.94D.....	113.65 cfs
Froude Number.....	3.96 (flow is Supercritical)

Open Channel Flow Module, Version 3.21 (c) 1990
Haestad Methods, Inc. * 37 Brookside Rd * Waterbury, Ct 06708

FLOWMASTER CALCULATION CD-2

APPENDIX XII

ADDED 2/18/92

INPUT SUMMARY
FOR W.S.: CD-3

STORM:		WATERSHED:	
DISTRIBUTION =	SCS TYPE 2	LAND SLOPE =	0.0000 PCT
		CURVE NUMBER =	98.00
PRECIP.DEPTH =	1.40 IN	CHANNEL LENGTH =	0.00 FT
		TIME OF CONC. =	0.5800 HR
DURATION =	6.00 HR	AREA =	0.71 AC
NUMBER OF LINES =	93	D =	0.0773 HR

OUTPUT SUMMARY

RUNOFF DEPTH = 1.1817 IN
INITIAL ABSTRACTION = 0.0408 IN
PEAK FLOW = 0.88 CFS (1.2238 IPH)
AT T = 3.56 HRS

TABLE CD-3

Circular Channel Analysis & Design
Solved with Manning's Equation

Open Channel - Uniform flow

Worksheet Name: DBD MINE DRAINAGE

Comment: CD-3

Solve For Actual Depth

Given Input Data:

Diameter	1.25 ft
Slope	0.4600 ft/ft
Manning's n	0.022
Discharge	0.88 cfs

Computed Results:

Depth	0.16 ft
Velocity	9.80 fps
Flow Area	0.09 sf
Critical Depth	0.37 ft
Critical Slope	0.0149 ft/ft
Percent Full	12.62 %
Full Capacity	25.89 cfs
QMAX @.94D	27.85 cfs
Froude Number	5.25 (flow is Supercritical)

FLOWMASTER CALCULATION CD-3

APPENDIX XII

ADDED 2/18/92

INPUT SUMMARY
FOR W.S.: CD-4

STORM:	WATERSHED:
DISTRIBUTION =SCS TYPE 2	LAND SLOPE = 0.0000 PCT
	CURVE NUMBER = 98.00
PRECIP.DEPTH = 1.40 IN	CHANNEL LENGTH = 0.00 FT
	TIME OF CONC. = 0.4600 HR
DURATION = 6.00 HR	AREA = 0.55 AC
NUMBER OF LINES = 113	D = 0.0613 HR

OUTPUT SUMMARY

RUNOFF DEPTH = 1.1817 IN
INITIAL ABSTRACTION = 0.0408 IN
PEAK FLOW = 0.82 CFS (1.4823 IPH)
AT T = 3.43 HRS

TABLE CD-4

Circular Channel Analysis & Design
Solved with Manning's Equation

Open Channel - Uniform flow

Worksheet Name: DBD MINE DRAINAGE

Comment: CD-4

Solve For Actual Depth

Given Input Data:

Diameter	1.25 ft
Slope	0.4500 ft/ft
Manning's n	0.022
Discharge	0.82 cfs

Computed Results:

Depth	0.15 ft
Velocity	9.52 fps
Flow Area	0.09 sf
Critical Depth	0.35 ft
Critical Slope	0.0149 ft/ft
Percent Full	12.27 %
Full Capacity	25.61 cfs
QMAX @.94D	27.54 cfs
Froude Number	5.18 (flow is Supercritical)

Open Channel Flow Module, Version 3.21 (c) 1990
Haestad Methods, Inc. * 37 Brookside Rd * Waterbury, Ct 06708

FLOWMASTER CALCULATION CD-4

APPENDIX XII

ADDED 2/18/92

R I P R A P S I Z I N G F O R
T R A P A Z O I D A L D I T C H E S

ENTER LISTED PARAMETERS
1. FLOW RATE (CFS) .82
2. CHANNEL SLOPE .29
3. BOTTOM WIDTH (FT) 12
4. SIDE SLOPE .5
5. PHI ANGLE 42
6. SPECIFIC GRAVITY OF RIPRAP 2.63

DESIRED SAFETY FACTOR FOR CHANNEL BOTTOM 1.5
DESIRED SAFETY FACTOR FOR CHANNEL BANKS 1.6

VELOCITY	DEPTH	D50	S.F. BTM	S.F. BANK
2.074	.033	.9886	2.217	1.6

RIPRAP SIZING CALCULATION CD-4

APPENDIX XII

ADDED 2/18/92

DES BEE DOVE MINE DRAINAGE

CD-2

1. Area = 18.18 Acres or .028 Sq. Mi.

2. Time of Concentration = .03 Hr.

   A. Hydrologic Length = 1100'
   B. Average Slope = 75%
   C. Velocity = 9.0 fps (SCS National Engineering Handbook, Section 4, Hydrology, Figure 15.2 - Chart A)

3. Curve Number = 85 (Chart B)

4. Design Flow = 10.08 cfs (See Table CD-2)
   10 Yr./6 Hr. Storm Event (R645-301-743.300)

5. Culvert

   30" CMP W/Headwater Depth of 1.0
   Capacity = 105 cfs (Flowmaster Calculation, CD-2)
   Length = 65'
   Slope = 19%
   Trash Rack = None (Due to oversizing of culvert and lack of facilities downstream)

6. Erosion Protection

   Culvert Inlet - Metal End Section
   Culvert Outlet - Bedrock With Natural Cobble and Boulder

UTAH DIVISION OF OIL, GAS AND MINING
STATE DECISION DOCUMENT AND
TECHNICAL ANALYSIS

PacifiCorp Electric Operations
Des-Bee-Dove Mine
Permit Renewal

Emery County, Utah
ACT/015/017
May 31, 1991

CONTENTS

A:/SDD&TA.DBD

ADMINISTRATIVE OVERVIEW

PacifiCorp Electric Operations
Des-Bee-Dove Mine
Permit Renewal
ACT/015/017

Emery County, Utah
May 31, 1991

Background

The Des-Bee-Dove Mine Complex is one of three separate mining operations owned by PacifiCorp Electric Operations located on East Mountain about 7 miles north of Orangeville, Utah. The three operations, the Des-Bee-Dove, Cottonwood/Wilberg, and Deer Creek, contain three minable coal seams: Hiawatha, Cottonwood, and Blind Canyon. Two of the seams are located within the Des-Bee-Dove permit area and are accessed through three mine portals. The Hiawatha (lower) seam is mined through the Deseret portal. The Blind Canyon (upper) seam is mined through the Beehive and Little Dove Mines.

The anticipated life-of-mine production from the Des-Bee-Dove Mine Complex is approximately 8.3 million tons by room-and-pillar continuous mining techniques. Estimated annual production was planned to average 725,000 tons.

The Des-Bee-Dove Mine Complex closed December 1983, due to a fire in the Beehive Mine and for economic reasons. The mine complex was reopened on January 14, 1985, to provide coal to the Hunter Power Plant to partially replace production lost due to the closure of the Wilberg Mine as a result of a fire which started in the mine on December 19, 1984. The Des-Bee-Dove Mine temporarily ceased operations on February 6, 1987. No mining activity has occurred since that date. A memo to the Coal Regulatory Staff dated October 11, 1988 from Lowell P. Braxton, entitled "Guidelines for Duration of temporary Cessation of Operations", outlines that temporary cessation may extend to 15 years.

The Des-Bee-Dove/Wilberg Junction Road was constructed in 1983, in response to public concern for safety in the previous route that went through the residential streets of Orangeville, Utah. Utah Power and Light Company represented the road as a public road and failed to obtain a permit from the regulatory authority to construct the Haul Road. UDOGM issued a notice of violation to Utah Power and Light Company on July 18, 1984, that required the Haul Road be included in the PAP for a permanent program permit. On July 31, 1984, UDOGM issued a cessation order preventing the Utah Power and Light Company from using the road. The cessation order was terminated October 1, 1984. The Utah Board of Oil, Gas and Mining reopened the Haul Road under an emergency order pursuant to the approved Utah

State Program, to allow Utah Power and Light Company to resume production and delivery of coal to the Hunter Power Plant without routing trucks through the town of Orangeville.

The entire permit area, including the Junction Road, was permitted by OSM in April, 1985. The State issued a permanent program permit September 20, 1985.

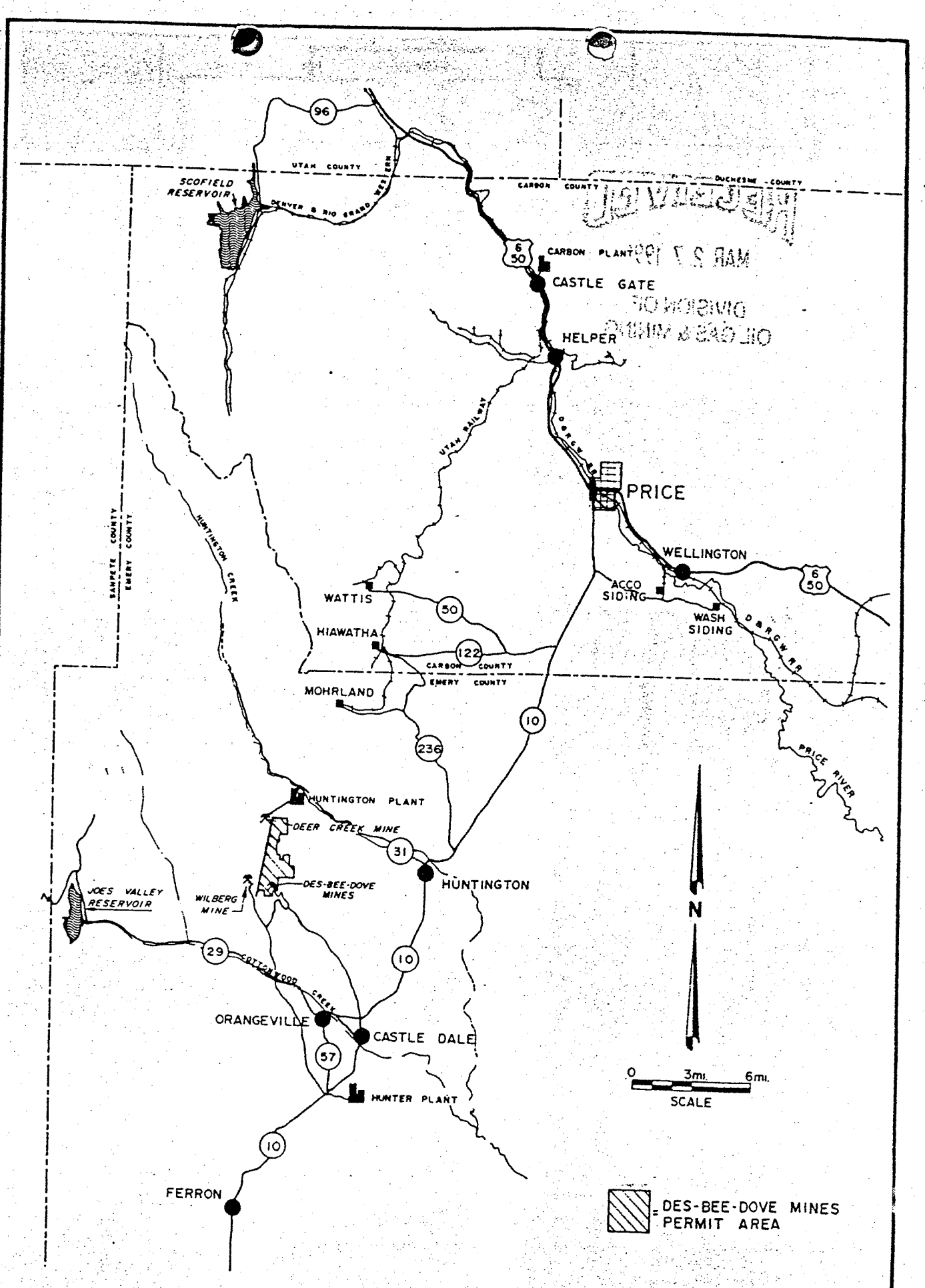
The permittee published notice for the five-year permit renewal for four consecutive weeks beginning December 4, 1990. No comments were received.

The permit was transferred from Utah Power & Light Company to PacifiCorp Electric Company on March 15, 1991.

Recommendation for Approval

Approval for the five-year permit renewal is recommended, based in a review of the Permit Application Package, updated through May 29, 1991, with nine conditions. The permit renewal term will not exceed the original permit term of five years and will expire on September 20, 1995.

jbe
DBDADMIO



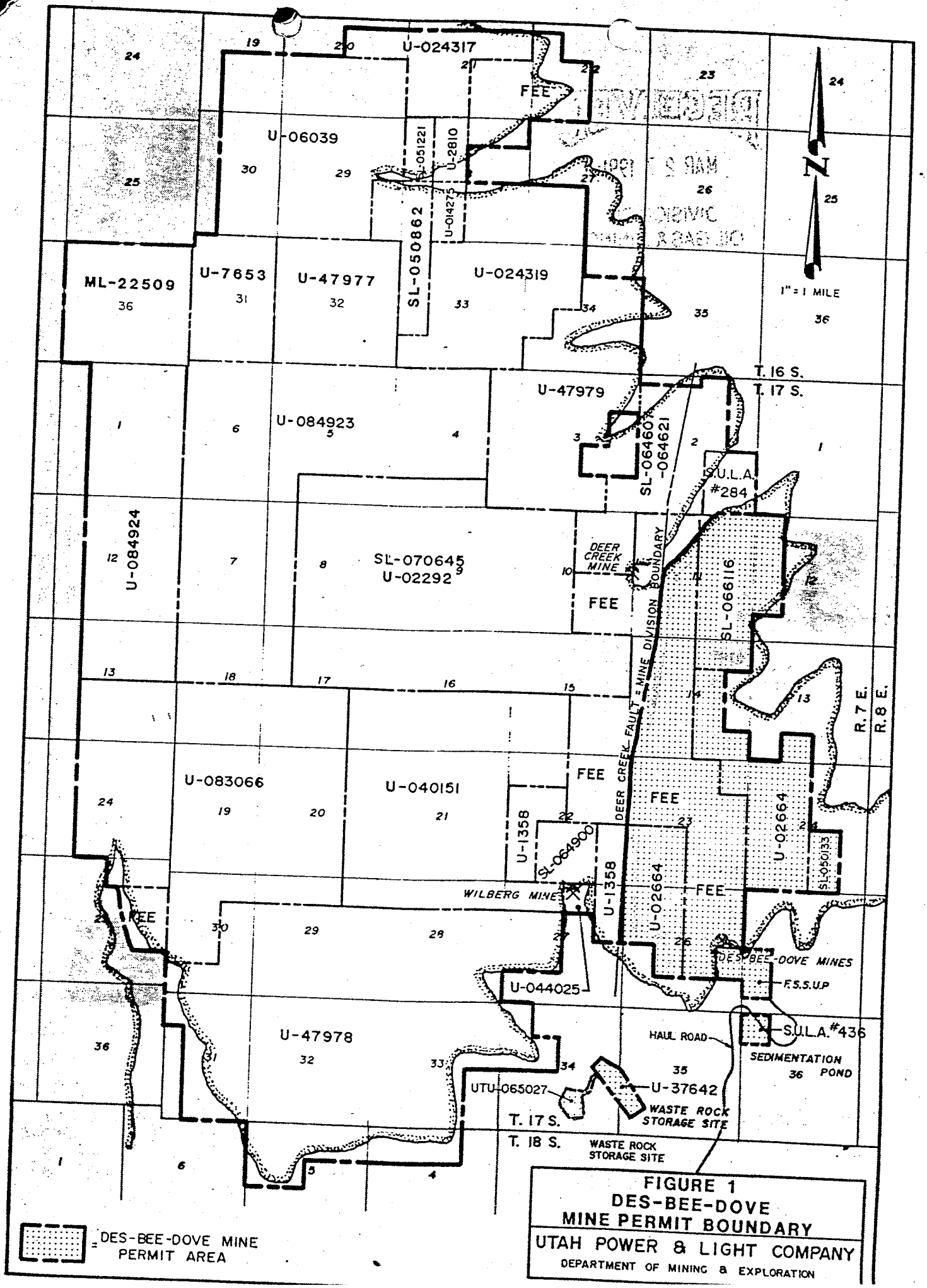


FIGURE 1
DES-BEE-DOVE
MINE PERMIT BOUNDARY

UTAH POWER & LIGHT COMPANY
DEPARTMENT OF MINING & EXPLORATION

PERMITTING CHRONOLOGY
Des-Bee-Dove Mine
ACT/015/017

October 11, 1988	Guidelines for Duration of Temporary Cessation of Operations outlines four conditions for temporary cessation. (Memo to Coal Regulatory Program Personnel from Lowell P. Braxton).
January 10, 1990	Letter to Dave Smaldone from Pamela Grubaugh-Littig advising him of upcoming five-year renewal.
April 27, 1990	UP&L submits five-year renewal materials for Des-Bee-Dove Mine.
June 25, 1990	Initial Completeness Review issued by Division of Oil, Gas and Mining.
June 29, 1990 July and Aug, 1990 (no specific dates noted)	Weekly and bi-weekly telephone conversations with Val Payne regarding timeliness and need for submittal to determine complete.
August 14, 1990	Letter from Lowell P. Braxton to Dee Jense regarding concern about timeliness of submittals.
August 28, 1990	Lowell P. Braxton, Pamela Grubaugh-Littig, and Dee Jense meet to discuss timeliness concerns.
September 6, 1990	A schedule is presented to the Division by UP&L as to when the Des-Bee-Dove Mine Five-Year Renewal materials will be submitted. Also, submittals for Deer Creek Five-Year Renewal Application and response to Rilda Canyon Lease Tract deficiencies.
September 7, 1990	Partial submittal for Des-Bee-Dove Mine Five-Year Renewal.
September 20, 1990	Cessation Order (#C90-20-2-1) is issued to Des-Bee-Dove Mine due to lack of completeness of permit renewal. Abatement date is January 18, 1991.
September 27, 1990	Submittal of responses to Initial Completeness Review by operator in rewritten format.
November 16, 1990	Division issues Determination of Completeness.

November 20, 1990	Cessation Order #C90-20-2-1 (part 1 of 2) is terminated due to permit renewal being determined complete.
December 4, 1990	PacifiCorp Electric Operations publishes four consecutive weeks, ending December 25, 1990.
December 14, 1990	Division issues Technical Deficiencies.
January 9, 1991	Cessation Order #C90-20-2-1 (part 2 of 2) is modified to have permit renewed by March 15, 1991, by letter of request of operator.
February 7, 1991	Operator responds to Technical Deficiencies.
March 5, 1991	Cessation Order #C90-20-2-1 (part 2 of 2) is modified to have permit renewed by March 29, 1991, by letter of request by operator.
March 15, 1991	Permit transferred from UP&L to PacifiCorp Electric Operations.
March 25, 1991	Cessation Order #C90-20-2-1 (part 2 of 2) is modified to have permit renewed by April 29, 1991 by Division request, due to increased oversight inspections.
April 29, 1991	Cessation Order #C90-20-2-1 (part 2 of 2) is modified to have permit renewed by May 31, 1991 by Division request due to increased oversight inspections.
May 29, 1991	Operator submits additional information.
May 31, 1991	Permit renewed with nine conditions. CO #C90-20-2-1 (part 2 of 2) is terminated.

jbe
A:\CHRON.DBD

MINE PLAN INFORMATION

Mine Name Des-Bee-Dove Mine State ID: ACT/015/017

Operator PacifiCorp Electric Operations County: Emery

Controlled By PacifiCorp Electric Operations

Contact Person(s) Blake Webster, Permitting Administrator

Telephone: (801) 220-4584 Fax (801) 220-4578

New/Existing Existing Mining Method Room and Pillar

Federal Lease Nos. U-02664; SL-050133; SL-066116
State Mineral Lease No. _____
Legal Descriptions _____

Surface Resources (acres)	Existing Permit Area	Proposed Permit Area	Total Life of Mine Area
Federal			1877
State			50
Private			920
Other			
TOTAL			2847

Coal Ownership (Acres)

Federal			1520
State			
Private			1040
Other			
TOTAL			2560

Coal Resource Data	Total in Place Reserves	Total Recoverable Reserves
Federal	10.5 mmt	5.1
State	0.2	0.1
Private	6.5	3.1
Other		
TOTAL	17.2	8.3

May 31, 1991

Mine Plan Information
Des-Bee-Dove
PacifiCorp Electric Operations
May 31, 1991

Recoverable Reserve Data	Name	Thickness	Depth
Seam	Blind Canyon	5-16'	1,000-1,600
Seam	Hiawatha	5-16'	1,100-1,700
Seam			
Seam			
Seam			

Mine Life Temporary Cessation Since February 6, 1987
Average Annual Production _____ Percent Recovery 45-50%
Date Projected Annual Rate Reached _____
Date Production Begins 1977 Date Production Ends N/A
Reserves Recoverable by: (1) Surface Mining _____
(2) Underground Mining _____
Reserves Lost Through Management Decision _____
Coal Market N/A

A:\MINEPLAN.DBD

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

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

June 3, 1991

Mr. Blake Webster
PacifiCorp Electric Operations
P.O. Box 26128
Salt Lake City, Utah 84126-0128

Dear Mr. Webster:

Re: Permit Renewal, PacifiCorp Electric Operations, Des-Bee-Dove Mine, ACT/015/017, Folder #3, Emery County, Utah

Enclosed please find two copies of the permit renewal for the Des-Bee-Dove Mine. Please sign both copies and return one to the Division.

Best Regards,

Dianne R. Nielson
Director

jbe
Enclosures
cc: L. Braxton
P. Grubaugh-Littig
AT015017.001

FINDINGS
FIVE-YEAR RENEWAL

Pacificorp Electric Operations
Des-Bee-Dove Mine
ACT/015/017

Emery County, Utah
May 31, 1991

1. The terms and conditions of the existing permit are being satisfactorily met. (R614-303-233.110)

2. The present coal mining and reclamation operations are in compliance with the environmental protection standards of the State Program. (R614-303-233.120)

3. The requested renewal does not substantially jeopardize the operator's continuing ability to comply with the State Program on existing permit areas. (R614-303-233.130)

4. The permittee has provided evidence of having liability insurance. (R614-303-233.140)

5. The permittee has provided evidence that a performance bond is in effect for the operation and will continue in full force and effect for the proposed period of renewal. (R614-303-233.150)

Permit Supervisor

Associate Director

Director

A:\FIVEYR.TA

FEDERAL

PERMIT
ACT/015/017

May 31, 1991

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/015/017, is being renewed for the state of Utah by the Utah Division of Oil, Gas and Mining (Division) to:

PacifiCorp Electric Operations
324 South State Street
P.O. Box 26128
Salt Lake City, Utah 84126-0128

for the Des-Bee-Dove Mine. A Surety Bond is filed with the Division in the amount of $1,837,712, payable to the State of Utah, Division of Oil, Gas and Mining and the Office of Surface Mining Reclamation and Enforcement (OSM). The Division must receive 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 the Act.

Sec. 2 **PERMIT AREA** - The permittee is authorized to conduct underground coal mining activities on the following described lands within the permit area at the Des-Bee-Dove Mine, situated in the state of Utah, Emery County and located:

Township 17 South, Range 7 East, SLM
Section 11: E1/2, E1/2 W1/2
Section 12: W1/2 NW1/4, NW1/4 SW1/4
Section 13: SE1/4 SW1/4
Section 14: W1/2, W1/2 E1/2, NE1/4 NE1/4, SE1/4 SE1/4
Section 23: All
Section 24: W1/2, W1/2 SE1/4
Section 25: W1/2 SW1/4
Section 26: N1/2, N1/2 SE1/4, NE1/4 SW1/4
Section 35: Portions of the E1/2 E1/2
Section 36: Portions of the N1/2 NW1/4

Township 18 South, Range 7 East, SLM
Section 2: Portions of the W1/2 NE1/4, Portions of the NE1/4 SW1/4

This legal description is for the permit area of the Des-Bee-Dove Mine. The permittee is authorized to conduct underground coal mining activities and related surface activities on the foregoing described property subject to the conditions of all applicable conditions, laws and regulations.

Sec. 3 **COMPLIANCE** - The permittee will comply with the terms and conditions of the permit, all applicable performance standards and requirements of the State Program.

Sec. 4 **PERMIT TERM** - This permit becomes effective on May 31, 1991, and expires on August 29, 1995.

Sec. 5 **ASSIGNMENT OF PERMIT RIGHTS** - The permit rights may not be transferred, assigned or sold without the prior written approval of the Division Director. 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 R614-303-300.

Sec. 6 **RIGHT OF ENTRY** - The permittee shall allow the authorized representative of the Division, including but not limited to inspectors, and representatives of the Office of Surface Mining Reclamation and Enforcement (OSM), 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, R614-400-220, 30 CFR 842.13 and R614-400-110;

(b) be accompanied by private persons for the purpose of conducting an inspection in accordance with R614-400-100 and R614-400-200 when the inspection is in response to an alleged violation reported to the Division by the private person.

Sec. 7 **SCOPE OF OPERATIONS** - The permittee shall conduct underground coal mining activities only on those lands specifically designated as within the permit area on the maps submitted in the approved plan and approved for the term of the permit and which are subject to the performance bond.

Sec. 8 **ENVIRONMENTAL IMPACTS** - The permittee shall take all possible steps to minimize any adverse impact to the environment or public health and safety resulting from noncompliance with any term or condition of the permit, including, but not limited to:

(a) Any accelerated or additional monitoring necessary 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. 9 **CONDUCT OF OPERATIONS** - The permittee 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 the Division 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 **EXISTING STRUCTURES** - As applicable, the permittee will comply with R614-301 and R614-302 for compliance, modification, or abandonment of existing structures.

Sec. 11 **RECLAMATION FEE PAYMENTS** - The operator shall pay all reclamation fees required by 30 CFR Part 870 for coal produced under the permit, for sale, transfer or use.

Sec. 12 **AUTHORIZED AGENT** - 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. 13 **COMPLIANCE WITH OTHER LAWS** - 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. 14 **PERMIT RENEWAL** - 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. 15 CULTURAL RESOURCES - If during the course of mining operations, previously unidentified cultural resources are discovered, the permittee shall ensure that the site(s) is not disturbed and shall notify the Division. The Division, after coordination with OSM, shall inform the permittee of necessary actions required. The permittee shall implement the mitigation measures required by Division within the time frame specified by Division.

Sec. 16 APPEALS - The permittee shall have the right to appeal as provided for under R614-300-200.

Sec. 17 SPECIAL CONDITIONS - There are special conditions associated with this permitting action, as described in Attachment A.

The above conditions (Secs. 1-17) 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 Division and the permittee at any time to adjust to changed conditions or to correct an oversight. The Division may amend these conditions at any time without the consent of the permittee in order to make them consistent with any federal or state statutes and any regulations.

THE STATE OF UTAH

By: Dianne R. Nielson

Date: 5-31-91

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

Authorized Representative of the Permittee

Date: _____

jbe
A:\DBDPRMT.TA

ATTACHMENT A

CONDITION R614-301-233-(1) (HS)

Within 45 days of permit renewal, the permittee must submit analyses of the five major fills within the mine area to include sampling procedures outlined on pages 4-100 through 4-102 and provide documentation of the depth of the soil mantle atop the coal waste within the tipple area.

Additionally, for the haul road between stations 165+00 through 243+18, the permittee must identify a borrow site and provide necessary information for the development and reclamation of the site or conduct field site trials to demonstrate the suitability of the Des-Bee-Dove Haul Road fill material as a plant growth medium for final reclamation.

CONDITION R614-301-514.300-(1) (JK)

Within 45 days of permit renewal, the permittee must provide, for inclusion in the Operation Plan, a commitment to do the following:

1) Inspection of the sediment pond quarterly, either by a professional engineer or else by a specialist experienced in the construction of impoundments (514.310);

2) Certification of the quarterly report promptly after each inspection by a qualified, registered, professional engineer and to send a copy of the report to the Division (514.312); and

3) Annual certification of the sediment pond by a qualified, registered, professional engineer and inclusion of the certification in the Annual Report.

CONDITION R614-301-542.300-(1) (JK)

Within 45 days of permit renewal, the permittee must revise and submit the following text and maps for inclusion in the PAP:

1) Map 3-10 (Existing Earthen Structures) must be modified to show, by shading, those areas which are used in estimating volumes of material which will contribute to the backfilling of highwalls, portal faceups, and the bathhouse/warehouse cut. This map must also show, by

crosshatching, highwalls, portal faceups, and other areas which will receive fill material.

2) Map 4-1 (Final Reclamation Map), sheet 2, must be modified to accurately show the anticipated final surface configuration of the present earthen fill structures.

3) Map 4-1 (Final Reclamation Map), sheet 5, must be modified to correspond to Map 3-10, i.e., it must show those areas that will receive and those that will contribute fill material with the same shading and crosshatch scheme used on Map 3-10.

4) Accurate cross-sections of the bathhouse/warehouse pad must be added to Map 4-1 (Final Reclamation Map), sheet 4. These cross sections must demonstrate that there is sufficient material available at the edge of the bathhouse/warehouse pad to completely backfill the pad, when that material is combined with the material that will be contributed by the other fill structures.

5) Earthwork quantities summarized on page 4-6 must be modified to verify the recalculated volume estimates as a result of the map and cross section changes.

CONDITION R614-301-728-(1) (TM)

Within 45 days of permit renewal, the permittee must submit a detailed plan for inclusion in the PAP, as to how the following information from the proposed test plots will be achieved, based on the following requirements:

728.331 Predicted sediment yield from the reclaimed haul road area;

728.332 Acidity, total suspended and dissolved solids and other important water quality parameters of local impact from the impact of coal mining and reclamation operations; and

728.335 Characterizations required by the Division for the test plots which must include:

1) Application methodology assessment for hydromulch (i.e., treatment method-soil prewetted prior to application to allow for better absorption of stabilizers) and other treatments, implying different methods of application must be tried and evaluated;

2) Soil bed preparation (roughness of seedbed) in relation to erosion control; and

3) Runoff collection on test plots to determine water quality (i.e., TDS and TSS).

CONDITION R614-301-731-(1) (TM)

Within 45 days of permit renewal, the permittee must submit technically adequate plans, for inclusion in the PAP, for sediment control (BTCA) on all areas not being treated by the sediment pond during reclamation. The PAP must include all sediment control measures and siltation measures with design criteria, cross-sections and maps as required by rule R614-301-742.110, Sediment Control Measures.

CONDITION R614-301-731.121-(1) (TM)

Within 45 days of permit renewal, the permittee must submit a detailed BTCA plan as an appendix to the PAP which specifically addresses the following issues (this is required in addition to the current plan, to use contour furrows and berms as shown on Plate 4-1, sheet 3 of 5):

1) A plan for providing sediment control during construction and following construction of all stream crossings and culvert removal sites where permanent diversions will be installed;

2) A revised and upgraded plan for the contour furrows and berms as shown on Plate 4-1, sheet 3 of 5 to address the runoff storage capacity of these BTCA measures in relation to the 10-year, 24-hour storm runoff volume. This will verify the treatments' effectiveness in providing treatment for all areas not draining to the sediment pond. This must be included in a BTCA Appendix showing all areas treated with BTCA measures other than sediment ponds; and

3) The assessment of the runoff water quality must be included as a design criteria for the test plot study. The data must be interpreted and included as part of the BTCA appendix upon submittal following test plot implementation. The plan must identify the surface water quality and quantity parameters to be monitored, sampling frequency and site location.

CONDITION R614-301-731.700-(1) (TM)

Within 45 days of permit renewal, the permittee must submit certified cross-sections of the sediment pond and certify maps HM-1 and HM-5 per the requirements identified in R614-301-731.730, R614-301-731.740 and R614-301-731.750.

CONDITION R614-301-742.220-(1) (TM)

Within 45 days of permit renewal, the permittee must provide drawings (Appendix VIII) that provide consistent information regarding the sediment pond. Three as-built drawings in Appendix VII provide three different pond bottom elevations. Page 3-54 of the PAP states five feet of clearance between a full sediment load elevation and the decant elevation. None of this information is in agreement (drawing #01-52-1-015 was revised on February 24, 1989 and October 1, 1984, to show as-built plans).

In addition to accurate as-built drawings and cross-sections being provided, the following information must also be submitted:

1) Sediment levels and clean-out elevations marked on all cross-sections (cross-sections are not marked as-built and certified);

2) Decant and clean-out procedures and a sediment testing and storage plan per Division guidelines;

3) A discussion of how sediment levels are determined to meet the 60% clean-out elevation determination; and

4) Calculations to prove that the open channel spillway is of nonerodible construction and capable of maintaining sustain flows. Riprap sizing calculations for the spillway must be included in Appendix VIII.

CONDITION R614-301-742.300-(1) (TM)

Within 45 days of permit renewal, all hydrologic calculations for existing hydrologic structures at the Des-Bee-Dove Mine site must be submitted for inclusion in the PAP.

jbe
DES-STIP.TA

utah power
& LIGHT COMPANY
MINING DIVISION
P.O. Box 310
Huntington, Utah 84528

July 31, 1990

Ms. Pamela Grubaugh-Littig
Permit Supervisor
Division of Oil, Gas and Mining
355 West North Temple
3 Triad Center, Suite 350
Salt Lake City, Utah 84180-1203

RE: Des Bee Dove Haul Road Reclamation Study, Utah Power and Light Company, Des Bee Dove Mine, ACT/015/017, Folder #2, Emery County, Utah

Dear Ms. Grubaugh-Littig:

Submitted in response to your letter to Mr. Smaldone dated July 25, 1990, please find the proposed schedule for the above referenced project.

PROJECT PHASES/TASKS	COMPLETION DATE
DESIGN	
Literature Review	9/30/90
Identify relevant factors and options	
Grading	
Drainage	
Erosion Control	
Revegetation	
Site/Area Characterization	10/31/90
Site vs literature info	
Topography	
Soils	
Vegetation	
Drainage/Erosion Patterns	
Precipitation	
Design Development	1/5/91
Consultation	
Engineering	
Hydrology/Hydraulics	
Vegetation	
Erosion/Sediment Control	
Monitoring	

Design Review/Modification/Approval 3/15/91
DOGM/OSM
Consultant

IMPLEMENTATION 10/15/91

Materials Procurement
Slope Stabilization
Erosion Control
Revegetation
Seed/Plants
Soil Amendments
Site Preparation
Materials Installation

before Spring

MONITORING AND EVALUATION 8/15/95

Stability
Erosion
Sediment Production
Precipitation
Vegetation
Soils

The project involves several uncontrollable factors including the schedules of various personnel (including DOGM and OSM), laboratory time, availability of materials and seasonal consideration for implementation. Therefore, I feel the proposed schedule is realistic and reasonable.

If you have questions or comments regarding this matter, please call me at 687-9821.

Sincerely,

Val Payne
Senior Environmental Engineer

VP/do

cc: D.W. Jense
S. Child
G. Davis
T. Faucheux
M. Moon

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

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 is in regards to Dee-Bee-Dove

October 11, 1988

TO: Coal Regulatory Staff

FROM: Lowell Braxton, Administrator LB

RE: Guidelines for Duration of Temporary Cessation of Operations

"Temporary Cessation of Operations" (UMC 817.131) outlines the requirements of the permittee for temporary cessation of operations but does not define the length of time an operator may maintain a permitted property under a temporary cessation. The regulation could be construed that the duration is indefinite. Conversely, "Contemporaneous Reclamation" (UMC 817.100) requires reclamation be undertaken in a contemporaneous fashion.

The purpose of this memo is to outline the guidelines for "duration" of temporary cessation of operations prior to final reclamation. Four aspects should be considered in terms of "extended" temporary cessation as follows:

1. An approved reclamation permit must be maintained by the operator. An adequate bond must be posted at all times.

2. Site maintenance must be undertaken as required according to the approved permit and performance standards.

3. Significant remaining mineable coal reserves must be documented by the permittee (BLM concurrence for federal coal mines).

If an operator meets the three conditions previously noted, then the duration of temporary cessation may extend to either 15 years after initiation of temporary cessation, or up to the third five-year permit renewal, which ever occurs first. Thusly, final reclamation would be required to commence at the end of the third five-year permit term following notification of temporary cessation or 15 years after initiation of temporary cessation if no action is taken by the permittee to activate the property.

Failure to meet the three conditions noted above will result in the Division ordering immediate final reclamation.

An operator has the option of appealing to the Board if ordered to complete final reclamation by the Division.

vb
WPOM/13-1&2

Technical Analysis
Des-Bee-Dove Mine
PacifiCorp Electric Operations
ACT/015/017
Permit Renewal

R614-301-100 GENERAL CONTENTS (SW)

R614-301-112 Identification of Interests

PacifiCorp is an Oregon corporation. The permit permittee is PacifiCorp Electric Operations and the mine operator is Energy West Mining Company (page 1-2). J. Blake Webster, PacifiCorp Electric Operations-Fuel Resources, is the mine's resident agent who will accept Service of Process. The names of PacifiCorp's officers and directors are found on pages 1-5 through 1-10. PacifiCorp currently has 10 coal mining and/or reclamation operations permitted in the United States (pages 1-2 through 1-4). The name and address of each owner of the surface and mineral property to be mined (page 1-39) and of each owner contiguous to the permit area (page 1-11 and 1-12) are listed in the permit application. The mine has three MSHA numbers, one assigned to each mine or portal, Deseret, Beehive and Little Dove. The permittee has no option, bid or other interest in any contiguous acreage other than within the permit areas of the Deer Creek Coal Mine and the Cottonwood Coal Mine.

R614-301-113 Violation Information

PacifiCorp has never had a federal or state coal mining permit suspended, revoked or forfeited a performance bond (page 1-13). A list of all violations received by PacifiCorp is provided on pages 1-14 through 1-28.

R614-301-114 Right-of-Entry Information

The documents upon which the permittee bases their legal right to enter and conduct coal mining and reclamation operations on is found on pages 1-29, 1-35, and 1-38 through 1-41. Surface owner consent for severance from surface and coal rights was given by the McKinnon Trust (page 1-29.1 through 1-29.2).

R614-301-115 Status of Unsuitability Claims

The permittee has consulted with federal land agencies and the Division, no lands within or adjacent to the permit area is designated or under study as unsuitable for coal mining and reclamation operations (page 1-30). No facilities or operations will be conducted within 300 feet of an occupied dwelling.

R614-301-116 through 150 Permit Term, Insurance and Maps

The permit application is for a five-year permit term (page 1-31). The Certificate of Liability Insurance is carried by Associated Electric & Gas Insurance Services Limited (pages 1-32 through 1-34). Public notice of permit renewal was made by PacifiCorp for the Des-Bee-Dove Mine (page 1-43).

The permit application package is clear, concise and filed in a format which is acceptable to the Division. A notarized signature by the Permitting Administrator stating that all information in the permit is true and correct is found on page 7.

All maps and plans are of an appropriate scale, and all applicable maps and plans distinguish between operations which occurred prior to August 3, 1977 and prior to issuance of a permit by the Division on August 29, 1985.

COMPLIANCE

The permittee is in compliance with all sections of R614-301-100.

R614-301-200 SOILS (HS)

R614-301-210 Introduction

Approximately 78 acres of disturbance is associated with the Des-Bee-Dove Mine Facility. Disturbed acreage is as follows: Mine area = 20 acres (pre-PL95-87); haul road = 50 acres; sedimentation pond and haul road = 8 acres (page 3-19). Subsoil was salvaged and stockpiled (Plate 3-7) from the sedimentation pond disturbance (page 3-53). Topsoil and/or subsoil was not separately removed from the mine area because initial construction occurred prior to the passage of PL 95-87 (page 3-22). The haul road was constructed without prior approval from the Division and therefore, no topsoil was salvaged. The permittee has proposed the use of substitute topsoil material as a plant growth medium for the reclamation of the mine area and the haul road (page 4-58).

Soil/spoil analyses of the fills within the mine facilities area is described on pages 4-59 and 4-60. Soil sample results of the adjacent undisturbed soils is on pages 2-183 through 2-188; soil sample results from the haul road on pages 2-177 and 2-178; and soil sample results of the adjacent undisturbed soils on pages 2-179 through 2-182.

R614-301-220 Environmental Description

The soils of the Des-Bee-Dove Mine are primarily colluvium and rock outcrops derived primarily from sandstone and shale. The soils tend to be very stony or bouldery, loamy skeletal (calcareous) mixed mesic throughout the profile.

An aridic bordering on a xeric to ustic moisture regime with a mesic temperature regime prevails. Average annual precipitation is between 8-10 inches with the mean annual soil temperature higher than 8°C but lower than 15°C. The topography of the area is gently sloping to steep, ranging from 0% to vertical but typically between 50% to 80% slopes. The aspect ranges from north to south but is generally southeast facing. The soil capability classification ranges from VIIs-sx to VIIIs-3 non-irrigated.

Under native vegetation erosion hazards associated with these soils, are moderate to severe. The erosion hazard for disturbed soils is high to severe. These soils are generally well drained and range in texture from very gravelly sandy loam to silt loam. The pH of the surface horizon ranges from neutral (7.0) to 8.4. The electrical conductivity (EC) is generally low (<4 mmhos/cm at 25°C), however, outwashes and conical slopes derived from Mancos Shale may have EC greater than or equal to 22 mmhos/cm at 25°C. The depths of reported A horizon ranges from 4-18 inches.

The Des-Bee-Dove Mine soil resource was surveyed at an unreported scale; but, the scale appears to be an Order II. The soils in the vicinity of the disturbance are as follows: lithic ustorthents; xerollic calciorthids.

The major limiting factors for the soils in the vicinity of the disturbance is extremely high growing-season temperatures, low precipitation, high exchangeable sodium, and high salt activity. Hence, the soils are low in nutrient and moisture availability and have poor physical conditions which deter water movement and root penetration.

R614-301-221 Prime Farmland Investigation

An investigation was conducted by the Soil Conservation Service to determine if prime farmland exists within the permit area. Ferris P. Allgood, State Scientist (1983) for the U.S. Soil Conservation Service, determined that the soils in the permit area are too steep and/or above established irrigation systems and therefore, do not meet the requirements for prime farmland (pages 2-224 through 2-227).

R614-301-230 Operational Plan

The disturbance associated with the mine area occurred prior to the passage of PL 95-87 (page 3-22). The disturbance created during the haul road construction was accomplished without prior approval from the Division. Topsoil was not separately salvaged from these areas. The permittee has proposed utilizing substitute topsoil from the surface (top 18-24 inches, page 4-62) of the five major fills of the mine area and the downcast road fill/base material from the haul road (pages 4-58 & 4-62).

As of February 6, 1987, the Des-Bee-Dive Mine was temporarily closed. The mine remains idle; however, prior to the resumption of coal mining activity, the permittee will give six months advance public notification (Page 3-1). The permittee does not anticipate new disturbance during the ensuing five-year permit term (page 3-22). The only activity planned for the next permit term is general maintenance and inspections and implementations of test plots to determine the suitability of the proposed substitute topsoil material (see R614-301-233).

R614-301-233 Topsoil Substitutes and Supplements

The downcast material and fill along the haul road was sampled in 1985 (page 2-177 through 2-178). Results indicate a saline/sodic soil and material which is unacceptable as a plant growth medium for final reclamation when compared with adjacent undisturbed soils (i.e., potential borrow material sampled in 1990) (pages 2-179 through 2-182) and Division Guideline for the Management of Topsoil and Overburden (Table 2).

The permittee has proposed the use of the road fill material as a plant growth for final reclamation (page 4-58). The permittee has prepared and submitted a proposal (letter to Pam Grubaugh-Littig, dated July 31, 1990/Des-Bee-Dove Haul Road Reclamation Study, February 15, 1991) to conduct field site trials to determine the reclaimability of the major fill slope located between stations 131+00 and 142+00 (Plate 5-5). Division review of said proposal will continue and test plots will be implemented in the Fall of 1991.

More favorable plant growth conditions exist from stations 165+00 through 243+18. This material is primarily sandstone parent material with lower slope angles and with adjacent undisturbed pinyon-juniper overstory and greater effective precipitation. However, as indicated by the soil analysis and the poor interim revegetation success along the embankments of the road, the Division finds that additional field site trials or the identification of a borrow site is necessary to insure the reclamation of this portion (including the access road to the sedimentation pond) of the haul road.

The outcome of the aforementioned site trials will greatly influence the reclamation plan for the haul road. Successful techniques as proven by the site trials will only be incorporated into the reclamation plan after Division approval (page 4-82).

The suitability of the five major fills within the mine area (i.e., proposed substitute topsoil material) and the depth of the coal waste soil mantle within the tipple pad must be determined. The original sample set found on pages 4-59 and 4-60 is incomplete and must be compatible with the soil analysis conducted for the undisturbed soils adjacent to the mine area (pages 2-183 through 2-188).

CONDITION R614-301-233-(1) (HS)

Within 45 days of permit renewal, the permittee must submit analyses of the five major fills within the mine area to include sampling procedures outlined on pages 4-100 through 4-102 and provide documentation of the depth of the soil mantle atop the coal waste within the tipple area.

Additionally, for the haul road between stations 165+00 through 243+18, the permittee must identify a borrow site and provide necessary information for the development and reclamation of the site or conduct field site trials to demonstrate the suitability of the Des-Bee-Dove Haul Road fill material as a plant growth medium for final reclamation.

R614-301-234 Topsoil Storage

The only topsoil/subsoil stockpile on the permit area is located adjacent to the sedimentation pond (plate 3-7, sheet 3 of 3). At the time of pond construction, it was determined that no topsoil existed in sufficient quantities to warrant separate removal and storage. Therefore, only subsoil has been stockpiled. Approximately 12,650 yds^3 of material has been stockpiled (Map 2-13, sheet 1 of 3). The stockpile has been seeded and is protected by berms, diversions and sediment control structures (page 3-53).

The pond area (4.5 acres) will be covered with the stockpile material at an average depth of 18 inches. Revegetation will proceed as outlined for the haul road (page 4-88).

R614-301-240 Reclamation Plan

As stated before, the reclamation of the mine area and haul road will be contingent upon the results derived from the various revegetation test plots (page 4-7). However, the basic reclamation procedure will not vary substantially from the forthcoming narrative.

All concrete, asphalt and all coal cleaned from the surface of the mine area will be used as coarse backfill and buried against the highwalls and covered with at least four feet of nontoxic- and nonacid-forming material (pages 3-24, 3-27, 3-30, 4-1, and 4-65). Maximum final fill slopes will be equal to or less than 2h:1v (page 4-1).

All asphalt and road base from the haul road will be placed at the north end of the project area and will be covered with four feet of soil removed from the excavation of the drainage channel (page 4-7).

If fill material is suitable as a plant growth medium for final reclamation of the mine area (see R614-301-233), the upper 18-24 inches of fill will be removed and temporarily stored (page 4-62) and protect with a mulch cover (page 4-69). After final grading, the surface of the backfilled material will be in an uncompacted roughened condition. If compacted, smooth surfaces exist, the material will be ripped to eliminate slippage surfaces and promote root penetration (page 4-70). All reclaimed roads will be scarified (page 4-90). The temporarily stored substitute topsoil will be redistributed on the newly graded surface 6-12 inches deep (page 4-62). Following redistribution of topsoil, samples will be taken (2 samples/acre @ 1 foot) and analyzed (page 4-101) for fertilizer recommendation. Fertilizer will then be applied at the recommended rates (page 4-70). The site will then be hand broadcast with seed (seed mixture page 4-76) and raked to cover seed. Following seeding, the area will be covered with hay mulch (2 tons/acre) and netted or covered with erosion control blanket (page 4-77). If rills and/or gullies on regraded surfaces develop that are greater than nine inches, the channels will be filled, regraded or otherwise stabilized and the areas will be reseeded.

The revegetation plan for the haul road may be revised to incorporate the results of the test plot studies; however, reclamation will follow the techniques and methodologies outlined above, except where noted below.

The haul road Pinyon-Juniper vegetation type seed mixture and the haul road/sediment pond salt desert shrub vegetation type seed mixture are described on pages 4-82 and 4-83. After backfilling and grading and installation of contour furrows (page 4-7) the material which ends up at the surface will be treated with soil enhancer (i.e., Land Tech Irish Peat at 250 lbs/acre) (page 4-84). The area will be hydroseeded. Fertilizer will be applied at the following rate: Ammonium Nitrate - 200 lbs/acre; Triple Super Phosphate - 300 lbs/acre; Sulfur - 1000 lbs/acre. A wood fiber hydromulch with tackifier will be applied at 2000 lbs/acre and 50 gal/acre respectively.

COMPLIANCE

The permittee is in compliance with all sections of R614-301-200, except for condition R614-301-233-(1) (HS).

R614-301-300 BIOLOGY (SW)

R614-301-320 Environmental Description

The Des-Bee-Dove Mine permit area covers five vegetative communities (page 2-159). The Pinyon-Juniper is the largest covering 1,480 acres or 53 percent of the area. The Pinyon-Juniper community is also the largest vegetative type which has been disturbed, 70 percent of the disturbance or 55 acres. There are 640 acres of sagebrush and 607 acres of mixed-Conifer communities within the permit area, although none of these vegetation typed are located within the disturbed area. The Salt-Desert shrub community, which only makes up three percent of the permit area vegetation, makes up 30 percent of the disturbed area. One small Aspen community is within the permit area, this area is only three acres in size.

The Soil Conservation Service estimated productivity of the Pinyon-Juniper and Salt-Desert shrub communities at the Des-Bee-Dove Mine area. Potential production of the Pinyon-Juniper community is 1,000 pounds per acre and only 200 pounds per acre in the Salt-Desert shrub community (page 2-154). Low productivity on these sites is not unexpected due to low rainfall amounts and the southern exposure of the mine area.

A letter from the U. S. Fish and Wildlife Service in 1980 states, "To the best of our knowledge, no endangered or threatened plant species or critical habitat or threatened or endangered wildlife species occur in the disturbed areas of the subject mining operations" (page 2-196). A letter sent to the U.S. Fish and Wildlife Service by the Division requesting current confirmation of this statement was signed on March 26, 1991. The permittee states that there has been winter sightings of Bald Eagles flying above the permit area.

The lower portion of the permit area haul road is classified as high priority deer winter range (Map 2-18). Critical elk winter range is located above the disturbed area, within the permit area on East Mountain. The entire escarpment area along East Mountain is designated as a raptor nesting zone (Map 2-178). This includes the mine disturbance area. Three golden eagle nest groups are found within the permit area.

The location and boundary of the reference areas are shown on Maps 2-12 and 2-13. These maps also delineate vegetative communities within the disturbed area boundary and within and adjacent to the permit area.

R614-301-330 Operation Plan

Most of the mine area at the Des-Bee-Dove Mine was disturbed prior to August 3, 1977. However, the permittee has stabilized all fill slopes within the mine facilities area with planting an interim seed mixture (page 4-164). The permittee has

committed to control erosion on disturbed areas by vegetative planting (page 4-66). The seed mixture, seedbed preparation, fertilizer and mulch plans for interim revegetation are found on pages 4-66 through 4-68.

Planned subsidence is expected through pillar extraction. Subsidence from both coal seams should not exceed 20 feet (page 4-150). The permittee has committed to replace any water, or any other resources, lost due to subsidence (page 4-156). Historically, the mine has had escarpment failure under the Castle Gate Sandstone (page 4-157). Future mining plans provide for greater protection of the escarpment. The golden eagle nests, 56B and 87C, are located within future proposed mining areas. Both these nest sites overlie barrier pillars which will remain unmined (page 4-161) as protection from subsidence.

Critical elk winter range and other areas on East Mountain are generally unaffected from mining disturbance (page 4-160). Subsidence monitoring is conducted annually to detect any such disturbance. No prime fisheries are located within the permit area, however hydrologic monitoring and sediment treatment continues on the properties. The transmission line to the mine provides phase-to-phase and phase-to-ground clearances to preclude electrical contact of raptors as agreed by the U. S. Fish and Wildlife Service (page 4-161). The haul road runs through high priority deer winter rage. Employees are shown a video produced by the Utah Division of Wildlife Resources (UDWR) to reduce the disturbance and killing of wildlife (page 4-162). Training is also provided on how to avoid deer-vehicle collisions as well as posting signs on the haul road (page 4-163). Personnel will also be instructed on the value of snake dens and reporting such locations to UDWR.

R614-301-340 Reclamation Plan

The permittee has developed a revegetation schedule which should allow sufficient times to complete all tasks (page 4-75.1).

Three different seed mixtures are proposed for final reclamation. The seed mixtures are the mine site - Pinyon-Juniper vegetation type (page 4-76), haul road - Pinyon-Juniper vegetation type (page 4-82), and haul road sediment pond - Salt-Desert shrub vegetation type (page 4-83).

The mine site seed mixture will be applied by broadcasting methods. The area will be raked to cover the seed and fertilizer. Areas which have been hand broadcast seeded will be covered with 2 tons per acre mulch and netting or erosion control blanket. Following hydroseeding, 2,000 pounds mulch with tackifier will be applied. The permittee was asked to delineate where each mulch treatment would be applied. The permittee felt that the requirements of the regulation had been met without this designation (response to technical deficiency, letter dated February 7, 1991). The

spring following planting, 200 shrub and tree species per acre will be planted (pages 4-76 through 4-79).

The appropriate haul road seed mixtures will be applied with a hydroseeder. No plans are stated to try to incorporate the seed by raking. The request was made to the permittee by the Division to drill seed accessible area along the haul road. The permittee's response was that the request is not supported by the regulations (letter dated February 7, 1991). Fertilizer and sulphur will be applied by the hydromulcher. Hydromulch will then be applied at the rate of 2,000 pounds per acre (pages 4-82 through 4-84).

Final reclamation will restore drainage channels and revegetate the disturbed area. Rock piles of varying sizes will be left as small mammal habitat. Some of the revegetation seed mixture is similar to the adjacent undisturbed community. The mine site seed mixture is primarily designed for erosion control on steep slopes, and not for wildlife value. However, if sufficient plant diversity is established, sufficient food and cover for wildlife should be obtained (page 4-165).

The plan for planting trees and shrubs at the mine site calls for clumping and layering in order to optimize cover value (page 4-78). Shrubs seeded along the haul road have proven nutritional value for wildlife species, particularly deer in this high priority winter range area. Shrubs seeded in the Salt-Deseret shrub community along the haul road were primarily selected for the ability to grow in Mancos Shale. Nutritional value was also selected for in some shrubs however, test plot information will determine if the shrubs will grow in this soil type.

R614-301-350 Performance Standards

The proposed vegetative cover is designed to be diverse, effective, permanent and capable of stabilizing the soil surface. However, two problem areas exist in the disturbed area:

Area 1 — In final reclamation the Pinyon-Juniper mine site disturbance area will have topsoil applied of which some has been seeded with Crested Wheatgrass and Smooth Brome. This potential seed bank of Crested Wheatgrass and Smooth Brome could establish plants on the final reclaimed area. The permit (page 4-73 through 4-75) justifies the use of these species due to deep rooting depth (Smooth Brome) and drought resistance (Crested Wheatgrass). These are the characteristics which tend to make these species aggressive and out compete the native species. This could potentially reduce diversity in this area. However, the U. S. Forest Service insists that this seed mixture is consistent with the management plan for the area (page 4-66).

Area 2 The Salt-Desert shrub disturbed area along the haul road is in the Mancos Shale formation. The soil is high in clays, erosive and high in salts. Some steep slopes also occur in this area. Some success has occurred from interim seeding on gentle slopes. However, to date, no success has been achieved from interim seeding on the steeper slopes. Deep erosion gullies have formed on the road fill slopes. Currently, a test plot was installed by the operator (in 1989) to test a synthetic emulsion for erosion control and the seed mixture. Additional test plots are scheduled to be installed in the Fall of 1991.

Total vegetative cover of the Salt-Desert shrub reference area is 26 percent. If 26 percent cover is achieved on the reclaimed Mancos Shale steep slopes, this still may not be sufficient vegetative cover to control erosion. The reclaimability of this area to predisturbance conditions is yet to be proven. These areas were approved by OSM in 1985.

The disturbed areas will be seeded in the Fall. Fall is the locally accepted season of planting in this area.

Success standards for Phase II bond release will be judged by comparing the reclaimed areas to reference areas and pre-determined shrub density standards. Two reference areas were selected; a Pinyon-Juniper and Salt-Desert shrub. Reference areas are shown on Map 2-13. Baseline vegetative data for the two reference areas are detailed in a consultants report on pages 2-145 through 2-166 and 2-168. Vegetative cover, shrub and tree density and species lists were measured and compiled for these sites.

The postmining land use is for wildlife and livestock grazing. Therefore, diversity, cover productivity, and shrub stocking rates will be used to determine revegetation success using Division accepted statistical comparisons and confidence intervals (page 4-85). The period of extended responsibility will continue for a minimum of ten years. Quantitative vegetation monitoring will occur in years 2, 3, 5, 9 and 10. Productivity measurements will be taken in years 9 and 10 (pages 4-80 through 4-82 and 4-85 through 4-87) and reference area data in year 10.

COMPLIANCE

The permittee is in compliance with all sections of R614-301-300.

R614-301-400 LAND USE AND AIR QUALITY (SW)

R614-301-411 Environmental Description

Mining began in 1898 in an unnamed canyon in which the Des-Bee-Dove mines are now located. Mining has continued off and on until the present (page 3-1). Utah Power and Light purchased the mine from the LDS church in 1972. Both the Blind Canyon Seam (map 1-3) and Hiawatha Seam (map 1-3) were mined prior to August 3, 1977. Additionally, the haul road was built without Division approval and a cessation order was issued. As such, no pre-mining productivity or land conditions are available.

However, reference areas are representative of the premining condition of the land. Productivity data is given on page 2-154, and the ecological condition of these reference areas are rated as fair. Land uses within the permit area, as described by the land use agencies, are recreation, forestry and mining, non-rangeland, grazing, and sand and gravel, as designated on map 2-17A. A discussion on livestock and wildlife stocking rates is given on pages 2-220 and 2-221.

Two cultural resource surveys were conducted for the permit area. One survey in 1980 for the general permit area (pages 2-1 through 2-131) and another for the haul road (pages 2-134 through 2-142). No significant finds were reported by the consultant. A letter from the Utah Division of State History (page 2-132), dated August 8, 1990, confirms the consultants report.

R614-301-412 Reclamation Plan

The postmining land use is grazing and wildlife habitat (page 4-106). By regrading to approximate original contour and after revegetation, the wash area should provide equivalent vegetative cover. Other areas at the mine site will be regraded to approximate original contour. However, terraces will be incorporated into the landscape where once steep, eroded slopes were located (page 4-105). These terraces will provide enhanced vegetative cover from the original area and flat areas for the wildlife and livestock. The reclamation of the road system will leave a cattle trail for access to the top of East Mountain. The cattle trail will allow continued use of the area by cattlemen, sportsmen and property owners. The trail will exclude vehicle use. The absence of water limits the potential of other uses (page 4-106).

Land surface owners are the U.S. Forest Service, Bureau of Land Management and the State of Utah Division of Lands and Forestry. The right-of-way for the surface use of these lands state that each site will be restored to their natural state (page 4-107). The permittee believes that the reclamation of these lands is in compliance with the right-of-way and postmining land usage.

COMPLIANCE

The permittee is in compliance with all sections of R614-301-400.

R614-301-500 ENGINEERING (JK)

R614-301-512 Certification (See R614-301-731.700, .730, and .740)

Most cross-sections, maps, plans and engineering designs which require certification under this section have been certified by a qualified, registered, professional engineer (page 6 and certification stamps on individual maps and plans).

R614-301-513 Compliance with MSHA Regulations and MSHA Approvals

There are no impoundments which meet the size or volume criteria of 30 CFR 77.216(a), no coal processing waste dams or embankments, and no refuse piles at this mine site.

The mine was idled in February of 1987. At that time, all openings to the surface from underground were temporarily sealed and posted with warning signs, in accordance with 30 CFR 75.1711 (page 3-1). All openings will be maintained in this temporarily-sealed condition throughout the permit period. The Division will be given 30 days notice if and when the mine reopens.

R614-301-514 Inspections

There are no excess spoil disposal facilities or structures and no refuse piles which require inspection or certification.

The permittee commits to making quarterly inspections of the sediment pond and to include these inspections in the Annual Report (page 3-20). This commitment, however, is incomplete.

CONDITION R614-301-514.300-(1) (JK)

Within 45 days of permit renewal, the permittee must provide, for inclusion in the Operation Plan, a commitment to do the following:

1) Inspection of the sediment pond quarterly, either by a professional engineer or else by a specialist experienced in the construction of impoundments (514.310);

2) Certification of the quarterly report promptly after each inspection by a qualified, registered, professional engineer and to send a copy of the report to the Division (514.312); and

3) Annual certification of the sediment pond by a qualified, registered, professional engineer and inclusion of the certification in the Annual Report.

R614-301-515 Reporting and Emergency Procedures

In the event of either a slide or an impoundment hazard, the permittee is committed to notify the Division promptly and to comply with any remedial measures required to protect and ensure the public health and safety (page 3-18).

In the event that temporary cessation of operations is to extend beyond 30 days, the permittee is committed to notify the Division and to comply with all of the requirements of R614-301-513.300 (page 3-18).

R614-301-516 Prevention of Slides in Surface Coal Mining and Reclamation Activities

Not applicable.

R614-301-520 Operation Plan

R614-301-521.110 Previously Mined Areas

Maps 1-3 (Mine Permit Area with Mine Development - - Beehive/Little Dove Mine) and 1-4 (Mine Permit Area with Mine Development - - Deseret Mine) show the location and extent of known workings of active, inactive, and abandoned underground mines within the permit and adjacent areas.

R614-301-521.120 Existing Surface and Subsurface Facilities and Features

Maps 3-6 and 3-7 (Surface Facilities Location Map), and Map 3-10 (Existing Earthen Structures) correctly show the locations of buildings, facilities, features, and roads within and adjacent to the permit area.

R614-301-521.130 Landowners and Right of Entry and Public Interest Maps

Maps 1-1 (Coal Ownership Map) and 1-2 (Surface Ownership Map) correctly show the boundaries and present owners of all lands within or contiguous to the permit area as well as those lands upon which the permittee has the legal right to enter and begin coal mining operations.

R614-301-521.140 Mine Maps and Permit Area Maps

Maps 1-3 (Mine Permit Area with Mine Development - - Beehive/Little Dove Mine), 1-4 (Mine Permit Area with Mine Development - - Deseret Mine), 1-5 (Disturbed Area Boundary Map), 3-10 (Existing Earthen Structures), 4-1 (Final Reclamation Map), and 4-3 (Disturbed Area Cross Sections) correctly show all areas which will be affected by mining and reclamation operations. A planimeter check of the permit area and disturbed area as represented by the maps shows them to be very close to the respective values of 2847 acres and 74.5 acres calculated by the permittee.

R614-301-521.150 Land Surface Configuration Maps

Maps 3-6 and 3-7 (Surface Facilities Location Map), 3-8 (Surface Drainage Map), and 3-10 (Existing Earthen Structures) adequately represent the existing land surface configuration of the area affected by surface operations and facilities.

R614-301-521.160 Maps and Cross Sections of the Proposed Features for the Proposed Permit Area

Maps 1-2 (Surface Ownership Map), 1-5 (Disturbed Area Boundary Map), and 3-6 and 3-7 (Surface Facilities Location Map) show all buildings and facilities, bonded areas, coal loading and storage areas, noncoal waste storage areas, and explosive storage facilities.

R614-301-521.170 Transportation Facilities Maps

Roads and conveyors are the only transportation facilities at this mine. All are shown on Maps 3-6 and 3-7 (Surface Locations Map) and described in detail in the text of the mine plan (pages 3-43 through 3-46).

R614-301-521.200 Sign and Markers Specifications

The permittee commits to maintaining mine and permit identification signs, perimeter markers, buffer zone markers, topsoil markers, and explosive warning signs in the appropriate places. All signs will be made of thin sheet metal and each type will be of a uniform design (pages 3-17 through 3-18).

R614-301-522 Coal Recovery

The mining operation will involve only room-and-pillar methods. Pillars will be extracted, except in those areas where they may be needed for roof support. Only barrier pillars and strata control coal will be left in place. Using such mining methods, the permittee expects an overall coal recovery rate of just over 50%. The permittee

commits, moreover, to work with the Bureau of Land Management to extract the maximum amount of economically recoverable coal (pages 3-7 through 3-9).

R614-301-523 Mining Methods

The application contains a full description of the proposed mining operation. Room-and-pillar methods with continuous mining machinery will be employed. The mining plan will be based on a six-entry system, with 20-foot entries on 80-foot centers. Three to five entries will be driven in development sections, and these entries will be 20-feet wide and will be driven on 50-foot X 100-foot centers. Using these mining methods, the permittee expects to reach an annual production of approximately 800,000 tons (pages 3-7 through 3-17).

R614-301-524 Blasting and Explosives

Since the mine site is already fully developed, the permittee does not foresee the need for any surface blasting. However, should the need for explosives arise, the permittee commits to develop a blasting plan in accordance with this section (Appendix VI and page 3-46).

R614-301-525 Subsidence

The application contains a subsidence control plan which includes an inventory of the area likely to be affected by subsidence, a description of methods of subsidence control to be employed, plans for mitigation of subsidence-caused damage, and details of a subsidence monitoring plan (pages 4-148 through 4-160).

The area likely to be affected by subsidence contains renewable resources in the form of springs, water seeps, grazing land, timber, and wildlife. Streams in the area are all ephemeral or intermittent. No structures such as buildings, roads, powerlines, oil or gas wells, pipelines, or utility structures are found in the area (page 4-148).

Room-and-pillar mining with pillar extraction is, by definition, a method of planned and controlled subsidence. The permittee expects, therefore, that any subsidence will occur as a gradual and uniform lowering of the land surface with little effect on the resources of the area (page 4-149).

The permittee commits to mitigate any material damage caused by subsidence. Such mitigation will consist of repair of subsidence cracks, repair of fences or stock ponds, and restoration of lost or diminished water resources (pages 4-155 through 4-157).

Subsidence was originally monitored using a combination of conventional surveying and aerial photogrammetry. However, since 1987, aerial photogrammetry has been the sole method of gathering subsidence data. Subsidence data are gathered from a network of control points which are established over each panel. The data are compiled in both map and table form and are submitted to the Division in the Annual Report. Subsidence monitoring will continue until subsidence has ceased, as agreed upon by both the permittee and the Division (pages 4-150 through 4-155).

R614-301-526 Mine Facilities

The application contains a narrative explaining the construction, use, maintenance, and removal of all surface facilities. All facilities are listed, along with their respective dates of construction, on page 3-57. Individual descriptions of all facilities are located throughout the text of Part 3. All facilities are located on Maps 3-6 and 3-7 (Surface Facilities Location Map), and photographs of all facilities are found in Appendix IX.

The permittee commits to operating and maintaining all facilities in accordance with R614-301. All facility plans are on file and available for public inspection at PacifiCorp Electric Operations office in Salt Lake City, Utah (pages 3-19 through 3-72).

R614-301-527 Transportation Facilities

There are two primary roads and no ancillary roads in the permit area. The two primary roads are the mine access road and the Des-Bee-Dove/Wilberg junction road. The mine access road begins at the lower end of the mine property and ends in the area of the Beehive portal. It is approximately 6100 feet in length. The Des-Bee-Dove/Wilberg Haul Road begins near the lower end of the property, on Danish Bench, winds past the sedimentation pond, and ends at its junction with the Wilberg road. It is approximately 2.8 miles long (pages 3-43 through 3-45).

Seven conveyors are used in the coal handling and sizing process. They are (1) the Little Dove Conveyor, (2) the Transfer Reclaim Conveyor, (3) the Deseret Conveyor, (4) the Main Stockpile Feed Conveyor, (5) the Auxiliary Stockpile Feed Conveyor, (6) the Tipple Feed Conveyor, and (7) the Tipple Process Conveyor. All conveyors are 42 inches in width except for the Tipple Feed Conveyor, which is 36 inches in width.

The Little Dove Conveyor delivers coal from the Little Dove portal to the stacking tube transfer, from the base of which it is delivered to the Deseret transfer by the Transfer Reclaim Conveyor. The Deseret Conveyor delivers coal to the Deseret transfer from both the Deseret mine and the Beehive mine via an underground transfer.

Two conveyors leave the Deseret transfer: the Main Stockpile Feed Conveyor and the Auxiliary Stockpile Feed Conveyor. The Main Stockpile Feed Conveyor delivers coal from the Deseret Transfer to the Main Stockpile by way of the picking table and the large concrete surge bin. The Auxiliary Stockpile Feed Conveyor delivers coal from the Deseret transfer to the upper coal storage pile, which lies next to the Main Stockpile and on the same earthen pad.

The Tipple Feed Conveyor takes coal from the base of the Main Stockpile to the Tipple and the Tipple Process Conveyor. The Tipple Process Conveyor, of course, is simply the internal tipple conveyor system (pages 3-45 through 3-46).

R614-301-528 Handling and Disposal of Coal, Overburden, Excess Spoil, and Coal Mine Waste

Coal is carried to the tipple from the mines by the conveyor system described in Section 527 (Transportation Facilities) above. It is sized and sorted in the tipple process. It is then loaded into trucks at the tipple and carried from there to its various destinations, primarily the Hunter Power Plant (pages 3-26 through 3-27).

Little, if any, overburden or spoil is now produced at this mine. That which was produced in the past was produced before 1977 and was incorporated into the various earthen fill structures and will be used as fill in final reclamation (pages 3-22).

No coal processing waste is produced as coal is not washed at this site.

Noncoal mine waste is gathered in concrete trash bins near the mine portals and in a pile below the tipple. As required, the noncoal waste is hauled from these bins to a state landfill for disposal (page 3-28).

R614-301-529 Management of Mine Openings

This mine has been idle since February 6, 1987. All mine openings have been sealed with temporary seals. All openings have, in addition, been fenced and posted with warning signs to prevent entry by unauthorized persons or by wildlife (pages 3-1 and 3-6). This temporary closing of the portals is in accordance with 30 CFR 75.1711-3.

R614-301-530 Operational Design Criteria and Plans

R614-301-532 Sediment Control

The total disturbed area of the mine site, including the sedimentation pond, is only 74.5 acres. Because of the steep topography and lack of space, the area designed for runoff collection and sediment control is almost 300 acres.

Runoff from both disturbed and undisturbed areas is collected by the drainage system and routed to the sedimentation pond. The drainage system consists of berms and ditches which catch the runoff from the pad areas and of underground culverts which collect this runoff, carry it beneath the permit area, and discharge it into the main channel of the canyon. The runoff follows the main channel then enters a large 72-inch diameter culvert which carries it beneath the Des-Bee-Dove/Wilberg Haul Road, and discharges into the sedimentation pond just south of that road. The entire runoff collection system, including the sedimentation pond, is designed to completely handle a 10-year, 24-hour storm event (pages 3-33 through 3-42 and 3-51 through 3-55).

Sewage from the office and bathhouse is collected in a 2500-gallon septic tank just south of the office complex. Treated effluent from the septic tank goes through a 6-inch line to a leach field near the tipple (page 3-38).

Areas, the runoff from which cannot be routed to the sedimentation pond, are designated as Alternative Sediment Control Areas (ASCAs). These areas are listed in Table 7, page 3-40. The sediment control for these areas consists of silt fences, straw bales, gravel filter dikes, berms, and catch basins. The total ASCA area for the mine site is 1.24 acres (pages 3-38 through 3-40).

In addition to the sediment control measures already mentioned, the permittee commits to contemporaneous reclamation and revegetation of denuded areas (pages 3-38 through 3-42).

R614-301-533 Impoundments

To meet State and Federal effluent limitations, a single sedimentation pond was constructed in 1979. The pond has a capacity of 19.8 acre-feet, which is adequate to completely contain a 10-year, 24-hour storm event. The pond is partly incised and partly banked. It lies south of the mine site in the bottom of the main channel of the canyon (pages 3-52 through 3-55 and Appendix VIII).

The sediment pond was analyzed for static and seismic stability by the firm of Chen Northern, Inc. in August of 1990. Chen Northern used, for the analysis, a standard rotational failure model (Bishop's Simplified Method of Slices). The pond embankments were found to have a minimum static factor of safety of 1.65 and a minimum seismic (pseudo-static with acceleration of 0.1g) factor of safety of 1.28. These figures compare favorably with the respective required minimum values of 1.5 and 1.2 (Appendix III).

R614-301-534 Roads

There are two primary roads and no ancillary roads in the permit area. The two primary roads are the mine access road and the Des-Bee-Dove/Wilberg junction road. The mine access road begins at the lower end of the mine property and ends in the area of the Beehive portal. It is approximately 6100 feet in length. It is paved below the office/bathhouse/warehouse pad and gravel surfaced above there. Its average grade is about 10%. Plans, profiles, and cross-sections for the mine access road are found in Map 3-9 (pages 3-43 through 3-44)

The Des-Bee-Dove/Wilberg Haul Road begins near the lower end of the property, on Danish Bench, winds past the sedimentation pond, and ends at its junction with the Wilberg road. It is approximately 2.8 miles long and is paved over its entire length. Plans, profiles, and cross-sections for the Des-Bee-Dove/Wilberg junction road are found in Appendix XIV (pages 3-43 through 3-44).

The road embankments were analyzed for static stability by the firm of Chen Northern, Inc. in August of 1990. Chen Northern used, for the analysis, a standard rotational failure model (Bishop's Simplified Method of Slices). The embankments were found to have a minimum static factor of safety of 1.72. This figure compares favorably with the required minimum value of 1.3 (Appendix III).

R614-301-535 Spoil

No spoil is now produced at this mine. Spoil which was produced in the past was produced before 1977 and was incorporated into the various earthen fill structures and will be used as fill in final reclamation (page 3-22).

R614-301-536 Coal Mine Waste

Coal mine waste, including sedimentation pond cleaning waste, is disposed of in a 16-acre waste rock disposal facility which lies just west of the Cottonwood/Wilberg haul road. This facility is shared with the Cottonwood/Wilberg Mine and was permitted in 1990 as a major revision of the Cottonwood/Wilberg permit (ACT/015/019).

The waste rock disposal facility is essentially a head-of-hollow fill which lies at the head of an ephemeral wash near the base of a cliff. Waste rock is placed in the fill and compacted in 10-foot lifts. As each lift is being filled, its outslopes are covered with topsoil and revegetated. This cycle of compaction and contemporaneous reclamation will continue until the design capacity of the entire facility is reached (page 3-43 and Cottonwood/Wilberg Waste Rock Storage Facility Volume, ACT/015/019).

R614-301-537 Regraded Slopes

See R614-301-533 (Backfilling and Grading) below.

R614-301-540 Reclamation Plan

R614-301-542 Narratives, Maps and Plans

542.100 Reclamation Timetable -- In accordance with this section, the PAP includes a detailed timetable for the completion of each major step in the reclamation plan. The timetable shows the time estimated for the completion of each major step in reclamation as if that step were an operation in itself. Most of the reclamation operations, however, will be conducted concurrently rather than consecutively. Thus, the initial phase of reclamation, which will involve the largest proportion of reclamation activities -- and which will include removal of facilities, portal sealing, backfilling and grading, disposal of toxic- and acid-forming materials, drainage channel installation, and revegetation -- is expected to take approximately 105 days. Reclamation of the Des-Bee-Dove/Wilberg Haul Road and the sediment pond will be accomplished five years into the reclamation period and is expected to take approximately 70 days (pages 4-109 through 4-115).

542.200 Backfilling Plan -- In accordance with this section, the PAP includes a plan for backfilling, soil stabilization, compacting and grading (see R614-301-553 "Backfilling and Grading").

542.300 Final Surface Configuration Maps -- Map 4-1 (Final Reclamation Map), which includes five sheets, shows the planned final surface configuration with contour maps (sheets 1, 2, and 3) and cross-sections (sheets 4 and 5). These sheets, however, do not accurately represent the final surfaces, or the required and available volumes of material for the various earthwork operations. In addition, Map 3-10 (Existing Earthen Structures), which is tied to Map 4-1, does not clearly show what material will be displaced. These deficiencies were discussed in a May 29, 1991 meeting between Jesse Kelley of the Division and Blake Webster of PacifiCorp Electric Operations.

CONDITION R614-301-542.300-(1) (JK)

Within 45 days of permit renewal, the permittee must revise and submit the following text and maps for inclusion in the PAP:

1) Map 3-10 (Existing Earthen Structures) must be modified to show, by shading, those areas which are used in estimating volumes of material which will contribute to the backfilling of highwalls, portal faceups, and the bathhouse/warehouse cut. This map must also show, by

crosshatching, highwalls, portal faceups, and other areas which will receive fill material.

2) Map 4-1 (Final Reclamation Map), sheet 2, must be modified to accurately show the anticipated final surface configuration of the present earthen fill structures.

3) Map 4-1 (Final Reclamation Map), sheet 5, must be modified to correspond to Map 3-10, i.e., it must show those areas that will receive and those that will contribute fill material with the same shading and crosshatch scheme used on Map 3-10.

4) Accurate cross-sections of the bathhouse/warehouse pad must be added to Map 4-1 (Final Reclamation Map), sheet 4. These cross sections must demonstrate that there is sufficient material available at the edge of the bathhouse/warehouse pad to completely backfill the pad, when that material is combined with the material that will be contributed by the other fill structures.

5) Earthwork quantities summarized on page 4-6 must be modified to verify the recalculated volume estimates as a result of the map and cross section changes.

542.500 Timetable and Plan for Sediment Pond Removal -- In accordance with this section, the PAP includes a plan and timetable for removal of the sediment pond. Removal of the sediment pond will take place five years after the start of the reclamation period. The pond will first be drained and allowed to dry. It will then be broken down and backfilled to achieve the original contour of the area and reestablish the original drainage (pages 4-88 through 4-89 and Map 4-1, sheet 3).

542. 600 Roads -- In accordance with this section, the PAP includes plans for reclaiming all roads. There are two primary roads: the Portal Access Road and the Des-Bee-Dove/Wilberg Haul Road.

The portal access road will be reclaimed during the initial phase of reclamation. The asphalt surface will be removed and buried at the base of the bathhouse/warehouse fill (page 4-132). The road surface will then be ripped, covered with topsoil, and revegetated (pages 4-89 through 4-90). The road, in its roughened condition, will be left as a cattle trail to East Mountain as part of the postmining land use of grazing and wildlife habitat (pages 4-106 through 4-107).

The Des-Bee-Dove/Wilberg Haul Road will be left in place during the first five years of the reclamation period to provide access to the sediment pond. At the time of sediment pond removal, the road will also be reclaimed. The asphalt surface will be

removed and covered with at least four feet of inert material at the north end of the road. All culverts will then be removed and the drainages restored. The road will then be backfilled and graded with material displaced during its construction and revegetated (pages 4-7 through 4-9 and 4-126 through 4-127).

542.700 Final Abandonment of Mine Openings and Disposal Areas -- All portals have been fenced and posted to prevent entry of wildlife or unauthorized persons. During reclamation, all portals will be sealed with concrete block walls and backfilled with at least 25 feet of noncombustible fill material. Since the mine workings are down dip from the portals, no hydrologic seals or drainage structures will be necessary (page 4-1 and Figure 1 of Chapter 4).

No fills, embankments, or other structures for disposal of spoil, coal mine waste, or noncoal mine waste are present at this site. Spoil and underground development waste were incorporated into the various earthen fills when the mine was opened, which was prior to 1977. These materials will be used in the backfilling and grading of the site during final reclamation.

542.800 Reclamation Cost Estimate -- In accordance with this section, the PAP contains a detailed estimate of reclamation costs upon which the bond amount is based (pages 4-109 through 4-147). The total estimated reclamation cost is $1,254,519 (1985 dollars). The total bond amount presently posted is $1,837,712. Using the Means Historical Cost Index escalation factor of 1.84% (1990), the original total estimated reclamation cost of $1,254,519 equates to $1,505,432 (1995 dollars). Thus, the present bond amount is adequate.

The reclamation cost is complete and represents the cost of final reclamation.

R614-301-550 Reclamation Design Criteria and Plans

R614-301-551 Casing and Sealing of Underground Openings

All portals have been fenced and posted to prevent entry of wildlife or unauthorized persons. During reclamation, all portals will be sealed with concrete block walls and backfilled with at least 25 feet of noncombustible fill material (page 4-1 and Figure 1 of Chapter 4). This is consistent with MSHA, 30 CFR 75.1711 and represents sound engineering procedure.

Since the mine workings are down dip from the portals, no hydrologic seals or drainage structures will be necessary.

R614-301-552 Permanent Features

No small depressions or impoundments of any kind will be retained after final reclamation.

R614-301-553 Backfilling and Grading

There are eight areas where backfilling and grading will take place. They are (1) the Beehive/Little Dove Portal Area, (2) the Deseret Portal Area, (3) the Stockpile Area, (4) the Tipple Pad, (5) the Bathhouse/Warehouse/Parking Area, (6) the Portal Access Road, (7) the Des-Bee-Dove/Wilberg Haul Road, and (8) the Sediment Pond Area. These areas will be graded and/or backfilled as follows:

1) Beehive/Little Dove Portal Area

This is a fill area at the head of the canyon. Material from the fill will be used to completely backfill the highwall and the portals. Some surplus material will also go into the Bathhouse/Warehouse/Parking fill. The fill will then be excavated to bedrock to restore the drainage. The maximum slope will be 2h:1v (pages 4-3, 4-4, 4-6, 4-121, Plates 3-10 and 4-1).

2) Deseret Portal Area

This is a fill area just below the Beehive/Little Dove Portal Area. Material from the fill will be used to completely backfill the highwall and the portals. Some surplus material will also go into the Bathhouse/Warehouse/Parking Fill. The fill will then be removed to bedrock to restore the drainage (pages 4-3 and 4-6, Plates 3-10 and 4-1).

3) Stockpile Area

This is a fill area just below the Deseret Portal Area fill. The area has no highwalls or portals. Material from the fill will be pulled back to fill the area. Some surplus material will also go into the Bathhouse/Warehouse/Parking fill (pages 4-3 and 4-6, Plates 3-10 and 4-1).

4) Tipple Pad

This is the largest of the earthen fill structures. The outslope of the structure was cut back in 1984 to a slope of 2h:1v in order to improve stability and raise the factor of safety above the required 1.5 (R614-301-537.230). This fill, which was constructed before 1977, constitutes a "settled and revegetated" fill under R614-301-537.200 and, as such, will not be removed. Instead, the drainage will be established around the fill by way of a riprap channel and will descend the face of the fill by way of a large riprap fan (pages 4-4, 4-5, 4-92, Plate 3-10 and 4-1).

The material in the Tipple Area Fill will be characterized by subsurface sampling during the summer of 1991 (see Condition R614-301-233). This will serve to determine whether or not the fill is made up of acid- and toxic-forming material (pages 4-3, 4-5, 4-91, Plates 3-10 and 4-1).

5) Bathhouse/Warehouse/Parking Area

This is a large cut and fill structure that lies southwest of the Tipple Area. It will be completely backfilled and terraced using material from its outslope as well as material borrowed from the other fill structures. The maximum slope will be 3h:1v (pages 4-4, 4-5, 4-6, 4-122 through 4-125, Plate 3-10 and 4-1).

6) Portal Access Road

This is the main road through the property from the entrance gate to the Beehive/Little Dove Portal Area. It will be reclaimed during the initial phase of reclamation. The asphalt surface will be removed and buried at the base of the bathhouse/warehouse fill (page 4-132). The road surface will then be ripped, covered with topsoil, and revegetated (pages 4-89 through 4-90). The road, in its roughened condition, will be left as a cattle trail to East Mountain as part of the postmining land use of grazing and wildlife habitat (pages 4-106 and 4-107, Plates 3-10 and 4-1).

7) Des-Bee-Dove/Wilberg Haul Road

This road will be left in place during the first five years of the reclamation period to provide access to the sediment pond. At the time of sediment pond removal, the road will also be reclaimed. The asphalt surface will be removed and buried with at least four feet of inert material at the north end of the road. All culverts will then be removed and the drainages restored. The road will then be backfilled and graded with material displaced during its construction and revegetated (pages 4-7, 4-8, 4-9, 4-126, and 4-127).

8) Sediment Pond

Removal of the sediment pond will take place five years after the start of the reclamation period. The pond will first be drained and allowed to dry. It will then be broken down and backfilled to achieve the original contour of the area and reestablish the original drainage (pages 4-88, 4-89, and Plate 4-1).

The entire disturbed area will be graded and all earthen structures except the tipple pad filled or reduced to achieve approximate original contour. All highwalls (Beehive/Little Dove Area, Deseret Portal Area, and Bathhouse/Warehouse/Parking Area) will be completely eliminated and depressions will be filled. Only the Portal Access Road will be left, and it will be in a broken and roughened condition. As has

been mentioned, the Portal Access Road, as reclaimed, will serve as a cattle trail to East Mountain, constituting an enhancement of the postmining land use of grazing and wildlife habitat (Plate 4-1).

A slope stability analysis of the bathhouse/warehouse fill was performed in August of 1990 by the firm of Chen Northern, Inc. (Appendix III). The stability analysis done by Chen Northern determined the relevant characteristics of the fill material (page 4-91) and used these in a standard rotational (Bishop's Method of Slices) failure model. The static factor of safety for a 2h:1v slope was found to be at least 1.74. Since no reclaimed slope will be steeper than 2h:1v, the static factor of safety for all grading and backfilling should be at least 1.74, which compares very favorably with the required value of 1.3 (533.130).

Material used in backfilling will be minus 3 inches. Material will be placed in 18-inch lifts and compacted in constructing the fills (page 4-90). The factor of safety is acceptable, and the foundation of all fills is and will be solid bedrock. The stability of all postmining slopes meets the requirements for backfilling and grading.

COMPLIANCE

The permittee is in compliance with all sections of R614-301-500, except condition R614-301-514.300-(1) and R614-301-542.300-(1) (JK).

R614-301-700 HYDROLOGY (TM)

R614-301-710 Introduction

Existing hydrologic resources are discussed in Volume 9 (section R614-301-722) of the PAP. All springs have been identified, as well as, any perennial, intermittent or ephemeral drainage on Map HM-5. Groundwater is also discussed in Volume 9.

R614-301-711.300 General Requirements

The methods and calculations utilized to achieve compliance with hydrologic design criteria and plans required by R614-301-740 are found on pages 4-11 through 4-57 of the PAP.

R614-301-713 Inspection

Inspection of all sediment ponds will be conducted quarterly. A certified annual report will be submitted to the Division (page 3-53 of the PAP).

R614-301-720 Environmental Description

722.100 No subsurface water has been encountered in the mine and the mine was bounded by faults on either side of the permit area leaving the area basically devoid of any aquifers.

722.200 The location of surface water bodies such as streams, lakes, ponds, and springs can be found on Map HM-5, Volume 9.

722.300 The elevations and locations of monitoring stations used to gather baseline data on water quality and quantity in preparation of the application is found on Map HM-1 of the PAP. The only surface water monitoring station is UPDES monitoring point UT-0023591-001 as shown on Map HM-1. Spring 82-51 is monitored according to accepted Division Guidelines (Volume 9).

722.400 No water wells are known to exist in the permit area or adjacent area.

R614-301-724 Baseline Information

All information related to hydrologic baseline and operational data collection and sampling programs is delineated in Volume 9 of the PAP. The permittee has identified all surface and groundwater sampling locations, parameters sampled, and monitoring schedules in Appendix A of Volume 9 of the PAP.

R614-301-724.400 Climatological Information

Climatological information is described in Volume 9 of the PAP. The permittee maintains a rainfall gauge and weather station above the Des-Bee-Dove Mine as shown on Map HM-1. All data from the weather station is submitted quarterly to the Division. This includes rainfall, temperature, and humidity.

R614-301-724.500 Supplemental Information

All supplemental information regarding erosion control test plots and treatments are contained on pages 4-70 through 4-72. These plots were set up to ascertain what erosion control treatments would provide protection from erosion on Mancos Shale. In addition to the current test plots, the permittee proposes to develop some additional test plots adjacent to the existing test plots incorporating a variety of treatments and soil amendments. These test plots will help better define the use of various erosion control and planting techniques (see Reclamation Study Update dated February 15, 1991).

R614-301-724.600 Survey of Renewable Resource Lands

Discussion of renewable resources and damage due to subsidence addresses the potential for impact related to subsidence and indicates no impact will occur (page 4-149). No damage to renewable resources have been documented to date.

R614-301-725 Baseline Cumulative Impact Area Information

Necessary hydrologic and geologic information in Volumes 2 and 9 of the PAP, addresses the Cumulative Impacts on the Hydrologic Balance for the Des-Bee-Dove Permit Area.

Increase in TDS (primarily sodium, calcium magnesium, bicarbonate, and sulfate, and TSS will occur and possible diminution of spring flow due to subsidence-related effects were the two impacts identified in the initial permit issued on June 20, 1985 (see CHIAS, Appendix I).

On going water monitoring is discussed in the current PAP in regards to the spring monitoring in Volume 9. It was interpreted in the initial permit review that monitoring of springs would provide the necessary documentation to determine the effects of subsidence. Spring 82-51 will be monitored during the months of July through October and raw data submitted quarterly as referenced in Volume 9.

Reclamation studies are in progress to better define the best erosion control methods and water harvesting methods to achieve reclamation success.

R614-301-727 Alternative Water Source Information

The discussion regarding water replacement is acceptable in that the PAP provides enough detailed information on existing water rights to identify the ownership of springs identified within the permit area as shown in Table HT-4. Any loss or adverse occurrence to water rights will be reported to the Division within ten days and then meet the applicant with the Division to determine the necessary course of action.

R614-301-728 Probable Hydrologic Consequences (PHC) Determination

The PHC makes certain findings regarding the hydrologic balance, acid- or toxic-forming materials, sediment yield, water quality, flooding, and other characteristics as determined by the Division.

The original permit issued by OSM determined that the "reclamation of the Haul Road will involve removal of all culverts. Material from culvert excavation will be used to cover the remaining road sections. The ephemeral stream channels will be returned to their original condition" (OSM's Technical Analysis, Hydrologic Balance -

Surface Water, page 13). The reclamation of the Des-Bee-Dove Mine site and Haul Road are the current major issues being reviewed regarding Hydrologic Consequences. No real analysis was made regarding the long-term stability of the road reclamation and its impact on surface water in the original permit.

728.200 The PHC determination is based on baseline hydrologic geologic and other information collected for the permit application and includes data statistically representative of the site.

A determination was made in the original permit approval that reclamation could be achieved without material damage to the hydrologic balance outside the permit area (Technical Analysis, OSM, 1985). Many concerns regarding reclamation of the Des-Bee-Dove Haul Road have been raised since the operation of the haul road and subsequent erosion of hillslopes have become a major issue in regards to the success of the haul road regrading and reclamation. To date, no data has been submitted to the Division from test plots involving the proposed reclamation study submitted to the Division February 22, 1991. There is very little documentation which demonstrates that successful reclamation on Mancos Shale (i.e., haul road) can be achieved. The original permit became effective on June 20, 1985 and the original Des-Bee-Dove Haul Road was constructed in 1983 and not included in the original permit because it was considered a public road. No prior studies or baseline data were collected prior to construction of the road.

It is felt that at this point in time, the permittee has offered to use what the permittee considers to be the best techniques available regarding reclamation and stabilization of Mancos Shale as discussed on page 4-89 of the PAP. To date, no conclusive statements can be made on the appropriateness of these sediment control methods other than they have been tried and no data has been generated regarding their long term success or failure.

CONDITION R614-301-728-(1) (TM)

Within 45 days of permit renewal, the permittee must submit a detailed plan for inclusion in the PAP, as to how the following information from the proposed test plots will be achieved, based on the following requirements:

728.331 Predicted sediment yield from the reclaimed haul road area;

728.332 Acidity, total suspended and dissolved solids and other important water quality parameters of local impact from the impact of coal mining and reclamation operations; and

728.335 Characterizations required by the Division for the test plots which must include:

1) Application methodology assessment for hydromulch (i.e., treatment method-soil prewetted prior to application to allow for better absorption of stabilizers) and other treatments, implying different methods of application must be tried and evaluated;

2) Soil bed preparation (roughness of seedbed) in relation to erosion control; and

3) Runoff collection on test plots to determine water quality (i.e., TDS and TSS).

R614-301-730 Operation Plan

R614-301-731 General Requirements

The plan includes the measures to prevent, to the extent possible, additional contributions of suspended solids to streamflow within the mine area, not the haul road. Data from the test plots on the haul road have not been generated regarding success or failure of various types of erosion control. There are numerous culvert crossings and channel rebuilds planned along the remainder of the haul road (page 4-89). The permittee insists a prior Division approval is criteria for acceptance of the permittee's sediment control policy. This approval (i.e., Division letter dated November 27, 1985), however, was in reference to the Deseret sediment pond removal **only**.

The use of soil stabilizers, hydromulch, and contour furrows constitutes a conceptual requirement for treatment of one portion of the haul road and does not provide the Best Technology Currently Available (BTCA) for the remainder of the haul road that does not drain to the Deseret Sediment Pond.

CONDITION R614-301-731-(1) (TM)

Within 45 days of permit renewal, the permittee must submit technically adequate plans, for inclusion in the PAP, for sediment control (BTCA) on all areas not being treated by the sediment pond during reclamation. The PAP must include all sediment control measures and siltation measures with design criteria, cross-sections and maps as required by rule R614-301-742.110, Sediment Control Measures.

731.121 Surface water protection must be addressed in a comprehensive BTCA plan regarding the haul road reclamation. The main mine site must be treated by the sediment pond until it is approved for removal based in the requirements of R614-301-763, Siltation Structures.

CONDITION R614-301-731.121-(1) (TM)

Within 45 days of permit renewal, the permittee must submit a detailed BTCA plan as an appendix to the PAP which specifically addresses the following issues (this is required in addition to the current plan, to use contour furrows and berms as shown on Plate 4-1, sheet 3 of 5):

1) A plan for providing sediment control during construction and following construction of all stream crossings and culvert removal sites where permanent diversions will be installed;

2) A revised and upgraded plan for the contour furrows and berms as shown on Plate 4-1, sheet 3 of 5 to address the runoff storage capacity of these BTCA measures in relation to the 10-year, 24-hour storm runoff volume. This will verify the treatments' effectiveness in providing treatment for all areas not draining to the sediment pond. This must be included in a BTCA Appendix showing all areas treated with BTCA measures other than sediment ponds; and

3) The assessment of the runoff water quality must be included as a design criteria for the test plot study. The data must be interpreted and included as part of the BTCA appendix upon submittal following test plot implementation. The plan must identify the surface water quality and quantity parameters to be monitored, sampling frequency and site location.

R614-301-731.200 Water Monitoring

The permittee currently monitors one spring 82-51, T17S R7E S26, WR #93-1605-F.S., shown on Map HM-5, Volume 9. In addition to this spring, the permittee monitors the sediment pond using discharge permit #UT-0023591; expiring October 31, 1992, as described in Volume 9 of the PAP. Since all drainage is ephemeral in nature and the sediment pond sits below all mine site disturbance, it becomes the sole monitoring point of significance. A detailed BTCA plan discussing monitoring locations, sampling frequency and parameters will be submitted as part of the conditional response to R614-301-731.121.

R614-301-731.300 Acid- and Toxic-Forming Materials (TM & HS)

All acid- and toxic-forming materials will be properly identified and treated when necessary as discussed on page 4-90 of the PAP.

Waste rock disposal plans and the reclamation plans are described for the old (now reclaimed) Cottonwood/Wilberg Waste Rock Storage Site in Appendix V. If a

coal mine activities resume, a roof and floor sampling plan approved by the Division and implemented. All future waste rock and sedimentation pond waste will be disposed of in the New Cottonwood/Wilberg Waste Rock Facility (pages 3-28 and 3-55).

The permittee has committed to covering all acid- and/or toxic-forming materials with at least four feet of nonacid- and nontoxic-forming materials or disposing of said material in an approved disposal facility within a permitted area (page 4-69).

Subsequent to facility demolition and prior to backfilling and grading, the permittee will conduct a soil/spoil sampling program to identify acid- and/or toxic-forming materials. Sampling methods and techniques will follow the procedures outlined on pages 4-100 through 4-102. If analysis indicate the presence of acid- and/or toxic-forming materials, additional sampling will be conducted.

731.400 No wells have been identified within the permit area.

731.500 No discharges are permitted within the permit area.

731.521 All portal seals are designed to prevent gravity discharges from the mine.

731.600 Stream Buffer Zones are not applicable to this PAP, due to the fact that all drainage is ephemeral in nature.

731.700 All water diversions are shown on certified Plate 3-11 for the main mine site. All storm water impoundment drawings are shown in Appendix VIII.

731.730 A map showing locations and elevations of each surface water station used for monitoring, shown on Map HM-5 and HM-1 is not certified.

731.740 Map HM-5 which shows the location of the Des-Bee-Dove Sediment Pond is not certified.

731.750 Cross-sections found in Appendix VIII of the PAP which show the cross-sections of the sediment pond are not certified.

CONDITION R614-301-731.700-(1) (TM)

Within 45 days of permit renewal, the permittee must submit certified cross-sections of the sediment pond and certify maps HM-1 and HM-5 per the requirements identified in R614-301-731.730, R614-301-731.740 and R614-301-731.750.

731.800 Water Rights and Replacement

The permittee has provided a statement which commits to replace any water determined to be lost or adversely affected as a result of the permittee's mining operations (page 4-156 of the PAP).

R614-301-740 Design Criteria and Plans

R614-301-742 Sediment Control Measures

The permittee has addressed what sediment control measures will be implemented for the mine site on areas not draining to the sediment pond (page 3-40 of the PAP and shown on Plate 3-7, sheet 3 of 3). The total drainage area of 1.24 acres was calculated. Monitoring and sampling will be completed as delineated on page 3-40.

The remainder of the mine site and the surrounding area is treated by the sediment pond as shown on Plate HM-1.

The permittee provided a plan for implementing test plots as described in Des-Bee-Dove Haul Road Reclamation Study to verify the success of reclamation methodologies on the reclaimed road.

R614-301-742.220 Sedimentation Ponds

The sediment pond was designed to contain treat the 10-year, 24-hour precipitation event. The pond is decanted down to the decant elevation of 6757.0 after a 24-hour detention time is maintained by a non-clogging dewatering device as shown in Appendix VIII. All calculations, drawings, and cross-sections of the sediment pond are contained in Appendix VII and VIII, and discussions are included on pages 3-53, 3-54 and 3-55 of the PAP.

The permittee appears to be in compliance with this rule but needs to supply the following additional information to clarify the plan and to confirm compliance.

CONDITION R614-301-742.220-(1) (TM)

Within 45 days of permit renewal, the permittee must provide drawings in Appendix VIII that provide consistent information regarding the sediment pond. Three as-built drawings in Appendix VII provide three different pond bottom elevations. Page 3-54 of the PAP states five feet of clearance between a full sediment load elevation and the decant elevation. None of this information is in agreement (drawing #01-52-1-015 was revised on February 24, 1989 and October 1, 1984, to show as-built plans).

In addition to accurate as-built drawings and cross-sections being provided, the following information must also be submitted:

1) Sediment levels and clean-out elevations marked on all cross-sections (cross-sections are not marked as-built and certified);

2) Decant and clean-out procedures and a sediment testing and storage plan per Division guidelines;

3) A discussion of how sediment levels are determined to meet the 60% clean-out elevation determination; and

4) Calculations to prove that the open channel spillway is of nonerodible construction and capable of maintaining sustain flows. Riprap sizing calculations for the spillway must be included in Appendix VIII.

R614-301-742.300 Diversions

Diversions have been constructed on the main mine site property to minimize adverse impact to the hydrologic balance. Drawings (Plate 3-8 sheet 1 of 2 and 2 of 2) and discussions found in Appendix VII do not currently include any calculations for the existing hydrologic structures at the Des-Bee-Dove Mine Site.

CONDITION R614-301-742.300-(1) (TM)

Within 45 days of permit renewal, all hydrologic calculations for existing hydrologic structures at the Des-Bee-Dove Mine site must be submitted for inclusion in the PAP.

COMPLIANCE

The permittee is in compliance with all sections of R614-301-700, except conditions R614-301-728-(1), R614-301-731-(1), R614-301-731.121-(1), R614-301-700-(1), R614-301-742.220-(1), and R614-301-742.300-(1) (TM).

jbe
A:\DBD.TA

Copy PAM
ACT/015/017 #3

PACIFIC POWER • UTAH POWER

324 South State
P.O. Box 26128
Salt Lake City, Utah 84126-0128

PACIFICORP
ELECTRIC OPERATIONS GROUP

January 4, 1991

Ms. Pamela Grubaugh-Littig
Permit Supervisor
Utah Division of Oil, Gas and Mining
355 West North Temple
3 Triad Center, Suite 350
Salt Lake City, Utah 84180-1203

Re: Public Notice, Proof of Publication, Five-Year Permit Renewal, PacifiCorp Electric Operations (UP&L), Des-Bee-Dove Mine ACT/015/017, Folder #3, Emery County, Utah

Dear Ms. Littig:

Please find enclosed a copy of the notarized Affidavit of Publication for the above-referenced renewal from the Emery County Progress dated December 25, 1990. Two pages were required for a single complete copy of the Notice due to the manner in which the Notice was folded and attached to the Affidavit.

Respectfully yours,

J. Blake Webster
Permitting Administrator

cc: Val Payne
Scott Child
File

JBW001

ECP 08 6 h 02 05 88

AFFIDAVIT OF PUBLICATION

STATE OF UTAH)
ss.
County of Emery,)

I, Dan Stockburger, on oath, say that I am the Publisher of the The Emery County Progress, a weekly newspaper of general circulation, published at Castle Dale, State and County aforesaid, and that a certain notice, a true copy of which is hereto attached, was published in the full issue of such newspaper for Four (4) consecutive issues, and that the first publication was on the

4th day of December, 19 90

and that the last publication of such notice was in the issue of such newspaper dated the

25th day of December, 19 90

Subscribed and sworn to before me this

25th day of December, 19 90

Holly Jo Crofts
Notary Public.

My Commission expires October 22, 1994

Residing at Price, Utah

Publication fee, $ 422.40

Notary Public
HOLLY JO CROFTS
260 North 600 West
Price, Utah 84501
My Commission Expires
October 22, 1994
State of Utah

NOTICE

PacifiCorp Electric Operations (successor in interest to Utah Power & Light Company), PO Box 26128, Salt Lake City, Utah 84126-0128, hereby announces its intent to file an application for renewal of a Coal Mining Permit for the Des Bee Dove Mine with the Division of Oil, Gas and Mining under the laws of the State of Utah and the Office of Surface Mining.

A copy of the complete application is available for public inspection at the Emery County Recorder's Office, Emery County Courthouse, Castle Dale, Utah 84513.

Written comments on the application should be submitted to the State of Utah, Division of Oil, Gas and Mining, 355 West North Temple, 3 Triad Center, Suite 350, Salt Lake City, Utah 84180-1203.

The area to be mined is contained on the U.S.G.S. 7.5-minute "Red Point" quadrangle map.

Utah, containing 80 acres
Lease No. SL-066116
Issued to Samuel K. Howard 6/1/55
Section 11 E1/2
Section 14 N1/2NE1/4
Section 12 W1/2NW1/4, NW1/4SW1/4
Township 17 South, Range 7 East, SLM
Utah, containing 520 acres

OWNERS OF COAL TO BE MINED OTHER THAN THE UNITED STATES

Description of Land:
Section 11 SE1/4NW1/4, E1/2SW1/4
Section 14 E1/2NW1/4, SW1/4
Section 23 NW1/4, SE1/4, NW1/4NE1/4, S1/2NE1/4
Section 26 NE1/4, NW1/4SE1/4
Township 17 South, Range 7 East, SLM
Utah, containing 1,000 acres
Owner:
PacifiCorp Electric Operations (successor in interest to Utah Power & Light Company)
324 South State Street
PO Box 26128
Salt Lake City, Utah 84126-0128

Description of Land:
Section 14 W1/2NW1/4
Section 11 W1/2SW1/4
That part lying East of the Deer Creek Fault
Township 17 South, Range 7 East, SLM Utah
Owner:
The Malcolm McKinnon Estate
Zions First National Bank Trustee
Salt Lake City, Utah 84111

SURFACE OWNERS OF RECORD WITHIN THE PERMIT AREA

Description of Land:
Section 11 SE1/4NW1/4, E1/2SW1/4
Section 14 SW1/4
Section 23 NW1/4, SE1/4, NW1/4NE1/4, S1/2NE1/4
Section 26 NE1/4, NW1/4SE1/4
Township 17 South, Range 7 East, SLM Utah
Owner:
PacifiCorp Electric Operations (successor in interest to Utah Power & Light Company)
324 South State Street
PO Box 26128
Salt Lake City, Utah 84126-0128

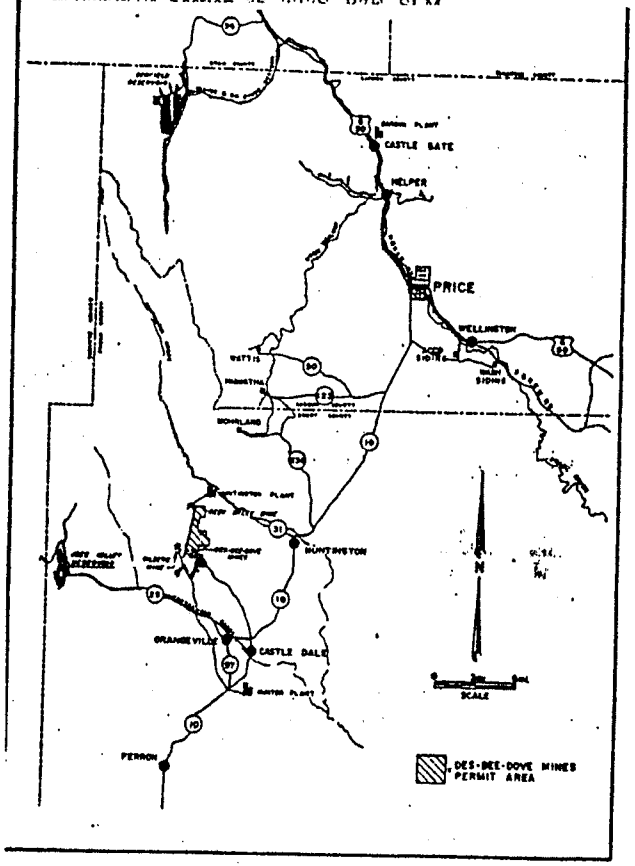
The remaining surface is controlled by:
The United States of America
Department of Agriculture
US Forest Service
The Manti-LaSal National Forest
599 West Price River Dr.
Price, Utah 84501

ADDITIONAL LANDS TO BE AFFECTED BY MINING

State of Utah Special Use Lease Agreement No. 436 utilized for a sedimentation pond located in NW1/4NW1/4, Section 36, T17S, R7E, SLM.

State of Utah Road Right-of-Way No. 2470 (49.34 acres) utilized for the location of the Junction Haul Road located within Section 36, T17S, R7E, SLM and Section 2, T18S, R7E, SLM.

State of Utah Road Right-of-Way No. 3137 utilized for the location of the Sediment Pond Access Road located with the W1/2NW1/4 Section 36, T17S, R7E, SLM



Published in the Emery County Progress December 4, 11, 18 and 25, 1990.

AFFIDAVIT OF PUBLICATION

STATE OF UTAH)
County of Emery,) ss.

I, Dan Stockburger, on oath, say that I am the Publisher of the The Emery County Progress, a weekly newspaper of general circulation, published at Castle Dale, State and County aforesaid, and that a certain notice, a true copy of which is hereto attached, was published in the full issue of such newspaper for Four (4) consecutive issues, and that the first publication was on the

4th day of December, 19 90

and that the last publication of such notice was in the issue of such newspaper dated the

25th day of December, 19 90

Subscribed and sworn to before me this

25th day of December, 19 90

Holly Jo Croft
Notary Public.

My Commission expires October 22, 1994

Residing at Price, Utah

Publication fee, $ 422.40

Notary Public
HOLLY JO CROFT
[illegible]
Price, Utah 84501
My Commission Expires
October 22, 1994
State of Utah

NOTICE

PacifiCorp Electric Operations (successor in interest to Utah Power & Light Company), PO Box 26128, Salt Lake City, Utah 84126-0128, hereby announces its intent to file an application for renewal of a Coal Mining Permit for the Des Bee Dove Mine with the Division of Oil, Gas and Mining under the laws of the State of Utah and the Office of Surface Mining.

A copy of the complete application is available for public inspection at the Emery County Recorder's Office, Emery County Courthouse, Castle Dale, Utah 84513.

Written comments on the application should be submitted to the State of Utah, Division of Oil, Gas and Mining, 355 West North Temple, 3 Triad Center, Suite 350, Salt Lake City, Utah 84180-1203.

The area to be mined is contained on the U.S.G.S. 7.5-minute "Red Point", quadrangle map.

The approximately 2,760 acres contained in the permit area involve all or part of the following federal coal leases and fee lands:

The following federal coal leases, upon which the Applicant bases its right to perform coal mining in the permit area, have all been subleased or assigned to PacifiCorp Electric Operations (successor in interest to Utah Power & Light Company).

Lease No. U-02664
Issued to Corporation of the Presiding Bishop of the LDS Church 1/1/57
Section 13 SE1/4SW1/4
Section 23 NE1/4NE1/4, SW1/4
Section 24 W1/2
Section 26 NW1/4, NE1/4SW1/4
and
Section 14 SW1/4NE1/4, W1/2SE1/4, SE1/4SE1/4
Added by Modification 10/31/79
Township 17 South, Range 7 East, SLM
Utah, containing 920 acres

Lease No. SL-050133
Issued to Bertha Christensen 8/1/33
Section 24 W1/2SE1/4
Township 17 South, Range 7 East, SLM
[illegible] Utah, containing 920 acres

Description of Land:
Section 14 W1/2NW1/4
Section 11 W1/2SW1/4
That part lying East of the Deer Creek Fault
Township 17 South, Range 7 East, SLM Utah
Owner:
The Malcolm McKinnon Estate
Zions First National Bank Trustee
Salt Lake City, Utah 84111

SURFACE OWNERS OF RECORD WITHIN THE PERMIT AREA

Description of Land:
Section 11 SE1/4NW1/4, E1/2SW1/4
Section 14 SW1/4
Section 23 NW1/4, SE1/4, NW1/4NE1/4, S1/2NE1/4
Section 26 NE1/4, NW1/4SE1/4
Township 17 South, Range 7 East, SLM Utah
Owner:
PacifiCorp Electric Operations (successor in interest to Utah Power & Light Company)
324 South State Street
PO Box 26128
Salt Lake City, Utah 84126-0128

The remaining surface is controlled by:
The United States of America
Department of Agriculture
US Forest Service
The Manti-LaSal National Forest
599 West Price River Dr.
Price, Utah 84501

ADDITIONAL LANDS TO BE AFFECTED BY MINING

State of Utah Special Use Lease Agreement No. 436 utilized for a sedimentation pond located in NW1/4NW1/4, Section 36, T17S, R7E, SLM.

State of Utah Road Right-of-Way No. 2470 (49.34 acres) utilized for the location of the Junction Haul Road located within Section 36, T17S, R7E, SLM and Section 2, T18S, R7E, SLM.

State of Utah Road Right-of-Way No. 3137 utilized for the location of the Sediment Pond Access Road located with the W1/2NW1/4 Section 36, T17S, R7E, SLM.

BLM Right-of-Way Grant U-37642 utilized for waste rock disposal. 48.62 acres located in the east half of Section 34 and the southwest quarter of Section 35, T17S, R7E, SLM.

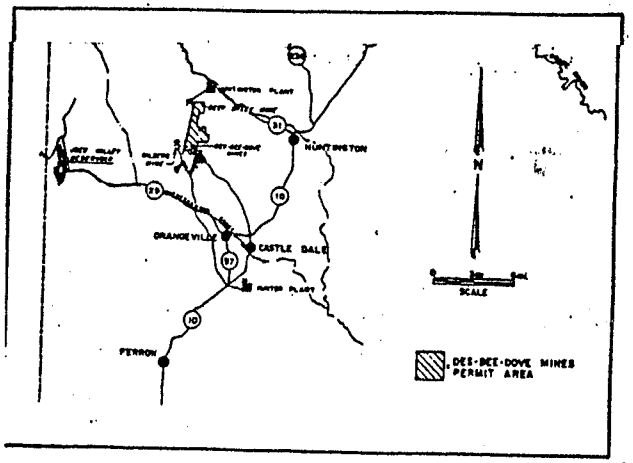
BLM Right-of-Way Grant U-50148 (28.29 acres) utilized for the location of the Junction Haul Road located with E1/2E1/2 Section 35, T17S, R7E, SLM.

BLM Right-of-Way Grant U-57134 (.37 acres) utilized for the location of the Sediment Pond Access Road located within the E1/2NE1/4 Section 35, T17S, R7E, SLM.

BLM Right-of-Way Grant UTU-65027 (25.49 acres) utilized for Waste Rock Disposal located within the SE1/4 Section 34, T17S, R7E, SLM.

United States Forest Service Special Use Permit for surface facilities, 100 acres located in Section 25 and 26, T17S, R7E, SLM.

United States Forest Special Use Permit of 8.95 acres utilized for the location of the Junction Haul Road located within the SW1/4SW1/4 Section 25 and the SE1/4SE1/4 Section 26, T17S, R7E, SLM.



Published in the Emery County Progress December 4, 11, 18 and 25, 1990.

ACT/015/017 #2
Copy Henry, Jesse, Tom
Ad PAM

PACIFICORP
ELECTRIC OPERATIONS

ONE UTAH CENTER

201 SOUTH MAIN • SUITE 2100 • SALT LAKE CITY, UTAH 84140-0021 • (801) 220-2000

August 15, 1991

Ms. Pamela Grubaugh-Littig
Permit Supervisor
Division of Oil, Gas and Mining
355 West North Temple
3 Triad Center, Suite 350
Salt Lake City, Utah 84180-1203

RE: PERMIT CONDITIONS, FIVE-YEAR RENEWAL, PACIFICORP ELECTRIC OPERATIONS, DES BEE DOVE MINE, ACT/015/017, EMERY COUNTY, UTAH

Dear Ms. Littig:

Enclosed please find one (1) copy of PacifiCorp's response to the above referenced Permit Conditions.

Each condition is addressed in the order which it appears in Attachment A of the Permit issued May 31, 1991 as follows:

CONDITION R614-301-233-(1) (HS)

Soil samples have been collected from the five major fills within the mine area as directed. However, the laboratory analyses have not been received to date. Upon receipt, the results will be submitted to the Division to update the information found on Pages 4-58 through 4-60. The data will be evaluated against that found on Pages 2-183 through 2-188 to assess the fill material -vs- surrounding native materials as plant growth media.

Concerning reclamation of the Haul Road between stations 165+00 and 243+18, please refer to Page 4-87.1 and 4-87.2 which are to be added to the PAP.

CONDITION R614-301-514.300-(1) (JK)

1. See Page 3-20, revised 8/15/91.
2. See Page 3-20, revised 8/15/91.

DAMS, EMBANKMENTS, AND OTHER IMPOUNDMENTS

Sediment Pond - A pond has been designed and constructed for sediment control at Des Bee Dove Mine. The pond design capacity is 19.8 acre-feet, 2.0 acre-feet for sediment and 17.8 acre-feet for runoff. The pond design will impound runoff from the 10 year/24 hour storm as determined from the N.O.A.A. Atlas 2. A grouted rip-rap spillway is installed in the dam to provide controlled release of runoff from storms in excess of the 10 year/24 hour precipitation event.

Construction and design of the pond was under the direction of a registered professional engineer. Details of pond construction are in Appendix VIII together with reconstructed dimensions after the inundation of the 100 year storm of August 1983.

Slopes constructed on fill have been revegetated to minimize erosion.

Maintenance of the sediment pond includes quarterly inspections, either by a professional engineer or a specialist experienced in the construction of impoundments, and discharge monitoring. A certified annual report by a qualified, registered, professional engineer is submitted to the regulatory authority (the Division) summarizing quarterly inspections. The pond will be dredged of sediment when sediment volume is 60% of design capacity.

Reclamation of the pond will complete the proposed Des Bee Dove reclamation process. The pond will be allowed to dry followed by backfilling and grading. Graded contours will be compatible with the natural surroundings. Revegetation will be performed as outlined in Reclamation Plan.

SEDIMENT CONTROL FOR STREAM CROSSINGS

During and following construction of stream crossings and culvert removal sites where permanent diversions are installed, sediment structures will be placed downstream to contain any sediment from leaving the area and contributing to the streamflow's suspended solids. The sediment structures will be siltfence, backed by strawbales or metal mesh (See Figure 7 for details). Volume and frequency of the sediment structures will be based on a 10 yr./24 hr. storm event using the following formulas:

$$S = \frac{1000}{CN} - 10$$

where:

S = Infiltration Depth

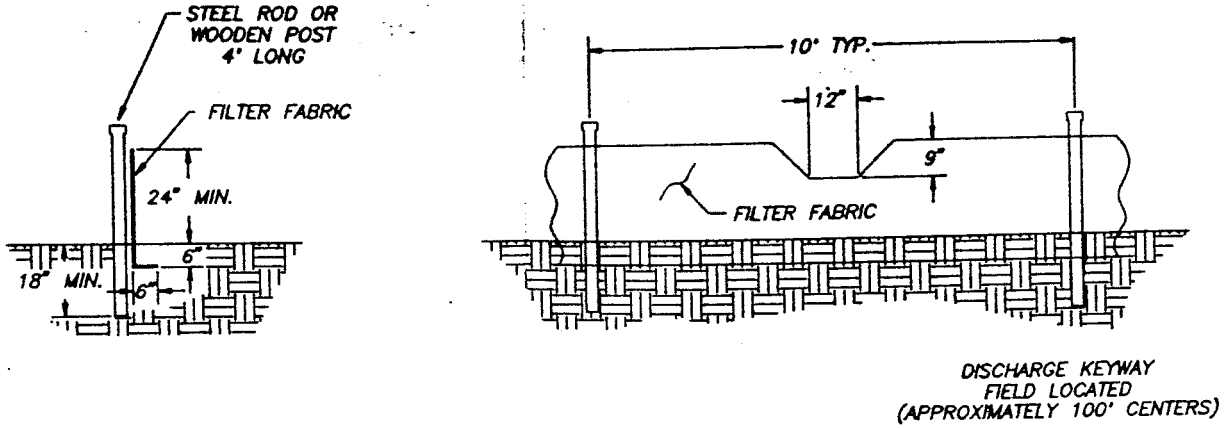
CN = Curve Number

and

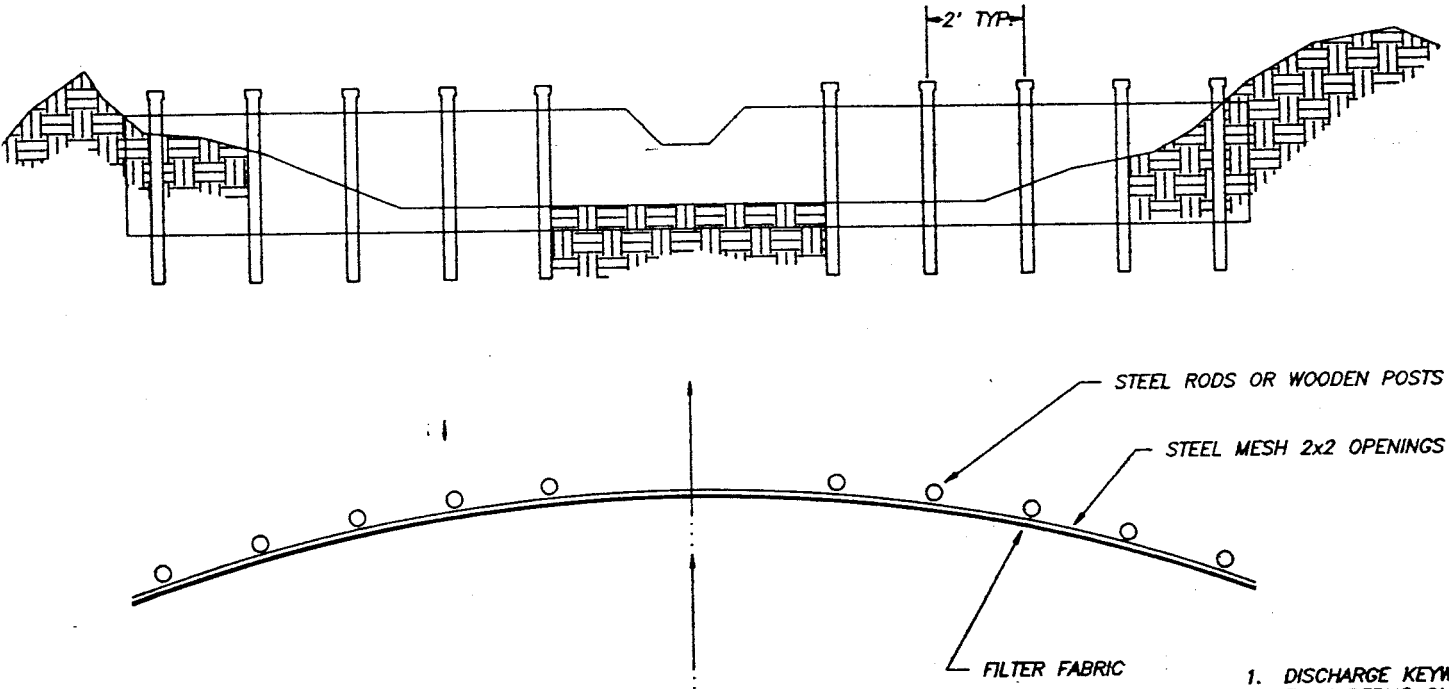
$$Q = \frac{(P - 0.2S)^2}{P + 0.8S}$$

Q = Runoff in Inches

P = Precipitation in Inches



SILT FENCE INSTALLATION



1. DISCHARGE KEYWAY MUST BE LO THAN BERMS ON EITHER SIDE.
2. WIRE MESH BACKING USED AT STREAM CROSSINGS.
3. STRAW BALES MAY ALSO BE USE TO BACK UP FILTER FABRIC.

SILT FENCE @ STREAM CROSSING

FIGURE 7

SEDIMENT STORAGE VOLUME

Present location of the dewatering stand pipe is set to accommodate 4.23 feet of clearance between a full sediment load and the decant elevation.

Operation of the pond requires all storm waters collected to be held for a minimum of twenty-four (24) hours before being released to the receiving drainage. The decant system will allow the water to be drained. During cleaning the pond will be drained dry with the exception of the remaining trapped sediment and water which is below the decant elevation. The remaining water will be pumped. The water will be sampled to determine the TDS level, and will be decanted at a rate which will insure compliance with 1 ton/day limit.

Sediment will be removed by a track-hoe and transported to the Cottonwood-Wilberg/Des Bee Dove Waste Rock Facility. Sediment material will be sampled, tested, and disposed of according to DOGM's "Title V Coal Program Policy For Disposal Of Sediment Pond Waste".

Field surveys (x-sections) are taken at right angles from the baseline to determine the top elevation of sediment. The volume of sediment is computed by the Average End Area Method, to determine when it reaches the 60% cleanout elevation.

GROUP II (SURFACE FACILITIES AND STRUCTURES)

Des Bee Dove is an abbreviation for Deseret, Beehive and Little Dove Mines. Two mines, Beehive and Little Dove Mine, are located in the upper seam (Blind Canyon), and the Deseret Mine is located in the lower seam (Hiawatha). Separated vertically by 140 feet, the portal facilities are literally one upon the other.

Individual photographs of each major surface facility are included in Appendix IX.

Mine development over the past forty years has seen a constant change of surface facilities. Tipple, loadout, and conveyors have undergone changes from modification to complete rebuilding. Specific dates of construction and completion are not possible in all cases and shall be noted as such.

Utah Power and Light company purchased these mines in 1972. Since that time major reconstruction of certain facilities has taken place, most notably, the bathhouse, parking lot and their structures.

QUANTITIES SUMMARY SHEET

FINAL RECLAMATION BACKFILLING AND GRADING

Little Dove-Beehive Area #5

Total Excavation			
Pad 5 X-Section End Area =	983 ft.^{2}		
Length of Excavation Pad 5 =	164.8 ft.		
983 ft.^{2} X 164.8 ft. / 27 yds^3/ft.^{5} =		6,000 c.y.	
Little Dove Highwall Embankment	3,677 c.y.		
Little Dove-Beehive Portals	900 c.y.		
10% Rip-Rap	600 c.y.		
Parking Lot Extension Embankment			823 c.y.

Deseret Area #4

Total Excavation			
Pad 4 X-Section End Area =	1,417.5 ft.^{2}		
Length of Excavation Pad 4 =	139.68 ft.		
1417.5 ft.^{2} X 139.68 ft. / 27 yds^5/ft.^{3} =		7,333 c.y.	
Parking Lot Extension Embankment			4,274 c.y.
Deseret Portals Embankment	900 c.y.		
10% Rip-Rap	730 c.y.		
Bathhouse-Warehouse Embankment			1,429 c.y.

#1 Stockpile Area #3

Total Excavation			
Pad 3 X-Section End Area =	1,499 ft.^{2}		
Length of Excavation Pad 3 =	117.53 ft.		
1,499 ft.^{2} X 117.53 ft. / 27 yds^3/ft.^{3} =		6,525 c.y.^{3}	
Bathhouse-Warehouse Embankment			5,869 c.y.
10% Rip-Rap	656 c.y.		

Bathhouse-Warehouse-Parking Lot Extension

X-Section Quantities (Embankment)		18,614.7 c.y.
X-Section Quantities (Embankment)	31,069.6 c.y. (Needed)	31,009.7 c.y. (Recovered)

The majority of the material to be used for reclamation of the Haul Road, between stations 165+00 and 243+18, will be obtained from three major fills at stations 173+80, 201+00 and 232+20. A substantial amount of vegetation currently exists on the slopes of these fills. To demonstrate the suitability of the material as a plant growth medium for final reclamation, as required by the Division, the fill sites will be assessed as follows:

Fall 1991

1. Vegetation inventory to assess cover, species composition and frequency, woody species density, productivity and condition.
2. Comparison of fill site vegetation and haul road reference area vegetation.
3. Supplemental seeding of fill areas, as necessary to meet final reclamation standards (see page 4-86).
4. Soil sampling at fill sites and analysis in accordance with parameter list on page 4-101.
5. Comparison of the analysis results with the data found on pages 2-179 and 2-180 to evaluate the fill material -vs- adjacent native soil.

1992 through 1995

1. Vegetation monitoring in accordance with page 4-87, 2nd through 5th year.

2. Comparison of fill site vegetation and haul road reference area vegetation.

3. Supplemental seeding of fill areas, as needed to meet final reclamation standards.

1995

1. Soil sampling at fill sites and analysis in accordance with parameter list on page 4-101.

2. Comparison of analysis results with 1991 data.

All information will be included in the annual report submittals.

SEDIMENTATION CONTROL

Sediment control is provided in several ways. First, utilizing a series of small contour ditches spaced approximately 15 feet apart, each ditch will contain approximately one cubic foot of water per lineal foot of ditch. This provides not only water retention to lesson runoff and reduced sediment loading but enhances soil moisture for plants adjacent to the ditches. Second, the entire revegetated area is covered with a two-inch blanket of mulch and anchored with a vexar netting. All ditches will be constructed on level contours as close as possible to prevent flow down the furrows. As a measure of erosion control, small earthen check dams will be implemented at 20 to 30 foot intervals (as required by DOGM). Each contour ditch will be blocked off at both ends to allow water retention within the area of each ditch to encourage revegetation success.

This system of sediment control will provide positive restraints in controlling runoff and erosion during the initial revegetation period.

RECLAMATION SEDIMENT CONTROL ON AREAS NOT TREATED BY SEDIMENT POND

During final reclamation of areas not treated by a sediment pond, total runoff volume will be computed to determine the adequate spacing of the 1 cu. ft./linear foot contour ditches.

Calculations will be based on a 10 yr./24 hr. storm event using the following formulas:

$$S = \frac{1000}{CN} - 10$$

where:

S = Infiltration Depth

CN = Curve Number

and

$$Q = \frac{(P-.2S)^2}{P + 0.8S}$$

where:

Q = Runoff in Inches

P = Precipitation in Inches

Spacing of the contour ditches will be based on the total runoff volume. A typical cross-section of the contour ditch design is on Map 4-1, 3 of 5. An earthen berm will be at the toe of each cutslope area.

EAST MOUNTAIN ACCESS

The main road which serves the mine is also an access road for local cattlemen who, twice each year, herd cattle through the mine area to reach East Mountain.

As this road is an established cattle drive route and the only road to East Mountain on the east side, it is desirous to maintain this road independently from the mine's final reclamation plan.

exposed. Temporary storage of the material, beyond 30 days must be approved by the Division. If identified areas of toxic and acid-forming materials are large enough in volume that adequate cover material is reduced, suitable material will be purchased from an outside source. All toxic or acid-forming substances or chemicals used for mining operations will be removed or properly disposed of according to State and/or Federal regulations before reclamation commences.

RECLAMATION COST (R614-301-334)

Estimated costs for reclamation are based on 1990 values and include all lands having been disturbed for the purpose of handling, crushing, storing and transporting coal extracted through the Deseret, Beehive and Little Dove Mines.

The following are the estimated costs for reclamation. (See Pages 4-106 thru 4-112.)

1.	Surface facilities removal	$ 197,935
	Items 1 and 2	
2.	Backfilling, compacting, grading	509,159
	Items 3 through 6	
3.	Revegetation	380,984
	Items 7 through 13	
*4.	Mobilization and demobilization	10,000
5.	10% Contingency	109,807
	1990 Total Reclamation Cost	$1,207,885

*It is customary for contractors, who must move men and equipment from job site to job site, to charge additional monies to competitively bid for such purpose. This charge is usually in

the form of mobilization and demobilization. On very large projects these charges are usually built into the unit costs of work. Applicant states no costs are built into the reclamation work and will provide a lump sum of $10,000 for such purpose. It is felt this sum is sufficient to transport the needed equipment from any of the three major cities along the Wasatch Front.

The average cost increase, during the preceding three years, as provided by the Means Historical Cost/Index (Salt Lake Index) is 1.84%.

Using the 1990 reclamation costs of $1,207,885 this compounds to $1,319,010 for 1995 reclamation costs.

The performance bond will be conditional upon the faithful performance of the requirements of the act, the regulatory program and the reclamation plan.

RECLAMATION PLAN: PROTECTION OF THE HYDROLOGIC BALANCE (R614-301-723)

Because the Des Bee Dove Mine workings are dry, no special provisions will have to be made to insure that water wouldn't flow from the mine portal after the mine is abandoned. The portals, however, will be sealed with a double-block wall 25 feet in from the surface. The area between the block wall and the surface will then be back-filled. This, along with the fact that the mine is dry, will insure that no water will flow from the portal after the mine is abandoned. Representatives of the BLM will be notified when the portal sealing will begin. Recommendations made by the BLM will be followed when sealing

RECLAMATION COSTS
PORTAL SEALING

ITEM #	DESCRIPTION	EQUIPMENT	QUANTITIES	UNIT COST	TOTAL COST	CONSTR. DAYS	COMMENTS
2-A	Portal Seals Includes Ventilation Portals	3-Man Crew Flatbed Truck Crawler Tractor	17	$ 2,516	$ 42,772	34	3 Little Dove 4 Beehive 10 Deseret
				Subtotal	$ 42,772	34	

BACKFILLING AND GRADING

ITEM #	DESCRIPTION	EQUIPMENT	HRS	LABOR	HRS	TOTAL	CONSTRUCTION DAYS
3-A	Beehive-Little Dove	D8G, 2 ea. 769B, 2 ea. 988	10.9 6.2 6.2	1 Supervisor 2 Operators 3 Operators	10.9 10.9 6.2	$ 4,743	1.4
3-B	Parking Lot Extension	235 769B, 2 ea. 825C D8 988	14.2 15.9 15.9 2.4 1.7	1 Supervisor 3 Operators 1 Operator 1 Operator	15.9 15.9 14.2 4.1	8,491	2.0
3-C	Parking Lot-Bathhouse -Warehouse	235 769B 825C	103.4 78.8 62.1	1 Operator 1 Supervisor 2 Operators	103.4 103.4 78.8	35,262	13.0
3-E	Haul Road - Remove and bury asphalt and road base	D8 Dozer 621B, 3 ea. 825C	145.0 100.0 145.0	6 Operators	590.0	67,573	12.0
3-F	Haul Road-Culvert Removal, Channel Re-construction and lining	D8 Dozer 621B Scraper 825 Compactor 235 Excavator	262.0 783.0 262.0 143.0	6 Operators 1 Supervisor	1450.0 360.0	184,230	45.0
	Rip-rap lining material	5450 cyds @ $10/cyd				54,500	
				Subtotal		$354,799	71.3

CONTINGENT SEEDING AND PLANTING

ITEM #	DESCRIPTION	EQUIPMENT	HRS	LABOR	HRS	TOTAL	CONSTRUCTION DAYS
12-A	Contingent Planting	Flatbed Hydroseeder	38.1 7.5	1 Supervisor 1 Laborer	38.1	$ 3,824	1.0
	Materials					13,017	
				Subtotal		$ 16,841	

REVEGETATION INVENTORY FOR BOND RELEASE

13-A	Vegetation Inventory	None		1 Supervisor 2 Laborers	72.0	$ 6,242	9.0
	Repeat Inventory on 9th and 10th years = 2 years @ $6,242						
				Subtotal		$ 12,484	
				Mobilization		10,000	
				Construction Cost		1,098,078	
				10% Contingency		109,807	
	TOTAL CONSTRUCTION COST					$1,207,885	

NOTE: The following items have been deleted from the Reclamation Cost Schedule for the reasons indicated.

1-N Rock Dust Silo - Removed in 1988
3-D Tipple Pad Slope Modification - Completed in 1984

18,614 cyds on Bathhouse level

823 cyds from Little Dove Pad

5,703 cyds from Deseret Pad

5,869 cyds from Coal Stockpile Pad

31,009 cyds total to be moved

235 Backhoe 31,009 cyds at 300 cyds/hr = 103.4 hrs

769C Trucks 18,614 cyds at 420 cyds/hr = 44.3 hrs

769C Trucks 6,526 cyds at 450 cyds/hr = 14.5 hrs

769C Trucks 5,869 cyds, use 20 hrs.

825 C Compactor 31,009 cyds at 500 cyds/hr = 62.1 hrs

Project Costs:

235 Backhoe 103.4 hrs x $107.84	$11,150.66
769C Truck 78.8 hrs x $74.62	5,880.06
825C Compactor 62.1 x $88.85	5,510.29
	22,541.01
1 Supervisor 103.4 hrs x $36.70	$ 3,794.78
1 Operator 103.4 hrs x $34.20	3,536.28
2 Operators 2 x 78.8 hrs x $34.20	5,389.92
	$12,720.98
TOTAL	$22,541.01
	12,720.98
	$35,261.99

INSERT AT THE END OF APPENDIX XII

ACT/015/017 #2
Copy Henry, Jesse, Tom
Ad PAM

PACIFICORP
ELECTRIC OPERATIONS

ONE UTAH CENTER

201 SOUTH MAIN • SUITE 2100 • SALT LAKE CITY, UTAH 84140-0021 • (801) 220-2000

August 15, 1991

Ms. Pamela Grubaugh-Littig
Permit Supervisor
Division of Oil, Gas and Mining
355 West North Temple
3 Triad Center, Suite 350
Salt Lake City, Utah 84180-1203

RE: PERMIT CONDITIONS, FIVE-YEAR RENEWAL, PACIFICORP ELECTRIC OPERATIONS, DES BEE DOVE MINE, ACT/015/017, EMERY COUNTY, UTAH

Dear Ms. Littig:

Enclosed please find one (1) copy of PacifiCorp's response to the above referenced Permit Conditions.

Each condition is addressed in the order which it appears in Attachment A of the Permit issued May 31, 1991 as follows:

CONDITION R614-301-233-(1) (HS)

Soil samples have been collected from the five major fills within the mine area as directed. However, the laboratory analyses have not been received to date. Upon receipt, the results will be submitted to the Division to update the information found on Pages 4-58 through 4-60. The data will be evaluated against that found on Pages 2-183 through 2-188 to assess the fill material -vs- surrounding native materials as plant growth media.

Concerning reclamation of the Haul Road between stations 165+00 and 243+18, please refer to Page 4-87.1 and 4-87.2 which are to be added to the PAP.

CONDITION R614-301-514.300-(1) (JK)

1. See Page 3-20, revised 8/15/91.
2. See Page 3-20, revised 8/15/91.

3. See Page 3-20, revised 8/15/91.

CONDITION R614-301-542.300-(1) (JK)

1. See Map CM-10392-DS, Packet 3-10, revised 8/13/91.
2. See Map CM-10393-DS, Sheet 2 of 5, Packet 4-1, revised 7/26/91.
3. See Map CM-10393-DS, Sheet 5 of 5, Packet 4-1, redrawn 7/10/91.
4. See Map CM-10393-DS, Sheet 4 of 5, Packet 4-1, redrawn 8/13/91.
5. See Page 4-6, revised 8/15/91.
   The following pages are also affected by this revision: 4-102, 4-103, 4-111, 4-115 and 4-125.

CONDITION R614-301-728-(1) (TM)

The proposed Reclamation Study for the Des Bee Dove Haul Road is presently being reviewed by the Division's Technical Staff. Revisions to the proposal are expected to result from that review. Additionally, PacifiCorp has been directed, by the Division (letter from Pamela Grubaugh-Littig to Blake Webster, July 17, 1991), to initiate activities which are also likely to result in changes to the study. Therefore, inclusion of the requested information in the PAP, at this time, seems premature. The condition items will be addressed as part of the ongoing study activities and dialogue. Upon approval, the finalized study proposal will be submitted to the Division as an update to the current Appendix XVI.

The attached memo, from Charles Semborski to Val Payne, contains suggested revisions to the study proposal. This material is provided for informational purposes and should be reviewed as part of the overall proposal review process.

CONDITION R614-301-731-(1) (TM)

See Pages 4-88.1 added 8/15/91 and 4-89, revised 8/15/91 and 3-42.1 and 3-42.2 added 8/15/91.

CONDITION R614-301-731.121-(1) (TM)

1. See Pages 3-42.1 and 3-42.2, added 8/15/91.
2. See Pages 4-88.1 added 8/15/91 and 4-89, revised 8/15/91.
3. This condition addresses the Reclamation Study proposal discussed previously under Condition R614-301-728-(1) (TM).

CONDITION R614-301-731.700-(1) (TM)

See Map CE-10478-EM, Packet HM1, Volume 9, updated 4/2/91, and Map CE-10866-EM, Packet HM5, Volume 9, updated 8/19/90.

CONDITION R614-301-742.220-(1) (TM)

Drawing CM-10555-DS, Sheets 1 of 2 and 2 of 2, Appendix VIII are replaced by Drawing CM-10868-DS, 6/13/91.

Drawings 01-52-1-015 and 01-52-1-016, Appendix VIII are replaced by Drawing CM-10833-DS, revised 6/19/91.

1. See Map CM-10868-DS, Appendix VIII.

2. See Pages 3-54, revised 8/15/91.

3. See Page 3-54, revised 8/15/91.
Page 3-55 is also affected by the above revisions.

4. The open channel spillway is a grouted rip-rap structure designed as an emergency spillway for flows of short duration; therefore, rip-rap sizing is not applicable.

CONDITION R614-301-742.300-(1) (TM)

See materials (17 pages) identified as Appendix XII, added 8/15/91.

Please direct any questions regarding this submittal to me at 220-4584 or to the Huntington Field Office staff at 653-2312.

Upon approval the required additional copies will be provided.

Sincerely,

Val Payne for

J. Blake Webster
Permitting Administrator

VP/dw
Enclosure

cc: G. Davis
J. Pollock
C. Semborski

ACT/015/017 #2
Copy Henry, Jose, Tom
and Pam

PACIFICORP
ELECTRIC OPERATIONS

ONE UTAH CENTER

201 SOUTH MAIN • SUITE 2100 • SALT LAKE CITY, UTAH 84140-0021 • (801) 220-2000

August 15, 1991

Ms. Pamela Grubaugh-Littig
Permit Supervisor
Division of Oil, Gas and Mining
355 West North Temple
3 Triad Center, Suite 350
Salt Lake City, Utah 84180-1203

RE: PERMIT CONDITIONS, FIVE-YEAR RENEWAL, PACIFICORP ELECTRIC OPERATIONS, DES BEE DOVE MINE, ACT/015/017, EMERY COUNTY, UTAH

Dear Ms. Littig:

Enclosed please find one (1) copy of PacifiCorp's response to the above referenced Permit Conditions.

Each condition is addressed in the order which it appears in Attachment A of the Permit issued May 31, 1991 as follows:

CONDITION R614-301-233-(1) (HS)

Soil samples have been collected from the five major fills within the mine area as directed. However, the laboratory analyses have not been received to date. Upon receipt, the results will be submitted to the Division to update the information found on Pages 4-58 through 4-60. The data will be evaluated against that found on Pages 2-183 through 2-188 to assess the fill material -vs- surrounding native materials as plant growth media.

Concerning reclamation of the Haul Road between stations 165+00 and 243+18, please refer to Page 4-87.1 and 4-87.2 which are to be added to the PAP.

CONDITION R614-301-514.300-(1) (JK)

1. See Page 3-20, revised 8/15/91.
2. See Page 3-20, revised 8/15/91.

3. See Page 3-20, revised 8/15/91.

CONDITION R614-301-542.300-(1) (JK)

1. See Map CM-10392-DS, Packet 3-10, revised 8/13/91.
2. See Map CM-10393-DS, Sheet 2 of 5, Packet 4-1, revised 7/26/91.
3. See Map CM-10393-DS, Sheet 5 of 5, Packet 4-1, redrawn 7/10/91.
4. See Map CM-10393-DS, Sheet 4 of 5, Packet 4-1, redrawn 8/13/91.
5. See Page 4-6, revised 8/15/91.
   The following pages are also affected by this revision: 4-102, 4-103, 4-111, 4-115 and 4-125.

CONDITION R614-301-728-(1) (TM)

The proposed Reclamation Study for the Des Bee Dove Haul Road is presently being reviewed by the Division's Technical Staff. Revisions to the proposal are expected to result from that review. Additionally, PacifiCorp has been directed, by the Division (letter from Pamela Grubaugh-Littig to Blake Webster, July 17, 1991), to initiate activities which are also likely to result in changes to the study. Therefore, inclusion of the requested information in the PAP, at this time, seems premature. The condition items will be addressed as part of the ongoing study activities and dialogue. Upon approval, the finalized study proposal will be submitted to the Division as an update to the current Appendix XVI.

The attached memo, from Charles Semborski to Val Payne, contains suggested revisions to the study proposal. This material is provided for informational purposes and should be reviewed as part of the overall proposal review process.

CONDITION R614-301-731-(1) (TM)

See Pages 4-88.1 added 8/15/91 and 4-89, revised 8/15/91 and 3-42.1 and 3-42.2 added 8/15/91.

CONDITION R614-301-731.121-(1) (TM)

1. See Pages 3-42.1 and 3-42.2, added 8/15/91.
2. See Pages 4-88.1 added 8/15/91 and 4-89, revised 8/15/91.
3. This condition addresses the Reclamation Study proposal discussed previously under Condition R614-301-728-(1) (TM).

CONDITION R614-301-731.700-(1) (TM)

See Map CE-10478-EM, Packet HM1, Volume 9, updated 4/2/91, and Map CE-10866-EM, Packet HM5, Volume 9, updated 8/19/90.

CONDITION R614-301-742.220-(1) (TM)

Drawing CM-10555-DS, Sheets 1 of 2 and 2 of 2, Appendix VIII are replaced by Drawing CM-10868-DS, 6/13/91.

Drawings 01-52-1-015 and 01-52-1-016, Appendix VIII are replaced by Drawing CM-10833-DS, revised 6/19/91.

1. See Map CM-10868-DS, Appendix VIII.

2. See Pages 3-54, revised 8/15/91.

3. See Page 3-54, revised 8/15/91.
   Page 3-55 is also affected by the above revisions.

4. The open channel spillway is a grouted rip-rap structure designed as an emergency spillway for flows of short duration; therefore, rip-rap sizing is not applicable.

CONDITION R614-301-742.300-(1) (TM)

See materials (17 pages) identified as Appendix XII, added 8/15/91.

Please direct any questions regarding this submittal to me at 220-4584 or to the Huntington Field Office staff at 653-2312.

Upon approval the required additional copies will be provided.

Sincerely,

Val Payne FOR

J. Blake Webster
Permitting Administrator

VP/dw
Enclosure

cc: G. Davis
J. Pollock
C. Semborski

DRAINAGE AREA 1

1. Area = 15.3 acres or .024 sq. mi. (See Figure 6)

2. Time of Concentration

   a. Hydraulic Length - 1200 ft.

   b. Average Slope - 63.5%

   c. Velocity 8.0 fps (See Chart A)

   d. Time of Concentration - .04 hr.

3. Curve Number

   CN = 85 (See Chart B)

4. Design Flow

   6.025 cfs (See Table 1)

   10 yr./6 hr. Storm Event

5. Culvert

   30" CMP with headwater depth of 1.0

   Capacity - 22 cfs (See Chart C)

   Length - 65'

   Slope of Culvert - 8%

6. Erosion Protection

   Culvert Inlet

      Apron

      Flow Velocity:

         Manning's Equation:

$$V = \frac{1.486}{n} R^{2/3} S^{1/2}$$

where:

S = Slope in decimal (.01)

R = Hydraulic Radius in feet

n = Manning's Roughness Coefficient (0.020)

Solve for R in Partially Full Culvert

$\frac{d}{D}$ = .36 (See Chart D)

d = .36 x 2.5' = .9'

$\frac{R}{D}$ = .212 (See Chart E and Table 2)

R = .212 x 2.5' = .53'

V = 4.89 fps

Culvert Outlet

Flow Velocity

Manning's Equation (See Inlet Information)

where:

S = .08

n = 0.022

R = Hydraulic Radius in feet

Solve for R in Partially Full Culvert

$\frac{d}{D}$ = .21 (See Chart D)

d = .525'

$\frac{R}{D}$ = .142 (See Chart E and Table 2)

R = .355'

V = 10.51 fps

Culvert Discharges onto bedrock

DRAINAGE AREA 2

1. Area = .81 Acres (See Figure 6)
2. Time of Concentration
   a. Hydraulic Length - 300'
   b. Average Slope - 1%
   c. Velocity - 2 fps (See Chart A)
   d. Time of Concentration - .04 hr.
3. Curve Number

   CN = 98 (See Chart B)
4. Design Flow

   2.81 cfs (See Table 3)

   10 yr./6 hr. Storm Event
5. Culvert

   15" CMP with headwater depth of 1.0

   Capacity - 4.0 cfs (See Chart C)

   Length - 25'

   Slope of Culvert - 80%
6. Erosion Protection

   Culvert Inlet

   Apron

   Flow Velocity:

Manning's Equation:

$$V = \frac{1.486}{n} R^{2/3} S^{1/2}$$

where:

S = Slope in decimal (.01)

R = Hydraulic Radius in feet

n = Manning's Roughness Coefficient (0.020)

Solve for R in Partially Full Culvert

$\frac{d}{D}$ = .7 (See Chart D)

d = .875'

$\frac{R}{D}$ = .304 (See Chart E and Table 2)

R = .38'

V = 3.92 fps

Culvert Outlet

Flow Velocity

Manning's Equation (See Inlet Information)

where:

S = .80

R = Hydraulic Radius in feet

n = 0.022

Solve for R in Partially Full Culvert

$\frac{d}{D}$ = .115 (See Chart D)

d = .143'

$\frac{R}{D}$ = .070 (See Chart E and Table 2)

R = .088'

V = 12.16 fps

Culvert Discharges onto bedrock

DRAINAGE AREA 3

1. Area = .88 Acres (See Figure 6)
2. Time of Concentration
   a. Hydraulic Length - 300'
   b. Average Slope - 1%
   c. Velocity - 2 fps (See Chart A)
   d. Time of Concentration - .04 hr.
3. Curve Number

   CN = 98 (See Chart B)
4. Design Flow

   3.05 cfs (See Table 4)

   10 yr./6 hr. Storm Event
5. Culvert

   15" CMP with headwater depth of 1.0

   Capacity - 4.0 cfs (See Chart C)

   Length - 175'

   Slope of Culvert - 43%
6. Erosion Protection

   Culvert Inlet

Apron

Flow Velocity:

Manning's Equation:

$$V = \frac{1.486}{n} R^{2/3} S^{1/2}$$

where:

S = Slope in decimal (.01)

R = Hydraulic Radius in feet

n = Manning's Roughness Coefficient (0.020)

Solve for R in Partially Full Culvert

$\frac{d}{D}$ **= .7 (See Chart D)**

d = .875'

$\frac{R}{D}$ **= .304 (See Chart E and Table 2)**

R = .38'

V = 3.92 fps

Culvert Outlet

Flow Velocity

Manning's Equation (See Inlet Information)

where:

S = .43

R = Hydraulic Radius in feet

n = 0.022

Solve for R in Partially Full Culvert

$\frac{d}{D}$ **= .135 (See Chart D)**

d = .17'

$\frac{R}{D}$ = .075 (See Chart E and Table 2)

R = .09'

V = 8.91 fps

Rip-rap Channel Design

Bottom Width - 4.5'

Side Slopes - 2:1

Slope - 60%

D_{50} - 2.5' (See Drainage Area 3 Rip-rap Sizing)

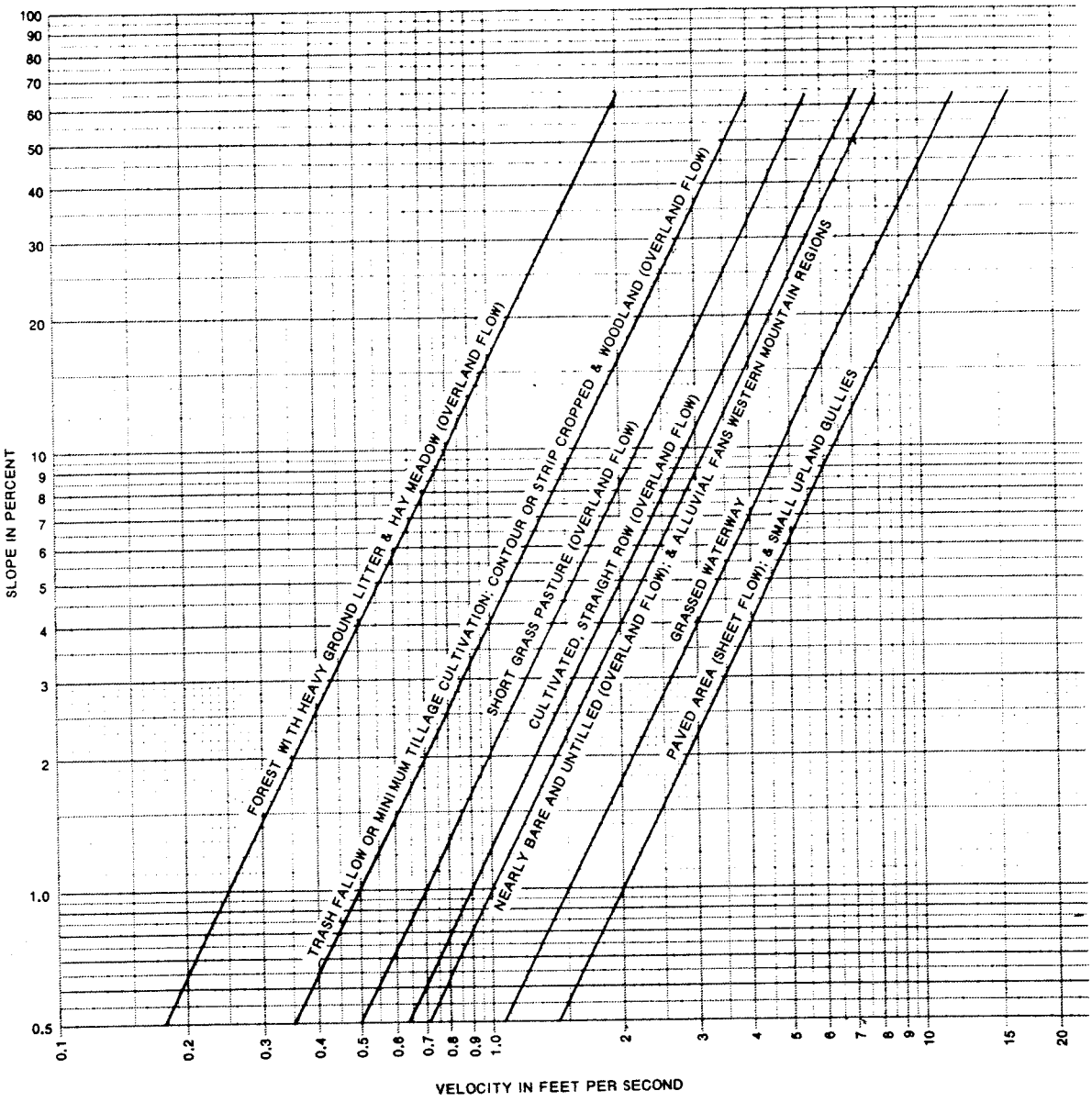


Figure 15.2.--Velocities for upland method of estimating T_c

FROM "NEH" SECTION 4

National

CHART A

Table 9.1.--Runoff curve numbers for hydrologic soil-cover complexes

(Antecedent moisture condition II, and $I_a = 0.2\ S$)

Land use	Cover Treatment or practice	Hydrologic condition	Hydrologic soil group A	B	C	D
Fallow	Straight row	----	77	86	91	94
Row crops	"	Poor	72	81	88	91
	"	Good	67	78	85	89
	Contoured	Poor	70	79	84	88
	"	Good	65	75	82	86
	"and terraced	Poor	66	74	80	82
	" " "	Good	62	71	78	81
Small grain	Straight row	Poor	65	76	84	88
		Good	63	75	83	87
	Contoured	Poor	63	74	82	85
		Good	61	73	81	84
	"and terraced	Poor	61	72	79	82
		Good	59	70	78	81
Close-seeded legumes 1/ or rotation meadow	Straight row	Poor	66	77	85	89
	" "	Good	58	72	81	85
	Contoured	Poor	64	75	83	85
	"	Good	55	69	78	83
	"and terraced	Poor	63	73	80	83
	"and terraced	Good	51	67	76	80
Pasture or range		Poor	68	79	86	89
		Fair	49	69	79	84
		Good	39	61	74	80
	Contoured	Poor	47	67	81	88
	"	Fair	25	59	75	83
	"	Good	6	35	70	79
Meadow		Good	30	58	71	78
Woods		Poor	45	66	77	83
		Fair	36	60	73	79
		Good	25	55	70	77
Farmsteads		----	59	74	82	86
Roads (dirt) 2/		----	72	82	87	89
(hard surface) 2/		---	74	84	90	92

1/ Close-drilled or broadcast.
2/ Including right-of-way.

FROM "NEH" SECTION 4

CHART B

TABLE 1

DRAINAGE AREA 1

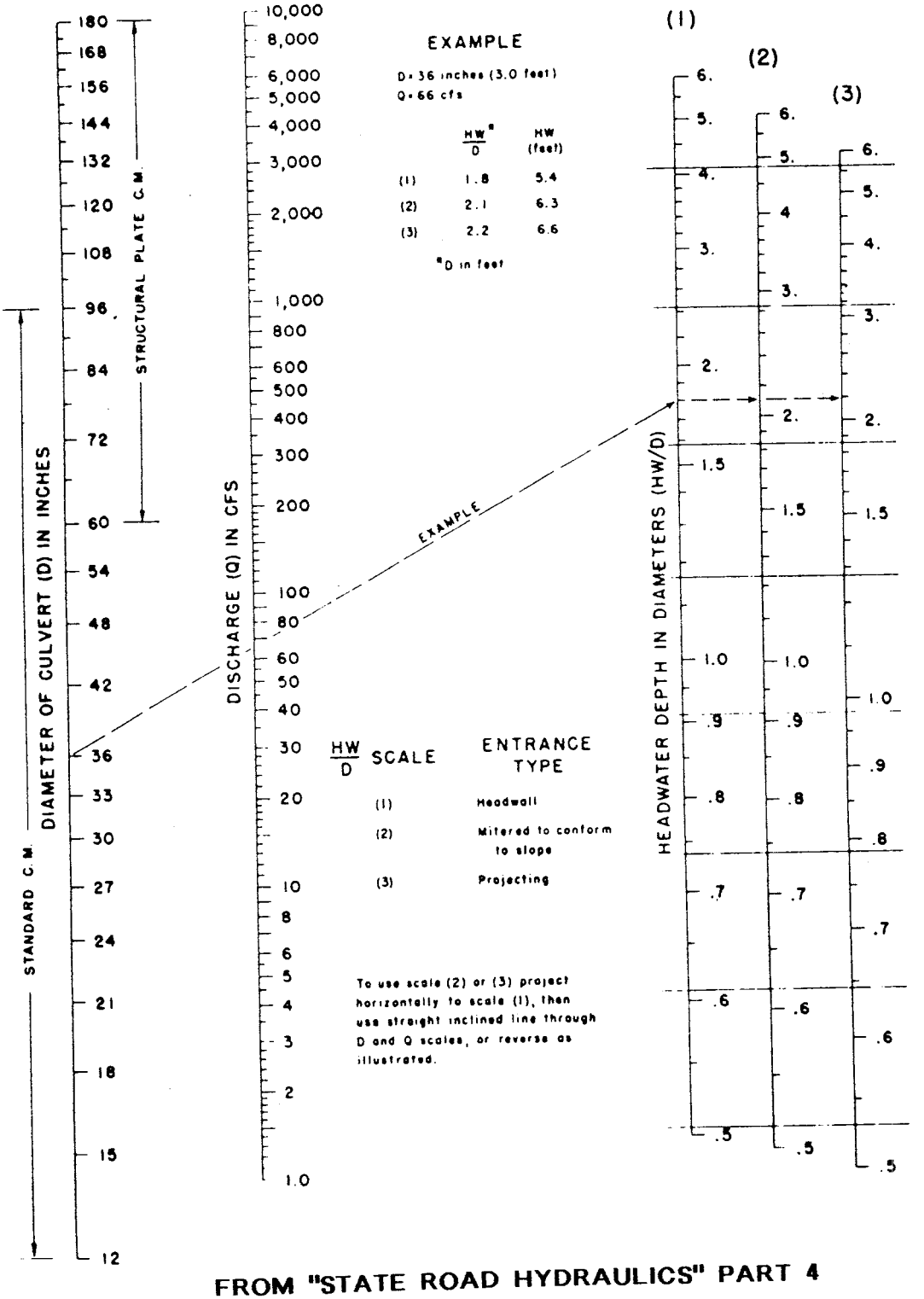
INPUT SUMMARY:

DISTRIBUTION = SCS TYPE II	RUNOFF AREA = .024 SQ. MILES
RAINFALL DEPTH = 1.2 INCHES	RUNOFF CURVE NO. = 85
STORM DURATION = 6 HOURS	TIME OF CONCENTRATION = .04 HRS.

OUTPUT SUMMARY:

TOTAL RUNOFF DEPTH = .275 IN.	TIME TO PEAK = 3 HOURS
INITIAL ABSTRACTION = .353 IN.	RUNOFF VOLUME CHECK = .275 IN.
PEAK FLOW = 6.025 CFS	

Chart 2-48: HEADWATER DEPTH FOR C.M.P. CULVERTS WITH INLET CONTROL

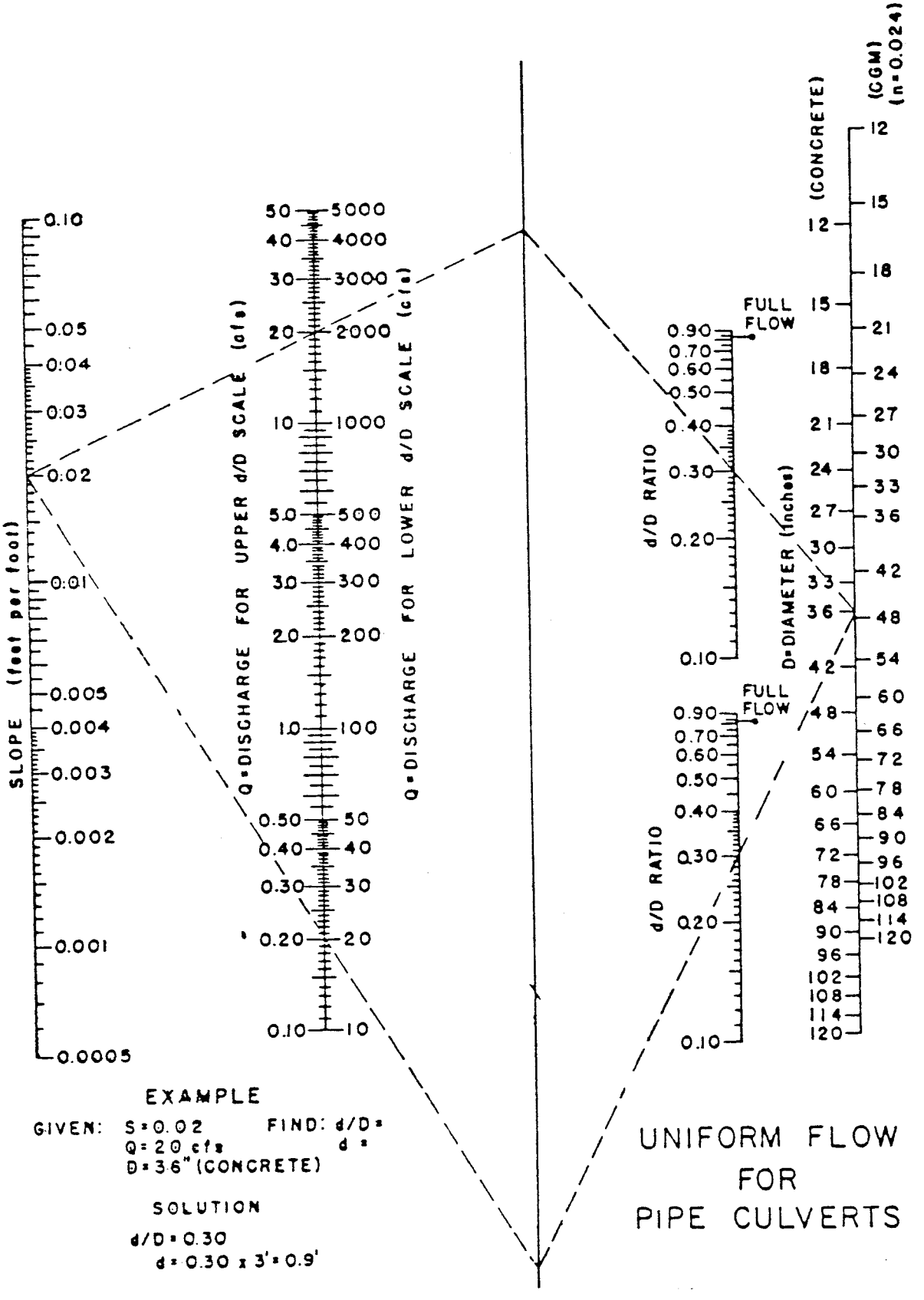


FROM "STATE ROAD HYDRAULICS" PART 4

BUREAU OF PUBLIC ROADS JAN. 1963

CHART C

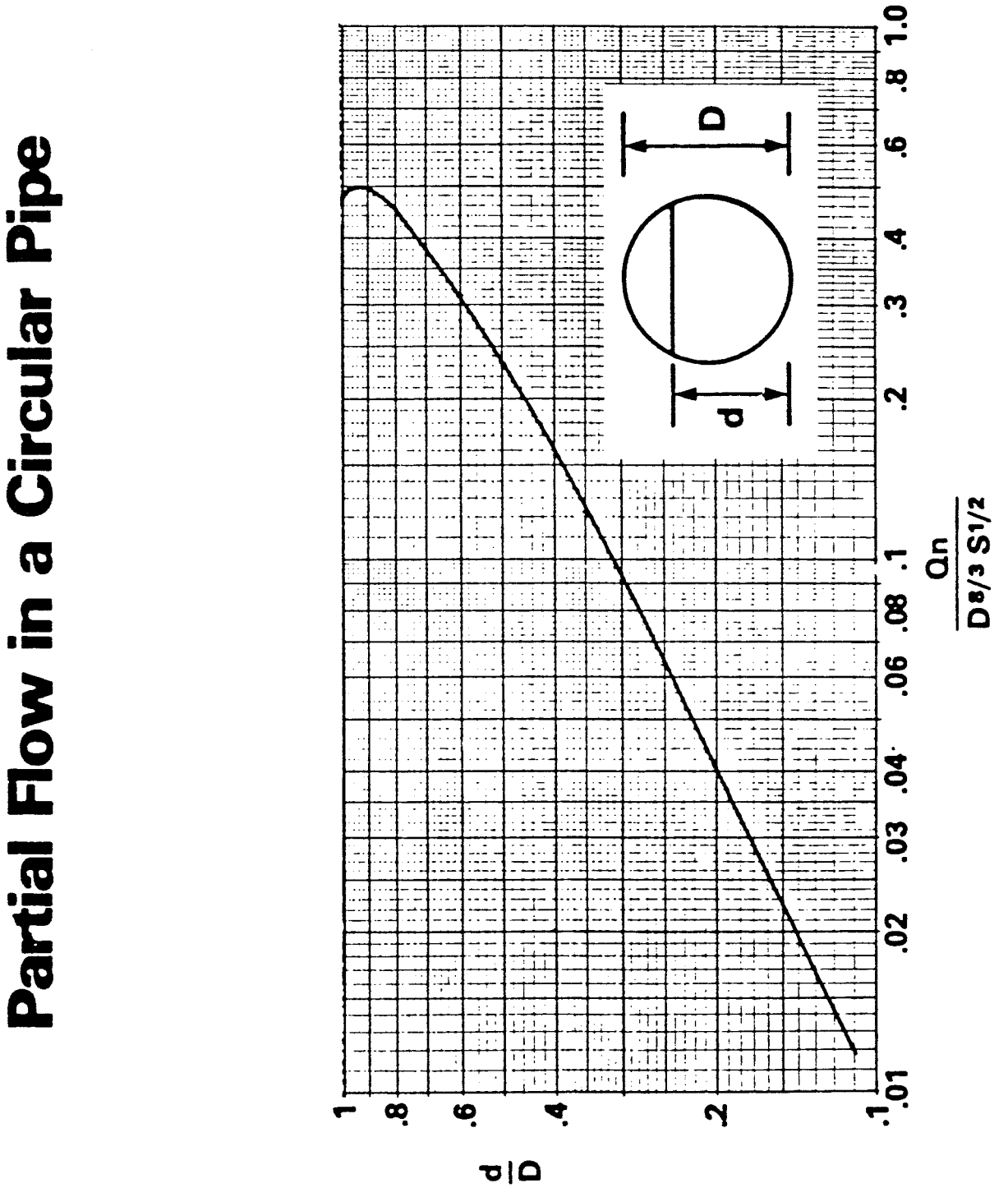
Chart 2-60: UNIFORM FLOW FOR PIPE CULVERTS



FROM "STATE ROAD HYDRAULICS" PART 4

CHART D

Chart 2-62: PARTIAL FLOW IN A CIRCULAR PIPE



FROM "STATE ROAD HYDRAULICS" PART 4

CHART E

HYDRAULIC PROPERTIES CIRCULAR CONDUITS FLOWING PART FULL

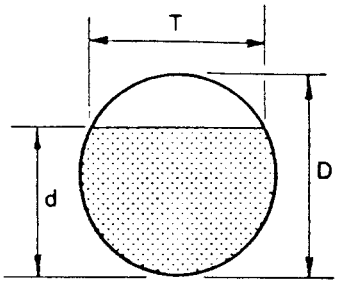
Determination of Area Values of $\frac{A}{D^2}$

$\frac{d}{D}$	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09
.0	.000	.001	.004	.007	.011	.015	.019	.024	.029	.035
.1	.041	.047	.053	.060	.067	.074	.081	.089	.096	.104
.2	.112	.120	.128	.136	.145	.154	.162	.171	.180	.189
.3	.198	.207	.217	.226	.236	.245	.255	.264	.274	.284
.4	.293	.303	.313	.323	.333	.343	.353	.363	.373	.383
.5	.393	.403	.413	.423	.433	.443	.453	.462	.472	.482
.6	.492	.502	.512	.521	.531	.540	.550	.559	.569	.578
.7	.587	.596	.605	.614	.623	.632	.640	.649	.657	.666
.8	.674	.681	.689	.697	.704	.712	.719	.725	.732	.738
.9	.745	.750	.756	.761	.766	.771	.775	.779	.782	.784
1.0	.785									

Determination of Hydraulic Radius Values of $\frac{R}{D}$

$\frac{d}{D}$	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09
0	.000	.007	.013	.020	.026	.033	.039	.045	.051	.057
.1	.063	.070	.075	.081	.087	.093	.099	.104	.110	.115
.2	.121	.126	.131	.136	.142	.147	.152	.157	.161	.166
.3	.171	.176	.180	.185	.189	.193	.198	.202	.206	.210
.4	.214	.218	.222	.226	.229	.233	.236	.240	.243	.247
.5	.250	.253	.256	.259	.262	.265	.268	.270	.273	.275
.6	.278	.280	.282	.284	.286	.288	.290	.292	.293	.295
.7	.296	.298	.299	.300	.301	.302	.302	.303	.304	.304
.8	.304	.304	.304	.304	.304	.303	.303	.302	.301	.299
.9	.298	.296	.294	.292	.289	.286	.283	.279	.274	.267
1.0	.250									

D = Diameter
d = Depth of Flow
A = Area of Flow
R = Hydraulic Radius
T = Top Width



Determination of Top Width Values of $\frac{T}{D}$

$\frac{d}{D}$	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09
.0	.000	.199	.280	.341	.392	.436	.457	.510	.543	.572
.1	.600	.626	.650	.673	.694	.714	.733	.751	.768	.785
.2	.800	.815	.828	.842	.854	.866	.877	.888	.898	.908
.3	.917	.925	.933	.940	.947	.954	.960	.966	.971	.975
.4	.980	.984	.987	.990	.993	.995	.997	.998	.999	1.000
.5	1.000	1.000	.999	.998	.997	.995	.993	.990	.987	.984
.6	.980	.975	.971	.966	.960	.954	.947	.940	.933	.925
.7	.917	.908	.898	.888	.877	.866	.854	.842	.828	.815
.8	.800	.785	.768	.751	.733	.714	.694	.673	.650	.626
.9	.600	.572	.543	.510	.475	.436	.392	.341	.280	.199
1.0	.000									

i.e. Given d = 3 ft., D = 4 ft., $\frac{d}{D} = 0.75$,

From Tables; $\frac{A}{D^2} = 0.632$, $\frac{R}{D} = 0.30$, and $\frac{T}{D} = 0.866$

FROM "STATE ROAD HYDRAULICS" PART 4

TABLE 2

TABLE 3

INPUT SUMMARY FOR W.S.: **DRAINAGE AREA 2**

STORM:	WATERSHED:
DISTRIBUTION =SCS TYPE 2	LAND SLOPE = 0.0000 PCT
	CURVE NUMBER = 98.00
PRECIP.DEPTH = 1.20 IN	CHANNEL LENGTH = 0.00 FT
	TIME OF CONC. = 0.0400 HR
DURATION = 6.00 HR	AREA = 0.81 AC
NUMBER OF LINES = 1141	D = 0.0053 HR

OUTPUT SUMMARY

RUNOFF DEPTH = 0.9838 IN
INITIAL ABSTRACTION = 0.0408 IN
PEAK FLOW = 2.81 CFS (3.4369 IPH)
AT T = 3.13 HRS

TABLE 4

INPUT SUMMARY FOR W.S.: **DRAINAGE AREA 3**

STORM:	WATERSHED:
DISTRIBUTION =SCS TYPE 2	LAND SLOPE = 0.0000 PCT
	CURVE NUMBER = 98.00
PRECIP.DEPTH = 1.20 IN	CHANNEL LENGTH = 0.00 FT
	TIME OF CONC. = 0.0400 HR
DURATION = 6.00 HR	AREA = 0.88 AC
NUMBER OF LINES = 1141	D = 0.0053 HR

OUTPUT SUMMARY

RUNOFF DEPTH = 0.9838 IN
INITIAL ABSTRACTION = 0.0408 IN
PEAK FLOW = 3.05 CFS (3.4369 IPH)
AT T = 3.13 HRS

CHANNEL AT DRAINAGE AREA 3

R I P R A P S I Z I N G F O R
T R A P A Z O I D A L D I T C H E S

ENTER LISTED PARAMETERS
1. FLOW RATE (CFS) 3.05
2. CHANNEL SLOPE .6
3. BOTTOM WIDTH (FT) 4.5
4. SIDE SLOPE .5
5. PHI ANGLE 42
6. SPECIFIC GRAVITY OF RIPRAP 2.65

DESIRED SAFETY FACTOR FOR CHANNEL BOTTOM .5
DESIRED SAFETY FACTOR FOR CHANNEL BANKS 1

VELOCITY	DEPTH	D50	S.F. BTM	S.F. BANK
6.074	.107	1.2838	.712	1

PACIFICORP
ELECTRIC OPERATIONS

INTERNAL CORRESPONDENCE

DATE: August 14, 1991

TO: Val Payne, Des-Bee-Dove Amendment Coordinator

FROM: Charles A. Semborski

SUBJECT: Des-Bee-Dove: Attachment A, Condition R614-301-728-(1)

As we discussed, the information requested under Condition R-614-301-728-(1) pertains to the Des-Bee-Dove Haul Road Reclamation Study which has yet to be approved by DOGM as part of the PAP. To satisfy the conditions listed under 728 (331, 332, 335), additional information outlined below should be inserted in the Phase II-Site Characterization section of the Des-Bee-Dove Haul Road Reclamation Study.

CONDITION R614-301-728-(1)

Within 45 days of permit renewal, the permittee must submit a detailed plan for inclusion in the PAP, as to how the following information from the proposed test plots will be achieved, based on the following requirements:

728.331 **Predicted sediment yield from the reclaimed haul road area;**

Response: Based on the "Proposed Reclamation Study" submitted to DOGM on February 15, 1991 the predicted sediment yield produced from the test plot area utilizing the standard of 0.1 acre ft/acre/year is as follows:

TEST PLOT DIMENSIONS:	Length =320 feet Width = 60 feet Acres = 0.44
Sediment Standard for disturbed areas:	0.1 acre ft/acre/year
Predicted Test Plot Sediment Yield	=0.04 acre feet or =0.16 tons/day*

* Assuming 60 lbs/cf^3

To verify the predicted sediment yield following the construction of the contour ditches, a sediment collection device will be installed at the bottom of the ditch and monitored on a quarterly basis to determine actual sediment yield produced from the contoured test plot. A total of four sediment collection devices will be installed, one in each of soil mixture types, i.e., soil mixture, weathered coal waste admixture, unweathered coal waste admixture, and no admixture (see Attachment 1).

728.332 **Acidity, total suspended solids, and other important water quality parameters of local impact from the impact of coal mining and reclamation operations;**

728.335(3) **Characterizations required by the Division for the test plots which must include:**

3) Runoff collection on test plots to determine water quality (i.e., TDS and TSS).

731.121-(1) **3) The assessment of the runoff water quality must be included as a design criteria for the test plot study. The data must be interpreted and included as part of the BTCA appendix upon submittal following test plot implementation. The plan must identify the surface water quality and quantity parameters to be monitored, sampling frequency and site location.**

To characterize the water quality, a network of single stage water quality samplers will be installed within the test plot area (see Attachment 2). Additional samplers will be installed above the disturbed area to collect samples from an undisturbed site with similar characteristics. A total of four single stage samplers will be installed, one in each of the soil mixture types, i.e., soil mixture, weathered coal waste admixture, unweathered coal waste admixture, and no admixture (see Attachment 1). Precipitation will be monitored utilizing a recording rain gage and compared to the sample volume and sediment yield. If sufficient volume of sample is collected in the single stage sampler, the following parameters will be analyzed.

Laboratory Measurements: (mg/l unless otherwise noted)

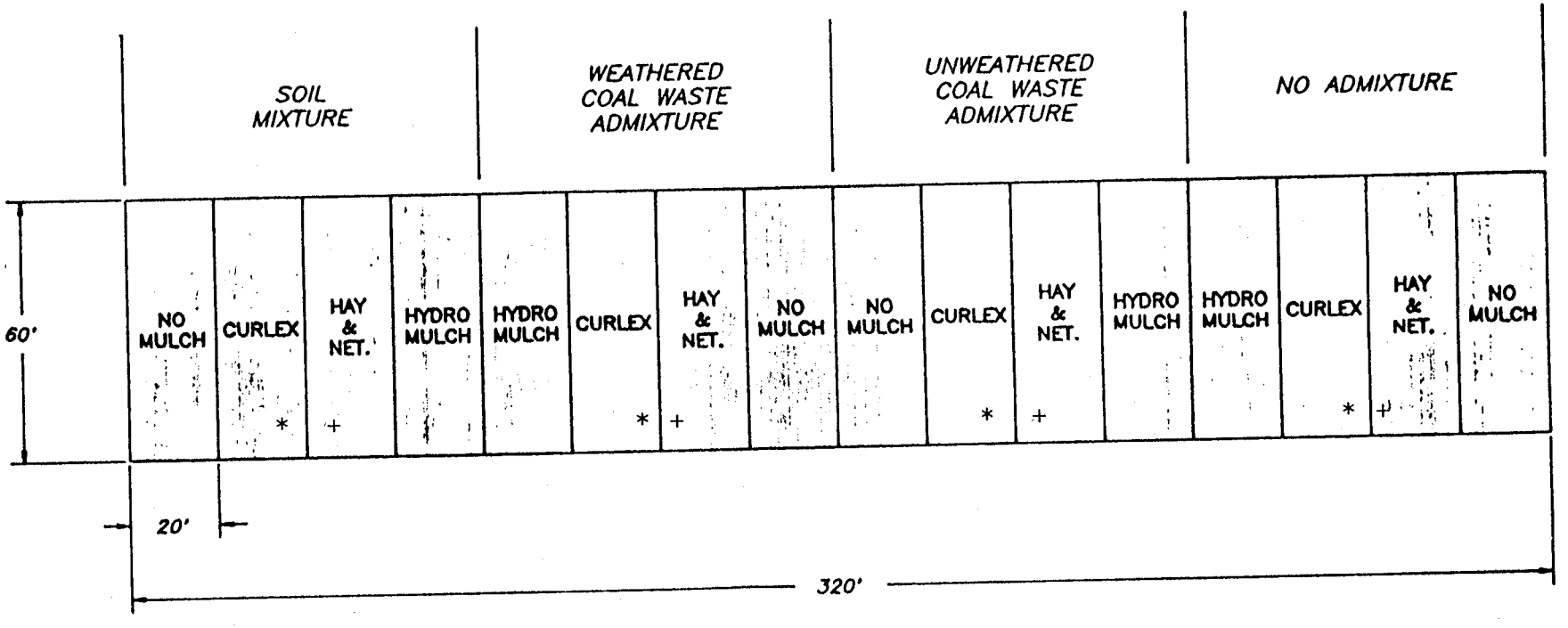
- Total Dissolved Solids
- Total Settleable Solids
- Total Suspended Solids
- Total Hardness (as $CaCO_3$)
- Acidity ($CaCO_3$)
- Alkalinity - Total
- Carbonate (CO_3^{-2})

- Bicarbonate (HCO_3^-)
- Calcium (Ca)
- Chloride (Cl^-)
- Conductivity (umhos/cm)
- Dissolved Oxygen
- Iron (Fe) - Total and Dissolved
- Magnesium (Mg)
- Total Manganese (Mn)
- pH (units)
- Potassium (K)
- Sodium (Na)
- Sulfate (SO_4^{-2})
- Turbidity (NTU's)
- Cation-Anion Balance

CAS/sh/1654

ATTACHMENT 1 SEDIMENT YIELD AND WATER QUALITY LOCATION SITES

DES–BEE–DOVE HAUL ROAD
RECLAMATION TEST PLOTS



* Sediment Yield Collection Device
\+ Water Quality Sampler

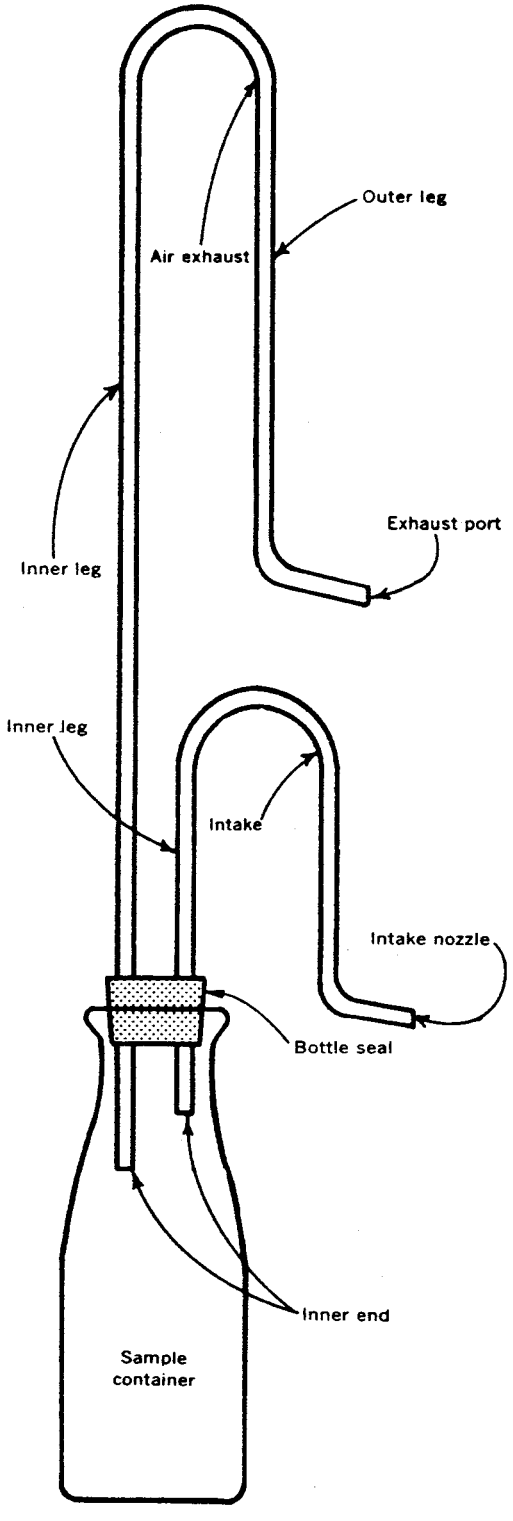
CAD FILE NAME/DISK#: HAULRD KL7

PACIFICORP ELECTRIC OPERATIONS
FUEL RESOURCES DEPARTMENT
P.O. BOX 26128 SALT LAKE CITY, UTAH 84126–0128

DES–BEE–DOVE
HAUL ROAD RECLAMATION STUDY
VEGETATION TEST PLOTS

DRAWN BY:	K. LARSEN	CS1284A	
SCALE:	1"=40'	DRAWING #:	
DATE:	MARCH 5, 1991	SHEET 1 OF 1	REV.

WITH SAMPLER
FOR W.Q. ON
ITAM TNET.



SINGLE STAGE SAMPLER

SOURCE: USGS: TECHNIQUES OF WATER-RESOURCES INVESTIGATIONS
FIELD METHODS FOR MEASUREMENTS OF FLUVIAL SEDIMENT - BOOK 3

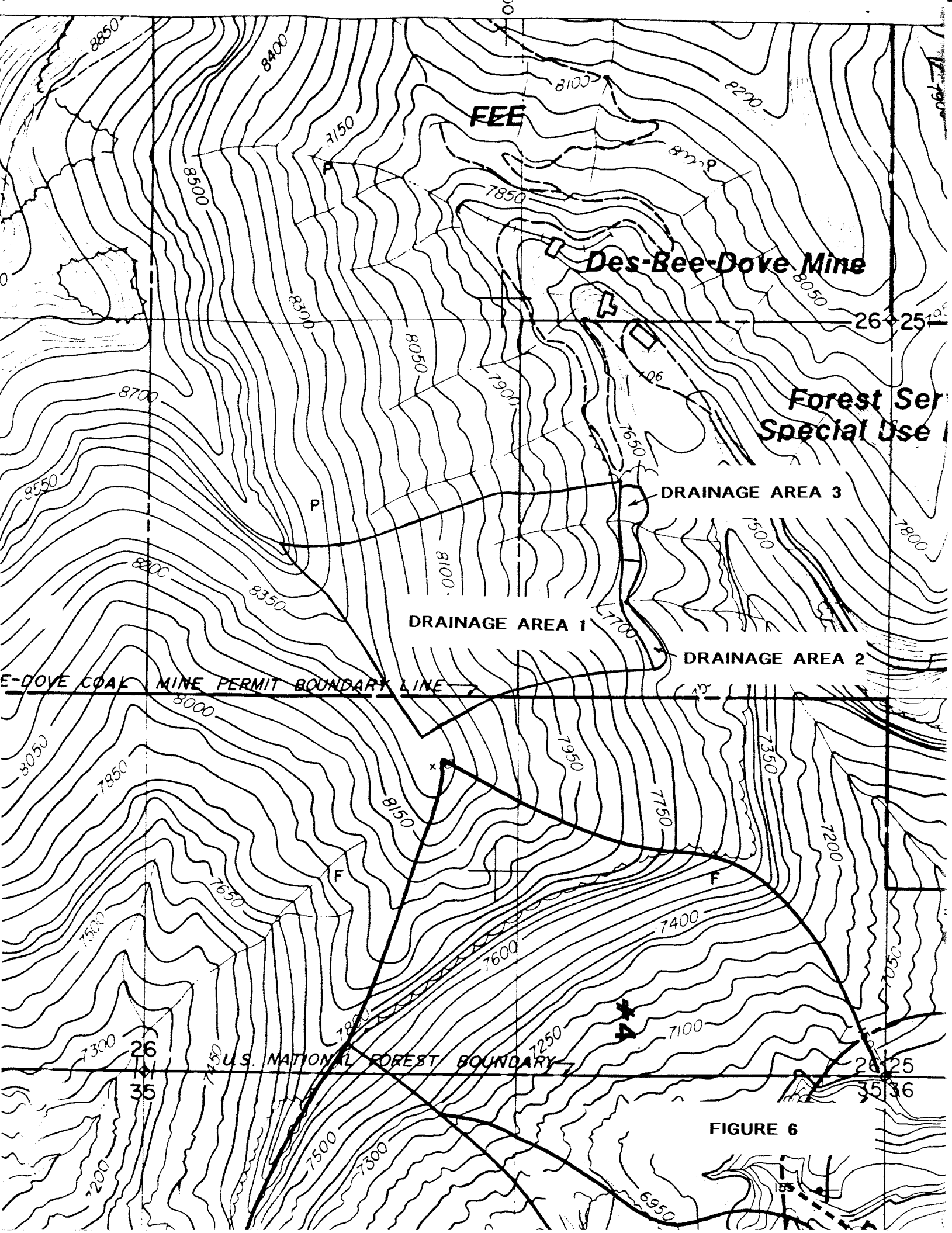

FEE
Des-Bee-Dove Mine
Forest Ser
Special Use
DRAINAGE AREA 3
DRAINAGE AREA 1
DRAINAGE AREA 2
E-DOVE COAL MINE PERMIT BOUNDARY LINE
U.S. NATIONAL FOREST BOUNDARY
26
25
35
36

FIGURE 6