

TRACKING FORM

I. KEY FEATURES OF PERMITTEE'S AMENDMENT APPLICATION

Permittee PacificCorp	Mine Name Trail Mountain	Amendment # ACT 10051009-96C	Date Received / 6-28-96 via US Mail
Proposal: Yard Drainage			
Description: The modifications will aid in the overall surface drainage of the Trail Mtn Yard.			

II. AMENDMENT CLASSIFICATION

<input type="checkbox"/> Major Amendment	Public Notice Required	<input type="checkbox"/> Yes	<input type="checkbox"/> No
<input checked="" type="checkbox"/> Minor Amendment	Outside of Permit Area	<input type="checkbox"/> Yes	<input type="checkbox"/> No
	Outside of Disturbed Area	<input type="checkbox"/> Yes	<input type="checkbox"/> No

III. SUMMARY OF DOGM PROCESSING DATES

Reviews Completed	FOLLOWUP REQUIREMENTS		
Approved Effective	MRP "After Const" Documents	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Disapproved	TA	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Mailed	CHIA	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Filed MRP SLO	Responds Within 15 days of Receipt? <input type="checkbox"/> Yes <input type="checkbox"/> No If no, explain below.		

IV. COORDINATED REVIEWS

EXTERNAL AGENCIES (Mine Specific) <small>(Adverse Comments, if Any, Include in Item V)</small>	DOGM REVIEWS/DISCIPLINES		
	COPY SENT	CONTACTED	
OSM	<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/> C <input type="checkbox"/> N/A	Generalists _____ <input type="checkbox"/> Yes <input type="checkbox"/> N/A
BLM	<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/> C <input type="checkbox"/> N/A	_____ INTERDISCIPLINARY APPROACH
US Forest Service	<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/> C <input type="checkbox"/> N/A	- Administrative _____ <input type="checkbox"/> Yes <input type="checkbox"/> N/A
US Fish & Wildlife	<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/> C <input type="checkbox"/> N/A	- Biology _____ <input type="checkbox"/> Yes <input type="checkbox"/> N/A
US National Parks	<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/> C <input type="checkbox"/> N/A	- Engineering _____ <input type="checkbox"/> Yes <input type="checkbox"/> N/A
UT Environmental Quality	<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/> C <input type="checkbox"/> N/A	- Geology _____ <input type="checkbox"/> Yes <input type="checkbox"/> N/A
UT Wildlife Resources	<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/> C <input type="checkbox"/> N/A	- Hydrology _____ <input type="checkbox"/> Yes <input type="checkbox"/> N/A
UT State History	<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/> C <input type="checkbox"/> N/A	- Soils _____ <input type="checkbox"/> Yes <input type="checkbox"/> N/A
UT Water Rights	<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/> C <input type="checkbox"/> N/A	- Permitting _____ <input type="checkbox"/> Yes <input type="checkbox"/> N/A
UT SITLA	<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/> C <input type="checkbox"/> N/A	- Other _____ <input type="checkbox"/> Yes <input type="checkbox"/> N/A
Other _____	<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/> C <input type="checkbox"/> N/A	

V. FOOTNOTES/ADDITIONAL EXPLANATION AS NECESSARY

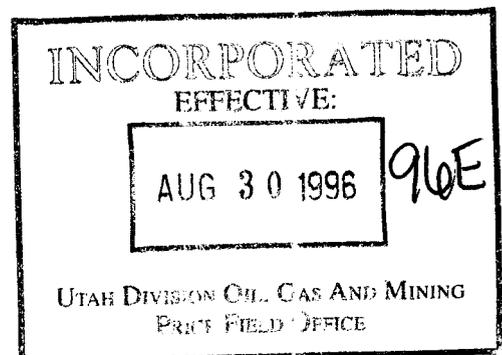
APPROVED BY 7/16/96

TABLE 7.10

Design values of the sedimentation pond

Sediment Storage Volume (ac-ft.)	0.47
Runoff Storage Volume (ac-ft)	1.67
Total Storage Volume (ac-ft) (Design Volume)	2.14
Embankment height at Design Volume*(ft)	14.50
Spillway Capacity (cfs)	36.5
Spillway Diameter (inches)	48.00
Head Above Spillway Crest as Design Discharge (ft)	0.80
Required Freeboard (ft)	1.00
Required Total Embankment Height * (ft)	16.00
Actual Embankment Height of Existing Ponds (ft)	17.00
Total Width (ft)	11-13

*Superseded
Material
1-15-97*



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has varied ownership (county, federal and private) and provides access for Forest Service and private land up Cottonwood Canyon.

Lands held by PacifiCorp are classified by Emery County, the US Forest Service, and the State of Utah as a recreation, forestry and mining area.

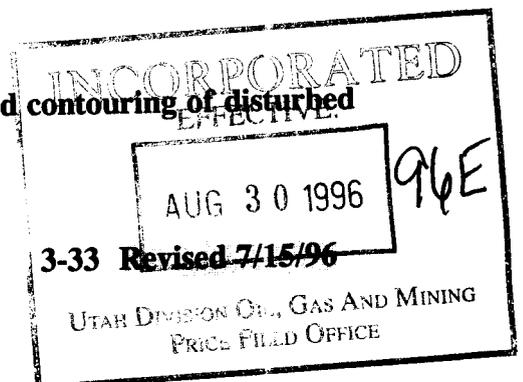
3.4.1.1 PROJECTED IMPACTS OF MINING ON CURRENT AND FUTURE LAND-USE

Within the permit area, approximately 24.84 acres has been disturbed by surface facilities of the mine. This disturbance has affected the soils and vegetation of the area. The effect on vegetation is temporary and will be eliminated by revegetation of the disturbed area. Wildlife loss of habitat in the riparian community has occurred. The acreage is small; however, the riparian area is considered to be of critical value to the overall density of terrestrial wildlife. Continued operation of the surface facilities will have no significant impact on the local wildlife. A full discussion can be found in Chapter 10.

3.4.1.2 CONTROL MEASURES TO MITIGATE IMPACTS

Careful planning of the reclamation activities will help to minimize the impact of the Trail Mountain Mine on land-use. Return of the mine site to the premining land-use of grazing, wildlife, and recreation at the conclusion of mining will be accomplished according to the steps outlined below:

- 1) Seal all large diameter openings with non-combustible material.
- 2) Remove all surface structures, equipment and facilities, followed by trash and debris removal.
- 3) Re-establishment of drainages and grading and contouring of disturbed areas.



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Trail Mountain Mine**

- (3) Necessary approvals for the road have been obtained from the authorities with jurisdiction over the public road through the cooperative effort of upgrading and paving of the road to the mine site. Necessary encroachment permits have been obtained from Emery County for accesses to and from the public road.
- (4) Required public notices concerning the operation have been posted in local newspapers for Permit Approvals, Permit Renewals and Permit Transfers.

3.2.11 TOTAL AREA FOR SURFACE DISTURBANCE DURING THE PERMIT TERM

The total area of present surface disturbance at the Trail Mountain Mine plan area, including all compliance activities (sediment pond, upper and lower culvert installation, borrow area portal areas and surface pad extension), is 24.84 acres (see Plate 3-1).

3.2.12 DETAILED CONSTRUCTION SCHEDULE

Construction of basic facilities was completed prior to the 1977 Act. Sediment controls, including the sediment pond, curb/gutter and bypass culverts were completed in late 1987. Minor system enhancements were completed from 1987 through the fall of 1990. Construction details and schedules for these projects are found in Appendices 7-13, 3-9, 3-7, 3-8, 3-9 and 3-10 respectively.

3.3 OPERATION PLAN

Trail Mountain Mine will employ a maximum of approximately 300 people to conduct its underground mining activities. Underground mining consists of longwall retreat mining and continuous miner development. Production is estimated between 3,500,000 to 5,000,000 tons per year. Coal is conveyed to the surface at approximately 16" x 0" run of mine product. It is then conveyed through an overland tube conveyor to the Cottonwood Mine Portal on the opposite canyon side. It then travels underground

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3-11 Revised 7/15/96
UTAH DIVISION OIL, GAS AND MINING
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TABLE 7-8

DESIGN CRITERIA
SEDIMENT POND INLETS

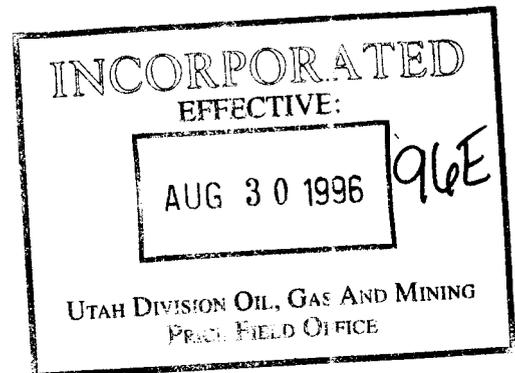
<u>Location</u>	<u>Curb/Gutter (Upper Section)</u>	<u>Curb/Gutter (near pond) (Lower Section)</u>	<u>Switchback</u>	<u>Culvert from Road</u>	<u>Mine Waterline</u>
Disturbed	9.55	8.800	0.18	0.287	-
Undisturbed Drainage Area (ac.)	26.61	14.700	3.79	-	-
Precipitation - 10/24 (in)	2.4	2.4	2.4	2.4	-
Flow (cfs)	22.56	22.56	4.65	0.45	0.20
Slope (%)	0.075	0.200	0.400	0.020	-
Bottom Width (ft.)	0.01	0.01	0.01	-	-
Side Slope (h:v)	4:1	5:1	2:1	-	-
Manning's N	0.015	0.015	0.035	0.024	-
Velocity (fps)	12.82	14.82	9.79	2.50	-
Flow Depth (ft.)	0.66	0.40	0.48	0.42	-
Runoff CN	78.5	78.5	78.5	90.0	-
Area Reg'd (Sq. Ft.)	1.77	1.52	0.48	0.18	-
Min. Structure Area (Sq. Ft.)	2.00	1.77	1.00	3.14	-

TABLE 7.9

Sedimentation pond storage and spillway capacity requirements.

VARIABLE

Disturbed Area, in acres	9.55
Undisturbed Area, in acres	26.61
Total Area (A) in mi ²	0.56
Weighted Curve Number (Disturbed Area)	78.5
Weighted Curve Number (Undisturbed Area)	72.0
S, in inches	2.74
25-year, 24-hour Precip. (P) in inches	2.9
25-year, 24-hour Runoff (Q) in inches (Disturbed)	1.22
25-year, 24-hour Runoff (Q) in inches (Undisturbed)	0.75
Hydraulic Length (L), in feet	2200
Average Watershed Slope (Y), in percent	8.0%
Time of Concentration (T _c), in hours	0.37
25-year, 24-hour Peak inflow, in cfs	36.46
10-year, 24-hour Precip., in inches	2.4
10-year, 24-hour runoff, in inches (Disturbed)	0.75
10-year, 24-hour Runoff, in inches (Undisturbed)	0.48
10-year, 24-hour Runoff, in ac-ft	1.67
Sediment Storage Requirement, in ac-ft	0.47
Pond Storage Requirement, in ac-ft.	2.14



SURETY BOND ESTIMATE
TABLE 3-4

Item	Amount Labor Man/Shift ^{1,2}		Cost/Man Shift	Labor Cost	Equipment ³ Requirements	Material ⁴ Equipment Shift/Cost ⁵	Materials Equipment Total/Cost	Total Labor Materials Equipment ¹¹
	2	3						
Containerized			120	720	Plant Materials	--	694	1414
							SUBTOTAL	\$56,116
MICELLANEOUS								
Handtools	N/A ⁽⁷⁾	N/A ⁽⁷⁾	N/A	N/A	Cutting Torch, etc	N/A 2000	2000	2000
Soil Analyses (Pregrade)	N/A ⁽¹⁰⁾	N/A ⁽¹⁰⁾	N/A	N/A	Handtools, Backhoe	N/A 600	600	600
Soil Analyses (Postgrade)	N/A	N/A	N/A	N/A	Handtools, Bags	N/A 920	920	920
Supervision ⁽⁸⁾	122		200	24400	N/A	N/A N/A	N/A	24400
Mobilization	N/A	N/A	N/A	N/A	Misc. Equipment	N/A 2000	2000	2000
Monitoring Maintenance	1	10 ⁽⁹⁾	200	40000	See Handtools	N/A 1000	1000	<u>41000</u>
							SUBTOTAL	\$70,920
							TOTAL	\$378,150

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SURETY BOND ESTIMATE
TABLE 3-4

ITEM	AMOUNT LABOR MAN/SHIFT^{1,2}	COST/MAN SHIFT	LABOR COST	EQUIPMENT³ REQUIREMENTS	MATERIAL⁴ EQUIPMENT SHIFT/COST⁵	MATERIALS EQUIPMENT TOTAL COST	TOTAL LABOR MATERIALS EQUIPMENT¹¹
Contour Trenching	1 5	160	800	Dozer	5 703	3515	4315
Mulch Park Ext. App 7-16	10 21 2 1	120 320	25200 320	Erosion Mat Combined Fert. Seed Mulch Trees	10 1100	11000 400	36200 720

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SURETY BOND ESTIMATE
TABLE 3-4

ITEM	AMOUNT LABOR MAN/SHIFT ^{1,2}	COST/MAN SHIFT	LABOR COST	EQUIPMENT ³ REQUIREMENTS	MATERIAL ⁴ EQUIPMENT SHIFT/COST ⁵	MATERIALS EQUIPMENT TOTAL COST	TOTAL LABOR MATERIALS EQUIPMENT ¹¹
Revegetation							
Fertilization	1 4	160	640	Dozer Spreader Fertilizer	4 703 4 55 10 30 * (arces)	2812 220 300	3452 220 300
Seedbed Preparation ^C(Grassland- Shrub)	1 4	160	640	Dozer Spreader Seed Land Imprinter	4 703 2 55 7 388 * (arces) 2 200	2812 110 2716 400	3452 110 2716 400
Seedbed Preparation (Riparian)	1 3	160	480	Dozer Spreader Fertilizer Disk Harrow Seed	3 703 1 55 1 55 1 55 1 55 3 236 * (arces)	2109 55 55 55 55 708	2589 55 55 55 55 708

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SURETY BOND ESTIMATE
TABLE 3-4

ITEM	AMOUNT LABOR MAN/SHIFT ^{1,8}	COST/MAN SHIFT	LABOR COST	EQUIPMENT ³ REQUIREMENTS	MATERIAL ⁴ EQUIPMENT SHIFT/COST ⁵	MATERIALS EQUIPMENT TOTAL COST	TOTAL LABOR MATERIALS EQUIPMENT ¹¹
Earth Moving and Recontouring (10, 12)	(14, 17) 1 25	160	4000	Dozer	25 703	17575	21575
	(15) 1 62	160	9920	988 Loader	62 971	60202	70122
	(16) 1 15	160	2400	Track Excavator	15 954	14310	16710
	6 3	160	2880	235 Hyd. Exc.	3 567	1701	4581
				2.5 yd Loader	3 293	879	879
				10 yd Dump Trk-4	3 226	2712	2712
						SUBTOTAL	\$116,579
Riprap ⁽¹⁹⁾	1 12	160	1920	Truck	12 250	3000	4920
	1 12	160	1920	Backhoe/Loader	12 225	2700	4620
	1 12	120	1440	None	- -	-	1440
	2 1.5	160	480	235 Trk Hoe	1.5 567	850	1330
				10 yd Dump Trk	1.5 226	339	339
						SUBTOTAL	\$12,649

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3-76.1 Added 7/15/96

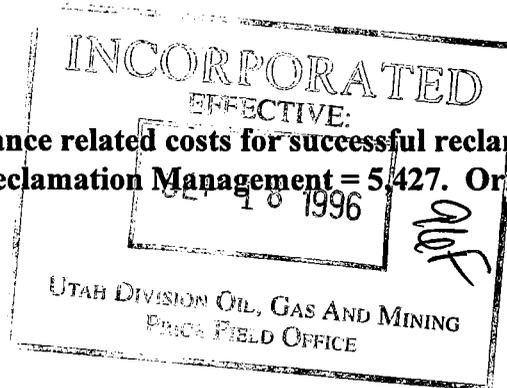
**TABLE 3-5
RECLAMATION COST BREAKDOWN FOR RECLAMATION BOND**

1. Surface Facility Removal	\$120,784
2. Earth Moving and Recontouring	\$108,407
3. Rip-Rap	\$ 10,980
4. Revegetation	\$ 56,096
5. Miscellaneous*	\$ 70,920
SUBTOTAL (1984 Dollars)	\$367,187
+10% Contingency	\$36,718
SUBTOTAL	\$403,906
+5.1% Reclamation Management	\$20,599
TOTAL	\$424,505
Add an inflation factor of 6.78 percent over 5 year Permit Term (1984 - 1989)	\$160,840
SUBTOTAL	\$585,345

<u>YEAR</u>	<u>ESCALATION FACTOR***</u>	<u>ESCALATED TOTAL</u>	<u>YEAR</u>	<u>ESCALATION FACTOR</u>	<u>ESCALATED TOTAL</u>
1989	--	\$585,345	1990	0.77%	\$589,852
1991	1.27%	\$597,343	1992	2.21%	\$610,545
1993	2.54%	\$626,052	1994	2.01%	\$638,636
1995	2.01%	\$651,473	1996	2.01%	\$664,567
1997	2.01%	\$677,925	1998	2.01%	\$691,551
1999	2.01%	\$705,452			

TOTAL SURETY ESTIMATE (1999 Dollars)	\$705,452
**1993 Exploration Drilling	144,266
SUGGESTED SURETY ESTIMATE	\$849,718

*Miscellaneous costs include all monitoring and maintenance related costs for successful reclamation establishments.
 **Total includes +10% Contingency = 12,622 and +4.3 Reclamation Management = 5,427. Original Cost 1994 Dollars = 126,217.
 ***Escalation Factors taken from Means©



**SURETY BOND ESTIMATE
TABLE 3-4**

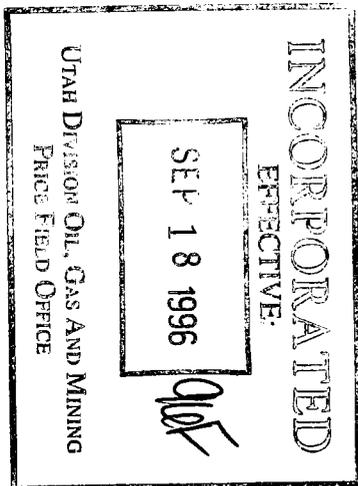
ITEM	AMOUNT LABOR MAN/SHIFT ^{1,8}	COST/MAN SHIFT	LABOR COST	EQUIPMENT ³ REQUIREMENTS	MATERIAL ⁴ EQUIPMENT SHIFT/COST ⁵	MATERIALS EQUIPMENT TOTAL COST	TOTAL LABOR MATERIALS EQUIPMENT ¹¹
Sediment Pond	1/2	160	320	Jeffrey	2/500	1000	1320
	1/2	160	320	Loader	2/225	450	770
Seal Portals	3/10	120	3600	Concrete Block	5/1000	5000	8600
Explosive Magazine	1/2	120	240	Concrete Block	2/500	1000	1240
Culverts	1/20	160	3200	Truck	20/250	5000	8200
	1/20	160	3200	Crane	20/381	7620	10820
	2/20	120	4800	None	-	-	4800
Trash Removal	1/2	120	240	Truck	1/250	250	<u>490</u>
						SUBTOTAL	<u>\$120,784</u>
Earth Moving and Recontouring (10,12)	1/25 (14,17)	160	4000	Dozer	25/703	17575	21575
	1/62 (15)	160	9920	988 Loader	62/971	60202	70122
	1/15 (16)	160	2400	Track Excavator	15/954	14310	<u>16710</u>
						SUBTOTAL	\$108,407
Riprap (19)	1/12	160	1920	Truck	12/250	3000	4920
	1/12	160	1920	Backhoe/Loader	12/225	2700	4620
	1/12	120	1440	None	-	-	<u>1440</u>
						Subtotal	\$10,980

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**SURETY BOND ESTIMATE
TABLE 3-4**

Storage	1/3	160	480	Truck	3/250	750	1230
Building	1/3	160	480	Backhoe/Loader	3/225	675	1155
	2/3	120	720	None			720
Concrete	1/6	160	960	235 Trackhoe	6/567	3402	4362
Pads	1/6	160	960	10 yd. Rock	6/226	1356	2316
				Truck			
				Pickup	3/70	210	210
	2/9	120	1200				1200
Concrete	1/.5	160	80	235 Trackhoe	.5/567	284	364
Pump House	1/.5	160	80	10 yd. Rock	.5/226	113	193
Pad				Truck			
				Pickup	.5/70	35	35
	2/.5	120	120	(Laborers)			<u>120</u>
							712



SURETY BOND ESTIMATE
TABLE 3-4

<u>ITEM</u>	<u>AMOUNT LABOR MAN/SHIFT^{1,8}</u>	<u>COST/MAN SHIFT</u>	<u>LABOR COST</u>	<u>EQUIPMENT³ REQUIREMENTS</u>	<u>MATERIAL⁴ EQUIPMENT SHIFT/COST⁵</u>	<u>MATERIALS EQUIPMENT TOTAL COST</u>	<u>TOTAL LABOR MATERIALS EQUIPMENT¹¹</u>
Storage Building	1 3	160	480	Truck	3 250	750	1230
	1 3	160	480	Backhoe/Loader	3 225	675	1155
	2 3	120	720	None			720
Concrete Pads	1 6	160	960	235 Trackhoe	6 567	3402	4362
	1 6	160	960	10yd Rock Truck	6 226	1356	2316
				Pickup	3 70	210	210
	2 5	120	1200				1200

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**SURETY BOND ESTIMATE
TABLE 3-4**

<u>ITEM</u>	<u>AMOUNT</u>		<u>COST/MAN</u>	<u>LABOR</u>	<u>EQUIPMENT³</u>	<u>MATERIAL⁴</u>		<u>MATERIALS</u>	<u>TOTAL LABOR</u>	
	<u>LABOR</u>	<u>MAN/SHIFT^{1,8}</u>				<u>SHIFT</u>	<u>COST</u>			<u>EQUIPMENT</u>
Sediment Pond	1	2	160	320	Jeffrey	2	500	1000	1320	
	1	2	160	320	Loader	2	225	450	770	
Seal Portals	3	10	120	3600	Concrete Block	5	1000	5000	8600	
Explosive Magazine	1	2	120	240	Concrete Block	2	500	1000	1240	
Culverts	1	20	160	3200	Truck	20	250	5000	8200	
	1	20	160	3200	Crane	20	381	7620	10820	
	2	20	120	4800	None	-	-	-	4800	
Trash Removal	1	2	120	240	Truck	1	250	250	<u>490</u>	
									SUBTOTAL	\$120,072
Earth Moving and Recontouring (10,12)	(14,17)	1	25	160	4000	Dozer	25	703	17575	21575
	(15)	1	62	160	9920	988 Loader	62	971	60202	70122
(16)	1	15	160	2400	Track Excavator	15	954	14310	<u>16710</u>	
									SUBTOTAL	\$108,407
Riprap(19)	1	12	160	1920	Truck	12	250	3000	4920	
	1	12	160	1920	Backhoe/Loader	12	225	2700	4620	
	1	12	120	1440	None	-	-	-	<u>1440</u>	
									SUBTOTAL	\$10,980

**PacifiCorp
Trail Mountain Mine**

**TABLE 3-5
RECLAMATION COST BREAKDOWN FOR RECLAMATION BOND**

1.	Surface Facility Removal	\$120,072
2.	Earth Moving and Recontouring	\$108,407
3.	Rip-Rap	\$10,980
4.	Revegetation	\$56,096
5.	Miscellaneous*	<u>\$70,920</u>
	SUBTOTAL (1984 Dollars)	\$366,475
	+10% Contingency	<u>\$36,637</u>
	SUBTOTAL	\$403,122
	+5.1% Reclamation Management	<u>\$20,156</u>
	TOTAL	\$423,278
	Add an inflation factor of 6.78 percent over 5 year Permit Term (1984 - 1989)	<u>\$160,840</u>
	SUBTOTAL	\$584,118

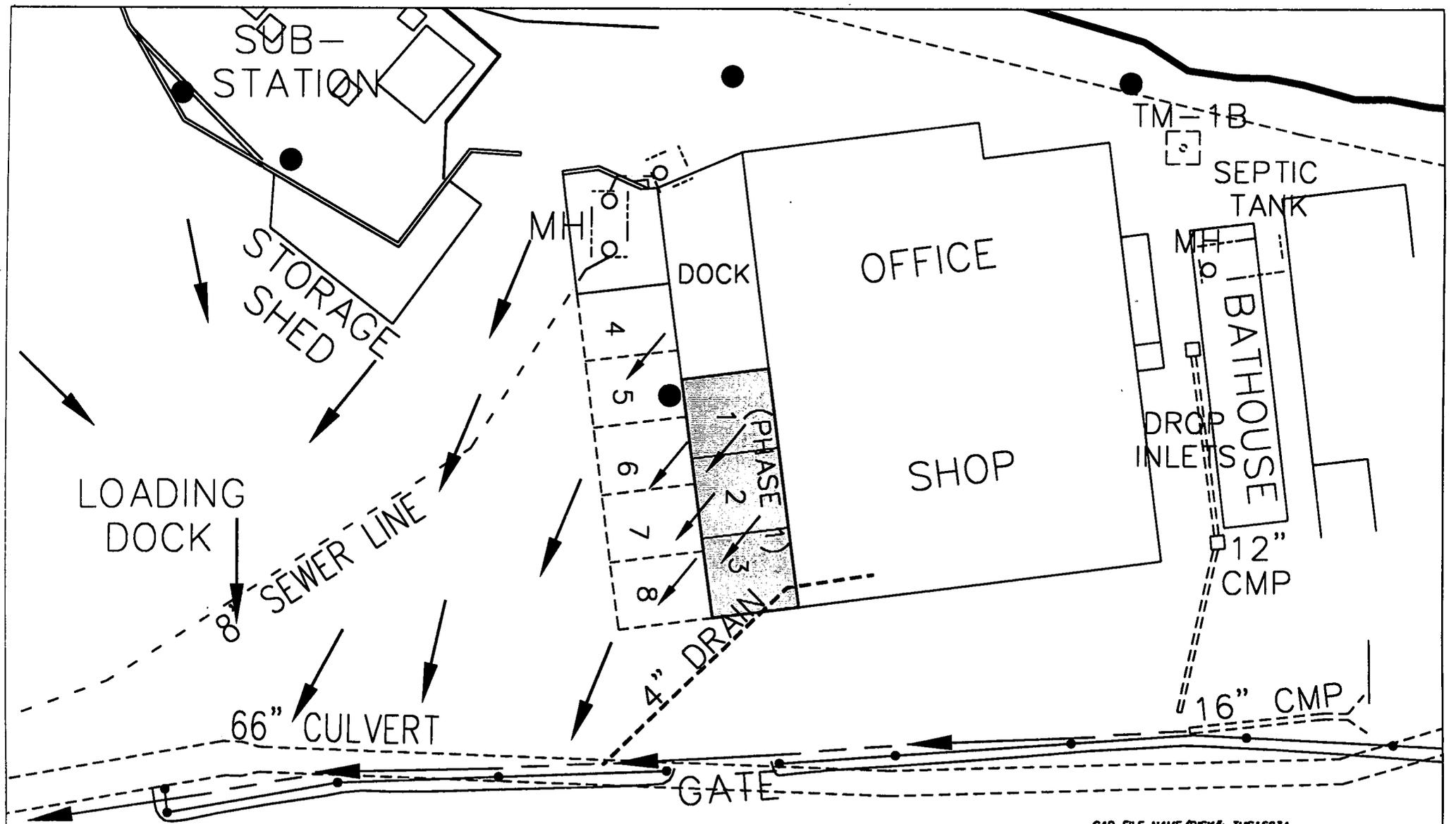
<u>YEAR</u>	<u>ESCALATION FACTOR***</u>	<u>ESCALATED TOTAL</u>	<u>YEAR</u>	<u>ESCALATION FACTOR</u>	<u>ESCALATED TOTAL</u>
1989	--	\$584,118	1990	0.77%	\$588,615
1991	1.27%	\$596,091	1992	2.21%	\$609,265
1993	2.54%	\$624,740	1994	2.01%	\$637,297
1995	2.01%	\$650,680	1996	2.01%	\$663,759
1997	2.01%	\$677,100	1998	2.01%	\$690,710
1999	2.01%	\$704,593			

TOTAL SURETY ESTIMATE (1999 Dollars)	\$704,593
**1993 Exploration Drilling	<u>144,266</u>
SUGGESTED SURETY ESTIMATE	\$848,860

*Miscellaneous costs include all monitoring and maintenance related costs for successful reclamation establishments.

**Total includes +10% Contingency = 12,622 and +4.3 Reclamation Management = 5,427. Original Cost 1994 Dollars = 126,217.

***Escalation Factors taken from Means©



CAD FILE NAME/DISK#: TMS1603A

**ENERGY WEST
MINING COMPANY**
HUNTINGTON, UTAH 84528

**TRAIL MOUNTAIN MINE
AMENDMENT TO YARD DRAINAGE**

DRAWN BY: **L. DRAPER**

TMS1603A

SCALE: **1" = 30'**

DRAWING #:

DATE: **JULY 9, 1996**

SHEET **1** OF **1**

REV. **---**



State of Utah

DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS AND MINING
1594 West North Temple, Suite 1210

Michael O. Leavitt
Governor
Ted Stewart
Executive Director
James W. Carter
Division Director

P.O. Box 145801
Salt Lake City, Utah 84114-5801
(801) 538-5340
(801) 359-3940 (Fax)

December 11, 1996

Chuck Semborski
PacifiCorp
PO Box 310
Huntington, Utah 84528

RE: Batch Processing of Trail Mountain Amendments, PacifiCorp, Trail Mountain Mine, ACT/015/009-96C, -96D, -96E, & -96F, Folder #3, Emery County, Utah

Dear Mr. Semborski:

The four amendments mentioned above required the submission of follow-up, unshaded documents. The following documents have been approved:

Table 7.8, 7.9, 7.10;
MRP pages 3-11, 3-33; and
Certified Surface Facilities Map.

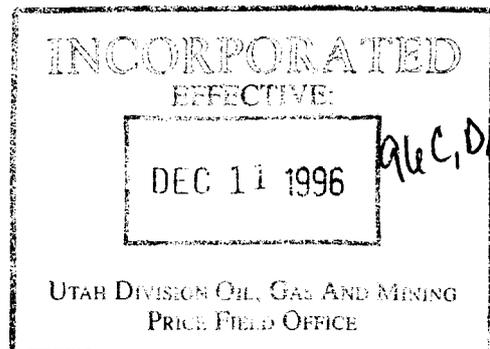
Please find enclosed a stamped copy for insertion into your MRP.

Sincerely,

Wm. J. Malencik
Reclamation Specialist

sd
enclosures

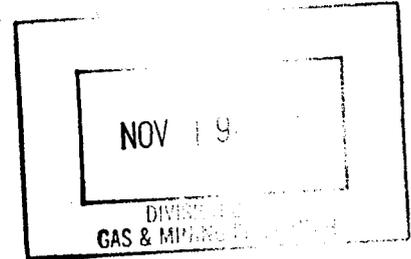
cc: Ranvir Singh, OSM, Denver
Mark Bailey, BLM, Price
Janette Kaiser, USFS, Price
Mark Page, State Eng, Price, w/o enc
Dave Ariotti, DEQ, Price, w/o enc
Bill Bates, DWR, Price, w/o enc
Joe Helfrich, DOGM, SLC





November 15, 1996

Division of Oil, Gas and Mining
451 East 400 North
P. O. Box 156
Price, Ut. 84501



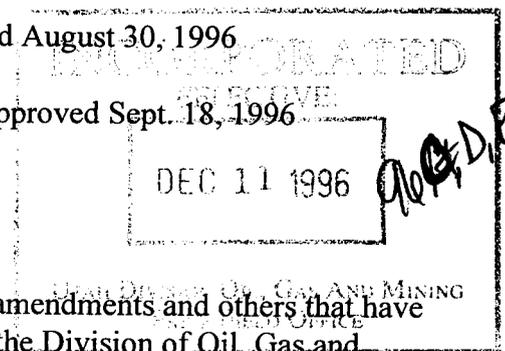
Attn. Mr. Bill Malencik

**Re: AS BUILT DRAWINGS, PACIFICORP, TRAIL MOUNTAIN MINE,
ACT/015/009, EMERY COUNTY, UTAH.**

PacifiCorp, by and through its wholly-owned subsidiary, Energy West Mining Company ("Energy West") as mine operator, herewith submits three copies each of the Surface Facility Drawing TMS-1362-D, and Surface Drainage Control Drawing TMS-1371-D. These drawings have been updated to reflect the changes as per the amendments listed below.

These drawings are shaded in areas reflecting updates:

1. Yard Drainage: Submitted: June 19, 1996, Approved July 15, 1996
2. Yard Drainage (No.2): Submitted: July 9, 1996, Approved July 29, 1996
3. Parking Lot Ext. Submitted: July 19, 1996, Approved August 30, 1996
4. Concrete Pad: Submitted: September 9, 1996, Approved Sept. 18, 1996



Reclamation Cost Increases:

During the course of the 1996 summer months, the above listed amendments and others that have been generated for construction projects have been submitted to the Division of Oil, Gas and Mining, and have since been approved, and construction for those projects listed above are complete. The pages 3-72.1, 3-76 Table 3-4 and page 3-81, Table 3-5 from the permit, chapter 3, have been a part of many of these amendments and reflect the changing reclamation cost increases. Recently these same pages have been reviewed by the Division as part of an amendment addressed as Non-Coal Waste. An approval for this amendment was received dated October 22, 1996. These reclamation cost figures will be the latest revision to date and will be incorporated into the permit, when final approval is received. Unshaded copies of pages 3-11, 3-

Huntington Office:
(801) 687-9821
Fax (801) 687-2695

Deer Creek Mine:
(801) 381-2317
Fax (801) 381-2285

Cottonwood Mine:
(801) 748-2319
Fax (801) 748-2380

Purchasing Fax (801) 687-9092

33, 3-76, 3-77, 3-78, permit volume 1, chapter 3, Table 7-8 (1 of 5), 7-9, and 7-10 , permit Volume 2, chapter 7, are required at this time, seven copies are included. These pages should bring the permit up to date on revisions.

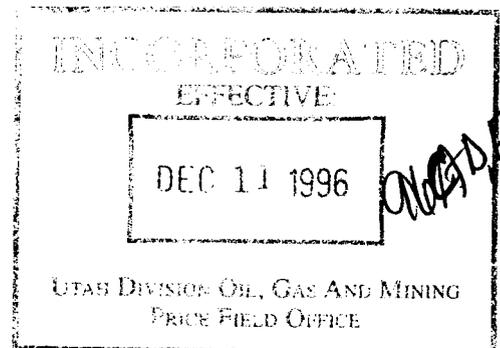
The " As Built" drawings, now being submitted, have been shaded for ease of review. When resubmitting, after approval, these same copies will not be shaded, seven copies will be sent.

Thank you for your help and assistance in completing this action, Please feel free to call Richard Northrup at 687-4822 if there are any questions or concerns.

Sincerely,

Handwritten signature of Richard Northrup in cursive script.

Val Payne
Sr. Environmental Engineer



APPLICATION FOR PERMIT CHANGE

Title of Change: *AS-BUILT DRAWINGS*

Permit Number: *ACT 1015 1009*

Mine: *TRAIL MOUNTAIN*

Permittee: *PACIFICORP*

Description, include reason for change and timing required to implement: *TO UPDATE PERMIT DRAWINGS, REFLECTING ADDITION OF SURFACE DRAINAGE, CONCRETE PADS.*

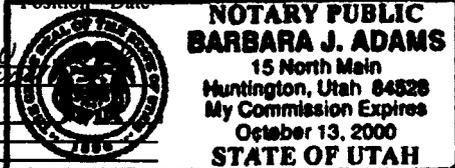
- Yes No 1. Change in the size of the Permit Area? _____ acres increase decrease.
- Yes No 2. Change in the size of the Disturbed Area? _____ acres increase decrease.
- Yes No 3. Will permit change include operations outside the Cumulative Hydrologic Impact Area?
- Yes No 4. Will permit change include operations in hydrologic basins other than currently approved?
- Yes No 5. Does permit change result from cancellation, reduction or increase of insurance or reclamation bond?
- Yes No 6. Does permit change require or include public notice publication?
- Yes No 7. Permit change as a result of a Violation? Violation # _____
- Yes No 8. Permit change as a result of a Division Order? D.O.# _____
- Yes No 9. Permit change as a result of other laws or regulations? Explain: _____
- Yes No 10. Does permit change require or include ownership, control, right-of-entry, or compliance information?
- Yes No 11. Does the permit change affect the surface landowner or change the post mining land use?
- Yes No 12. Does permit change require or include collection and reporting of any baseline information?
- Yes No 13. Could the permit change have any effect on wildlife or vegetation outside the current disturbed area?
- Yes No 14. Does permit change require or include soil removal, storage or placement?
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- Yes No 17. Does permit change require or include water monitoring, sediment or drainage control measures?
- Yes No 18. Does permit change require or include certified designs, maps, or calculations?
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- Yes No 20. Does permit change require or include subsidence control or monitoring?
- Yes No 21. Have reclamation costs for bonding been provided or revised for any change in the reclamation plan?
- Yes No 22. Is permit change within 100 feet of a public road or perennial stream or 500 feet of an occupied dwelling?
- Yes No 23. Is this permit change coal exploration activity inside outside of the permit area?

7 Attach **7** complete copies of proposed permit change as it would be incorporated into the Mining and Reclamation Plan.

I hereby certify that I am a responsible official of the applicant and that the information contained in this application is true and correct to the best of my information and belief in all respects with the laws of Utah in reference to commitments, undertakings, and obligations herein.

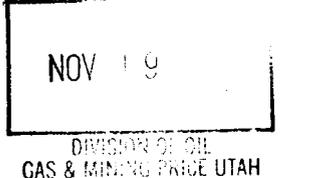
Richard [Signature] Env. Eng. 11-15-96
Signed - Name Position Date

Subscribed and sworn to before me this *15* day of *Nov* 1996
Barbara J. Adams
Notary Public



My Commission Expires: _____
Attest: STATE OF _____
COUNTY OF _____

Received by: Oil, Gas & Mining

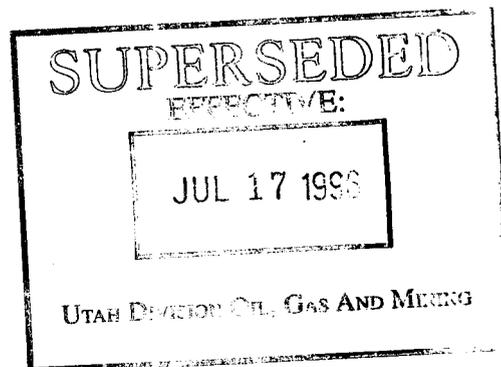


ASSIGNED PERMIT CHANGE NUMBER

908, D, E, F

LIST OF TABLES

<u>TABLE</u>	<u>DESCRIPTION</u>
7-1	Water Quality Analyses from within the Mine
7-2	Runoff Curve Numbers
7-3	Water Quality Data from Stream Station
7-4	USGS Water Quality Data
7-5	Utah Division of Health Water Quality Standards
7-6	Surface Water Rights in the Vicinity of the Trail Mountain Mine
7-7	Peak Flows and Related Designs
7-8	Design Criteria and Calculation Results for the Diversion Ditches
7-9	Sedimentation Pond Storage and Spillway Capacity Requirements
7-10	Design Values of Sedimentation Pond
7-11	Design Criteria Reclamation Hydrology





State of Utah
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS AND MINING

Michael O. Leavitt
Governor

Ted Stewart
Executive Director

James W. Carter
Division Director

355 West North Temple
3 Triad Center, Suite 350
Salt Lake City, Utah 84180-1203
801-538-5340
801-359-3940 (Fax)
801-538-5319 (TDD)

July 16, 1996

Val Payne, Senior Environmental Engineer
Energy West Mining Company
P.O. Box 310
Huntington, Utah 84528

Re: Yard Drainage, PacifiCorp, Trail Mountain Mine, ACT/015/009-96C, Folder #2, Emery County, Utah

Dear Mr. Payne:

The referenced amendment submitted to Bill Malencik received by the Price office June 28, 1996, is hereby approved effective July 15, 1996. Mr. Malencik forwarded the submittal to the hydrology staff at the Salt Lake office, whereby the information was reviewed and recommended for approval by Steven M. Johnson, Reclamation Hydrologist for the Division.

Enclosed is a stamped approved copy of your submittal for incorporation into your permit. Follow up action is required from you. Please update the hydrology/surface facility map by submitting seven certified copies to this office. These should be submitted within 30 days after installation of the revised drainage system. Also, please place a stamped "incorporated copy" of enclosed designs in your MRP. If you have any comments please call.

Sincerely,

Joseph C. Helfrich
Permit Supervisor

blb

Enclosure

cc: Ranvir Singh, WRCC
Mark Bailey, BLM,-Price
Janette Kaiser, USFS-Price
Robert Williams, USFWS (w/o enclosure)
Mark Page, Water Rights-Price (w/o enclosure)
Dave Ariotti, Health-Price (w/o enclosure)
Bill Bates, Wildlife-Price (w/o enclosure)
Max Evans, History (w/o enclosure)
PFO





State of Utah
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS AND MINING

Michael O. Leavitt
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Ted Stewart
Executive Director
James W. Carter
Division Director

355 West North Temple
3 Triad Center, Suite 350
Salt Lake City, Utah 84180-1203
801-538-5340
801-359-3940 (Fax)
801-538-5319 (TDD)

July 9, 1996

TO: Joe Helfrich, Permit Supervisor

FROM: Wm. J. Malencik, Reclamation Specialist 

RE: Drainage Amendment, PacifiCorp, Trail Mountain Mine, ACT/015/009-96C, Folder #2, Emery County, Utah

Have received the enclosed amendment and it appears the changes will improve the yard drainage system.

The purpose of this memorandum is three-fold:

- 1) Request to have the hydrologist review the amendment and provide such information to me.
- 2) Should the hydrologist have any questions concerning hydrologist's calculations, please contact Chuck Semborski, and
- 3) Return the original case file, together with the hydrologist's recommendations.

Approval of the amendment has a high urgency. The on-the-ground work will be performed during miner vacations, which is scheduled for July 22, 1996.

sd

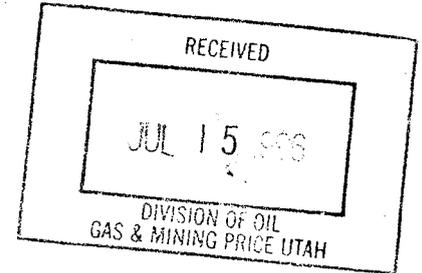
enclosure

cc: Val Payne, PacifiCorp



July 9, 1996

Division of Oil, Gas and Mining
451 East 400 North
Box 156
Price, Utah 84501



Attention: Mr. Bill Malencik

#2 960C

Re: AMENDMENT TO YARD DRAINAGE , PACIFICORP, TRAIL MOUNTAIN MINE, ACT/ 015/ 009, EMERY COUNTY, UTAH.

PacifiCorp, by and through its wholly-owned subsidiary, Energy West Mining Company ("Energy West") as mine operator, hereby requests an amendment to modify yard drainage. It is proposed at this time to establish an open-ended yard drainage amendment, consisting of several phases. The reason for this, is to do the work as funds become available. This type of arrangement would help expedite the work process as funds are released. A letter of intent to perform each phase of work would be sent to your office, with an attached drawing depicting the work to be accomplished during that phase. A written or verbal reply of approval by the Division would be received before work would commence.

The first phase would consist of three concrete pads placed at the entrance to the maintenance shop. Each pad would be approximately 17' x 18' x 10" with Number (6) reinforcing bar on 12" centers. The surface drainage from these concrete pads will flow onto the yard and sheet flow to the existing curb and gutter on the east side of the yard. A 8 1/2" x 11" yard map is attached for your convenience and depicts the proposed pad locations and direction of surface water flow. The mine manager would like to have the work accomplished during the vacation period scheduled for July 22 to August 2, 1996.

The following phases will include pads 4 through 8 as shown on the attached yard map.

Huntington Office:
(801) 687-9821
Fax (801) 687-2695
Purchasing Fax (801) 687-9092

Deer Creek Mine:
(801) 381-2317
Fax (801) 381-2285

Cottonwood Mine:
(801) 748-2319
Fax (801) 748-2380

No significant increase in surface runoff will be associated with this amendment.

Please find attached the revised pages 3-72.1, 3-76, Table 3-4 and 3-81, Table 3-5 for the Surety Bond Estimate Costs found in volume 1.

The required Drainage Control Drawing TMS1371D, Figure 7-5 and the Surface Facility Drawing TMS1362D, Figure 3-1, Volume 3, will be updated and submitted when all phases of the amendment are complete.

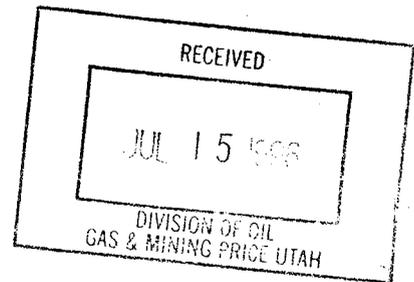
Thank you for your help and assistance in completing this amendment, if you have any questions or concerns please call Richard Northrup at 687-4822, or myself at 687-4722.

Sincerely



Val Payne

Sr. Environmental Engineer



APPLICATION FOR PERMIT CHANGE

Title of Change: <p style="font-size: 1.2em; margin-left: 20px;">AMENDMENT TO YARD DRAINAGE</p>	Permit Number: <i>ACT 1015 1009</i>
	Mine: <i>TRAIL MOUNTAIN</i>
	Permittee: <i>PACIFICORP</i>

Description, include reason for change and timing required to implement: *PLACEMENT OF CONCRETE APPROACH PADS TO THE MAINTENANCE SHOP - (2) WEEKS TO COMPLETE*

<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	1. Change in the size of the Permit Area? _____ acres <input type="checkbox"/> increase <input type="checkbox"/> decrease.
<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	2. Change in the size of the Disturbed Area? _____ acres <input type="checkbox"/> increase <input type="checkbox"/> decrease.
<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	3. Will permit change include operations outside the Cumulative Hydrologic Impact Area?
<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	4. Will permit change include operations in hydrologic basins other than currently approved?
<input checked="" type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	5. Does permit change result from cancellation, reduction or increase of insurance or reclamation bond?
<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	6. Does permit change require or include public notice publication?
<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	7. Permit change as a result of a Violation? Violation # _____
<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	8. Permit change as a result of a Division Order? D.O.# _____
<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	9. Permit change as a result of other laws or regulations? Explain: _____
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<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	11. Does the permit change affect the surface landowner or change the post mining land use?
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Attach ⁽⁷⁾ complete copies of proposed permit change as it would be incorporated into the Mining and Reclamation Plan.

I hereby certify that I am a responsible official of the applicant and that the information contained in this application is true and correct to the best of my information and belief in all respects with the laws of Utah in reference to commitments, undertakings, and obligations, herein.

Vale Payne
 Signed - Name - Position - Date
 _____ SR. ENV. ENGINEER 7/10/96

Subscribed and sworn to before me this 10-13 day of July, 1996

Barbara J. Adams
 Notary Public
 15 North Main
 Huntington, Utah 84528
 My Commission Expires
 October 13, 1998
 State of Utah

Attest: _____
 COUNTY OF _____

Received by Oil, Gas & Mining
RECEIVED

JUL 15 1996

DIVISION OF OIL
GAS & MINING PRICE UTAH

ASSIGNED PERMIT CHANGE NUMBER



State of Utah
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS AND MINING

Michael O. Leavitt
Governor

Ted Stewart
Executive Director

James W. Carter
Division Director

355 West North Temple
3 Triad Center, Suite 350
Salt Lake City, Utah 84180-1203
801-538-5340
801-359-3940 (Fax)
801-538-5319 (TDD)

July 15, 1996

TO: File #2

THRU: Joe Helfrich, Permit Supervisor 

FROM: Steven M. Johnson, Reclamation Hydrologist 

RE: Drainage Amendment, Trail Mountain Mine, PacifiCorp, ACT/015/009-96C, File #2, Emery County, Utah

SUMMARY:

PacifiCorp has proposed drainage modification to the Trail Mountain Mine yard. The modifications include installation of a drop inlet into CMP #1 and a new CMP #4 with drop inlet. CMP #4 will discharge into CMP #1. A temporary culvert (CMP #5) will be installed to convey water generated at the transfer building.

OPERATIONAL HYDROLOGY--DIVERSIONS

Rr645-301-742-300.

Analysis:

The proposed drainages changes are all temporary and diverting of miscellaneous flow. The 10-year, 6-hour storm event is required by the regulations for their design. PacifiCorp has designed to culverts and inlets to convey the 100-year, 6-hour which is much more conservative. The culverts sizes chosen will pass the design storms will much space to spare.

Findings:

The operator has met the requirements of operational diversion design regulation in designing CMP #1, 4 and 5 for the 100-year, 6-hour storm event.



Page 2

[Mine Number]-[Project number]

July 15, 1996

RECOMMENDATION:

This amendment should be approved for construction.

O:\015009.TMT\DRAFT\DRAINCHA.SJ

cc: Bill Malencik, DOGM (Price)



State of Utah
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS AND MINING

Michael O. Leavitt
Governor
Ted Stewart
Executive Director
James W. Carter
Division Director

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Salt Lake City, Utah 84180-1203
801-538-5340
801-359-3940 (Fax)
801-538-5319 (TDD)

July 9, 1996

TO: Joe Helfrich, Permit Supervisor

FROM: Wm. J. Malencik, Reclamation Specialist 

RE: Drainage Amendment, PacifiCorp, Trail Mountain Mine, ACT/015/009-96C, Folder #2, Emery County, Utah

Have received the enclosed amendment and it appears the changes will improve the yard drainage system.

The purpose of this memorandum is three-fold:

- 1) Request to have the hydrologist review the amendment and provide such information to me.
- 2) Should the hydrologist have any questions concerning hydrologist's calculations, please contact Chuck Semborski, and
- 3) Return the original case file, together with the hydrologist's recommendations.

Approval of the amendment has a high urgency. The on-the-ground work will be performed during miner vacations, which is scheduled for July 22, 1996.

sd

enclosure

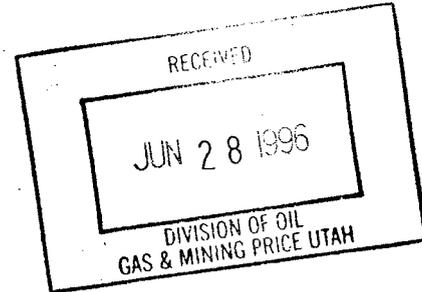
cc: Val Payne, PacifiCorp





June 19, 1996

Division of Oil, Gas and Mining
451 East 400 North
Box 156
Price, Utah 84501



Attention: Mr. Bill Malencik

#2
96C

Re: AMENDMENT TO YARD DRAINAGE , PACIFICORP, TRAIL MOUNTAIN MINE, ACT/015/009, EMERY COUNTY, UTAH.

PacifiCorp, by and through its wholly-owned subsidiary, Energy West Mining Company ("Energy West") as mine operator, hereby requests an amendment to modify the yard drainage at the Trail Mountain Mine. The modifications will aid in the overall surface drainage of the Trail Mountain Yard. These areas of concern have been identified during onsite inspections.

PROPOSED YARD DRAINAGE MODIFICATIONS

A drop inlet (# 1 on the enclosed dwg.) is to be installed off the east corner of the high pressure pumphouse. This inlet will flow into the existing 12" C.M.P. (CMP #1) As shown on the attached drawing, the inflows to this culvert will be areas 1a, 1b, and 1c. Attached calculations indicate that this culvert will be approximately 1/4 full during the designed storm event (100 year, 6 hours). Along with this modification the overflows, from the water tanks which used to drain into C.M.P. #1 will now be routed to an underground sump.

Inlet # 4 is proposed to be installed at the southeast corner of the tank farm. Along with this inlet, a new 12" C.M.P. (culvert # 4) will be installed under the haulage road and will discharge into the existing surface drainage. The inflows to this inlet will be the discharge of C.M.P. #1 (areas 1a, 1b, and 1c) and a portion of area 4. Calculations also indicate this culvert to be approximately 1/4 full during the designed storm event.

Inlet # 5 and pipe # 5 will be temporarily installed to handle the product water generated at the transfer building. The pipe will be 6 inch steel and will be approximately 1/2 full when 4

Huntington Office:
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Fax (801) 748-2380

washdown hoses are being used at 45 gpm each. This pipe will only be a temporary solution to drainage from the transfer building location. The long term solution is to pump the water to an underground sump.

Please find attached (7) copies of the calculations for surface runoff and pipe sizing reporting to the specified areas on the yard map and as explained in the text. These estimates were accomplished by using the O.S.M. program STORM 6.21 and pipe sizing by the 1990 Haestad Methods, Inc. program FLOWMASTER 1, Version 3.21.

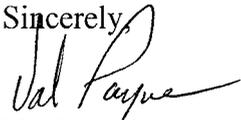
Attached are (7) copies of the List of Tables revision, found in the Table of Contents Volume II.

Please find attached a surface drainage drawing # TMS1589C depicting the locations and the areas delineated as to the surface runoff. This drawing is for your information to help in reviewing the amendment. When construction is completed (7) copies of the updated Drainage Control Plate 7-5, and Surface Facilities Drawing, Plate 3-1 will be submitted.

Reclamation of the concrete inlet boxes and culvert will occur during the backfilling and grading process. The final reclamation costs will be associated with these items and covered under the original proposed estimates. No additional costs are expected.

Thank you for your help and assistance in completing this amendment, if you have any questions or concerns please call Richard Northrup at 687-4822, or myself at 687-4722.

Sincerely,



Val Payne

Sr. Environmental Engineer

APPLICATION FOR PERMIT CHANGE

Title of Change:

AMENDMENT TO YARD DRAINAGE

Permit Number: ACT 1 015 1009

Mine: TRAIL MOUNTAIN

Permittee: PACIFICORP.

Description, include reason for change and timing required to implement:

AMENDMENT TO TRAIL MTN. YARD DRAINAGE, TO PROVIDE IMPROVEMENTS TO SURFACE RUNOFF AND CONTROL OF DRAINAGE.

- Yes No 1. Change in the size of the Permit Area? _____ acres increase decrease.
- Yes No 2. Change in the size of the Disturbed Area? _____ acres increase decrease.
- Yes No 3. Will permit change include operations outside the Cumulative Hydrologic Impact Area?
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Attach ⁷ complete copies of proposed permit change as it would be incorporated into the Mining and Reclamation Plan.

I hereby certify that I am a responsible official of the applicant and that the information contained in this application is true and correct to the best of my information and belief in all respects with the laws of Utah in reference to commitments, undertakings, and obligations, herein.

Val E Payne VALE PAYNE Sr. ENV. ENGINEER 6/21/96
Signed - Name - Position - Date

Subscribed and sworn to before me this 21 day of June, 19 96
Barbara J Adams
Notary Public

My Commission Expires: 10-13, 19 96
Attest: STATE OF _____ COUNTY OF _____



Notary Public
BARBARA J. ADAMS
15 North Main
Huntington, Utah 84523
My Commission Expires
October 13, 1996
State of Utah

Received by Oil, Gas & Mining

JUN 28 1996

DIVISION OF OIL
GAS & MINING PRICE UTAH

ASSIGNED PERMIT CHANGE NUMBER

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7-5	Utah Division of Health Water Quality Standards
7-6	Surface Water Rights in the Vicinity of the Trail Mountain Mine
7-7	Peak Flows and Related Designs
7-8	Design Criteria and Calculation Results for the Diversion Ditches
7-9	Sedimentation Pond Storage and Spillway Capacity Requirements
7-10	Design Values of Sedimentation Pond
7-11	Design Criteria Reclamation Hydrology
7-12	East Mountain Temperature Summary
7-13	Design Criteria for Surface Drainage, Yard Drainage Amendment (5 of 5)
7-14	Design Criteria for CMP Sizing, Yard Drainage Amendment (3 of 3)

Project Title = trail mtn area la

Table 7-13

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

Watershed data for watershed # 1

Curve number = 95.0
 Area = 0.2 acres
 Hydraulic length = 320.00 Feet
 Elevation change = 8.0 feet.
 Concentration time = 0.03 hours
 Concentration time type = SCS Upland Curves
 Unit hydrograph type = Disturbed
Total Area = 0.2 acres

Storm data

Total precipitation = 2.2 inches
 Storm type = SCS 6 hour design storm
 Peak Discharge = 0.15 cfs
 Discharge volume = 0.02 acre ft

time	rainfall	hydrograph	time	rainfall	hydrograph
(hr.)	(in.)	(cfs)	(hr.)	(in.)	(cfs)
0.00	0.000	0.000 *	0.20	0.028	0.000
0.40	0.028	0.000 *	0.60	0.035	0.000
0.80	0.042	0.001 *	1.00	0.042	0.003
1.20	0.047	0.006 *	1.40	0.047	0.009
1.60	0.065	0.015 *	1.80	0.084	0.023
2.00	0.084	0.028 *	2.20	0.327	0.115
2.40	0.327	0.145 *	2.60	0.208	0.106
2.80	0.088	0.051 *	3.00	0.088	0.043
3.20	0.070	0.036 *	3.40	0.070	0.035
3.60	0.059	0.030 *	3.80	0.048	0.025
4.00	0.048	0.024 *	4.20	0.043	0.022
4.40	0.043	0.022 *	4.60	0.039	0.020
4.80	0.035	0.018 *	5.00	0.035	0.018
5.20	0.032	0.016 *	5.40	0.032	0.016
5.60	0.033	0.017 *	5.80	0.035	0.018
6.00	0.035	0.018 *	6.20	0.000	0.003
6.40	0.000	0.000 *			

Project Title = trail mtn area l b

Table 7-13

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

Watershed data for watershed # 1

Curve number = 98.0
 Area = 0.2 acres
 Hydraulic length = 140.00 Feet
 Elevation change = 1.0 feet.
 Concentration time = 0.02 hours
 Concentration time type = SCS Upland Curves
 Unit hydrograph type = Disturbed
Total Area = 0.2 acres

Storm data

Total precipitaion = 2.2 inches
 Storm type = SCS 6 hour design storm
 Peak Discharge = 0.20 cfs
 Discharge volume = 0.03 acre ft

time	rainfall	hydrograph	time	rainfall	hydrograph
(hr.)	(in.)	(cfs)	(hr.)	(in.)	(cfs)
0.00	0.000	0.000 *	0.20	0.028	0.000
0.40	0.028	0.001 *	0.60	0.035	0.005
0.80	0.042	0.011 *	1.00	0.042	0.015
1.20	0.047	0.020 *	1.40	0.047	0.022
1.60	0.065	0.032 *	1.80	0.084	0.044
2.00	0.084	0.048 *	2.20	0.327	0.176
2.40	0.327	0.204 *	2.60	0.208	0.143
2.80	0.088	0.067 *	3.00	0.088	0.056
3.20	0.070	0.047 *	3.40	0.070	0.045
3.60	0.059	0.039 *	3.80	0.048	0.032
4.00	0.048	0.031 *	4.20	0.043	0.028
4.40	0.043	0.028 *	4.60	0.039	0.026
4.80	0.035	0.023 *	5.00	0.035	0.023
5.20	0.032	0.021 *	5.40	0.032	0.020
5.60	0.033	0.021 *	5.80	0.035	0.022
6.00	0.035	0.023 *	6.20	0.000	0.003
6.40	0.000	0.000 *			

Project Title = trail mtn area l c

Table 7-13

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

Watershed data for watershed # 1

Curve number = 77.0
 Area = 1.6 acres
 Hydraulic length = 513.00 Feet
 Elevation change = 52.0 feet.
 Concentration time = 0.06 hours
 Concentration time type = SCS Upland Curves
 Unit hydrograph type = Forested
Total Area = 1.6 acres

Storm data

Total precipitation = 2.2 inches
 Storm type = SCS 6 hour design storm
 Peak Discharge = 0.31 cfs
 Discharge volume = 0.07 acre ft

time	rainfall	hydrograph	time	rainfall	hydrograph
(hr.)	(in.)	(cfs)	(hr.)	(in.)	(cfs)
0.00	0.000	0.000 *	0.20	0.028	0.000
0.40	0.028	0.000 *	0.60	0.035	0.000
0.80	0.042	0.000 *	1.00	0.042	0.000
1.20	0.047	0.000 *	1.40	0.047	0.000
1.60	0.065	0.000 *	1.80	0.084	0.000
2.00	0.084	0.000 *	2.20	0.327	0.047
2.40	0.327	0.226 *	2.60	0.208	0.313
2.80	0.088	0.255 *	3.00	0.088	0.244
3.20	0.070	0.242 *	3.40	0.070	0.247
3.60	0.059	0.241 *	3.80	0.048	0.225
4.00	0.048	0.217 *	4.20	0.043	0.204
4.40	0.043	0.194 *	4.60	0.039	0.180
4.80	0.035	0.165 *	5.00	0.035	0.158
5.20	0.032	0.149 *	5.40	0.032	0.143
5.60	0.033	0.143 *	5.80	0.035	0.146
6.00	0.035	0.147 *	6.20	0.000	0.091
6.40	0.000	0.060 *	6.60	0.000	0.048

Table 7-13

time	rainfall	hydrograph	time	rainfall	hydrograph
(hr.)	(in.)	(cfs)	(hr.)	(in.)	(cfs)
6.80	0.000	0.037 *	7.00	0.000	0.028
7.20	0.000	0.020 *	7.40	0.000	0.014
7.60	0.000	0.009 *	7.80	0.000	0.004
8.00	0.000	0.002 *	8.20	0.000	0.000
8.40	0.000	0.000 *			

Project Title = trail mtn area 4

Table 7-13

WATERSHED HYDROGRAPH

Inflow into structure # 1

Structure type: Null

Watershed data for watershed # 1

Curve number = 95.0
 Area = 0.1 acres
 Hydraulic length = 109.00 Feet
 Elevation change = 52.0 feet.
 Concentration time = 3.5 hours
 Concentration time type = SCS Upland Curves
 Unit hydrograph type = Disturbed
Total Area = 0.1 acres

Storm data

Total precipitaion = 2.2 inches
 Storm type = SCS 6 hour design storm
 Peak Discharge = 0.07 cfs
 Discharge volume = 0.02 acre ft

time	rainfall	hydrograph	time	rainfall	hydrograph
(hr.)	(in.)	(cfs)	(hr.)	(in.)	(cfs)
0.00	0.000	0.000 *	0.20	0.028	0.000
0.40	0.028	0.000 *	0.60	0.035	0.000
0.80	0.042	0.000 *	1.00	0.042	0.002
1.20	0.047	0.003 *	1.40	0.047	0.004
1.60	0.065	0.007 *	1.80	0.084	0.011
2.00	0.084	0.013 *	2.20	0.327	0.056
2.40	0.327	0.071 *	2.60	0.208	0.051
2.80	0.088	0.024 *	3.00	0.088	0.021
3.20	0.070	0.017 *	3.40	0.070	0.017
3.60	0.059	0.015 *	3.80	0.048	0.012
4.00	0.048	0.012 *	4.20	0.043	0.011
4.40	0.043	0.010 *	4.60	0.039	0.010
4.80	0.035	0.009 *	5.00	0.035	0.009
5.20	0.032	0.008 *	5.40	0.032	0.008
5.60	0.033	0.008 *	5.80	0.035	0.009
6.00	0.035	0.009 *	6.20	0.000	0.001
6.40	0.000	0.000 *			

Table 7-14

Circular Channel Analysis & Design
Solved with Manning's Equation

Open Channel - Uniform flow

Worksheet Name: Trail Mtn. pipe #1
Comment: Trail Mtn. culvert # 1 (inflows la,b,c)

Solve For Actual Depth

Given Input Data:

Diameter	1.00 ft
Slope	0.0600 ft/ft
Manning's n	0.025
Discharge	0.66 cfs

Computed Results:

Depth	0.26 ft
Velocity	4.12 fps
Flow Area	0.16sf
Critical Depth. . .	0.34 ft
Critical Slope. . .	0.0208 ft/ft
Percent Full	25.77%
Full Capacity. . .	4.54 cfs
QMAX @.94D. . .	4.88 cfs

Table 7-14

Circular Channel Analysis & Design
Solved with Manning's Equation

Open Channel - Uniform flow

Worksheet Name: Trail Mtn. pipe #4
Comment: Trail Mtn. CMP #4, inflows (1a,b,c & 4)

Solve For Actual Depth

Given Input Data:

Diameter	1.00 ft
Slope	0.0670 ft/ft
Manning's n	0.025
Discharge	0.73 cfs

Computed Results:

Depth	0.26 ft
Velocity	4.41 fps
Flow Area	0.17sf
Critical Depth	0.36 ft
Critical Slope	0.0209 ft/ft
Percent Full	26.37%
Full Capacity	4.80 cfs
QMAX @.94D	5.16 cfs

Table 7-14

Circular Channel Analysis & Design
Solved with Manning's Equation

Open Channel - Uniform flow

Worksheet Name: Trail Mtn. pipe #5

Comment: Trail Mtn. Temp. pipe #5

Solve For Actual Depth

Given Input Data:

Diameter.	0.50 ft
Slope.	0.0580 ft/ft
Manning's n.	0.016
Discharge.	0.41 cfs

Computed Results:

Depth	0.21 ft
Velocity	5.19 fps
Flow Area.	0.08 sf
Critical Depth. . .	0.33 ft
Critical Slope. . .	0.0140 ft/ft
Percent Full	42.33%
Full Capacity. . .	1.10 cfs
QMAX @.94D. . .	1.18 cfs