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February 4, 1986

TO: Technical File

FROM: David Cline, Reclamation Hydrologist DJC

RE: Submittal of January 16, 1986, Price River Coal Complex, Drainage Control Modifications in Hardscrabble Canyon, ACT/007/004, Folder 3, Carbon County, Utah

Summary:

Price River Coal Company submitted a proposal for Drainage Control Modification in Hardscrabble Canyon on October 31, 1985. A deficiency letter was sent to Price River Coal Company from the Division in November 6, 1985. A response to the deficiency letter was received by the Division on November 14, 1985. On January 15, 1986, Rick Summers, Dave Cline and Randy Harden of the Division accompanied Rich Allison and Dennis Bryant of Amax and Ken Hutchinson of Price River Coal Company on a field visit to Hardscrabble Canyon. The purpose of the visit was for the Division to become familiar with all aspects of the drainage control modifications. On January 16, 1986, Price River Coal Company submitted their response to the December 30, 1985 deficiency letter from the Division. The Division has reviewed the latest submittal and is still unable to approve the modifications. Several deficiencies still exist concerning the technical adequacy of the proposal.

Body:

The following deficiencies should be addressed by the applicant.

1. Comment #2 made by the Division in the December 30, 1985, deficiency letter required that the plan view of diversion D-6 on Exhibit 3.3-11 be correlated and referenced to a topographic map depicting all diversion structures. The applicant must delineate the locations of the cross-sections on Exhibit 3.3-11 on Exhibit 3.3-4a.

2. Comment #5 made by the Division in the December 30, 1985 deficiency letter required that the proposal must contain designs for the channel to replace culvert C-3. The applicant has stated that a small diversion, D-3A, will replace culvert C-3. The proposal states that the diversion will be excavated into rock. An on site visit performed by the Division on January 15, 1986 indicated that the location for diversion D-3A is not in rock but rather on an unstable slope. Therefore, complete designs for stabilizing the fill prior to the excavation of diversion D-3A are required. Additionally, Table 3.3-5(D) includes a Mannings "n" value of 0.045. Since the diversion will have to be excavated in stabilized fill a Mannings "n" value that is representative of a riprapped lined channel must be used to compute the velocity during the design event.

3. Comment #6 made by the Division in the December 30, 1985 deficiency letter requested channel stability measures for the reclaimed section of diversion D-5 in the vicinity of culvert C-2 after removal. Table 3.3-5(c) indicates that the design discharge will flow with a velocity of approximately 9.8 feet/second. Therefore, plans for a channel lining to minimize erosion at the design discharge must be submitted. Additionally, Table 3.3-5(c) includes a Mannings "n" value of 0.045. A Mannings "n" value that corresponds to the D50 rip rap size must be used for computation of velocity at the design event. Figure 3.3-11(A) must be revised to incorporate the channel lining design to be used.

4. Comment #9 made by the Division in the December 30, 1985, deficiency letter required designs to demonstrate that each proposed channel will be stable at the design flows. The applicant must submit channel lining designs for diversions D-2, D-3, D-3A, D-5 and D-6. A Mannings "n" value that is representative of the riprap size to be used must be used for velocity computations. All figures of diversion cross-sections must be drawn to scale and revised to incorporate channel lining designs. Additionally, the applicant must commit to placing riprap on all sections of diversion D-6 that are not excavated in bedrock.

5. Exhibit 3.3-4a depicts diversion D-3 as extending only to within 300 feet of the Number 4 Mine Portal. The applicant must clarify how diversion D-3 collects runoff from the portion of sub-watershed Hc-3 that is located upstream of the head of the diversion.

6. Section 3.3-3(1)B states that diversion D-2 was constructed in rock. An on site visit performed by the Division on January 15, 1986 indicated that diversion D-2 is not constructed in rock but rather a valley fill material. The slope of diversion D-2, as determined from Exhibit 3.34a is 26% rather than the 10% which was used on Table 3.3-5(A). The design of diversion D-2 must be modified to reflect the unstable nature of the material, the correct slope, and a Manning's "n" value that corresponds to the size of rip rap to be used as a channel lining.

RECOMMENDATIONS:

The above deficiencies should be sent to Mr. Ken Hutchinson of PRCC and copied to Mr. Jim Buck of Amax in the form of a deficiency letter. Additionally, the letter from OSM to DOGM dated January 16, 1986 should be included with the deficiency letter.

jvb
cc: W. Hedberg
S. Linner
R. Summers
T. Wright
0363R-11

Orig mine file
cc R. Summers

# United States Department of the Interior

OFFICE OF SURFACE MINING
Reclamation and Enforcement
BROOKS TOWERS
1020 15TH STREET
DENVER, COLORADO 80202

RECEIVED
JAN 16 1986
DIV. OIL, GAS, MINING

Dianne Nielson
Division of Oil, Gas & Mining
355 W. North Temple
3 Triad Center, Suite 350
Salt Lake City, Utah 84180-1203

Dear Dr. Nielson:

This letter is intended to confirm and clarify the conference call of December 16, 1985, between Rick Summers of Utah Division of Oil, Gas and Mining (DOGM) and the Office of Surface Mining Reclamation and Enforcement (OSMRE) Hydrologist, Lynn Shown and project leader Vernon Maldonado. The following items were discussed in regard to the Price River Coal Company's submission of a November 29, 1985, Sediment Control Plan for the Price River Complex Mine (ACT/007/004) located in Hardscrabble Canyon.

1. Diversion #2 proposed design slope of 0.1 ft. per ft. is quite steep and will result in flow velocitites in excess of 9 ft. per second with a flow of approximately 69 cfs. The bed of this diversion will probably have to be lined. Rip-rap was proposed as a link for channel sides but no sizing designs for the rip-rap was provided.

2. The print out from the HEC-2 model for the water-surface profile should better identify the output parameters and a key to all abbreviations is needed.

3. Diversions D-2 and D-5 are located on the topographic map; however, D-6 is not. The profile diagram provided for the D-6 diversion indicated that the slopes were too steep.

4. OSMRE's preliminary review comments were not based on an analysis of the submission with the OSMRE runoff model, but were compiled from SCS curve number (CN) diagrams and tables.

5. This initial review is in the final completeness stage, and OSMRE will submit to Utah DOGM more comprehensive technical comments during the technical review stage.

I hope that you find these comments to accurately reflect the discussion. Should you have any questions, please call Vernon Maldonado or Richard Holbrook at (303) 844-2451.

Sincerely,

Richard E. Dawes

for Allen D. Klein
Administrator
Western Technical Center

PRCC - Hardscrabble Canyon
Tc, peak flows
1/26/86 - D. Cline

Tc - use Kent's formula -

$$Tc = \left[ \frac{l^{0.8} (S+1)^{0.7}}{1900\ y^{0.5}} \right] / 0.6$$

10yr - 24hr precip. event = 1.90 inches; SCS Type II
CN, from PRCC submittal 11/14/85

| Watershed | CN | Tc DOGM | Tc PRCC | Area DOGM | Area PRCC | Peak DOGM | Peak PRCC |
|---|---|---|---|---|---|---|---|
| HC-19 | 76 | .05 | .04 | 2.00 | 1.00 | 0.82 | |
| HC-1 | 78 | .19 | .09 | 128.96 | 124.2 | 52.22 | 85 |
| HC-2 | 79 | .15 | .08 | 58.25 | 53.1 | 27.31 | 43 |
| HC-3 | 84 | .13 | .08 | 59.46 | 60.7 | 41.45 | 51 |
| HC-4 | 81 | .20 | .12 | 179.41 | 173.5 | 93.31 | 137 |
| HC-5 | 78 | .38 | .23 | 358.64 | 356.8 | 111.27 | 152 |
| HC-6 | 76 | .12 | .04 | 28.46 | 27.7 | 10.57 | 25 |
| HC-7 | 76 | .08 | .04 | 9.81 | 4.2 | 3.87 | |
| HC-8 | 76 | .09 | .04 | 11.36 | 13.1 | 4.41 | |
| HC-9 | 89 | .09 | .07 | 13.20 | 12.7 | 12.92 | 18 |
| HC-10 | 87 | .06 | .03 | 6.94 | 6.5 | 6.14 | |
| HC-11 | 83 | .11 | .07 | 50.73 | 55.0 | 33.58 | 54 |
| HC-12 | 76 | .11 | .04 | 9.87 | 8.5 | 3.72 | |
| HC-13 | 76 | .04 | .03 | 1.83 | 1.3 | 0.76 | |
| HC-14 | 76 | .05 | .08 | 2.41 | 2.1 | 0.99 | |
| HC-15 | 79 | .11 | .03 | 20.83 | 19.3 | 10.23 | |
| HC-16 | 80 | .09 | .03 | 17.44 | 17.7 | 9.50 | 14 |
| HC-17 | 79 | .19 | .09 | 128.96 | 2.3 | 57.10 | 85 |
| HC-18 | 76 | .05 | .04 | 3.67 | 4.7 | 1.51 | |
| HC-3A | 76 | .05 | .02 | 2.29 | 1.80 | 0.94 | |
| HC-9A | 89 | .03 | .03 | 3.90 | 3.5 | 3.91 | |

PRCC - Drainage Control Modifications
Tc for Hardscrabble Canyon - Kent's formula
Reviewer: D. Clive 1/23/86

| Watershed | L (ft) | h (ft) | Sc (%) | l (ft) | $S = (1000/CN) - 10$ | Tc (hrs) |
|---|---|---|---|---|---|---|
| HC-4 | 29,000 | 200 | 74.0 | 4600 | 2.34 | .20 |
| HC-1+17 | 16,500 | 200 | 59.0 | 3500 | 2.82 | .19 |
| HC-2 | 7,000 | 200 | 55.1 | 2500 | 2.65 | .15 |
| HC-3 | 9,000 | 200 | 69.0 | 2750 | 1.90 | .13 |
| HC-3A | 1250 | 40 | 50.1 | 550 | 3.15 | .05 |
| ~~HC-4~~ | | | | | | |
| HC-5 | 38,250 | 200 | 48.9 | 7,000 | 2.82 | .38 |
| HC-6 | 4750 | 200 | 76.6 | 2,000 | 3.15 | .12 |
| HC-7 | 5500 | 40 | 51.5 | 1,000 | 3.15 | .08 |
| HC-8 | 8500 | 40 | 68.7 | 1,400 | 3.15 | .09 |
| HC-9 | 7000 | 40 | 48.7 | 1,500 | 1.23 | .08 |
| HC-9A | 2500 | 40 | 59.0 | 500 | 1.24 | .03 |
| HC-10 | 5750 | 40 | 76.0 | 1,250 | 1.49 | .06 |
| HC-11 | 8000 | 200 | 72.0 | 2,300 | 2.05 | .11 |
| HC-12 | 7250 | 40 | 67.0 | 1,750 | 3.16 | .11 |
| HC-13 | 1300 | 40 | 65.0 | 500 | 3.16 | .04 |
| HC-14 | 2000 | 40 | 76.0 | 700 | 3.16 | .05 |
| HC-15 | 3000 | 200 | 66.0 | 1,750 | 2.66 | .11 |
| HC-16 | 3000 | 200 | 79.0 | 1,750 | 2.50 | .09 |
| ~~HC-17~~ | | | | | | |
| HC-18 | 2750 | 40 | 69.0 | 700 | 3.16 | .05 |
| HC-19 | 1700 | 40 | 78.0 | 700 | 3.16 | .05 |

PRCC - Handscrabble Canyon - Drainage Control Plan

Reviewer: D. Clie 1/23/86

| Structure # | Watersheds | Area Doom | Area PRCC | Peak |
|---|---|---|---|---|
| D1 | — | | | |
| D2 | 9, 3 | 72.7 | 73.4 | |
| D3 | 3 | 59.4 | 60.7 | |
| D3A | 3A | 2.3 | 1.8 | |
| D4 | 9A | 3.9 | 3.5 | |
| D5 | 2, 3, 4, 5, 6, 7, 8, 9, 14 | 721.0 | 712.7 | |
| D6 | 1, 2, 3, 4, 5, 6, 7, 8, 9, 11, 14, 16, 17 | 918.12 | 911.7 | |
| D7 | 1 + 17 | 128.9 | 126.4 | |
| | | | | |
| C1 | 3, 9 | 72.6 | 73.4 | |
| C2 | 4, 5, 6, 7, 8 | 587.7 | 584.1 | |
| C3 | 3 | 59.5 | 60.7 | |
| C4 | 3, 4, 5, 6, 7, 8, 9 | 660.4 | 657.5 | |
| C5 | 3, 4, 5, 6, 7, 8, 9 | 660.4 | 657.5 | |
| C6 | 11 | 50.7 | 55.0 | |
| C7 | 2, 3, 4, 5, 6, 7, 8, 9, 11, 14, 16 | 789.2 | 785.3 | |

PRCC - Hardscrabble Canyon
Watershed Areas - in acres
1/23/86 - D. Cline

| | UBOGM | PRCC |
|---|---|---|
| HC - 1 + 17 - | 128.96 Acres | 126.4 Acres |
| HC - 2 - | 58.25 | |
| HC - 3 - | 59.46 | 60.7 |
| HC-4 | 179.41 | |
| HC-5 | 358.64 | |
| HC-6 | 28.46 | |
| HC-7 | 9.81 | |
| HC-8 | 11.36 | |
| HC-9 | 13.20 | |
| HC-10 | 6.94 | |
| HC-11 | 50.73 | |
| HC-12 | 9.87 | |
| HC-13 | 1.83 | |
| HC-13A | 2.18 | |
| HC-14 | 2.41 | |
| HC-15 | 20.83 | |
| HC-16 | 17.44 | |
| HC-18 | 3.07 | |
| HC-19 | 2.00 | |
| HC-9A | 3.90 | 4.9 |
| HC-3A | 2.29 | 1.5 |