FILE 007/004

0060

PRICE RIVER COAL COMPANY
P.O. BOX 629 HELPER, UTAH 84526 (801) 472-3411

April 8, 1982

CERTIFIED MAIL NO. 3968396
Return Receipt Requested

Ms. Sally Keefer
Reclamation Hydrologist
State of Utah
Department of Natural Resources
Division of Oil, Gas, and Mining
4241 State Office Building
Salt Lake City, Utah 84114

Re: Drainage Controls at the No. 5 Mine Site in Sowbelly Canyon

Dear Sally:

Price River Coal Company recently received an N.O.V. for not having a discharge structure in the final pond, I.D. No. 005, in Sowbelly Canyon. We had been prepared to install a CMP type principal spillway in Pond 005 until our discussion on 3/30/82, regarding these matters. You intimated that the possibility existed to consider the ponds at No. 5 as "evaporation ponds", if large enough and so designated, not required to have a spillway. Please consider the following facts and review the included map. We will proceed on your decision as to best practices in this case.

Drainage and Water Shed Characteristics of the No. 5 Mine Site:

14.2 acres are included within the controlled drainage plan for No. 5 Mine site. 11.9 acres of this area is used for mine facilities and materials storage. The remaining 2.3 acres is comprised of steep, vegetated* areas which cannot be divered away, due to the physical limitations of the topography. All other surface runoff has been diverted around the site by ditches, berm and culverts. On site drainage is directed to three interconnected ponds. The connection is via an 18" sub-surface CMP as shown on the enclosed map. The site has a grade of about 5% to the south. About one-half of the surface is highly compacted road and access areas with the remainder somewhat more water retentive, due to stockpiled materials and loose sand/gravel surfacing.

Ponds:

The three ponds, designated 003, 004 and 005, are excavated into natural ground. Pond 003 is sealed with 2-3 inches of bentonite to prevent leakage to the mine slope approximately 50' beneath. Actual measured capacity is:

*Undisturbed and naturally revegetated areas are shown on the enclosed map.

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003: 11,253 ft.^{3}

004: 40,460 ft.^{3}

005: 16,766 ft.^{3}

Total water storage capacity: 68,479 ft.^{3}

Runoff Characteristics:

The 10 year, 24 hour storm, as stated in our NPDES Permit, is 1.8" of rainfall. The 25 year, 24 hour storm, derived from Price monitoring data, is 2.18" of rainfall. Runoff is calculated using the S.C.S. National Engineering Handbook on Hydrology (USDA, 1972).

The hydrologic group of the local soils is generally the B Group in Sowbelly Canyon. The curve numbers used for determinations of runoff are interpolated from S.C.S. Handbook, Table 9.1, to be 65 for the vegetated areas and averaged to 85 for the disturbed areas. Total runoff volume is calculated as follows from Figure 10.1, S.C.S. Handbook, "Solution to Runoff Equation $Q = \frac{(P-0.2S)^2}{P+0.8S}$". $S = \frac{1000}{CN} - 10$

1.8" Rainfall Vegetated Areas: 0.1"
Disturbed Areas: 0.65"

2.18" Rainfall Vegetated Areas: 0.3"
Disturbed Areas: 0.9"

10/24 $\frac{2.3 \text{ acres} \times 0.1 \times 43560}{12} = 835$ ft.^{3}

25/24 $\frac{2.3 \times 0.3 \times 43560}{12} = 2{,}505$ ft.^{3}

10/24 $\frac{11.9 \times .65 \times 43560}{12} = 28{,}078$ ft.^{3}

25/24 $\frac{11.9 \times 0.9 \times 43560}{12} = 38{,}877$ ft.^{3}

Total Estimated Runoff, 10 year, 24 hour storm = 28,913 ft.^{3}

Total Estimated Runoff, 25 year, 24 hour storm = 41,382 ft.^{3}

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Sediment Storage:

UMC 817.46(b)(2) requires that ponds have 0.1 acre/feet sediment storage per acre foot. However, prior Price River Coal pond designs (see Crandall Canyon Pond 014 and 015 designs) have been approved based on 0.035 acre/feet storage per disturbed acre based on the universal soil loss equation and this region of Utah's low annual precipitation (10-12 inches). These ponds have been in place for nearly three years and have accumulated only 3-4 inches of sediments. Using 0.035 sediment storage per acre, the required capacity would be 1,512 ft.^{3}.

$$\frac{11.9 \times 0.035 \times 43560}{12} = 1{,}512 \text{ ft.}^3$$

Total required pond capacity for 10 year, 24 hour storm retention:

$$\begin{array}{r} 28{,}913 \text{ ft.}^3 \\ 1{,}512 \\ \hline 30{,}425 \text{ ft.}^3 \end{array}$$

Total capacity needed to retain the 25 year, 24 hour event:

$$\begin{array}{r} 38{,}877 \text{ ft.}^3 \\ 1{,}512 \\ \hline 40{,}389 \text{ ft.}^3 \end{array} \qquad \begin{array}{r} 41{,}382 \\ 1{,}512 \\ \hline 42{,}894 \end{array}$$

Total Existing Pond Capacity: 68,479 ft.^{3} = 25,585 excess

The excessive constructed capacities is probably due to the original regulatory requirement for 0.2 acre/feet storage per acre and designs generated by a consulting firm based in a more humid region of the country. To our knowledge, these ponds have not only never discharged off site, there has also never been an occurrence of inter flow via the 18" CMP connection.

Snow Melt Considerations:

Specific calculations for snow melt on this small water shed by using a regional analysis or a degree day method will probably not provide any useful information as can be related to pond holding capacities. It is generally accepted that snow depth converts to 1/10 the depth in water equivalent. Considering that our total existing pond capacity is 68,479 ft.^{3}, actual runoff is about 5% for vegetated areas and 40% for disturbed areas (considering all variables of storm intensity, antecedent moisture and evaporation rate) and snow depths' 10% conversion to water, we might calculate the total theoretical equalized snow accumulation that when melted, will be retained in the ponds to be about three feet of snow.

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$$\frac{(68{,}479 \times 12)}{\left(\frac{43{,}560}{14.2 \text{ total acres}}\right)} = 1.33\text{" Runoff/Acre}$$

1.33" = 35% (Average of disturbed and undisturbed) of total water depth that will run off to ponds.

Total Water Depth - 100% = 3.8"

Snow Depth 3.8" x 10 = 38"

The result of this exercise is likely conservative. Accumulations of 48" of snow where measured in Sowbelly this past winter without any overload of runoff to the ponds.

Please review and discuss this material with Mr. Loff so that we may resolve this problem in short order. We are prepared to install a pipe discharge if you feel it is necessary. However, we would like to designate these ponds as evaporation structures if possible. In two years or less, we will be closing the No. 5 facility and beginning reclamation. Successful revegetation should allow the removal of ponds within some minimum time period.

We are operating under an N.O.V. compliance time. Your most rapid review would be appreciated.

Sincerely,

R.L. Wiley

Robert L. Wiley
Environmental Engineer

RLW:ga
Attachments

cc: J. Smith, DOGM
K. B. Hutchinson

No. 5 MINE SITE

PROPOSED SEWER & WATER LINE FOR NO. 5 & NO. 4 MINE

NO. 5 MINE

3. Substation
4. Gate
5. Fan
6. Battery Charging Shed
7. Storage Sheds
8. Warehouse Trailer
9. Temporary Shops
10. Coal Chute (not in use)
11. Portal (manway)
12. Water Tank
13. Sediment Pond
14. Office Trailer
15. Bathhouse Trailers

N

BZ 42
EL. 707000

18" C.M.P.

SOWBELLY

STORAGE YARD

STORAGE AREA

LEGEND

VEGETATED AREA: 2.3 acres.

TOTAL CONTROLLED DRAINAGE AREA 14.2 acres.

POND CAPACITIES

003: 11,253 cu. ft.
004: 40,460 " "
005: 16,766 " "

PRICE RIVER COAL COMPANY
AMERICAN ELECTRIC POWER SERVICE CORPORATION
HELPER, UTAH

DRAINAGE CHARACTERISTICS

ENGINEER _____	DATE 7/1/82	MINE NO. 5
APPROVED _____	DATE _____	
DRAWN BY _____	DATE _____	
SCALE: 1" = 200'		DRAWING NO.