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Telephone 303 575 7502  
  
Environmental Services

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File ACT/015/004



September 30, 1980



Mr. Ronald W. Daniels  
Deputy Director  
Division of Oil, Gas & Mining  
1588 West North Temple  
Salt Lake City, Utah 84116

Dear Mr. Daniels:

Enclosed for your review are two copies of reports sent to OSM in response to two special stipulations for the Beaver Creek Coal Company, Huntington Canyon #4 Mine, Mining and Reclamation Plan. Special Stipulation No. 14 addresses description of all springs and surface water courses. Special Stipulation No. 22 addresses revegetation reference areas vegetation survey. A complete vegetation survey will be submitted the first week of November.

Submission of these reports is made by Atlantic Richfield Company on behalf of Beaver Creek Coal Company. The reports are intended to satisfy the attached guidelines to Don Crane's (OSM) letter of January 30, 1980 to Max Robb, President of Beaver Creek Coal Company and yourself.

If you should have any questions concerning this matter, please call myself (303) 575-7404 or Ben Costello, Manager of Permits and Compliance at (303) 575-7525.

Sincerely,

James A. Ives  
Principal Environmental  
Coordinator

JAI:cdt

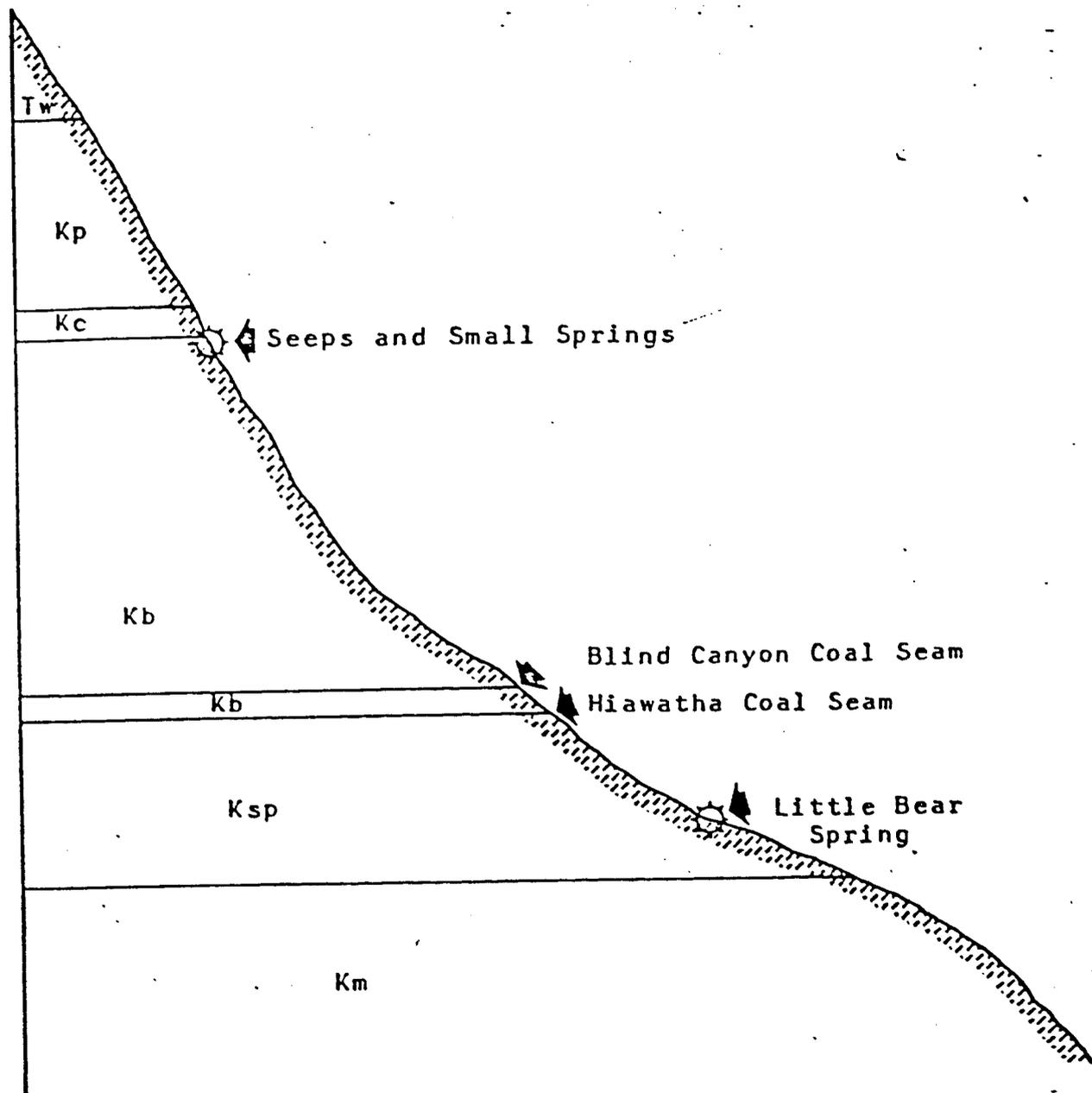
Special Stipulation No. 14 - Survey of Springs and Surface Water CoursesBeaver Creek Coal Company, Huntington Canyon No. 4 Mine

Two principal surface water courses are found within 100 horizontal feet of the mine workings. - Little Bear Creek and the Millfork. Both flow east into Huntington Creek. Little Bear Creek on the northern parameter is an intermittent stream at its mouth, although flow from the Little Bear Spring is sufficient to provide perennial flow. The channel pattern is dendritic with a more developed drainage on the north facing slopes (as shown in Exhibit 1a). The pattern is indicative of greater flow production from the north facing slopes. Snow melt runoff and perched groundwater appear to provide a substantial component of the intermittent flow for Little Bear Creek. Surface runoff from exposed rock and from saturated zones along Little Bear Creek and its tributaries would constitute the dominant source of storm runoff.

Little Bear watershed is extremely steep. The average change in elevation along Little Bear Canyon is 1600 feet per mile. (A detailed representation of channel profiles is included in Exhibit 1b). The canyon sides are steep and rocky. The stream cuts through six different geologic formations as shown in the Figure 2. The rugged topography gives rise to a number of falls, pools and cataracts on Little Bear Creek. A number of debris dams are also evident apparently resulting from the 1964 fire.

With the exception of Little Bear Spring, most of the seeps and springs are the result of perched groundwater discharge from the North Horn and Price River formations high on the watershed. The seepage is generally well above the coal outcrop but might possibly be impacted by land subsidence within the watershed as the result of mining activity.

FIGURE 2: CROSS-SECTION OF LITTLE BEAR CANYON FROM WESTERN MOST POINT TO MOUTH SHOWING GEOLOGICAL TYPES, SEEPS, AND SPRINGS.



**LEGEND**

- Tw = North Horn Formation
- Kp = Price River Formation
- Kc = Castle Gate Sandstone
- Kb = Blackhawk Formation
- Ksp = Star Point Sandstone
- Km = Mancos Shale (Masuk Member)

Flowing springs were not encountered during a survey in late August of 1980; however, seepage zones were discovered. The seeps and springs apparently result from precipitation within the catchment. Variation in flow within these springs and seeps would occur as a result of variation in precipitation patterns as well as possible impacts of land subsidence.

If small perched groundwater systems are affected, it is unlikely to significantly impact the hydrologic balance of the basin. All the geologic formations above and immediately below the coal seam outcrop along the northern, eastern, and southern margins of the permit area. Since recharge is generally from the higher elevations to the west, any impacted perched groundwater system would contribute to seepage or spring flow from lower formations. No perennial streams, impoundments or aquifers that serve as a source of water supply are found above the coal seam within the permit area.

The only aquifer that is a source of water supply is the Starpoint sandstone. The Starpoint sandstone is below the coal seam and is unlikely to be impacted by mining activities. Water supply is obtained from the Little Bear Spring. Little Bear Spring is a perennial spring with an annual yield of approximately 6 area-inches. This is a greater water yield than can be expected from the Little Bear Watershed. The spring received a predominant degree of recharge from areas west and north of the watershed as indicated in a report by Vaughn Hansen Associates in 1977. Water from the Little Bear Spring is diverted to the city of Huntington for its use by way of a pipeline starting at a concrete collection box in Sec. 9 T16S, R.T.E. Overflow water is discharged from the collection box into Little Bear Canyon. The vegetative cover on the slopes surrounding the Little Bear Spring consists of Alpine Fir (Abies lasiocarpa), Engleman

Spruce (Picea engelmannii) and Quaking Aspen (Populus tremuloides). The bottom land is comprised of Willows (Salix sp.), Bluegrass (Poa, sp.), Sedges (Carex sp.) and False Solomon Seal (Smilacina sp.). Sagebrush has encompassed part of this site due to disturbance at the time of construction of the collection box.

Millfork, the other principal drainage, is an intermittent stream at its mouth producing about 20 acre feet of water per year. The drainage of the Millfork is a trellised pattern. The channels are more developed on the north facing slopes indicating the importance of evapotranspiration and snowmelt runoff to the hydrologic balance. Sparse vegetation and bare rock on the south facing slope appear to have an important role in the production of storm runoff. Areas with high soil moisture near the Millfork itself also contribute to storm water runoff. The channel is steep, although not as steep as the Little Bear Canyon. The average change in elevation along the Millfork is approximately 590 feet per mile. (A detailed representation of channel profiles is included in Exhibit 1b.) Occasional seeps are found in the Starpoint sandstone below the coal outcrop. The seeps appear most often along road cuts or near the Millfork stream channel. Mining is not expected to affect springs or seeps in the lower formations because of their location below the coal seam.