

MEMORANDUM ON THE RED FORK, POWDER RIVER DAMSITE
JOHNSON COUNTY

Location

The proposed damsite on the Red Fork of the Powder River is located in NE 1/4, SE 1/4 Sec. 8, T. 43 N., R. 83 W. At the request of the Natural Resources Board, the writer made a geological examination of the proposed site on October 27, 1954.

Geology

The damsite is situated in a narrow "V-shaped" gorge that has been eroded in the west flank of a north-northwest-trending anticline. The rocks cropping out here are believed to be the basal part of the Chugwater (Embar?) formation. At the damsite the formation strikes north-northwest and varies in dip from 5° - 35° SW.

The rocks cropping out in the vicinity of the damsite consist of light brown crossbedded platy sandy shale overlain by a red gypsiferous shale which, in turn, is overlain by a light gray chert.

The gypsiferous shale unit weathers and erodes readily as evidenced by the large cavernous depressions exposed on the northeast side of the gorge. The largest depression observed is approximately 30 feet long, 8 feet high and 15 feet deep (measured along the bedding plane). The caverns are all oriented with their longest dimension parallel to the

bedding. The proposed dam would abut against this gypsiferous shale. Since the gypsum occurs principally as the cementing material of the rock it is very likely that an earth-filled dam would be highly unstable here.

Structures have been built on gypsum, but in general other sites should be considered due to the unknown rate of solution. In this case, a flexible structure would have to be considered and also some impermeable barrier between gypsiferous shale and the dam. Since this would entail more expense than the reservoir warrants, the writer recommends that the proposed damsite be abandoned.

William H. Wilson
Assistant State Geologist
Geological Survey of Wyoming
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