CHUGWATER SPRINGS DAMSITE
PLATTE COUNTY

Introduction

The Chugwater Springs damsite is located in NW 1/4, SW 1/4 Sec. 4, T. 23 N., R. 67 W.

Original plans called for a small earth-filled dam which would support a reservoir with a capacity of 1375 acre-feet of water. The water in the reservoir was to be used for irrigation storage. Maximum depth of the water level is 50 feet measured at the face of the dam.

At the request of the Natural Resources Board, the writer made a geological examination of the site on September 2, 1954, in the company of O. D. Howe, Wheatland, Wyoming.

Geology

The general geology of the region has been described by McGrew (1953), but a detailed description of the damsite was not included in her study.

The rocks cropping out in the immediate vicinity of the damsite consist of approximately 56 feet of a light brownish gray fine-grained calcareous sandstone that contains light gray limestone concretions and lenses at irregular intervals within the exposed section. In places, the sandstone contains a relatively high percentage of ferro-magnesium minerals, thus giving it a rude "salt and pepper" appearance. For the most part, the

rock is highly porous and weathers readily. At the proposed damsite, these rocks strike N. 28° - 55° E. and dip 10° NW. The section is believed to be part of the Harrison (?) formation of Miocene age. Overlying bed rock is a thin veneer of gravels, consisting chiefly of fragments of granite-gneiss, chalcedony, quartz, biotite and hornblende schist.

A conjugate joint set is exposed on the southwest abutment in which one joint set strikes N. 55° E. and dips vertically while the other strikes N. 34° W., with vertical dip. Small bushes were noted growing in the former indicating a possible path for solutions as well as a plane of weakness. Because of the joint pattern, the uppermost sandstone weathers into rudely rectangular blocks. Further, a small northeast-trending normal fault that dips 56° SE was noted about 50 feet downstream from the southwest abutment.

The joints on the northeast abutment are not as well defined as on the southwest side. The prominent trend here is N. 64° E. and dips vertically.

A small spring was noted approximately 25 feet upstream from the centerline of the proposed dam. This may indicate an impermeable barrier existing a few feet below the surface.

Conclusion and Recommendations

The damsite has a good topographic location, but the southeast abutment is poor geologically for the following reasons:

(1) Porous, poorly cemented, easily weathered rock.

(2) Presence of the conjugate joint set.

(3) Small fault striking downstream.

(4) Downstream dip of rocks.

To counteract the geological conditions the damsite could be reinforced with a concrete retaining wall, or lined with a high swelling bentonite, or moved about 75 feet upstream. All of these suggestions would involve more expense than using an earth-filled dam at the present site.

There is the possibility that little leakage would occur and that the dam would be perfectly stable, but in view of the geological disadvantages the writer would not recommend the site without favoring one of the three alternatives mentioned above.

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Reference

McGrew, L. W., (1953), "The Geology of the Grayrocks Area, Platte and Goshen Counties, Wyoming", unpublished M. A. thesis, University of Wyoming.