

## PASS CREEK DAMSITE, JOHNSON COUNTY

Location: SE 1/4, SE 1/4 sec. 14, T. 46 N., R. 85 W.

Date Examined: - July 13, 1955, in the company of Mr. Floyd Bishop.

Storage: - 10,000 acre-feet. Dam, 100 feet high.

### GEOLOGY

The rock cropping out at the damsite consists of a tan colored dolomitic limestone containing lenses and pods of light brown to dark gray chert. This unit occurs in the upper part of the Madison formation. Approximately two hundred feet higher topographically and stratigraphically, are red shales and sandstones of the Amsden formation. A short distance to the north, the Madison formation is unconformably overlain by white tuffaceous claystones and siltstones of Oligocene (?) age.

The Madison formation at the damsite strikes N. 32° E. and dips (downstream) from 2-3° SE. A prominent joint set is exposed and strikes parallel to the trend of the formation with vertical dip. Further, the rock cropping out near the east abutment is cavernous. In general the caverns are oriented with their longest dimension parallel to the bedding. The largest cavern observed was seven feet long, three feet high, and five feet deep.

Approximately 100 yards downstream, Pass Creek appears to sink and flow underground. On closer observation, the stream apparently

flows on bedrock, but is almost entirely concealed by about a one- to two-foot fill of boulders. As nearly as can be determined, the flow of the stream remains constant, and very little water percolates down into the underlying rocks.

### CONCLUSION AND RECOMMENDATIONS

The presence of solution cavities in the rocks cropping out near the east abutment presents an element of risk in constructing a reservoir here. On the other hand, the fact that no apparent water loss occurs in Pass Creek at and downstream from the damsite would tend to minimize the danger of seepage from the reservoir.

The dam, if constructed with a concrete core wall, should be stable. It may be necessary to pressure grout near the abutments to minimize seepage.

The problem of water loss by seepage from the reservoir is difficult to ascertain since the openings in the limestone may be so widely dispersed that it is not feasible to locate and treat them all before the filling of the reservoir. It is probably preferable to let the reservoir fill, and if important leakage is noted, the reservoir may be drawn down and the trouble spots plugged. Further, natural silting may lessen the volume of seepage with time. Thus the risk element is present with this site and should be considered before going to the expense of building such a reservoir.

If a diversion ditch from the North Fork of the Powder River is attempted, it should be noted that considerable silting and erosion will take place if it passes through the rocks of Oligocene (?) age mentioned earlier in this report.

It is the writer's opinion that leakage from the reservoir at Pass Creek may not be too serious, but the possibility should be carefully considered. The damsite on the North Fork of the Powder River (located a short distance east of the Hazelton road) is in pre-Cambrian rock and is geologically sound. Because of the possibility of seepage from the Pass Creek site, it would seem that the North Fork site is the more preferable of the two.

A handwritten signature in cursive script, reading "William H. Wilson".

William H. Wilson  
Assistant State Geologist  
July 26, 1955