

**KANSAS GEOLOGICAL SURVEY
OPEN-FILE REPORT ND-4**

PROPOSED DAMSITE AT ROCK SPRINGS RANCH

by

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ND-4

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The proposed damsite at the 4-H camp at Rock Springs Ranch, Dickinson County, Kansas, is located in a small creek valley out into Pennsylvanian rocks of the Chase group. The valley is cut into the Blue Springs shale which forms the bed-rock floor beneath the thin valley fill. The valley sides are formed by the Florence limestone overlain by 4 to 5 feet of Oketo shale capped by the lower few feet of Ft. Riley limestone which forms the "rim rock" or "rock ledge" at the valley borders.

The dam is tentatively planned to be constructed on the 1006-acre drainage line to take advantage of the natural constriction of the valley formed by the terrace remnant extending from the west valley wall. The water line is to be on the 120-foot contour line as shown on the topographic survey of the campsite by the Soil Conservation Service.

The feasibility of impounding water at this location is challenged by the occurrence of the cherty Florence limestone in the valley walls. The Florence, a well-known aquifer, is a good conductor of water. The residual material left in a valley cut into or through a thick cherty limestone is often composed of coarse limestone and chert cobbles which form a zone of very permeable material just above the valley floor.

In order to determine the character of the rocks forming the floor and walls of this proposed reservoir the State Geological Survey drilled three test holes in the alluvium and terrace deposits along the 1006-acre drainage line and examined the outcrops on the valley sides.

Test hole no. 1, 240 feet west of the base of the east bluff encountered the Blue Springs shale at 17 feet. Test hole no. 2, 168 feet west of no. 1, was drilled into the Florence limestone at 17 feet. Test no. 3, 123 feet east of no.

1, encountered the Blue Springs shale at 8 feet. The zone of highest permeability, the 2 to 3 feet above bedrock containing the coarse chert and limestone fragments

contained much silt and clay. There was no appreciable circulation loss in drilling this material. Assuming material of equally low permeability between test holes, this terrace should be suitable for a base for a low earth-fill dam.

The Florence limestone, which forms the lower 33 feet of the valley walls at this point, was found to contain many fractures enlarged by solution, most numerous in the upper two-thirds of the member. It is unlikely that the Florence would form a satisfactory wall for impounding water. Flowing springs downstream and upstream from the damsite demonstrate the water-transmitting character of this member. The spring at the farm house with a measured flow of more than 1000 gallons per minute is on about the 105-foot contour line. This proposed water line on the 120-foot contour would probably lose much water to similar openings in this zone.

A low dam at this point, planned to have a water line not above the 105-foot contour, might be feasible.

By O. S. Fent