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UNITED STATES
DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Gallup, N. Mex.
May 12, 1938

MEMORANDUM FOR R. H. LOVALD

Attention: Wayne Wright

From: C. Wallace Miller and Howard F. Johnson

Subject: Hopi Reservoir

Copies to: G. M. Volk, L. K. Armstrong

Attached are analysis of soil samples collected at Hopi Reservoir.

All soils in the immediate vicinity, including foundation and fill materials are sandy. Soil sample 1693 is a representative composite sample from the dam; seepage is very rapid through this material. No rock was encountered to a depth of 120 inches at the sample locations.

A high water table present in the valley appears on the surface at the toe of the dam, and remains on the surface 50 feet below the toe of the dam in the vicinity of the outlet canal. Three hundred feet below the dam the water table had dropped 18 inches below the surface.

The upstream face of the dam is a vertical loose rock wall, the downstream slope steep and the crest narrow. Water standing near the crest of the dam, combined with a high water table, sandy fill material, and a narrow structure, raised the line of saturation in the dam until seepage on the down-stream face almost resulted in failure by "blowing."

The crest of the dam should be raised to allow adequate free-board.

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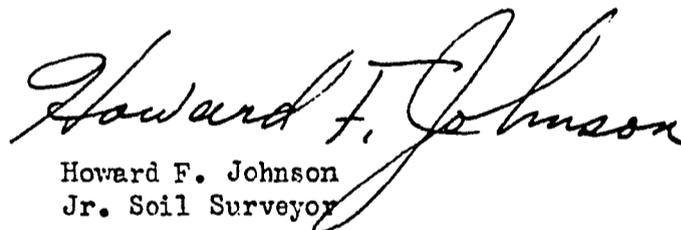
The down-stream slope should be increased to at least 3 to 1, or sufficient to bring the line of saturation within the down-stream toe.

All fill materials available for increasing the crest and fill are sandy and similar to the material already in the structure; therefore a French drain will be necessary after increasing the size of the fill. This should be built of well graded material, placing coarse sand next to the face followed in order by gravel, crushed rock or cobbles and large rock.

If provision is made for spillway passing water over the sandy soil below the dam, stabilizers are necessary to prevent cutting.



C. Wallace Miller
Assistant Soil Surveyor



Howard F. Johnson
Jr. Soil Surveyor

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<u>Lab. No.</u>	<u>F. No.</u>	<u>Location</u>	<u>Depth</u>	<u>Sand</u>	<u>Silt</u>	<u>Clay</u>	<u>% Disp.</u>
1689	S11-03-08A	Hopi Res. 50' below toe of dam, near outlet	0-6"	76.4	16.3	7.3	18.0
1690	08B	"	6"-40"	83.2	8.6	8.2	23.7
1691	08C	"	40-80	85.5	7.2	7.3	5.5
1692	08D	"	80-120	84.0	7.8	8.2	8.2
1693	09	Dam materi- al 200' W. of outlet	0-5'	89.8	4.0	6.2	11.0
1694	10	300' below sample 1689 150' West ditch	40"- 100"	59.0	18.1	22.9	16.5

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