

October 7, 1918

REPORT ON FLOOD PROTECTION OF CORN LANDS ALONG
WEPO WASH, IN THE HOPI RESERVATION.

The lands used by the Hopi Indians along Wepo Wash for the growing of corn have furnished a supply of corn for them, never failing, but in constantly lessening amounts. This decrease has been due to the cutting of channels and gullies in the land by floods. Originally the cornfields were one wide flat plain. Flood waters coming down from the watershed between First and Second Mesas spread out over this plain without making well defined channels.

Since the land above has been overstocked with sheep and goats, the vegetation, which formerly held back the rains and distributed the flow over a longer period, has been destroyed; the floods come suddenly and are cutting a channel through the land.

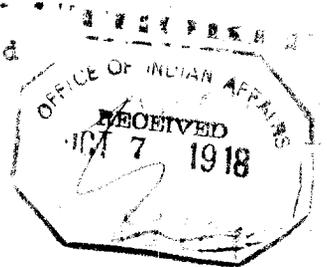
The Indians attempt to spread these flows by building sand dikes, with small success.

A plan to stop this cutting and spread the waters was thought out by Mr. A. H. Womack, in charge of well drilling with headquarters at Polacca. The accompanying plan and the following report are the result of his ideas, with certain modifications made necessary by the lay of the land.

The plan I submit consists of the following features:

1. A rock and brush diversion dam at the head of the system.
2. Earth dikes running approximately parallel to the stream flow.

RG 75 BIA Brig. Div.
Gen. Corcoran, 1901-31
Dist. 5, Box 107
Hopi - Moque 1918



3. Hog wire fences at proper intervals and on proper courses to retard and spread the diverted waters.

4. Gates through the lower end of the earth dikes to let the water on to the land below.

1. The rock and brush dam I have located in the narrowest place in the wash. It will be 500 feet long, from \sphericalangle to 6 feet high, 3 feet wide on top and having $1\frac{1}{2}$ to 1 slopes. It will take 300 cubic yards of material and is estimated to cost \$450.00.

2. The earth dikes shown on the plans are necessary to retain the water on the land and keep it from flowing back into the channel. They also serve to give direction to the flow to the lands below.

There is already a dike 1300 feet long, put on the land as a boundary between clans.

To connect this dike, which is well located to be used in the plan, a dike 2900 feet long, as shown, must be built.

This dike will be 2 feet wide on top, from 2.5 to 4 feet high, with $1\frac{1}{2}$ to 1 slopes. It will require 1400 cubic yards of material and will cost, I estimate, \$700.00.

3. The water having been diverted must in some manner be controlled. The plan proposed is to place fences of woven wire or hog wire in such a way as that the water can cut no more channels, and that it will spread evenly. I estimate that a grade of ~~from~~ 0.2% to 0.4% will allow

enough velocity to give even spreading and prevent cutting. The fences are located to secure that end. Each fence is located so that its top is on a 0.35% grade below the bottom of the fence above. The fences slope away from the dikes on about a 0.25% grade. As the floods bring silt and debris down the tendency will be to form a series of low terraces. There will be no need to build banks along the fences--the water will do that.

This plan will fix the grade of the land permanently. Any small irregularities in the land can be graded by the Indians. These are few and of small area. The land is so level that in running levels I frequently found in 1000 feet less than 2 feet difference between the highest and lowest spots.

The area covered by these fences is 85 acres. The water will be directed to the south end of this area and let on to the land below. Between the dikes of this plan and a boundary dike some distance below there are at least 150 acres.

The fences will be built of 20 inch wide hog wire, with meshes 6" x 4", attached to cedar posts 5 to 6 inches in diameter set 30 inches in the ground and 10 feet apart.

It was a problem to determine the proper height of these fences. After platting the levels it seemed much the best to fix the height at 20 inches. This allows approximately 600 feet spacing of the fences, a distance

not too long to prevent easy handling of the water by the Indians. The fences I estimate will cost \$475.00.

4. The water is finally directed to the south end of the dikes where it is allowed to flow through 6 gates.

These gates are proposed to be of the ordinary galvanized gates with cut off and 12 feet of 10 inch corrugated iron pipe. They are disposed so as to spread the water over the land below.

Should it be found that cutting of channels is threatened on the lower land, the installation of a few fences in the proper places will stop that.

The gates I estimate will cost \$150.00.

The following is a list of material, supplies and equipment needed for the work:

- 5000 linear feet hog wire
equivalent to No. # 25 of
the Simmons Hardware Co. (Page 1436 of catalogue)
20 inches wide, 63 lbs. to the rod.
- 500 cedar posts 5" to 6" on top
and 4' - 2" long.
- 40 lbs wire staples
- 6-12 pound rock hammers
with one sharp edge.
- 12-36" hammer handles
- 3 Post-hole diggers, jaw pattern
- 6 Standard galvanized iron gates with hand operated
cut-off, 10" opening and having 12 feet of 10"
galvanized corrugated pipe.

The Indians can furnish the cedar posts. The other material, I would suggest, should be sent in by way of

Holbrook instead of Gallup, the former being so much nearer than the latter.

The total cost of the project I estimate as follows:

Brush and rock dam	\$450.00
Dikes	700.00
Wire fences	475.00
Gates	150.00
Engineering, superintendence, travel, etc.	<u>350.00</u>
Total	\$2125.00

This will benefit 235 acres of a unit cost of about \$9.00 per acre.

Respectfully,

(Signed) George M. Post,

Superintendent of Construction.