

UNITED STATES DEPARTMENT OF AGRICULTURE
IRRIGATION
SERVICES
DISTRICT
No. 5

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Supervising
Engineer

1919.

U. S. NATIONAL ARCHIVES

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GANADO.

The work done on this project during the past year consisted principally of raising the storage reservoir dam, an extension of the diversion canal five hundred feet long, riprapping the inner slopes of the reservoir, building a spillway, and the excavation of the north side canal, a length of 28,700 feet (nearly $5\frac{1}{2}$ miles). In addition there has been the regular operation and maintenance, which included the cleaning of the main and southside canal, and some extensive repairs to the lower end of this ditch made necessary by heavy storms bringing water through the various arroyos, the cross drainage of the country.

Difficulty was experienced on this project as on all others, by lack of men, the flu situation in the late fall and early winter, and by the cold weather, which reached 26 degrees below zero by the last of November and the ground was frozen from then to the end of January so it was impossible to do any excavation.

During August, September and October the work was

largely confined to the raising of the reservoir dam. Three feet were placed on top, for a length of 2600 feet and 10, 926 cubic yards being placed. A force was also employed quarrying rock for the riprap. During November excavation was commenced on the north side canal and was continued until stopped by the freezing of the ground and the heavy storms.

From then until the end of January continued the riprapping, laying 8,100 square yards. Work was resumed in February on the north side canal and by the end of the season the excavation was completed and the work all side-sloped and finished. The excavation, exclusive of the finishing, included 9,902 cubic yards of earth and 898 cubic yards of rock.

Under an agreement with Mr. J. L. Hubbell, who has rights in the reservoir, the main canal from the reservoir to below his place is cleaned by him at his own expense. This was done as usual this year, taking nine days. Water was turned into the canal April 30 and has been furnished as needed during the balance of the year.

Last year, on account of needed repairs to the outlet gate, all of the water in the reservoir was allowed to run out, but by the beginning of the irrigation season there was 2650 acre feet in the reservoir, and there was sufficient runoff during the early part of the season to supply all water used and the seepage and evaporation losses, and at the end of the fiscal year there remained in the reservoir 2650 acre feet, just the amount there was at the beginning of the irrigation season.

The condition of the project on June 30 is as follows: The reservoir is completed. The south side canal is completed and in good condition. The north side canal has all of the excavation completed, but no structures in place. It is thought that with the money now unexpended, and which is available for the next year, that this work can be completed.

This north side canal has brought under ditch the best area of land in the valley. There are now 740 acres under the south side canal, including the original con-

struction on the north side of the river, and under the new north side canal there are 710 acres, a total of 1450 acres in the project.

The work on this project has been under the supervision of Mr. Post, but in the immediate charge of Mr. Maus, foreman.

The area under cultivation on this project is:

Indians	250 acres
J. L. Hubbell	115 "
Total	<u>365 "</u>

The total area reported as under cultivation last year was 226 acres, an increase, all of which is Indian, of 139 acres.

There would have been more put in this year had the Indians been assured that they could have the lands they desired to cultivate. As has been reported to you for several years past, nothing has been done to encourage the Indians to settle on this land. It was subdivided several years ago, with the intention of allotting it, but there has been no one here to do this. The Agency forces are absolutely indifferent to the matter.

I have directed the foreman in charge of the project to furnish any Indian water on any tract he might settle on, but to tell him that until his occupancy of the land was assured by the Superintendent he could only remain there from year to year.

This has deterred many from taking up land as they are loth to clear and level a tract with no assurance that it would become theirs, or that they could remain there for more than one year.

As suggested in my report for last year (page 57-59), if the Office desires immediate settlement of this land a farmer should be located here and given authority to make tentative allotments to the Indians with full assurance that they would either be allowed to remain there permanently or that they would be reimbursed for any improvements they might make in case the land was allotted to some one else.

We have been delivering water through the ditches of this system for several years and only 250 acres under cultivation by the Indians. A little effort on the part of the Agency forces and authority from the Indian Office to allot, would soon see every acre under cultivation.

MARSH PASS.

After many delays this project has at last been completed and is ready for the irrigation of any of the land there, excepting that the lower end of the canal will need cleaning, as a considerable quantity of sand has blown in during the past year.

Work was resumed early in the fiscal year and it was expected that the project would be completed before winter, but owing to floods which did considerable damage, as reported to you in the July monthly report, and the lack of men to take charge on account of the number who left the service to enter the Army, which was followed by the flu epidemic early in the fall, the work was not finished until this spring.

The only use that has been made of the water so far is the cultivation of about forty acres of land, or perhaps a little less, near the head of the canal. The Indians had put nearly all of this under cultivation last year and it is again being cultivated this year.

Owing to the fact that there is no employee of the Irrigation Service within a long distance of this project,

together with the fact that the project is too small to keep a man there for its operation, and the further fact that a government farmer is located there, authority was given by the Indian Office on November 9, 1917, to turn the project over to the superintendent in charge of the western Navajo reservation.

Superintendent Runke was notified some time ago that this would be done and he was again notified in June that the project was completed and was turned over to him for future operation.

It will now be up to the superintendent and the farmer in charge to get the Indians to settle on the land and make use of the project.

It is probable that Superintendent Runke will ask for money for its operation and maintenance, but if he has not done so, there should be given him not less than five hundred dollars, and perhaps a thousand would be better, for this purpose during the fiscal year of 1920.

UNDERGROUND WATER DEVELOPMENT. NAVAJO AND HOPI.

Each year the value of the underground water development that has been going on in the Navajo and Hopi reservations for the past few years becomes more apparent.

When this work was commenced it was planned to drill wells where it was thought there was a chance of securing water, but we have been surprised at the general distribution of this underground water over such an area of "the land of little rain." In addition to the well work it was planned to develop the various springs on the reservation.

Both of these have been followed. The well work being pushed steadily and the spring work from time to time as the occasion demanded and the other work would allow.

The amount of water in any of the springs is so very small, however, that one good well, equipped with a windmill and tank will furnish many times as much water as the best of them.

It is estimated that the permanent water on the

reservation is now from ten to twenty times as much as when this work was commenced.

Up to that time the amount of stock on the reservation was limited to that which the scanty water supply would support, and all increase in excess of this would perish for want of water or food, as the feed within a reasonable distance from all watering places would be so overgrazed and tramped out that often there was not a sufficient quantity for the few head that the water would care for.

Most of the wells have been put down in sections where there was feed, but no water. The flocks and herds have been moved to the water and have increased many fold, in some sections several hundred per cent.

Before the wells were put in, it was a hand to mouth struggle and little or no chance for success; with them they have a good chance. It would seem that there is no other practical way to advance the civilization of these Indians. They have no living streams, no timber, almost no farming land, and if they are to advance and still

remain on their own reservations, it must be through the stock business. This can only be through developing water for them (as they are unable to do this themselves), and if they can have this assistance they will become self supporting and prosperous, will be able to live on a plane above that formerly occupied by them, and thus advance along the lines leading to civilization and secure an ability to hold their own against the whites.

The country is great in extent, the cost of doing any work there is in proportion to the area, and the amount of money that is given for this work from year to year is not large enough to show a big increase for any one year.

When the work first started, it was thought that all that was necessary to do was to go in and develop a well and leave it to the Indian as a permanent improvement. Almost as soon as the work commenced it was found that putting in the well was but a small part of what was required. The Indian as a rule has no mechanical ability. The Navajo especially has no racial pride nor any idea of

cooperation. If a thing will help him personally, he is willing to do his part, but if it is for the assistance of the tribe at large or for a group of Indians, his attitude is to "Let George do it", and he is absolutely indifferent.

If we put down a well, and equip it with a mill and tank, unless we give its use exclusively to one man, he will do nothing toward keeping it up. We cannot get him to see that it is to his advantage to oil the mill occasionally. He would rather let it go until it was worn out or broken down, and then ride in a hurry a hundred miles to one of our men to get him to come and repair the mill so his sheep would not die from thirst.

It was therefore impressed upon us that it was necessary to maintain these wells, not only because they would go to ruin in a short time, but also by reason of the increase in the stock, the stopping of the flow of water of one of these wells would, in all probability, mean the death of a large flock, as the increase has been such that there is no other watering place that is not already caring for its maximum, either in the water flow or in the area of grass land tributary to it.

We have now organized two outfits, one with headquarters at Chin Lee in the Navajo country and one at Polacca in the Hopi country whose duty it is to patrol the lines of wells and keep them in repair.

At present it takes something over 600 miles of travel to visit all of the wells once, and it is necessary to visit them at least once a month to be sure they are running right, and with every new well put down the length of the line is increased.

At first we were able to do all of the work in connection with the wells, and the erection of tanks and mills with one white man and his helpers. Now the two outfits are unable to attend to all of the work and it will be necessary to put on another one in the near future.

With this increase in the operation and maintenance costs, it will be necessary to have an increased appropriation from year to year if further development is to continue with the same speed.

The work done in this department during the past year has not been satisfactory in the amount of work

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accomplished. This has been for several reasons. The flu epidemic and the extreme weather handicapped us severely. The cold weather froze up many of the pumps and as the wind would blow and the mills continued to turn, they were damaged or wrecked and had to be overhauled and repaired extensively. And, too, the storms and bad roads made it almost impossible to get around to do the necessary work.

The same conditions handicapped the operations of the two well rigs in the Navajo and Hopi country. At times it was impossible to work, at other times not much speed could be obtained when there were frequent storms, a shortage of all help, and temperatures of from 10 to 32 degrees below zero for days at a time.

When it was time to move the rig from a finished well to a new site, the roads were so bad it was almost impossible, and the Indians were unable to work as their stock was in such shape from storms and starvation. At one move made by Rig No. 4 the whole outfit was moved by the one team with the rig. This was accomplished by dismantling everything so it could be moved by one team,

and it took several weeks to make the move.

Rig No. 1 practically went to pieces, and a new one was authorized. Because of the war situation and the difficulty of getting anything and then of moving the freight, the new rig did not reach Gallup until in the winter when the roads were at their worst, and over a month was lost in getting the rig delivered sixty miles north.

Mr. Morrison, the driller in charge of this rig proved absolutely incompetent. Because of all the handicaps the man was given the benefit of the doubt, but when the new rig was finally on the ground and he was unable to set it up alone and showed no results after ample time, his resignation was requested as the easiest way out of the situation, and since then the rig has remained idle, as it has been impossible to secure a driller.

Owing to the oil excitement in every direction, any man who can do anything at all with a rig is in demand at good wages. I have written everywhere and am met with the reply that drillers are demanding and receiving as high as \$14 a day and expenses, and helpers

are being paid as high as \$11. Just at the end of the year a man was found and he is being corresponded with and it is hoped that he will be all right and can be secured.

With Well Rig No. 1, practically nothing has been accomplished during the year, the new rig being at the same hole that was commenced a year ago. It is about finished, and it is hoped that a new man will make a well in a short time and be ready to move on. Now that we have a new and good rig, we should be able to accomplish something provided we can get a driller.

This sounds almost like the story of the two men who were lost, and had become hungry, and one of them said to his companion, "If we had some eggs now, we could build a fire and have some ham and eggs, if we had the ham.", but it takes the combination of the rig and the driller, plus some pep, to get anything done out 60 miles from a town and base of supplies.

Well Rig No. 4 has put down the following wells:

<u>Well No.</u>	<u>Depth</u>	<u>Character</u>	<u>Location.</u>
472	161 ft.	Good well.	Keams Canyon Wash.
473	92 "	" "	Wepo Wash near Walpi.
474	70 "	Dry.	2 $\frac{1}{2}$ Miles S. Oraibi.
475	67 "	"	3 Miles S. Oraibi.
476	152 "	"	" " " "
477	92 "	Good well.	2 $\frac{1}{2}$ Miles N. Oraibi.
478	Record missing.		
479	335 ft.	Good well.	6 Miles N. Hotavilla.
480	343 "	" "	6 " " W. Oraibi. Denebito Wash.
481	127 "	Dry.	7 Miles N. W. Denebito Wash.

These wells all open up a new country where water is much needed and will be of great benefit to the Indians.

It is hoped (and planned) to make a much better showing the coming year, and every effort will be put forth to that end.

For further details regarding the water development, see a special report made you Feb. 9, 1918, and the Annual report for that fiscal year.

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