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REPORT OF E. B. LINNEN, CHIEF INSPECTOR,

H. T. BROWN, SPECIAL AGENT, AND

WALTER G. WEST, SUPERVISOR,

ON THE

IRRIGATION PROJECT ON THE NAVAJO INDIAN RESERVATION AT

GANADO, ARIZONA.

DATED APRIL 24, 1918.

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## DEPARTMENT OF THE INTERIOR

## UNITED STATES INDIAN SERVICE

Federal Building,  
Denver, Colorado.

April 24, 1918.

Honorable Cato Sells,  
Commissioner of Indian Affairs,  
Washington, D. C.



My dear Mr. Commissioner:

We have the honor to advise that complying with your instructions we have visited the Ganado Irrigation Project on the Navajo Indian Reservation in the State of Arizona, and made a thorough investigation of same. We now have the honor to report as follows:

The dam for this project is situate about three miles northeast of Ganado, Arizona, and about a half mile east of the reservoir, on the Little Pueblo Colorado River, which is a dry stream most of the year, but which carries considerable water during flood periods.

The idea is to conserve the waters of the Little Pueblo Colorado in a reservoir with the necessary diversion structures, and a canal for a distributing system.

The dam is constructed of logs with rock and earth fill, and some concrete structures, at which there is a spillway ninety-two feet long, and about two feet high, which spillway has gone out three times since the

structure was built in 1914, and a new concrete spillway was being put in by S. G. Maus, the gentleman in charge of the project, on the day we visited same, April 8th. At the lower end of this spillway there is a concrete headgate about sixty feet long, with five openings into a canal which carries the water into the reservoir about a half mile west. This canal running from the headgate is sixteen feet wide on the bottom, and about five feet deep, and it only carries water during the flood periods, during heavy rains, and when the snow melts in the mountains. The heavy rains and floods occur during the months of July and August.

Work on this project was started in the Spring of 1913, and has been completed, except that about four feet more of concrete wall has been added to the top of the diversion dam. It is intended also, we were advised, to add about four feet more of earth work on the embankment of the reservoir. Last year we were advised that water ran three feet over the top of the headgate, and it is contemplated moving the same in a westerly direction about fifty feet in order to lengthen the spillway by that distance.

Last year there was considerable water in the reservoir. The flow of the water into the ditch was controlled from a tower, and in the Spring by reason of the heaving and action of the ice the tower collapsed, and practically all of the water escaped from said reservoir. This tower has been replaced by a new gate, which is governed by a winding lever from the top bank of the reservoir just opposite the main ditch. This new gate had just been put in when we visited this project.

The fill across the top of the reservoir is 3,200 feet long, with a maximum height of twenty-two feet, and is an earth embankment with rock facing on the water side, which is not concreted. As heretofore stated it is the intention to raise this embankment four feet higher the entire distance of 3,200 feet, which work if done will cost a considerable sum of money, but would greatly increase the capacity of the reservoir.

The main ditch from the reservoir runs in a southwesterly direction, and is at present about six miles long. The ditch has not been cleaned this year, and no water has been turned in for irrigation. In fact there is but very little water in the reservoir,

about sufficient to irrigate two hundred acres of crops once.

There are a number of steel flumes on this project, the largest being 190, 92, and 70 feet respectively. The total length of the six flumes on this project is about 530 feet. There are also a number of well constructed drops on this project, and one chute dropping the water about thirty feet.

Considerable difficulty has been experienced heretofore by reason of breaks occurring in the dam, and by reason of flood waters, which has resulted in considerable additional expense in maintaining this project.

This project, and the ditches planned were intended to cover about 700 acres of land. None of the Indians have been allotted on this irrigable land, and hence they take very little interest in it. Last year there were only about 150 acres of land farmed under this project, ninety acres of which were farmed by J. L. Hubbell, trader at Ganado. Only two Indians live on lands under this project, and some eight or nine farmed small patches last year.

It was noticed that several Indians were clearing small patches of ground with a view to placing them in crop this year, but it is very doubtful whether they

will get any water to irrigate same, as there is only sufficient water in the reservoir now to irrigate 200 acres once.

The cleaning of the ditch and reservoir southwesterly has been done heretofore by Mr. J. L. Hubbell, who receives most of the benefit from this irrigation project. In fact he was almost the exclusive benefactor. The main lateral or canal from the headgate into the reservoir is cleaned and maintained by the Irrigation Department.

This Ganado Irrigation Project cost to June 30, 1917, the sum of approximately \$83,000, and as heretofore stated only about 60 acres have been farmed so far by the Indians, in small patches, with no prospect of materially increasing the acreage this year.

We do not hesitate to state that this project has been badly planned, and the work badly executed. The diversion dam as constructed was found to be inadequate, and now is believed to be located in the wrong position. The reservoir as constructed, with the gate opening into the main canal, did not hold water, which was permitted to escape, there being practically no water in the reservoir. A large additional expense will necessarily have to be incurred if the reservoir bank is raised as anticipated, and it is doubtful then if same will hold.

It would appear that the history of this whole project has been one of disaster, one of flood waters washing out the dam, overflowing the headgate, filling the ditches with silt and debris, wrecking the riprapping in the vicinity of the dam, wrecking the tower with the control works, etc., and a great amount of money has been expended in repairing these various breaks, so much in fact that there is now very little to show for the expenditure of the \$83,000.00.

It is doubtful if any number of Indians will live under this project, unless they be allotted, and even then they have not funds with which to clear and level the land, to build homes, barns, and fences, and make the necessary improvements.

Just below the end of the present main ditch there is a considerable amount of good agricultural land in a nice valley, which could be irrigated if sufficient water can be stored for such purpose. This of course would occasion a further considerable outlay of money.

Under present conditions the project seems quite hopeless, no adequate return having been received from the large outlay expended, and no immediate relief in sight.

WELLS DRILLED ON THE NAVAJO RESERVATION FOR DOMESTIC  
AND STOCK USE.

The Indian Irrigation Service has drilled or dug during the past six years 189 wells for the purpose of furnishing domestic and stock water for the Navajo Indians on various parts of the Navajo Reservation. Of these wells 103 were good wells, and 86 were dry. The wells have as a general thing been placed at different points where there is not any natural water supply, with the result that the grazing area has been greatly increased.

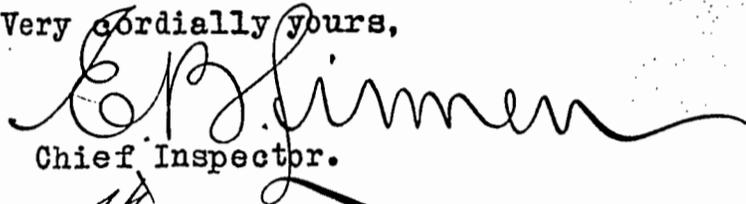
These wells as a general thing have been provided with wind mills and tanks, and water troughs for stock. They vary from 100 feet up to about 1,150 feet in depth, and a few are flowing wells.

The Irrigation Service employs one man whose business it is to visit and repair the different windmills and pumps. He makes his rounds periodically, and in the event that a pump or windmill breaks down, the Indians promptly report the matter to him, and he immediately makes the necessary repairs. The Indians can be depended upon to do this for the reason that where the wells are located there is no water supply, and if the pump be not promptly repaired it will be necessary for them to move, together with their flocks and herds to some point where a water supply is available.

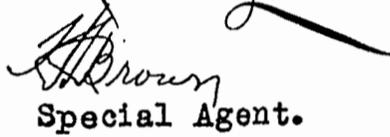
This well drilling work is of utmost importance, to the Navajo Indian, for the reason that some parts of the reservation where grazing is the best are without any water supply, and a supply of water from a well enables the Indian to settle down in that locality, building himself a permanent home, and remaining in one place, while were he dependent on the natural water supply he would be forced to move each time the water fails.

All of which is very respectfully submitted.

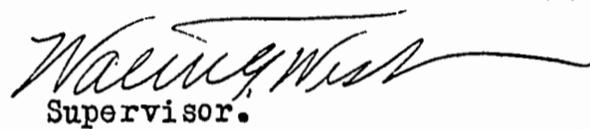
Very cordially yours,



Chief Inspector.



Special Agent.



Supervisor.

BJM