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IRRIGATION REQUIREMENTS IN THE SAN JUAN RIVER BASIN FOR THE NAVAJO INDIANS

Undoubtedly the oldest as well as the most extensive of the prehistoric Indian agriculture on the North American continent took place within the Basin of the Colorado River.

Many ruins of a prehistoric civilization based upon agriculture are found in the San Juan River Basin. No descendants of these people remain in the Basin, but the Navajo Indians have since made use of many of the ancient farm areas. Authorities believe that the Navajo Indians came to the San Juan River Valley in the late 15th or early 16th century and made use of its waters for agricultural purposes. Statements from aged Navajo Indians indicate that these Indians cultivated lands on both sides of the San Juan River as far upstream as the mouth of the Navajo River, as well as lands on the tributaries of the San Juan below the Navajo River.

More recent developments by the Indian Service include the Hogback Project begun in 1894, the Fruitland Project, the Many Farms Project and many smaller ones.

The present and proposed developments of areas and water uses by states are as follows:

ARIZONA: On the Navajo Reservation within the state of Arizona are about 45 small irrigation developments, aggregating 13,740 acres. Twenty of these units, totaling about 5,000 acres, lie within the Little Colorado River watershed, and 25 units, with an area of about 8,740 acres, are within the San Juan River Basin. It is planned to provide irrigation facilities for an additional 31,530 acres, which will make the ultimate irrigable area within Arizona approximately 45,270 acres, about 23,265 acres of which will be in the Little Colorado River watershed, and 22,005 acres in the San Juan watershed. The water is secured by direct diversion from miscellaneous streams and the pres-

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diversion is estimated at 68,700 acre feet, of which 25,000 acre feet are from tributaries of the Little Colorado River, and 43,700 acre feet from tributaries of the San Juan. The average annual diversion requirement for the ultimate area is estimated at 226,350 acre feet, of which 116,325 acre feet will be from the Little Colorado River watershed and 110,025 acre feet from the San Juan watershed.

NEW MEXICO

Shiprock Project: Within the Navajo Reservation in New Mexico, in the vicinity of Shiprock, is a reasonably compact area of potentially irrigable land, comprising at least 70,000 acres. Irrigation of this area would require the construction of a storage reservoir on the San Juan, together with a canal and lateral system. The Bureau of Reclamation has studied the possibility of constructing a 125,000 acre feet storage dam, on the San Juan River near the Colorado-New Mexico state line, together with a diversion dam near Blanco and a gravity conduit extending about 75 miles, to the land. A pumping lift of about 100 feet would be required to irrigate part of the area which lies above the conduit location. The Indian Service is studying this plan and possible modifications of it. The average annual diversion requirement for this project, regardless of the plan adopted, would be approximately 350,000 acre feet.

Monument Rocks Project: Within the Navajo Reservation, north of the San Juan River, in a reasonably compact area of potentially irrigable land which is included in the proposed development of the Animas-LaPlata Project proposed by the Bureau of Reclamation. This potentially irrigable area totals 25,500 acres. It is estimated that the average annual diversion requirement would amount to 127,500 acre feet. Detail surveys are required in order to define the area and prepare cost estimates. The cost of such surveys is estimated at \$10,000.

Miscellaneous Small Projects: Within the Navajo Reservation in New Mexico are about 30 small irrigation developments, and several additional small projects

are proposed for development. The present irrigated area aggregates 12,000 acres, and the proposed additional developments total 10,500 acres, making a total aggregate area of 22,500 acres. The water supply is secured from the San Juan River and numerous miscellaneous streams tributary to the San Juan River. The present average annual diversion is 60,000 acre feet, and the average annual diversion requirement for the ultimate irrigable area is estimated at 112,500 acre feet. The development cost of these small projects, including subjugating the land, is estimated at about \$2,000,000, although additional surveys are required to define the areas and prepare accurate cost estimates. The cost of such additional studies will be approximately \$10,000.

UTAH: In Utah are four small projects on which are now irrigated 455 acres and which will ultimately be expanded to include 1,320 acres of irrigated land.

SUMMARY NAVAJO: The need for the full and early development of all feasible irrigation projects on the Navajo Reservation is acute. Within the Navajo Reservation in Arizona and New Mexico there are approximately 30,000 acres now provided with irrigation facilities. Some of the many separate developments are merely flood water projects, and are of little value during years of extreme drought. Additional storage is required to provide a dependable water supply. Additional subjugation work also needs to be done in order to conserve water and make it possible for the Indians to carry on farming operations. With the full development of all feasible irrigation units on the Navajo in Arizona and New Mexico, and Utah including the Monument Rocks area, the Shiprock area, and the miscellaneous small projects, there would be a total of approximately 160,000 acres of irrigable land available for use by these Indians. The estimated cost of the new developments, including the subjugation of the land, is \$27,000,000 or an average of about \$260 per acre, for the new acreage.

Living on and adjacent to the reservation are approximately 52,000 Navajo

Indians, practically all of whom are full bloods. This population comprises about 11,000 families. It is the obligation of the government to provide these people with resources sufficient for them to attain economic independence at a reasonable standard of living. The present carrying capacity of the grazing range available to them is estimated at 611,000 sheep units. This would permit the grazing of approximately 70 sheep per family, whereas at least 400 sheep per family are required to provide a minimum standard of living. Assuming that 3,000 of these Indian families will find their way into industry or otherwise secure their living off the reservation, there remain 8,000 families to be provided for. With the range land divided equally they could each have not to exceed about 75 sheep per family. With the full development of all potentially irrigable lands totaling 160,000 acres, it would be possible to assign an average of about 20 acres of irrigable land to each of the 8,000 families, in addition to which each family could graze an average of 75 sheep. This would not solve the total economic problem of the Navajo, but it would raise their present standard of living considerably. Many of these Indians are in the armed services and many more are engaged in war work. When the war is over and the present war work opportunities do not exist, these people must inevitably return to the reservation. Unless detailed plans can be developed and construction work started on these proposed irrigation developments immediately after cessation of hostilities, the conditions on this reservation will be such as to require the expenditure of large sums for relief or "made work". This alternative must be avoided.

OMAHON PROJECTS - NAVAJO RESERVATION
and Proposed - July 1, 1945

Present Annual PAYMENTS (AGRE 14)	Ultimate No. OF PROJECTS	Ultimate Irrigated AREA (ACRES)	Ultimate Annual PAYMENTS (AGRE 14)
43,700	31	22,905	110,025
--	1	70,000	350,000
--	1	25,500	127,500
60,000	31	22,500	112,500
<u>2,300</u>	<u>4</u>	<u>1,320</u>	<u>6,600</u>
106,000	68	141,325	706,625
25,000	24	20,265	116,325
<u>500</u>	<u>5</u>	<u>700</u>	<u>3,500</u>
<u>25,500</u>	<u>27</u>	<u>23,965</u>	<u>119,825</u>
131,500	95	165,290	826,450

**SUMMARY OF IRRIGATION PROJECTS - NAVAJO RESERVATION
Present and Proposed - July 1, 1945**

SAN JUAN RIVER BASIN

ARIZONA

	Present No. of Projects	Present Irrigated Area (Acres)	Present Annual Diversion (Acres ft)	Ultimate No. of Projects	Ultimate Irrigated Area (Acres)	Ultimate Annual Diversion (Acres ft)
Misc. Projects	25	6,740	43,700	31	22,605	110,025

NEW MEXICO

Shiprock Project	-	-	-	1	70,000	390,000
Monument Hg. Proj	-	-	-	1	25,500	127,500
Misc. Small Projects	30	12,000	60,000	51	22,500	112,500

UTAH

Misc. Small Projects	3	425	2,300	4	1,320	6,600
TOTAL, SAN JUAN BASIN -	58	21,195	106,000	68	142,325	706,625

LITTLE COLORADO RIVER BASIN

ARIZONA

Misc. Projects	20	5,000	25,000	24	20,265	114,325
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NEW MEXICO

Misc. Projects	3	114	500	3	700	3,500
TOTAL, LITTLE COLORADO BASIN	23	5,114	25,500	27	23,965	119,825

TOTAL, NAVAJO RESERVATION

	61	26,909	131,500	95	165,290	826,450
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