9054-M

OFFICE OF INDIAN AFFAIRS
RECEIVED
JUL 27 1937
62517

NARRATIVE & COST REPORT

FOR

FISCAL YEAR 1937

NAVAJO SERVICE IRRIGATION DIVISION
WINDOW ROCK ARIZONA

E. R. FRYER
GENERAL SUPERINTENDENT

REPRODUCED AT THE NATIONAL ARCHIVES

1310 10

CONSTRUCTION IRRIGATION PROJECTS, ARIZONA

CHINLE

J. D. Seery, Asst. Engineer, Employee in Charge

This project is located in the Chinle Valley near Chinle Boarding School, Land Management District No. 10. Approximately 109° 32' Longitude and 36° 10' Latitude.

To influence the flow of the wash into the headings it was necessary to construct false throats. This was done by jettying well casing into the wash for a distance of 150 feet upstream from the heading. Hog wire was tied to these casing and rock and brush placed against it, thereby forming a diversion wall. This was done at both the upper and lower Chinle canal headings. Two sluice structures were reconditined, and canal grades increased between the headings and sluice structures. In addition to this work a syphon on the main lower canal was thoroughly cleaned out and put into operation. Canals were put in operation before the farming season.

GANADO

S. E. Wood, Jr. Engineer, Employee in Charge

During the month of August a channel change was made just above the syphon on the main canal to prevent the destruction of a section of canal by the rapidly eroding stream bank adjacent to it. Approximately 3200 cubic yards were moved in making this channel change. With this new channel the canal seemed to be safe, but the springs floods this

REPRODUCED AT THE NATIONAL ARCHIVES

CANAMO (Cont.)

year again eroded the bank to such an extent that the canal was in danger of being destroyed by floods resulting from summer rains. In June a pile driver was moved to this location and started driving a row of piling parallel to the bank a few feet out in the stream bed. It is planned to fasten heavy wire netting on to the piling and fill between this and the bank with large rock. The Soil Conservation Service participated in this work to the extent of furnishing the pile driver and supplying the common labor.

LOWER ROCK POINT

S. E. Wood, Jr. Engineer, Employee in Charge

This project is located in Arizona on the Chinle Wash near Rock Point trading post.

A wasteway leading from the end of the canal to the Chinle Wash was constructed for the purpose of relieving the system of excess water.

To remedy the silting of the head end of the main canal a reinforced concrete sluice structure with a radial gate was constructed at station 10 + 30. From this structure a sluiceway was excavated to the Chinle Wash. The grade of the sluiceway is much higher than that of the wash and to prevent the eroding of the sluiceway a concrete drop was constructed at the outlet end.

During the winter months the operation and maintenance foreman installed approximately 20 metal turnout gates at various places along the main canal.

NAVAJO SUBSISTENCE TRACTS

Fort Defiance

This project is located in Bonita Creek at Fort Defiance Arizona Approximately 109° 05' Longitude and 35° 45" Latitude.

A 20 foot length of steel pipe with a reinforced conrete wing type head wall on each end was installed to carry irrigation water across the Fort Defiance drain.

During the fiscal year 1937 the Irrigation Division made minor repairs on the following projects:

Moencopi

Tesnospos

Red Lake

Natural Bridge

This work consisted mainly of replacing and repairing gates, repairing canal breaks and assisting the Indains in cleaning their canals to grade and installing turnouts.

RED ROCK

Charles F. Holly, Gen. Foreman, Employee in Charge

This project is located in Arizona approximately 8 miles southwest of Red Rock, New Mexico.

The work on this projectwas started prior to the beginning of the fiscal year 1937 and during that time the foundation excavation for the dam was completed. The dam itself which is a rock masonry arch 35 feet in height was started in July of this fiscal year and completed in October. In addition to the storage dam a rock masonry waste way and

REPRODUCED AT THE NATIONAL ARCHIVES

ROUND ROCK (Cont.)

control structure was built and 1500 linear feet of canal excavated. Due to the nature of the soil it was necessary to line 1030 feet of the canal with rock paving.

This project is now in operation and at the beginning of the irrigation season the reservoir was full of water which may be utilized for irrigation purposes. The work on this project was done cooperatively by the Irrigation Division and the Soil Conservation Service.

ROUND ROCK

S. E. Wood, Jr. Engineer, Employee in Charge

This project is located in Arizona near the Round Rock Trading Co. in Land Management District No. 11. Approximately 109° 30' Longitude and 36° 30' Latitude. Project is operated by Irrigation Division of Navajo Service.

On this project under the old direct diversion system from Lukachukai Creek the Indians had a number of small fields in c ultivation. Corn was the principal crop and a fair yield was obtained. One hundred and thirty seven acres were cultivated and yielded an estimated value of $1,447.67. An average yield of $10.57 per acre.

A feeder canal 2 miles long was excavated thru earth and rock material from the Round Rock diversion dam on Lukachukai Creek to the proposed storage dam site. Bridges, culverts, rock drop structures, and lined canal sections were included in this construction which was accomplished in July and August 1936.

A well 226 feet deep was drilled in September to furnish water for puddling the storage dam and for domestic uses.

REPRODUCED AT THE NATIONAL ARCHIVES

CV-6417-201 NN008441

(Round Rock - Continued)

Storage dam construction was started September 14, 1936, at the site of a former E.C.W. stock water development. Plans were made for revamping and raising the existing dam eleven feet. In order to accomphish this result a cut was made through the old dam, an outlet pipe and gate tower installed, and a core trench excavated along the down stream toe.

The newly constructed storage dam has a 15-foot crown, with 3:1 slope upstream and 2:1 slope downstream. The total length is 950 feet, height at the gate tower 29 feet, freeboard three feet and the total fill 28,000 cubic yards. The 50-foot spillway is on the south end of the dam. An excellent rock riprap was placed on the upstream face to defeat wave action. Earth work was started October 29, 1936, and an average of 500 cubic yards were placed per shift. Material was moved from borrow pit by power shovel and trucks, spread in thin layers by tractor drawn grader and sprinkled. Construction operations were carried on two eight hour shifts per day.

Water was turned into the dam as soon as it was completed. Seepage has developed through the dam, and, although no material damage has resulted at this date, plans are being made to remedy this condition.

A two mile distributary canal was excavated to deliver water to the farm lands from the storage dam. The necessary drop structures, lined sections (1012 linear feet), culverts, bridges and turnout gates, were installed, and the canal completed December 15, 1936.

Subjugation of farm lands was started in May with three tractor units. All land was prepared for the border method of irrigation, concrete drop structures installed in farm laterals, and gates installed. Fifty acres have been completed. Two allotments are being farmed by local Indians at present.

This project is operating very nicely, with an abundant water supply on hand in the storage dam for use this year.

REPRODUCED AT THE NATIONAL ARCHIVES

CV-6417-201 NN008442

June, 1937

GANADO PROJECT

Neil Campbell, deceased, Foreman, employee in charge until September, 1936. S. Mortensen, Foreman, employee in charge since September, 1936.

This project is located in Land Management District No. 17 in the vicinity of Ganado, Arizona, and is operated and maintained by the Irrigation Division of the Navajo Service. Of the 1176 irrigated acres on this project 146 acres are held by the Hubbell family and the Presbyterian Mission.

Water is diverted from the Rio Pueblo Colorado into the Ganado storage reservoir and released to the distributary system for irrigation purposes when needed. To augment, water is diverted from Beautiful Valley into the Ganado secondary storage reservoir.

RESERVOIR REPORT, GANADO STORAGE RESERVOIR

July 1, 1936	12.8 gauge	1262.2 acre feet
August 1, 1936	11.2 gauge	930.1 acre feet
September 1, 1936	14.2 gauge	1839.5 acre feet
October 1, 1936	13.5 gauge	1661.1 acre feet
November 1, 1936	13.9 gauge	1760.7 acre feet
December 1, 1936	14.2 gauge	1839.5 acre feet
January 1, 1937	14.3 gauge	1866.4 acre feet
February 1, 1937	14.4 gauge	1893.3 acre feet
March 1, 1937	15.9 gauge	2387.9 acre feet
April 1, 1937	18.8 gauge	3337.2 acre feet
May 1, 1937	18.6 gauge	3257.3 acre feet
June 1, 1937	17.0 gauge	2742.8 acre feet
July 1, 1937	15.7 gauge	2304.2 acre feet

REPRODUCED AT THE NATIONAL ARCHIVES

CV-6417-201 NN008443

RESERVOIR REPORT, GANADO SECONDARY RESERVOIR

August 1, 1936	0.0 gauge	0.0 acre feet
* September 1, 1936	8.3 gauge	104.2 acre feet
October 1, 1936	8.3 gauge	104.2 acre feet
November 1, 1936	8.5 gauge	112.6 acre feet
** December 1, 1936	4.4 gauge	19.3 acre feet
January 1, 1937	4.2 gauge	17.4 acre feet
February 1, 1937	4.3 gauge	18.3 acre feet
March 1, 1937	7.7 gauge	83.7 acre feet
April 1, 1937	9.8 gauge	177.0 acre feet
May 1, 1937	10.4 gauge	211.7 acre feet
June 1, 1937	9.3 gauge	149.9 acre feet
July 1, 1937	8.7 gauge	129.8 acre feet

* Dam completed.

** 93.3 acre feet were drawn from the secondary reservoir and stored in the Ganado reservoir.

During the fiscal year water was delivered to the farm lands from July 1936 until October 1936, and from May 1937 to date. During part of both seasons the entire irrigation system was operated on a 24-hour basis. More water is available for irrigation this season than in any previous year since the initiation of the project.

The 1936 crops were harvested in September and October, and the prevailing prices paid by the traders in the vicinity had a total value of $8672.00. This is a poor showing for the number of acres under the project and is the result of the Indians leaving their farms to work for wages on relief projects. This year many of them have returned to their farms and the prospects for a greater yield are much better than

REPRODUCED AT THE NATIONAL ARCHIVES

any year since 1932.

During the late fall and early spring many minor repairs were made to the canal banks and canal structures. A deep blanket of snow covered the project during January and February making any activity during this period impossible. In the latter part of March the Indians living on the project were organized into groups for the purpose of spring canal cleaning. This work was accomplished during April with all the Indian farmers participating. When the cleaning was accomplished all canals were thoroughly sluiced and put in readiness for operation which started on May 1.

Details of the construction work accomplished on this project during the fiscal year appear under F.P. 596, Arizona and Construction Irrigation Systems, Arizona.

REPRODUCED AT THE NATIONAL ARCHIVES

June 1937

HOPI CONSTRUCTION

LOWER DENEBITO PROJECT

J. Len Westerman, Assistant Engineer, employee in charge.

This project is located on the Denebito Wash approximately 14 miles north of Oraibi, Arizona, and in Land Management District No. 4.

Work was started in the latter part of November and has been continued through the remainder of the fiscal year. It was necessary to curtail construction for six weeks in the winter, due to weather conditions. A reinforced concrete buttress type diversion dam 160 feet in length and 11 feet high, with a stilling pool wall 12 feet from the down stream toe was completely constructed. In connection an outlet box from the dam and a silt trap with a radial type gate were built. All concrete work set on solid rock footings.

One mile of the main canal containing 16,500 cubic yards was excavated with a dragline at a cost of 87 cents per cubic yard. A 160 feet steel flume was designed with a 36-foot-center-truss section.

This project is still in the course of construction and the work will be carried on during the fiscal year 1938.

ORAIBI WASH PROJECT

This project is located on Oraibi Wash approximately 15 miles northeast of Oraibi, Arizona.

To make it possible to remove the silt which collects in front of the headgate at the diversion dam, a radial sluice gate was installed in

REPRODUCED AT THE NATIONAL ARCHIVES

CV-6417-201 NN008446

(Craibi Wash Project - Continued)

the dam adjacent to the wing well on which the headgate is located. This was accomplished by removing a section of the rock masonry and constructing a concrete sluice structure with a 4 by 4-foot radial gate. In addition to this work some minor repairs were made to the canal.

REPRODUCED AT THE NATIONAL ARCHIVES

June 1937

F. P. 596, NAVAJO, ARIZONA

GANADO

The construction of an earth fill storage dam, a rock masonry diversion dam and a feeder canal running between them was continued into this fiscal year, and completed in September.

The storage dam which has a puddle core contains 48,000 cubic yards of earth which was moved at a cost of slightly under 19 cents per cubic yard. On the upstream face a rock blanket containing 1174 cubic yards was placed at a cost of $1.87 per cubic yard. As there was no available water supply which could be utilized for puddling the core, it was necessary to drill a well for this purpose. A very good supply of water was developed and an excellent job of puddling was accomplished. The diversion dam which is of the rock masonry construction and the feeder canal running from it to the secondary storage reservoir were constructed under cooperative agreement with the Soil Conservation Service. The Irrigation Division furnished the materials and supervised the work, and the Soil Conservation Service supplied the labor.

LOWER MOENCOPI WASH

This project is located 10 miles south of Tuba City, Arizona, on Moencopi Wash.

The work on this project covered by this report was started during the fiscal year 1936 and continued into the fiscal year 1937 until October. During July the retaining wall at the south end of the stilling basin was completed. A protection dike containing 350 cubic yards of earth was constructed at the south end of the masonry dam. Fifteen hundred square feet of riprap were placed on the face of this dike adjacent to the wash to protect it from sloughing during high waters.

REPRODUCED AT THE NATIONAL ARCHIVES

CV-6417-201 NN008448

The excavation of the main canal which was started during the fiscal year 1936 was continued until the latter part of September with a total of approximately 10,000 cubic yards of earth moved during July, August and September.

Two sluice pipes were installed and wasteways leading from them to the wash were excavated. The length of these sluiceways totaled 1,000 feet.

Due to the rapid fall of the terrain it was necessary to construct nine rock masonry drops in the canal to maintain a grade which would not scour.

The work done on this project during the fiscal year 1937 was accomplished under cooperative agreement by the Irrigation Division and the Soil Conservation Service.

NAVAJO AGENCY FLOOD CONTROL DAMS

The work on this project was done cooperatively with the E.C.W. and was started in November 1935.

During July and August, fiscal year 1937, the masonry work and concrete cap on the arch dam was completed. During August a rock lined spillway leading from the earth dam was constructed. The purpose of these dams is to control the flood waters which formerly flowed around the Agency buildings after a hard summer rain.

REPRODUCED AT THE NATIONAL ARCHIVES

CV-6417-201 NN008449

June, 1937

WATER SUPPLY, NAVAJO and HOPI

John J. Schwarz, Foreman, employee in charge.

Regular inspections of windmills, wells, tanks and troughs were made throughout the fiscal year 1937 by four regular maintenance crews operating over the entire Navajo and Hopi reservations. An average of 106 wells equipped with windmills were inspected each month, and repairs made wherever necessary. In cooperation with the Education Division eight day school wells were repaired during the year by irrigation forces.

A program of revamping dug wells and springs which was initiated during the last fiscal year was carried on throughout this fiscal year in the northern, southern and western Navajo Divisions. Under this program there were 137 springs and 55 dug wells completely revamped. This work consisted mainly of cleaning out the well or spring, replacing the gravel filter and cleaning, repairing or replacing the pipe lines leading from the well or spring to the troughs. Due to the lowering of the water table in several small valleys, it was necessary to revamp three springs into dug wells.

During the fiscal year the 15 wells tabulated below were drilled in Arizona and New Mexico.

Number	Location	Depth	Capacity 24-hour run
88	At Rock Point store, Arizona	124 feet	40,000 gallons
90	Near Red Rock, north of Round Rock, Arizona	165 feet	17,280 gallons
339	At Fraziers Store, Arizona	190 feet	43,200 gallons
403	Three miles north of Chinle, Arizona	130 feet	38,880 gallons

REPRODUCED AT THE NATIONAL ARCHIVES

(Water Supply, Navajo and Hopi - Continued)

Number	Location	Depth	Capacity 24-hour run
404	Sixteen miles south of Chinle, Arizona at Short Canyon	92 feet	14,400 gallons
406	Four miles east of Round Rock, Arizona	280 feet	72,000 gallons
407	Four miles southeast of Round Rock, Arizona	202 feet	10,080 gallons, artesian flow
408	At Round Rock store, Arizona	750 feet	5,760 gallons, artesian flow
428	Many Farms, Arizona, near Chinle	110 feet	20,160 gallons
440	Four miles northwest of Round Rock, Arizona	800 feet	7,280 gallons, artesian flow
630	At Wide Ruins, Arizona	130 feet	37,460 gallons
641	Eight miles southwest of Standing Rock, New Mexico	384 feet	7,200 gallons
642	Five miles east of Twin Lakes, New Mexico	873 feet	144,000 gallons, artesian flow
643	Six miles south of Stony Butte, New Mexico	942 feet	40,320 gallons
644	Six and one-half miles northeast of Tohatchi, New Mexico	155 feet	25,800 gallons

During the latter part of the year concrete tanks with a capacity of 10,000 gallons were constructed at the following wells: Nos. 88, 90, 106, 335, 339, 354, 367, 406, 428 and 748. These tanks which are entirely of reinforced concrete construction have a radially reinforced concrete top. In many sections of the Navajo country it has become necessary to construct covered tanks due to the rapid evaporation during the hot, dry summer months, the blowing of sand in the spring months and the freezing during the extremely cold winter months.

During the year a new type of concrete trough with a concrete apron was developed so that both sheep and larger stock could be watered advan-

REPRODUCED AT THE NATIONAL ARCHIVES

tageously. These troughs are 24-feet long and arranged in such a manner that 36 sheep can drink at each trough simultaneously without crowding. Thirty-one of these troughs have been constructed at various windmills and springs and have so far proved to be much more satisfactory than the old type of troughs.

REPRODUCED AT THE NATIONAL ARCHIVES