

ANNUAL REPORT

1935

FIFTH IRRIGATION DISTRICT

H. C. NELSON  
SUPERVISING ENGINEER



1311

	<u>Page</u>
New Mexico Pueblos (Cont.):	
Santa Ana (Ranchitos).....	24
Santo Domingo.....	26
Zia.....	22,27
Oklahoma, Investigations in.....	31
Pine River Project.....	14,73
Public Works Projects:	
F. P. 6 White Horse Lake.....	33
"    6 Standing Rock.....	33
"    6 Canoncito.....	34
"    14 Chimopovy.....	35,91
"    14 Hotevilla.....	35
"    14 Polacca.....	36
"    15 Pinon.....	36
"    16 Oraibi.....	37
"    20 Deneshotso.....	38
"    20 Red Rock.....	39
"    27 Zuni High School.....	39
"    32 Twin Lakes.....	40
"    32 Mexican Springs.....	41
"    32 Sawmill.....	41
"    32 Wide Ruins.....	42
"    86 Tohatchi Well.....	42
"    94 Northern Navajo Heating & Power....	43
"    211 Fruitland.....	44
"    212 Capt. Tom Wash.....	47
"    213 Hogback.....	48
"    217 Casamera Lake.....	49
"    220 Choiska.....	49
"    224 Red Lake.....	50
"    225 Deneshotso.....	51
"    226 Lower Rock Point.....	52
"    228 Tesnospos.....	53
"    229 Tochenlini.....	54
"    230 Todenstani.....	54
"    231 Chinle.....	55
"    232 Ganado.....	55
"    233 Kinlechee.....	56
"    234 Klagetoh.....	56
"    235 Natural Bridge.....	57
"    236 Nazlini.....	58
"    237 Round Rock.....	58
"    238 Sehili.....	59

REPRODUCED AT THE NATIONAL ARCHIVES

Public Works Projects (Cont.):

	<u>Page</u>
F. P. 240 Marsh Pass.....	60
" 242 Lower Moencopi Wash.....	60
" 243 Paiute Canyon.....	61
" 244 Oraibi Wash.....	61
" 245 Nambe.....	62
" 246 Picuris.....	63
" 247 Santa Clara.....	64
" 248 San Ildefonso.....	65
" 249 San Juan.....	66
" 250 Taos.....	67
" 251 Tesuque.....	68
" 253 Acoma.....	69
" 254 Jemez.....	69
" 255 Laguna.....	70
" 257 Zia.....	71
" 258 Zuni (Ojo Caliente).....	71
" 259 Zuni.....	72
" 267 Pine River.....	73
" 287 Burnham.....	74
" 287 Aneth.....	75
" 287 The Cove.....	75
" 287 Rock Point.....	76
" 288 Kinlechee.....	76
" 288 Hunter's Point.....	77
" 288 Greasewood.....	78
" 288 Steamboat.....	78
" 288 Naschiti.....	79
" 288 Rough Rock.....	80
" 288 Coyote Canyon.....	80
" 288 Two Wells (Cousins).....	81
" 288 Pine Springs.....	82
" 288 Chinle.....	82
" 288 Klagetoh.....	83
" 288 Wide Ruins.....	83
" 288 Cornfields.....	83
" 289 Lake Valley.....	84
" 289 Pueblo Alto.....	84
" 289 Huerfano.....	85
" 289 Torreon.....	86
" 289 Baca.....	86
" 289 Mariano Lake.....	87
" 290 Navajo Mountain.....	88
" 290 Kaibito.....	88
" 290 Kayenta.....	89
" 290 Moenava.....	90

	<u>Page</u>
Public Works Projects (Cont.):	
F. P. 291 Section 22 (Sebadalkai).....	90
"    292 Torreva-Chimopovy.....	91
"    393 Navajo Central Agency.....	91
"    416 Mescalero.....	93
"    419 Tesuque.....	93
"    426 Leupp Flood Control.....	94
Pueblo Wells.....	21
Reports, Special.....	4
Round Rock Project.....	18
Sandia Pueblo.....	24
San Felipe Pueblo.....	25
Santa Ana Pueblo (Ranchitos).....	24
Santo Domingo Pueblo.....	26
Tenospos Project.....	18,53
Zia Pueblo.....	22,71
Zuni Project.....	15,71,72
Water Supply:	
Navajo and Hopi.....	20
Pueblo Wells.....	21
Zia Pueblo.....	22,71

Ganado Project

Neil Campbell, Foreman, Employee in Charge.

This project is located in the Southern Navajo subdivision in Arizona, and is operated and maintained by this Service. Water is diverted from the Rio Pueblo Colorado into the Ganado Storage Dam. There are 1,176 acres under this project, and most of this acreage is assigned to Indians. Of the total acreage, 116 acres are held by the Hubbell family and the Presbyterian Mission. The season of 1934 was a very poor one for this project. Very few of the Indians regularly farming on this project were on their assignments and the area cultivated dropped far below that of any recent year.

Early irrigation practically depleted the water stored in the reservoir, but the run-off of the Rio Pueblo Colorado during July and August permitted diversion of sufficient amount to take care of the irrigation of the cultivated area for the balance of the season. Operation of the canal was continued until October 31. General repairs to structures as far as weather conditions would permit were carried on throughout the winter. The spring run-off of the Rio Pueblo Colorado started early in March and continued throughout the month of April. With the increased storage capacity, there is ample supply to meet the demands for the 1935 irrigation season. Details of the enlargement of the Ganado Storage Dam is described under F. P. 232. Delivery of

water was started April 25, and operation continued through May and June.

There is a substantial increased acreage under cultivation under this project for the season 1935.

Miscellaneous Navajo Projects

C. A. Burns, Engineer, Employee in Charge.

Capt. Tom Wash

This irrigation project is located in the Northern Navajo subdivision in New Mexico. The principal supply of water for irrigation is from flood waters, and in order that the Indians of this project could make the fullest use of the water when the run-off occurs, they were assisted in the extension of their lateral system, thereby permitting a more equal distribution to the 2,700 acres of irrigable land under this project.

Kinlechee

This irrigation project is located in the Southern Navajo subdivision in Arizona. A new diversion dam was being constructed for this project under the Public Works program, and in order that there would be no interruption in the delivery of water to the Indian farms, certain repairs were necessary to the old log crib diversion dam. The work was done during the time of the Public Works construction.

Leupp

Surveys were made for additional protection work for the Leupp School. A study was made of the present river channel conditions in order that jetties might be located more advantageously. A program of channel control and levee construction

under Public Works is described under F. P. 1126.

Lower Crystal

This irrigation project is located in the Southern Navajo subdivision in Arizona. Heavy rains during August, September, and October resulted in an abnormal run-off, causing considerable damage to the canal system. The Indians were assisted in the replacing of a flume and several culverts in the rehabilitation of their canal system.

Round Rock

This irrigation project is located in the Southern Navajo subdivision in Arizona. Assistance was given to the Indians on this project in the reconstruction of the first one-half mile of the main canal, as bank erosion of the stream was encroaching on the canal alignment.

Tenospos

This irrigation project is located in the Northern Navajo subdivision in Arizona. Upon the completion of the construction program under Public Works, a small crew of regular employees worked with the Indians in the organization of a Farmers Water Users Association and in the construction of a farm lateral system. Instructions were given the Indians on the proper operation of the project and in the value of careful use of the water.

Miscellaneous Surveys

Throughout the reservation, there are groups of Indian farms of limited acreage too small for regular development. Assistance was rendered to many of these groups in bettering their canal systems and diversions, making it possible that the most benefits be received from their limited water supplies.

Water Supply, Navajo & Hopi

John J. Schwarz, Foreman, Employee in Charge.

Maintenance of the existing wells, windmills, tanks, troughs, dug wells, and springs were carried on throughout the Navajo and Hopi Reservations. This maintenance work was taken care of by two crews, one operating from Polacca, Arizona, and the other from Chinle, Arizona. Continuing the program of redeveloping drilled wells on the Navajo and Hopi Reservations that had failed after long years of use, two well rigs operated intermittently during the year. Eleven wells were worked on and placed in service again. In some cases, it was impossible to pull the old casing and a new hole was drilled alongside the old one, and the windmill set over the new well.

per minute will be installed. All features were completed, with the exception of installing pumping equipment, on January 12.

There was expended for labor during the year \$2,080.20. The total Indian man days for this period were 529 and the white 140.

F. P. 14 Chimopovy

See F. P. 292 Torreva and Chimopovy.

F. P. 14 Hotevilla

This school is located in the Hopi Reservation in Arizona. Construction on this water development for day school water supply was started October 2. A spring area alongside the Bacobi Trail was developed for this supply. The area was opened back to the original formation, and a concrete collection chamber 11 feet wide, 17 feet long, and 12 feet in depth was constructed to collect the flow of the springs. A graded gravel filter was filled in around the springs before being backfilled with an impervious blanket. A test of the flow of this development, after completion, was 2-1/2 gallons per minute. Low temperatures during the months of December and January caused considerable delay in this work. A Gould 2,500 gallon per hour pump is used to elevate the water from the collection chamber to the storage tank at the Hotevilla School. A masonry pump house was constructed, and a total of 4,000 feet of 2 1/2-inch pipe was laid connecting

the pump house with the tank. This development was completed September 2.

There was expended for labor during the year \$3,538.53. The total Indian man days for this period were 304 and the white 164.

F. P. 14 Polacca

This school is located in the Hopi Reservation in Arizona. Construction activity of this water development was started December 22 with the moving in of a well rig and crew in preparation to drilling another well for the Polacca School supply. The former supply for this school was an artesian well located a short distance from the village. It was planned to drill into the same artesian strata in order to increase the supply. The well was finished February 2 after drilling to a depth of 610 feet. A flow of one gallon per minute was encountered; however, the supply of this well tested 22 gallons per minute by pumping. A Deming working head was installed capable of delivering 18 gallons per minute. It is necessary to construct a masonry pump house to complete this project.

There was expended for labor during the year \$944.99. The total Indian man days for this period were 67 and the white 119.

F. P. 15 Pinon

This school is located in the Hopi Reservation in Arizona.

Construction activities were resumed on this water development April 1, 1935. There were constructed a masonry pump house and concrete storage tank. A pipeline was installed connecting the tank and the pump house. Two wells had been drilled, each developing 10 gallons per minute. Two Deming working heads powered by the same gasoline engine were installed. This development was completed June 15.

There was expended for labor during the year \$2,123.90. The total Indian man days for this period were 625-1/4 and the white 55-1/4.

#### F. P. 16 Oraibi

This school is located in the Hopi Reservation in Arizona. Construction activities were started April 6, 1935 on this water developmer with the moving in of a well rig and crew. The pump house of the former development was removed from over the concrete caisson and the rig set to drill through the bottom of this caisson in order to tap the water strata in a lower depth. The well was drilled to a depth of 715 feet, and the supply was increased to 18 gallons per minute. Drilling operations were completed May 18. Water is pumped to the ground surface and in turn forced to the storage tank near the school. These two pumps are powered by the same gasoline engine. Except for a new gasoline motor which was purchased, the present pumping equipment was installed again.

There was expended for labor during the year \$2,033.40. The total Indian man days for this period were 242 and the white 243.

F. P. 20 Donehotso

This school is located in the Northern Navajo subdivision in Arizona. Construction activities on this water development were started July 14 with preparations being made to start work on the concrete storage tank and masonry pump house. Construction on these two features were not started at this time, but the well rig and crew moved in and drilling was started August 24. The well was drilled to depth of 707 feet and a small artesian flow was encountered. This was not sufficient to supply the school and a Deming working head was installed capable of delivering 40 gallons per minute. Construction was resumed March 2 to complete the concrete storage tank and build the masonry pump house. In addition there were installed 1,145 feet of 3-inch pipe connecting the well with the storage tank. These features were completed April 27, but the pumping equipment will not be installed until later.

There was expended for labor during the year \$5,224.22. The total Indian man days for this period were 860-1/2 and the white 402.

F. P. 20 Red Rock

This school is located in the Northern Navajo subdivision in Arizona. Construction activities on this water development were started December 8. The concrete caisson, 16 feet in diameter, was constructed and sunk to a depth of 21 feet. Water stands 12 feet below the ground surface. In addition, there was constructed a concrete storage tank and a masonry pump house, and a total of 850 feet of 2-inch pipe was installed. A Gould 2,500 gallon per hour working head was installed. Work on this development was completed March 2.

There was expended for labor during the year 5,926.45. The total Indian man days for this period were 1,116 and the white 145.

F. P. 27 Zuni High School

This school is located in the Zuni Reservation in New Mexico. Activities on this water development were started February 9 with the moving in of a well rig and crew. The well was spudded in February 11, and drilling was continued until February 25. Drilling was carried to a depth of 560 feet, but was mudded back to 535 feet where an artesian flow of 4-1/2 gallons per minute had been encountered. The concrete crew resumed activity May 4, starting work on a masonry pump house and a concrete storage tank. Construction of the tank was not completed by the end of the fiscal year. A Deming working

head capable of delivering 3 gallons per minute will be installed in the well. The artesian flow will be collected in a concrete sump at the well during such time when no more than the flow of the well is needed. Water is forced from the collection sump to an elevated tank by a Deming double-acting pump capable of delivering 2,500 gallons per hour. A pipeline 1,486 feet in length connects the well with the storage tank.

There was expended for labor during the year \$2,426.52. The total Indian man days for this period were 469-1/2 and the white 206.

#### F. P. 32 Twin Lakes

This school is located in the Southern Navajo subdivision in New Mexico. Drilling activities were started on this project January 5. The well was drilled to a depth of 1,497 feet and a small artesian flow of 1/2 gallon per minute was encountered; however, the pumping capacity of this well is 38 gallons per minute. Drilling operations were completed April 13, and on May 25 the concrete crew resumed activities starting the construction of a concrete storage tank and pump house. Two hundred feet of pipe connect the pump house and the storage tank. A Deming working head capable of delivering 25 gallons per minute is to be installed.

There was expended for labor during the year \$5,274.07. The total Indian man days for this period were 587-1/2 and the white 469-1/2.

F. P. 32 Mexican Springs

This school is located at the Soil Conservation Experimental Station in the Southern Navajo subdivision in New Mexico. Construction on the concrete storage tank was continued throughout the month of July, 1934. A concrete pump house built over the concrete caisson was started August 4. The caisson is 31 feet in diameter and was sunk to a depth of 39 feet. Water stands 20 feet below the ground surface. All of this construction was completed the previous fiscal year. A Johnson vertical turbine pump capable of delivering 250 gallons per minute was installed. Construction was completed on this project September 8.

The Soil Conservation Service shared in the construction of this water development and the amounts set forth for labor do not show the total, but only that portion paid by this Service. There was expended for labor during the year \$203.54. The total Indian man days for this period were 6 and the white 39-1/2.

F. P. 32 Sawmill

This school is located in the Southern Navajo subdivision in Arizona. Construction on this water development was started April 20, 1935, and there were constructed a concrete storage tank, masonry pump house, and concrete caisson. A Gould pump capable of delivering 2,500 gallons per hour will be installed.

Construction activities, with the exception of the setting of the pumping equipment, were completed June 29.

There was expended for labor during the year \$2,535.33. The total Indian man days for this period were 643 and the white 94.

F. P. 32 Wide Ruins

This school is located in the Southern Navajo subdivision in Arizona. Drilling operations were started on this project July 20, 1934. Favorable progress was made considering the depth to which the well was drilled. This activity was completed September 30. Construction activities were resumed on this project January 12, 1935. There were constructed a pump house and concrete storage tank, and a 2 $\frac{1}{8}$ -inch pipeline, 1,700 feet long, was laid connecting these two features. This water development was completed, with the exception of installing pumping equipment, March 9. The well was drilled to a depth of 1,870 feet, and water stands 670 feet below the ground surface. A Deming working head capable of delivering 10 gallons per minute will be installed.

There was expended for labor during the year \$4,781.33. The total Indian man days for this period were 535 and the white 530.

F. P. 86 Tohatchi Well

Tohatchi School is located in the Southern Navajo subdivision in New Mexico. Construction activities were resumed at

REPRODUCED AT THE NATIONAL ARCHIVES

the Tokatchi well May 26, 1935, with work starting on a pump house. This structure was not finished by the end of the fiscal year.

There was expended for labor during the year \$1,032.04. The total Indian man days for this period were 208 and the white 310.

F. P. 9/ Northern Navajo Heating & Power

This project is situated in the Northern Navajo subdivision in New Mexico and is to provide electrical power for the Shiprock School and four pumping units of the Hogback project. Building operations on the power house and the installation of all the necessary machinery was continued until October 13 when this activity was suspended due to lack of funds. During this period most of the heavy equipment such as the gas engines, generators and their accessories, the overhead crane, switchboard, etc., were received and installed in whole or in part.

With the allotment of additional funds, work was resumed March 2 and was continued until June 22 when suspension again was necessary due to the exhausting of the allotment. During this latter period, considerable progress was made in completing the power house, although considerable work remains to be done before operation can be started. Practically all wiring of the switchboard and the interior wiring of the power house was completed. The transmission lines connecting the power

placed in readiness for operation. There are 400 acres under this system.

All work on the diversion dam was completed within forty days and the canal work finished March 16, completing the work on this project.

There was expended for labor during the year \$1,462.87. The total Indian man days worked during this period were 216 and the white 154.

#### F. P. 224, Red Lake

This project is situated in the Southern Navajo subdivision in Arizona and New Mexico. The reconstruction of the diversion dam for the Red Lake project was started April 6, 1935. One-half of this diversion structure was isolated from the stream by the construction of a coffer dam. Work was started immediately to tear out the old log crib and excavate to the bed rock, upon which the new masonry and concrete structure is founded. Construction was started immediately on the spillway section and south abutment wall, and the masonry work was carried along progressively as the old structure was removed.

The spillway or overflow section was built of masonry to within two feet of the final elevation, the remaining two feet being capped with concrete and anchored to the masonry section with reinforcing steel. Favorable progress was made on this structure, and by June 30 a total of 660 cubic yards of masonry

had been placed in the overflow section and abutment wall.

This structure will probably be completed within sixty days.

A delay occurred on April 1<sup>st</sup> when a flood of considerable size in Black Creek broke through the coffer dam and flooded the excavation. A weeks time was lost repairing the break and clearing the excavated part.

There are 700 acres of land available for assignment on this project. There was expended for labor during the year \$7,323.07. The total Indian man days for this period were 1,934-1/2 and the white 44-1/4.

#### F. P. 225 Denehotso

This project is situated in the Northern Navajo subdivision in Arizona. Betterments to this irrigation project were started October 13. Two radial sluice gates were installed in the diversion dam, one at each end. Installation of the gates was completed by December 15, and until the end of the month the crew supervised the construction of two dikes extending out from each end of the diversion dam in order to protect the irrigable lands below this structure from any danger of flood waters.

In the construction of these dikes the Indians of the community gave fifty per cent of their time without compensation.

Construction on this project was completed December 24. Eight hundred acres of first class agricultural land are under

F. P. 231 Chinle

This project is situated on the Southern Navajo subdivision in Arizona. Construction on this project was started September 15, 1934 when a dragline was moved to the project and started excavation of the main canal for the upper diversion unit. The principal structures including the headgate and sluice gate in this upper unit were completed November 17 and work on the lower unit, which is identical in all respects to that of the upper unit, was completed January 26.

Six hundred acres of land can be farmed under these two diversions. There was expended for labor during the year \$4,875.68. The total Indian man days for this period were 584 and the white 776.

F. P. 232 Ganado

This project is situated in the Southern Navajo subdivision in Arizona. Funds were allotted for the raising of the storage dam and the rehabilitation of canal structures. Work was started August 6, 1934 with the installation of a siphon replacing a flume structure on the main canal. Preparations for raising the embankment of the reservoir and the installation of a new outlet gate and tower were made with the earth work starting September 8. The embankment was raised 5 feet, the 34,500 cubic yards of earth being transported by trucks to the embankment where it was spread, sprinkled and rolled. This work was completed October 13 and the extending of the rock blanket

on the water face was started at that time.

While the work on the storage dam was being carried on, three additional siphons replacing flume structures on the main canal were installed.

Work on this project was completed November 10. There was expended for labor during the year \$16,168.85. The total Indian man days for this period were 3,763 and the white 1,335-1/2.

F. P. 233 Kinlechee

This project is situated in the Southern Navajo subdivision in Arizona. Construction activities were resumed on this project April 22 after an additional allotment of funds had been made.

In order to complete this project it was necessary to reconstruct three siphons on the distributary system, excavate a sluiceway at the headgate and install a small flume at the lower end of the main canal.

All work on this project was completed June 15, 1935. Of the 360 acres of land on this project, eighty per cent is assigned. There was expended for labor during the year \$2,324.72. The total Indian man days were 438 and the white 48-1/2.

F. P. 234 Klagetoh

This project is situated in the Southern Navajo subdivision

in Arizona. Construction activities were resumed on this project November 3, 1934. All equipment used in the raising of the embankment of the Ganado Reservoir was moved to this project for completing the construction of the embankment of the Klagetoh Reservoir. Sufficient water had been accumulated in the partially completed reservoir to puddle the fill. All earth work, totaling 28,000 cubic yards of embankment, was completed November 17 and 1,700 cubic yards of spillway excavation and construction of the headgate for the main canal were started immediately.

Concrete work on the headgate was completed December 8 and the distributary system was finished December 22, completing the work on this project. Four hundred acres of land are available for assignment. There was expended for labor during the year \$2,328.90. The total Indian man days were 389 and the white 402-1/2.

#### F. P. 235 Natural Bridge

This project is situated in the Southern Navajo subdivision in Arizona. Construction activities on this project were started July 28, 1934. An outlet gate structure for the reservoir was constructed, and the raising of the embankment, increasing the capacity of the reservoir, was done, using both the dragline and Indian teams.

A dam with headgate was constructed making it possible to

divert all or part of the flow of Black Creek into the reservoir.

Construction on this project was completed August 20. One hundred fifty acres of land can be served by the distributary system below the reservoir. There was expended for labor during the year \$3,686.37. The total Indian man days for this period were 564-1/2 and the white 344-1/2.

F. P. 236 Nazlini

This project is situated in the Southern Navajo subdivision in Arizona. Construction was started January 2, 1934. A drag-line was moved in to assist in the excavation of the distributary system and diversion dam. There were constructed a masonry and concrete diversion dam with headgate and sluice gate and several canal structures.

A flood of considerable size occurred the last of August, and after observing the action of this flood at the diversion dam, some changes were made in its design in order to provide extra free board and better protection from high water.

Work on this project was completed September 15. A total of 300 acres of land can be served under this project. There was expended for labor during the year \$4,198.39. The total Indian man days for this period were 593-1/2 and the white 422.

F. P. 237 Round Rock

This project is situated in the Southern Navajo subdivision

in Arizona. Excavation for the foundation of the diversion dam was started July 14, 1934. Laying of the masonry for the dam was finished by August 11, and the construction of the headgate, silt trap, and sluice gate was completed by the 18th.

All work, including 6,000 cubic yards of excavation of the distributary system, was completed by September 8. Four hundred acres of land are available for cultivation. There was expended for labor during the year \$4,274.03. The total Indian man days were 891 and the white 256.

F. P. 238 Sehili

This project is situated in the Southern Navajo subdivision in Arizona. Construction on the diversion dam was continued from the previous fiscal year, with the excavation for the foundation of the gate tower completed by July 14. Construction on this project included 800 cubic yards of rock fill on the diversion dam and headgate structure and excavation of 1,500 cubic yards in the first section of the canal to connect with the old distributary system. Flumes and small canal structures were built to place the system in operating condition.

All construction was completed July 28. There are 500 acres of irrigable land under this project. Fifty per cent of this area has been previously cultivated, and the new area is open for assignment. There was expended for labor during the year \$2,233.34. The total Indian man days for this period were 541-1/2 and the white 183.

F. P. 240 Marsh Pass

This project is situated in the Western Navajo subdivision in Arizona. The old log, rockfilled crib dam was replaced by a masonry structure. Favorable progress was made on this construction except for such delays as were caused from flash floods occurring in August and September. The diversion dam was completed September 22. Directly below there was constructed a silt trap and sluice gate structure. The reservoir of this project, with capacity of 890 acre feet, was rehabilitated, including the installing of a new outlet gate. Canal excavation included new alignment and enlargement of the old ones.

Construction on this project was completed October 13. This project serves 250 acres of land. There was expended for labor during the year \$8,985.77. The total Indian man days for this period were 1,478-1/2 and the white 738.

F. P. 242 Lower Moencopi Wash

This project is situated in the Western Navajo subdivision in Arizona. Construction on this project was continued from the previous fiscal year, and was completed during the month of July, 1934. Activities were resumed April 22, 1935 in constructing certain betterments to the diversion dam, principally the addition of a concrete apron directly below the overflow section of the dam in order to check erosion of the stream bed.

The north abutment wall was extended for a considerable dis-

tance to protect the structure from flood waters. These improvements were completed June 22. The 400 acres of land under this project are available for assignment. There was expended for labor during the year \$3,820.23. The total Indian man days for this period were 700-1/4 and the white 85-1/2.

F. P. 243 Paiute Canyon

This project is situated in the Western Navajo subdivision in Arizona. Construction activities were continued from the previous fiscal year. It required the first two weeks of July to transport to the bottom of the canyon all of the materials necessary for the construction of the flumes. This transportation could be affected only by pack horse.

Floods occurred in the canyon during the latter part of the month delaying construction to some extent and causing considerable damage to existing ditches.

All work on this project was completed September 1. There are 150 acres of land at the bottom of this canyon. There was expended for labor during the year \$2,774.79. The total Indian man days for this period were 706 and the white 183-1/2.

F. P. 244 Oraibi Wash

This project is situated in the Hopi Reservation in Arizona. Construction was continued from the previous fiscal year with final work on this project being completed by July 21. Some

betterments were made to the flume structure and to the sluice gate during the month of June, 1935.

Four hundred fifty acres of land are available under this project. There was expended for labor during the year \$1,259.20. The total Indian man days for this period were 300-1/4 and the white 65.

F. P. 245 Namba

Construction on this project was continued from the previous fiscal year. During the month of July a program of bank protection and channel control in the arroyos crossed by flume structures on the High Line Canal was carried on.

Exposed rock in one section of the High Line Canal was drilled and shot in order to establish a new grade, thereby increasing the amount of water delivered below this point. This work was completed by the end of August.

Construction was resumed April 6, 1935 with the drilling of test holes at the site of the proposed Namba Storage Dam. Four tests were put down averaging eighty feet in depth. A new gauging station was constructed on the High Line Canal in order that complete records of the water diverted for use could be kept.

The proposed program for this project has not been completed in its entirety. The total irrigable area of this