Department of the Interior
U. S. Indian Irrigation Service

ANNUAL IRRIGATION REPORT

DISTRICT NO. 6

CALENDAR YEAR 1931

H. C. Neuffer, Supervising Engineer
Albuquerque, New Mexico

RECEIVED
DIRECTOR OF IRRIGATION
FIELD SERVICE

CV-6417-201 NN013464

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# DEPARTMENT OF THE INTERIOR

## UNITED STATES INDIAN FIELD SERVICE

Fifth Irrigation District

Albuquerque, New Mexico

OFFICE OF INDIAN AFFAIRS
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MAY 26 1932
27130

February 6, 1932

Assistant Director

U. S. Indian Irrigation Service

326 Wilda Building

Denver, Colorado

Dear Mr. Clotts:

There is transmitted herewith, in duplicate, Annual Irrigation Report, District No. 5, Calendar Year 1931.

Very truly yours,

H. C. Neuffer

H. C. Neuffer,

Supervising Engineer

U. S. INDIAN SERVICE
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FEB 9 1932
DIRECTOR OF IRRIGATION
FIELD OFFICE

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*To be prepared and submitted* ~~*June 30 each year*~~

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*Summary Irrigation Data*

DISTRICT No. 5

# DEPARTMENT OF THE INTERIOR

## UNITED STATES INDIAN IRRIGATION SERVICE

Dec. 31, 19 31

**Reservation** Southern Navaho **State** Arizona **Project** Ganado **Division**

**Total area reservation** 14,000,000 **Tribes** Navaho **Total census in 19** 31, 40,500

### LOCATION AND CLIMATIC CONDITIONS

County: Apache
Townships and ranges: T 27N, R 26 E, G & SRM
Railroads on and adjacent: A T& SF R R
Railroad stations: Chambers, Arizona. Gallup, N.
Distance from project: 38miles, 60 miles
Market for products: Local
Average elevation irrigable area: 6100
Average elevation watershed: 7000
Average rainfall on irrigable area: 13"
Average rainfall on watershed: 14"
Range of temperature on irrigable area: ±2° to 100°

### WATER SUPPLY

Source of water supply: Rio Pueblo Colorado
Area of drainage basins in square miles: 205
Annual run-off in acre feet: No Record

### SUMMARY OF RESULTS

Present available reservoir capacity
1 Reservoir 2649 acre feet.
Reservoir acre feet.

Canal miles, with capacites in second-feet,
- More than 500
- From 250 to 500
- From 50 to 250
- From 15 to 50: 9.69 Miles
- Less than 15

Tunnels
- Number: 0
- Total length
- Size

Waste ditches
- Miles 0 capacity sec. feet.
- Miles capacity sec. feet.

Storage dams, number 1 cu. yds.
- Masonry
- Earth 72,686
- Rockfill

Diversion dams, number 0 cu. yds.
- Masonry
- Earth
- Rockfill
- Crib

Dikes or levees
- Total length, feet: 700
- Volume cubic yards: 730

Number of canal structures (exclusive of dams and tunnels, but including bridges, culverts, pipes, flumes),
- Costing over $2,000 each, Masonry / Concrete 1 / Wood
- Costing from $500 to $2,000 each, Masonry / Concrete 4 / Wood 1
- Costing from $100 to $500 each, Masonry 5 / Concrete 8 / Wood 7
- Costing less than $100 each, Masonry 5 / Concrete 3 / Wood 4

Bridges—

| | | Steel | Combination | Wood | Concrete |
|---|---|---|---|---|---|
| Number | Length 50 feet or more | | | | |
| | Length less than 50 feet | | | 4 | |
| Total length, feet | | | | 86 | |

Culverts
- Masonry: number 4, length 120 Ft.
- Concrete: number 2, length 96 Ft.
- Wood: number 9, length 324 F.t
- Metal: number, length

Pipe Lines—

| | Under 12" | 13" to 24" | Over 24" |
|---|---|---|---|
| Concrete | 144 Ft. | | |
| Metal | | | |
| Terra cotta | | | |
| Wood | | | |

Flumes, concrete—
Number 0 size length
Number 0 size length
Number 0 size length

Flumes, steel—
Number 7 size 60 x length 742 Ft.
Number size length
Number size length

Flumes, wood—
Number 1 size 24 x 18 length 75 Ft.
Number size length
Number size length

Buildings (Permanent)—
Number of offices 1 cost $370.00
Number of residences 1 cost $ 25.00
Number of power plants cost
Number of pumping stations cost
Number of barns cost
Number of warehouses 1 cost $ 420.00

Wells—
Number 1
- Aggregate depth: Abandoned
- Aggregate cost

Total number constructed this year: None

Roads—
Miles constructed: None aggregate cost

Telephone lines—
No. stations 0 aggregate cost miles

Transmission lines—
Miles constructed 0 aggregate cost

Water power
- H. P. developed: 0
- Development cost per H. P.

Material excavated
- Class 1, cubic yards: 90503 cost $ 47,700.31
- Class 2, cubic yards: 3230 cost $ 1,047.50
- Class 3, cubic yards: 3964 cost $ 1,565.00

Riprap, square yards 18,664 cost $ 13,127.50
Masonry, cubic yards 119 cost $ 2,159.00
Dry wall, cubic yards 247 cost $ 1,360.00
Concrete, cubic yards 155 cost $ 2,489.25
Cement, bbls. used cost

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How many Indian families are farming under project? 36 White families? 2

Proportion of Indians and whites on reservation See Above

Proportion of work done by force account Nearly All; by contract Some earth work by Indians

Crops raised: Kinds Alfalfa, Corn, Wheat, Garden Truck, Oats, Melons, value $ 25,026.00

How many acres are being irrigated, but not cultivated? 30 acres

When was project initiated? 1910

How many acres were brought under cultivation during the last year by Indians? ~~494~~ 0 acres

How many acres were brought under cultivation during the last year by whites? ~~156~~ 5 acres

Cost of preparing land for cultivation, per acre Prepared by the Indians

M. and O. cost per acre, per year $ 1.98 per acre

Average acreage cultivated by each Indian family 14 acres

Are any of the Indians financially able to pay in full for their share of maintenance and operation costs? Free labor

For any part of the construction costs? Free labor

| | | |
|---|---|---|
| Area of irrigable land owned by whites | acres, | 170 |
| Area of irrigable land owned by Indians | acres, | 1030 |
| Total area of irrigable land in project, or division | acres, | 1200 |
| Estimated amount required to complete the project or division | $ | 25,165.00 |
| Estimated cost per acre when completed | $ | 92.20 |
| Estimated value of irrigated land, per acre | $ | 200.00 |
| Irrigated on ~~June 30~~ Season of, 19 31 — By Indians | acres, | 494 |
| Of Indian land, leased | acres, | 0 |
| Of white-owned land and Mission School | acres, | 156 |
| Area under constructed ditches, not irrigated | acres, | 150 |
| Total area under constructed ditches on project, division | acres, | 800 |
| Estimated expenditures for construction, during next fiscal year | $ | 25,165.00 |
| Estimated expenditures for O. and M. during next fiscal year | $ | 3,000.00 |

Other data and remarks in explanation of the true conditions of the project Water is diverted from the Rio Pueblo Colorado into a storage reservoir. At present the reservoir a capacity of 2649 acre feet. The diversion of water is watched very carefully so as to exclude most of thd heavy silt laden water. The project lies on the both sides of the stream, and of the tatal acreage some 800 acres are on the south side of the stream, and the balance under the canal on the north side. All work for the year was operation and maintenance, July 28th a severe wind rain and hail storm swepthe Ganado area causing considerable damage, washing out a diversion dam three flumes, And damage to the canal. Plans for the rehabiliation have been approved and the appropriation to carry on the work is included in the Deficiency Bill.

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*To be prepared and submitted* ~~*June 30 each year*~~

5—163 d

*Summary Irrigation Data*

DISTRICT No. 5

# DEPARTMENT OF THE INTERIOR

Dec. 31, 1931

## UNITED STATES INDIAN IRRIGATION SERVICE

Reservation Southern Navaho State Arizona Project Kin Lee Chee Division

Total area reservation 14,000,000 Tribes Navaho Total census in 1931, 40,500

### LOCATION AND CLIMATIC CONDITIONS

County Apache
Townships and ranges T-27N, R-26E, H & S R M
Railroads on and adjacent None
Railroad stations Chambers, Arizona; Gallup N.M.
Distance from project 52 miles 70miles
Market for products Local
Average elevation irrigable area 5100
Average elevation watershed 6500
Average rainfall on irrigable area 13 inches
Average rainfall on watershed 12 inches
Range of temperature on irrigable area - 10° to 110°

### WATER SUPPLY

Source of water supply Rio Pueblo Colorado
Area of drainage basins in square miles 205
Annual run-off in acre feet No Record

### SUMMARY OF RESULTS

Present available reservoir capacity Noen
..... Reservoir ..... acre feet.
..... Reservoir ..... acre feet.

Canal miles, with capacites in second-feet,
- More than 500
- From 250 to 500
- From 50 to 250
- From 15 to 50
- Less than 15 1 mile

Tunnels
- Number 0
- Total length
- Size

Waste ditches
- Miles 0 capacity ..... sec. feet.
- Miles ..... capacity ..... sec. feet.

Storage dams, number 0 cu. yds.
- Masonry
- Earth
- Rockfill

Diversion dams, number 1 cu. yds.
- Masonry
- Earth
- Rockfill
- Crib 312

Dikes or levees
- Total length, feet 0
- Volume cubic yards

Number of canal structures (exclusive of dams and tunnels, but including bridges, culverts, pipes, flumes),

| | | |
|---|---|---|
| Costing over $2,000 each, | Masonry | |
| | Concrete | |
| | Wood | |
| Costing from $500 to $2,000 each, | Masonry | |
| | Concrete | |
| | Wood | 2 |
| | Metal | |
| Costing from $100 to $500 each, | Masonry | |
| | Concrete | |
| | Wood | |
| Costing less than $100 each, | Masonry | |
| | Concrete | |
| | Wood | |

Bridges— None

| | | Steel | Combination | Wood | Concrete |
|---|---|---|---|---|---|
| Number | Length 50 feet or more | | | | |
| | Length less than 50 feet | | | | |
| Total length, feet | | | | | |

Culverts
- Concrete 0 number ..... length
- Wood 0 number ..... length
- Metal 0 number ..... length

| Pipe Lines— | Under 12" | 13" to 24" | Over 24" |
|---|---|---|---|
| Concrete | 0 | | |
| Metal | 0 | | |
| Terra cotta | 0 | | |
| Wood | 0 | | |

Flumes, concrete—
Number 0 size ..... length
Number 0 size ..... length
Number 0 size ..... length

Flumes, steel—
Number 1 size 30 length 165 ft.
Number 1 size 42 length 115ft.
Number ..... size ..... length

Flumes, wood—
Number 0 size ..... length
Number 0 size ..... length
Number 0 size ..... length

Buildings (Permanent)— None
Number of offices ..... cost
Number of residences ..... cost
Number of power plants ..... cost
Number of pumping stations ..... cost
Number of barns ..... cost
Number of warehouses ..... cost

Wells—
Number 0
- Aggregate depth
- Aggregate cost

Total number constructed this year 0

Roads—
Miles constructed 0 aggregate cost

Telephone lines—
No. stations 0 aggregate cost ..... miles

Transmission lines—
Miles constructed 0 aggregate cost

Water power
- H. P. developed 0
- Development cost per H. P.

Material excavated
- Class 1, cubic yards ..... cost
- Class 2, cubic yards ..... cost
- Class 3, cubic yards ..... cost

No Record
Riprap, square yards ~~No Record~~ cost
Masonry, cubic yards " " cost
Dry wall, cubic yards " " cost
Concrete, cubic yards " " cost
Cement, bbls. used " " cost

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How many Indian families are farming under project? 12 White families? 0

Proportion of Indians and whites on reservation - - - - - - -

Proportion of work done by force account All; by contract None

Crops raised: Kinds Alfalfa, beans, corn, hay, pumpkins, wheat, garden; value $5,006.60

How many acres are being irrigated, but not cultivated? 25

When was project initiated? 1920

How many acres were brought under cultivation during the last year by Indians? ~~217~~ 107 acres

How many acres were brought under cultivation during the last year by whites? 0

Cost of preparing land for cultivation, per acre Prepared bythei Indians

M. and O. cost per acre, per year Except on structures, work done by the Indians

Average acreage cultivated by each Indian family 18

Are any of the Indians financially able to pay in full for their share of maintenance and operation costs? Free Labor

For any part of the construction costs? No

| | | |
|---|---|---|
| Area of irrigable land owned by whites | acres, | 0 |
| Area of irrigable land owned by Indians | acres, | 267 |
| Total area of irrigable land in project, or division | acres, | 267 |
| Estimated amount required to complete the project or division | $ | 25,000.00 |
| Estimated cost per acre when completed | $ | 178.00 |
| Estimated value of irrigated land, per acre | $ | 75.00 |
| Irrigated on ~~June 30~~ Season of, 19 31 — By Indians | acres, | 217 |
| Irrigated on ~~June 30~~ Season of, 19 31 — Of Indian land, leased | acres, | 0 |
| Irrigated on ~~June 30~~ Season of, 19 31 — Of white-owned land | acres, | 0 |
| Area under constructed ditches, not irrigated | acres, | 50 |
| Total area under constructed ditches on project, division | acres, | 267 |
| Estimated expenditures for construction, during next fiscal year | $ | 0 |
| Estimated expenditures for O. and M. during next fiscal year | $ | 1268.00 |

Other data and remarks in explanation of the true conditions of the project This project is located some seven and one-half miles northeast of Ganado, Arizona, and is on the main branch of the Rio Pueblo Colorado. The irrigable area of the project is 267 acres and the project is diveded by two deep washes, one which cuts the project east and west, and one norhh and south.

The constructed works of the project consist of a log crib diversion dam and twoo long flumes crossing the twwo washes mentioned. The log crib diversion dam id rapidly deteriorating and it is for only a matter of a year at the mo st that it can be expected to withstand the floods. The two flumes are of expensive steel construction and are too small to serve any practical purpose and will have to be replaced by larger structures. In other words, the entire project if to continue in use, will have to be re-constructed at a cost equal to the original construction cost.

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5—163 d

*Summary Irrigation Data*

DISTRICT No. 5

# DEPARTMENT OF THE INTERIOR

Dec. 31, 1931

## UNITED STATES INDIAN IRRIGATION SERVICE

**Reservation** Western Navaho **State** Arizona **Project** Moencopi Wash **Division**

**Total area reservation** 14,000,000 acres **Tribes** Navaho **Total census in 1931**, 40,500

### LOCATION AND CLIMATIC CONDITIONS

County: Coconino
Townships and ranges: T-32N, R-11E, G & S R M
Railroads on and adjacent: None
Railroad stations: Flagstaff, Arizona
Distance from project: 90 miles
Market for products: Local
Average elevation irrigable area: 4500
Average elevation watershed: 5800
Average rainfall on irrigable area: 6.91"
Average rainfall on watershed: 8 "
Range of temperature on irrigable area: -12° to 105°

### WATER SUPPLY

Source of water supply: Moencopi Wash
Area of drainage basins in square miles: 367
Annual run-off in acre feet: No Record

### SUMMARY OF RESULTS

Present available reservoir capacity: None
_____ Reservoir _____ acre feet.
_____ Reservoir _____ acre feet.

Canal miles, with capacites in second-feet,
- More than 500
- From 250 to 500
- From 50 to 250
- From 15 to 50
- Less than 15: 3 miles

Tunnels
- Number: 0
- Total length
- Size

Waste ditches
- Miles: 0 capacity _____ sec. feet.
- Miles _____ capacity _____ sec. feet.

Storage dams, number: 0 cu. yds.
- Masonry
- Earth
- Rockfill

Diversion dams, number: 1 cu. yds.
- Masonry
- Earth
- Rockfill
- Concrete.....Crib....288.5

Dikes or levees
- Total length, feet: 0
- Volume cubic yards

Number of canal structures (exclusive of dams and tunnels, but including bridges, culverts, pipes, flumes),

| | | |
|---|---|---|
| Costing over $2,000 each, | Masonry | |
| | Concrete | |
| | Wood | |
| Costing from $500 to $2,000 each, | Masonry | |
| | Concrete | 2 |
| | Wood | |
| Costing from $100 to $500 each, | Masonry | |
| | Concrete | |
| | Wood | 1 |
| Costing less than $100 each, | Masonry | |
| | Concrete | 1 |
| | Wood | |

Bridges— None

| | | Steel | Combination | Wood | Concrete |
|---|---|---|---|---|---|
| Number | Length 50 feet or more | | | | |
| | Length less than 50 feet | | | | |
| Total length, feet | | | | | |

Culverts
- Concrete: 0 number _____ length
- Wood: 0 number _____ length
- Metal: 0 number _____ length

| Pipe Lines— | Under 12" | 13" to 24" | Over 24" |
|---|---|---|---|
| Concrete | 0 | | |
| Metal | 0 | | |
| Terra cotta | 0 | | |
| Wood | 0 | | |

Flumes, concrete—
- Number: 0 size _____ length
- Number: 0 size _____ length
- Number: 0 size _____ length

Flumes, steel—
- Number: 0 size _____ length
- Number: 0 size _____ length
- Number: 0 size _____ length

Flumes, wood—
- Number: 1 size: 6' x 2' length: 30 ft.
- Number _____ size _____ length
- Number _____ size _____ length

Buildings (Permanent)— None
- Number of offices _____ cost
- Number of residences _____ cost
- Number of power plants _____ cost
- Number of pumping stations _____ cost
- Number of barns _____ cost
- Number of warehouses _____ cost

Wells—
- Number: 0
  - Aggregate depth
  - Aggregate cost
- Total number constructed this year: 0

Roads—
- Miles constructed: 0 aggregate cost

Telephone lines—
- No. stations: 0 aggregate cost _____ miles

Transmission lines—
- Miles constructed: 0 aggregate cost

Water power
- H. P. developed: 0
- Development cost per H. P.

Material excavated
- Class 1, cubic yards: 1265 cost $ 366.79
- Class 2, cubic yards _____ cost
- Class 3, cubic yards: 862 cost $ 1286.50

Riprap, square yards: 153.28 cost $ 411.12
Masonry, cubic yards: 174.3 cost $ 1618.77
Dry wall, cubic yards: 74 cost $ 431.88
Concrete, cubic yards: 539.8 cost 6701.13
Cement, bbls. used: 714 cost 4086.01

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How many Indian families are farming under project? White families?

Proportion of Indians and whites on reservation

Proportion of work done by force account All; by contract None

Crops raised: Kinds Not Reported this year.; value - - - -

How many acres are being irrigated, but not cultivated?

When was project initiated? By the Indians many years ago.

How many acres were brought under cultivation during the last year by Indians?

How many acres were brought under cultivation during the last year by whites?

Cost of preparing land for cultivation, per acre Prepared by them Indians

M. and O. cost per acre, per year Except on structures work done by the Indians

Average acreage cultivated by each Indian family

Are any of the Indians financially able to pay in full for their share of maintenance and operation costs? Free Labor

For any part of the construction costs? No

| | | |
|---|---|---|
| Area of irrigable land owned by whites | acres, | 0 |
| Area of irrigable land owned by Indians | acres, | 800 |
| Total area of irrigable land in project, or division | acres, | 800 |
| Estimated amount required to complete the project or division | $ | Complete |
| Estimated cost per acre when completed | $ | 44.00 |
| Estimated value of irrigated land, per acre | $ | 75.00 |
| Irrigated on ~~June 30~~ Season of, 19 31 — By Indians Not Reported this year | acres, | 350. |
| Irrigated on ~~June 30~~ Season of, 19 31 — Of Indian land, leased | acres, | 0 |
| Irrigated on ~~June 30~~ Season of, 19 31 — Of white-owned land | acres, | 260 |
| Area under constructed ditches, not irrigated | acres, | - - - -190 |
| Total area under constructed ditches on project, division | acres, | Limited by water 800 |
| Estimated expenditures for construction, during next fiscal year | $ | 0 |
| Estimated expenditures for O. and M. during next fiscal year | $ | 0 |

Other data and remarks in explanation of the true conditions of the project

Land s under the diversion dam ar e farmed by the school and the Navahos. Moencopi Wash is an ephemeral stream and at times there are only flood waters with which to irrigate. It has been hard to manitain a diversion in this wash because of the desert nature of the country, and the fact that the entire rainfall comes in two or three torrential downpours. Principal structures are the diversion dam with a sluice gate near the headgate. 2000 ft. of canal lined with concrete, Sluice gate at the end of this linign and a water bridge over the canal.

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*To be prepared and submitted June ~~30 each year~~*

5—163 d

*Summary Irrigation Data*

DISTRICT No. 5

# DEPARTMENT OF THE INTERIOR

Dec. 31, 1931

## UNITED STATES INDIAN IRRIGATION SERVICE

Reservation Southern Navaho State Arizona New mexico Project Red Lake Division

Total area reservation 14,000,000 Tribes Navaho Total census in 1931, 40,500

### LOCATION AND CLIMATIC CONDITIONS

County Apache- McKinley
Townships and ranges T-2N, R-5W., Navaho Base Line
Railroads on and adjacent None
Railroad stations Gallup N.M.
Distance from project 45 miles
Market for products Local- Gallup N.M.
Average elevation irrigable area 7000
Average elevation watershed 8000
Average rainfall on irrigable area 13.72"
Average rainfall on watershed 14"
Range of temperature on irrigable area - 10° to 101°

### WATER SUPPLY

Source of water supply Black Creek
Area of drainage basins in square miles 250.
Annual run-off in acre feet 30,000

### SUMMARY OF RESULTS

Present available reservoir capacity
1 Reservoir 4275 acre feet.
Reservoir acre feet.

Canal miles, with capacites in second-feet,
- More than 500
- From 250 to 500
- From 50 to 250
- From 15 to 50
- Less than 15 3 miles

Tunnels
- Number 0
- Total length
- Size

Waste ditches
- Miles .25 capacity 35 sec. feet.
- Miles capacity sec. feet.

Storage dams, number 1 cu. yds.
- Masonry
- Earth 15,200
- Rockfill

Diversion dams, number 1 cu. yds.
- Masonry
- Earth
- Rockfill
- Crib 1,0000

Dikes or levees
- Total length, feet 0
- Volume cubic yards

Number of canal structures (exclusive of dams and tunnels, but including bridges, culverts, pipes, flumes),

| | | |
|---|---|---|
| Costing over $2,000 each, | Masonry | |
| | Concrete | |
| | Wood | |
| Costing from $500 to $2,000 each, | Masonry | |
| | Concrete | |
| | Metal | |
| | Wood | 1 |
| Costing from $100 to $500 each, | Masonry | |
| | Concrete | 5 2 |
| | Wood | 5 |
| Costing less than $100 each, | Masonry | |
| | Concrete | |
| | Wood | 7 |

Bridges—

| | | Steel | Combination | Wood | Concrete |
|---|---|---|---|---|---|
| Number | Length 50 feet or more | | | | |
| | Length less than 50 feet | | | 1 | |
| Total length, feet | | | | 30 | |

Culverts
- Concrete number length
- Wood number 5 length 60 ft.
- Metal number length

| Pipe Lines— | Under 12" | 13" to 24" | Over 24" |
|---|---|---|---|
| Concrete | 0 | | |
| Metal | 0 | | |
| Terra cotta | 0 | | |
| Wood | 0 | | |

Flumes, concrete—
Number 0 size length
Number 0 size length
Number 0 size length

Flumes, steel—
Number 1 size # 60 length 64 ft.
Number size length
Number size length

Flumes, wood—
Number 0 size length
Number 0 size length
Number 0 size length

Buildings (Permanent)— None
Number of offices cost
Number of residences cost
Number of power plants cost
Number of pumping stations cost
Number of barns cost
Number of warehouses cost

Wells—
Number 0
- Aggregate depth
- Aggregate cost

Total number constructed this year 0

Roads—
Miles constructed 0 aggregate cost

Telephone lines—
No. stations 0 aggregate cost miles

Transmission lines—
Miles constructed 0 aggregate cost

Water power
- H. P. developed 0
- Development cost per H. P.

Material excavated
- Class 1, cubic yards 4900 cost $ 1662.00
- Class 2, cubic yards 0 cost
- Class 3, cubic yards 0 cost

Riprap, square yards 12,195 cost $ 1045.45
Masonry, cubic yards 40½ cost
Dry wall, cubic yards 0 cost
Concrete, cubic yards No Record cost
Cement, bbls. used 39 cost $ 187.30*

* Partial

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How many Indian families are farming under project? 17 White families? 0

Proportion of Indians and whites on reservation - - - - - - - -

Proportion of work done by force account All; by contract None

Crops raised: Kinds Alfalfa, corn, hay, potatoes, pumpkins, wheat, rye; value $ 2,052.00

How many acres are being irrigated, but not cultivated? None

When was project initiated? 1885

How many acres were brought under cultivation during the last year by Indians? ~~99 acres~~

How many acres were brought under cultivation during the last year by whites? 0

Cost of preparing land for cultivation, per acre Prepared by the Indians

M. and O. cost per acre, per year Except on structures, work done by the Indians

Average acreage cultivated by each Indian family 6

Are any of the Indians financially able to pay in full for their share of maintenance and operation costs? Free Labor

For any part of the construction costs? No

| | | |
|---|---|---|
| Area of irrigable land owned by whites | acres, | 0 |
| Area of irrigable land owned by Indians | acres, | 700 |
| Total area of irrigable land in project, or division | acres, | 700 |
| Estimated amount required to complete the project or division | $ | 15,000.00 |
| Estimated cost per acre when completed | $ | 42.00 |
| Estimated value of irrigated land, per acre | $ | 75.00 |
| Irrigated on ~~June 30,~~ Season of 19 31: By Indians | acres, | 98 |
| Irrigated on ~~June 30,~~ Season of 19 31: Of Indian land, leased | acres, | 0 |
| Irrigated on ~~June 30,~~ Season of 19 31: Of white-owned land | acres, | 0 |
| Area under constructed ditches, not irrigated | acres, | 252 |
| Total area under constructed ditches on project, division | acres, | 350 |
| Estimated expenditures for construction, during next fiscal year | $ | 1,500.00 |
| Estimated expenditures for O. and M. during next fiscal year | $ | 0 |

Other data and remarks in explanation of the true conditions of the project The rehabilitation of the Red Lake Project was undertaken a few years ago at which time the Fort Defiance School requested that forty acres be set aside for their use and also to serve as a demonstation farm for the Indians. This is among the oldest projects on the Navaho reservation and one of which very little use has been made untill the last two years.

During the years this project has been in the existance considerable trouble was experienced by the Indians because of their lack of attention in the control of the irrigation works. The storage dam was destroyred several times and remained unused over a long period of years. Perhaps this is the reason why the Indians are reluctant to place lands under cultivation.

At the present time the project is faced with a serious situation. The log crib diversion dam which has been in use for some twenty years is rapidly deteriorating and at the best can only be expected to server one year.

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*To be prepared and submitted June ~~30 each year~~*

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*Summary Irrigation Data*

DISTRICT No. 5

# DEPARTMENT OF THE INTERIOR

Dec. 31, 1931

## UNITED STATES INDIAN IRRIGATION SERVICE

Reservation Western Navaho State Arizona Project Reservior Canyon Division

Total area reservation 14,000,000 acres Tribes Navaho Total census in 1930, 40,500

### LOCATION AND CLIMATIC CONDITIONS

County Coconino
Townships and ranges T-32N., R-11E, G & S R M
Railroads on and adjacent None
Railroad stations Flagstaff Arizona
Distance from project 90 miles
Market for products Local
Average elevation irrigable area 4500
Average elevation watershed 5800
Average rainfall on irrigable area 6.91"
Average rainfall on watershed 8"
Range of temperature on irrigable area -12° to 105°

### WATER SUPPLY

Source of water supply Springs
Area of drainage basins in square miles
Annual run-off in acre feet Discharge 0.5 sec. Ft.

### SUMMARY OF RESULTS

Present available reservoir capacity
3 Reservoir 150 acre feet.
Reservoir acre feet.

Canal miles, with capacites in second-feet,
- More than 500
- From 250 to 500
- From 50 to 250
- From 15 to 50
- Less than 15 1½ miles

Tunnels
- Number 0
- Total length
- Size

Waste ditches
- Miles 0 capacity sec. feet.
- Miles capacity sec. feet.

Storage dams, number 3 cu. yds.
- Masonry
- Earth No Records
- Rockfill

Diversion dams, number 0 cu. yds.
- Masonry
- Earth
- Rockfill
- Crib

Dikes or levees
- Total length, feet 0
- Volume cubic yards

Number of canal structures (exclusive of dams and tunnels, but including bridges, culverts, pipes, flumes),
- Costing over $2,000 each,
  - Masonry
  - Concrete
  - Wood
- Costing from $500 to $2,000 each,
  - Masonry
  - Concrete
  - Metal 1
- Costing from $100 to $500 each,
  - Masonry
  - Concrete
  - Wood
- Costing less than $100 each,
  - Masonry
  - Concrete
  - Wood

Bridges— None

| | | Steel | Combination | Wood | Concrete |
|---|---|---|---|---|---|
| Number | Length 50 feet or more | | | | |
| | Length less than 50 feet | | | | |
| Total length, feet | | | | | |

Culverts
- Concrete 0 number length
- Wood 0 number length
- Metal 1 number 15" length 700Ft.

| Pipe Lines— | Under 12" | 13" to 24" | Over 24" |
|---|---|---|---|
| Concrete | 0 | | |
| Metal | 0 | | |
| Terra cotta | 0 | | |
| Wood | 0 | | |

Flumes, concrete—
Number 0 size length
Number 0 size length
Number 0 size length

Flumes, steel—
Number 0 size length
Number 0 size length
Number 0 size length

Flumes, wood—
Number 0 size length
Number 0 size length
Number 0 size length

Buildings (Permanent)— None
Number of offices cost
Number of residences cost
Number of power plants cost
Number of pumping stations cost
Number of barns cost
Number of warehouses cost

Wells—
Number 0
- Aggregate depth
- Aggregate cost

Total number constructed this year 0

Roads—
Miles constructed 0 aggregate cost

Telephone lines—
No. stations 0 aggregate cost miles

Transmission lines—
Miles constructed 0 aggregate cost

Water power
- H. P. developed 0
- Development cost per H. P.

Material excavated
- Class 1, cubic yards 125 cost $ 107.00
- Class 2, cubic yards cost
- Class 3, cubic yards cost

Riprap, square yards 0 cost
Masonry, cubic yards 0 cost
Dry wall, cubic yards 0 cost
Concrete, cubic yards 0 cost
Cement, bbls. used 0 cost

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How many Indian families are farming under project? ..... White families? .....

Proportion of Indians and whites on reservation .....

Proportion of work done by force account .....All.....; by contract .....None.....

Crops raised: Kinds .....Not reported this year.....; value .....

How many acres are being irrigated, but not cultivated? .....

When was project initiated? ....By the Indians many years ago.....

How many acres were brought under cultivation during the last year by Indians? .....

How many acres were brought under cultivation during the last year by whites? .....

Cost of preparing land for cultivation, per acre .....Prepared by the Indians.....

M. and O. cost per acre, per year ....Work done by the Indians.....

Average acreage cultivated by each Indian family .....

Are any of the Indians financially able to pay in full for their share of maintenance and operation costs? Free Labor

For any part of the construction costs? .....No.....

| | | |
|---|---|---|
| Area of irrigable land owned by whites | acres, | 0 |
| Area of irrigable land owned by Indians | acres, | 300 |
| Total area of irrigable land in project, or division | acres, | 300 |
| Estimated amount required to complete the project or division | $ | Complete |
| Estimated cost per acre when completed | $ | 44.00 |
| Estimated value of irrigated land, per acre | $ | 75.00 |
| Irrigated on ~~June 30,~~ Season of 19 31 — By Indians | acres, | Not reported this year |
| Irrigated on ~~June 30,~~ Season of 19 31 — Of Indian land, leased | acres, | 0 |
| Irrigated on ~~June 30,~~ Season of 19 31 — Of white-owned land | acres, | 0 |
| Area under constructed ditches, not irrigated | acres, | No Record |
| Total area under constructed ditches on project, division | acres, | " " |
| Estimated expenditures for construction, during next fiscal year | $ | 0 |
| Estimated expenditures for O. and M. during next fiscal year | $ | 0 |

Other data and remarks in explanation of the true conditions of the project .....

This area cultivated bythe Hopi has always been included in the report of Tuba-Moencopi Wash. Most of the area cultivated by the Hopi is irrigated from storage from sprongs, and are all above the diversion dam on the Moencopi Wash. Our records do not show the segregation of these areas but these figures will be determined later.

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