Benefits derived from the project when farmed, is estimated to be about $30,000 per acre.

RESERVOIR CANYON - MOENKOPI TUBA UNIT

Location:

These two projects are located within the vicinity of Tuba City, Coconino County, Arizona. Reservoir Canyon project is located one mile southwest of Tuba City and Moenkopi Tuba project is located 3 miles southwest of Tuba City.

This area was farmed by the Mormon settlers before the tract of land was set aside by an Executive Order of January 8, 1900 as part of the Navajo Reservation. In 1903 the Government purchased this land from the Mormon settlers and made it a part of the reservation. These two areas were then divided into small tracts and assigned to individual families. The 700 acre Moenkopi Tuba project was assigned to Navajo Indians and the 350 acre Reservoir Canyon project to Hopi Indians.

Primitive Indian Location and Agriculture:

It is not accurately known how long the Hopi Indians have been planting their crops in the vicinity of the project area. Coronado, however, found the Hopi Indians in about the same place they are presently located in 1540. A full blooded Hopi, Frank Tewa makes the following pertinent statement:

> "I was born at Old Oraibi, Arizona, (date unknown about 1863), was a boy about 12 years old when the Mormons settled in Tuba City (1875). For many years the Hopis from Old Oraibi traveled to what is now Moenkopi and Pasture Canyon. The first crops planted were cotton and wheat, later on we planted corn, beans, and melons. When I first moved to Moenkopi I helped build the first five houses in the village. For many years the Moenkopi wash was very shallow and the water was diverted by small dirt diversions."

Mark Quashera, a full blooded Hopi says:

> "I was born at Old Oraibi in 1881 and moved to Moenkopi in 1893. I attended school at Keams Canyon and Phoenix, Arizona. When I moved to Moenkopi the Hopis were using the water from Pasture Canyon Reservoir which had been constructed by the Mormons. At that time the Moenkopi wash was very shallow and the Indians were diverting from the wash at many different points by building small dirt diversions."

History of Irrigation Development:

When the Hopi Indians first started to irrigate crops in the Moenkopi area is difficult to determine. They were there when the Mormons first settled in this area in 1875.

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The Mormons developed the springs and built some small reservoirs for retaining the water for irrigation purposes. They also constructed a dam on the Moencopi Wash.

The Government took over the project in 1903 from the Mormons. In 1909 this dam they had built washed out and was repaired the same year. It again was washed out in 1910, and was later destroyed by floods. A concrete diversion dam was built in 1915. A canal, sluice gate and wasteways were completed in 1921 to 1924. The irrigated acres have been fairly well subjugated. The total cost of the projects was $63,629.

Irrigated and Irrigable Areas:

The project area contains 1050 acres of good fertile land. No increase in the present acreage is anticipated. The size of the project is restricted to the available water supply.

The soils have not been classified but have been producing excellent crops for over 50 years.

This part of the reservation is arid to semi-arid with an average annual rainfall of from 6 to 9 inches.

With a growing season of a little over 200 days lends to the possibility of growing a wide variety of crops and several types of fruit. The alfalfa, corn, beans, squash, potatoes, vegetables and fruit produced on the project are of excellent quality.

Description of the Physical Works:

The Moencopi Project works consist of a diversion dam, a sluice gate, headgate and a 15 c.f.s. canal.

Pasture Canyon project works consist of two earth filled storage dams. The upper reservoir has a capacity of 350 acre feet and the lower one has a capacity of 75 acre feet. A small 7 c.f.s. canal serves the area.

Record of Historical Diversions:

Stream diversions to the project lands have not been recorded.

Annual Average Duty of Water Covering the Service Area of the Project or Development:

The annual average duty of water for the project area was determined as follows:

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	Acre-Feet
Consumptive Use *	1.0
Estimated losses due to irrigation efficiency	1.6
Farm delivery requirements	3.6
Estimated conveyance losses project laterals 25%	1.2
Requirements at head of project	4.8
Estimated canal losses 13%	.7
Diversion Requirements	5.5
Estimated Return Flow	2.4

* Consumptive use requirements were based on the Blaney-Criddle method of analysis.

The 1054 acres of project lands based on 5.5 acre feet per acre would require 5,780 acre feet of water per year.

Utilization of Water for Purposes other than Agriculture:

Except for domestic purposes the water is used only for irrigation .

Administration of Irrigation System:

Except for a little assistance from the Extension Agent at Tuba City, the Indians operate the project. They clean the ditches and assist in replacing structures. Major replacements are usually under the direction of the Indian Service.

Project Land Utilization:

In 1952 sixty-five Hopi or Navajo families farmed 611 acres of land. The average annual return per acre was estimated at $56.

RED LAKE UNIT

Location:

Red Lake Project is located on Black Creek in Apache County, Arizona 12 miles north of Fort Defiance. This project is part of the land set aside as the Navajo Reservation by the Treaty of June 1, 1868. (This unit is a part of the Red Lake unit in New Mexico)

Primitive Indian Location and Agriculture:

Underhill, in her book, "Here Come the Navajo" places the Navajo Indian in the vicinity of Fort Defiance as early as 1776.

Carl Mute, a full blooded Navajo says:

"I was born in 1882 at Crystal, New Mexico, and lived there until 1892 when my folks moved to Red Lake about 12 miles north of Fort Defiance. I attended the Fort Defiance Government School, and later attended public school at Grand Junction, Colorado. It was while attending the Fort Defiance School that

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