Fruitland Irrigation Project, Yellowman Siphon
Nenahnezad Chapter House Vicinity
Fruitland Vicinity
San Juan County
New Mexico

HAER No. NM-6-A

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PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

FIELD RECORDS

HISTORIC AMERICAN ENGINEERING RECORD
Rocky Mountain Regional Office
National Park Service
P.O. Box 25287
Denver, Colorado 80225-0287

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HISTORIC AMERICAN ENGINEERING RECORD
FRUITLAND IRRIGATION PROJECT, YELLOWMAN SIPHON

I. INTRODUCTION

Location:	The Yellowman Siphon reconstruction project extends for 1.75 miles from .75 mile west of the Nenahnezad Chapter House at Fruitland, San Juan County, New Mexico.
Quadrangle:	USGS Fruitland Quadrangle, 7.5 minute series
UTM:	West end of siphon - 4068870N, 727490E East end of siphon - 4068630N, 730240E
Date of Construction:	1934 (Modified in 1964 by internal coating of cement slurry).
Present Owner:	The Navajo Tribe, Division of Natural Resources, Water Development and Maintenance Department
Present Use:	Seasonal transmittal of irrigation water to 1250 acres of cropland in lower Fruitland. Two hundred seventy feet of the total 9200 feet of pipe has degenerated over time with leaks and increasing potential of failure. This worst section is scheduled for replacement in 1995.
Significance:	The Yellowman Siphon is an inverted siphon that carries 35 cubic feet/second of water for irrigation. The siphon ranked 10th in importance of 83 such projects in 1986. Approximately 103 Navajo farmers are dependent upon the Yellowman Siphon, and 1250 acres are served.
Historian:	B. Miles Gilbert, PhD, CSWTA, Inc. February 1995

II. HISTORY

A. NEED FOR THE SIPHON

"So the river is a god
Knee-deep among reeds, watching me
Or hung by the heels down the door of a dam
It is a god, and inviolable.
Immortal. And will wash itself of all deaths."
Ted Hughes, from River

The San Juan River has served as a water source for horticulturalists for well over a thousand years. More than 400 years ago Navajos living with Pueblo Indians in Largo Canyon near the San Juan River were making brush dams so that river waters would flood their fields. Elsewhere there is a history of successful management of irrigated land by the Navajo. American troops riding along the Chinle Wash in 1858 saw irrigation ditches dug by Navajo farmers [1].

The Navajos began building more dams and ditches when metal tools were made available in 1868. Navajo farmers dug 37 miles of ditches to irrigate their fields along the San Juan River. By 1900 there were more than 270 irrigated fields along the San Juan and there were other irrigated Navajo fields at Carrizo Wash, Cottonwood Wash, Fort Defiance, Red Lake, Two Grey Hills, and Wheatfields [1].

At Rock Point and similar places small earth dams were built across washes every year by teams of Navajo with shovels. These small dams would quickly wash away and had to be rebuilt every spring. Between 1933 and

1945 the Government helped some communities build bigger dams and longer ditches so that the people could grow food more reliably. Some 83 small irrigation projects were built at different places on the Navajo Reservation during those years. The Yellowman Siphon was built during the second year (1934) of those endeavors, and ranked 10th in importance in a study of Navajo irrigation projects in 1986 [2].

Small irrigation projects were operated and maintained by the US Indian Service (currently the Bureau of Indian Affairs) until the 1960s when management was turned over to the Tribe. The Tribe in turn delegated control to the local Chapters. Some of the projects have subsequently deteriorated from lack of knowledge and funding for operation and maintenance. The Yellowman Siphon is scheduled for emergency replacement of 270 feet of pipe as soon as possible, and for replacement of an additional 1700 feet within 16 months. This represents just over 19 percent of the total length (9300 feet) of the siphon. Annual budgets will include funding to eventually replace the remaining pipeline during the non-use season.

B. NAVAJO WATER RIGHTS

Native American (Indian) water rights exist within the broader framework of resource ownership within the federal government. The Constitution gave the federal government plenary authority over Indian Affairs,

and this power has been exercised from the earliest days of the Republic [3]. Treaties were made with Indian tribes under the Confederation and under the Constitution until 1871. This and related factors yielded the judicial characterization of tribes as "domestic dependent nations."

Federal statutes regulating relations between Indians and non-Indians were passed by the First Congress. Every other Congress has enacted at least some Indian affairs legislation. This power contrasts historically, if not constitutionally with the post 1937 rule of constitutional law that defers to Congress to regulate most aspects of federalism [4]. In some legal fields there remains at least a mild presumption against federal preemption of state law except in Indian country.

Indian treaties and statutes carry sweeping implications but few specifics, and much has been left to judicial decision or to executive discretion. The Supreme Court has attempted to protect Indians from private interests and from political harshness. This judicial attitude has construed Indian treaties and laws favorably to the Indians and has served as one basis for the preemption bias.

There are conceptually two levels of preemption of state law by Indian treaties and statutes. The treaty, statute or executive order setting aside tribal Indian country protects tribal sovereignty over members and their territory. Other federal statutes preempt state law over more specific subjects such as

Indian trust property. Indian trust property is defined by federal law, has many descriptive titles, and a variety of sources. It includes an implied appurtenant water right sufficient to carry out the purposes for which reservation land was set aside [4]:

1. No statute allows the alienation of an Indian reservation water right.
2. There is authority to sustain the leasing of Indian reservation water rights as an appurtenance to land and mineral leases.
3. Indian allotments have a right to use a just and equal share of tribal water rights.
4. There is authority for allotment water rights to survive the end of the federal trust and to vest in non-Indian successors.
5. State and federal courts have jurisdiction to quantify Indian water rights as part of a full-stream adjudication.

The historical development of Indian reserved water rights begins with an 1899 decision of the Supreme Court in which the Court held that the United States reserved certain water rights for federal lands riparian to the Rio Grande despite its recognition of local laws of prior appropriation. The decision initiated the idea of federal reserved rights which became known as the Winters Doctrine [5]. The full nature of Indian reserved water rights can be understood by looking at five aspects of the Winters Doctrine: reserved rights, priority, quantity, perfected rights, and the transferability aspect. These are discussed in full by Helmich, 1983 [5].

C. CONSTRUCTION CHRONOLOGY

The Yellowman Siphon was designed by the Indian Agricultural Engineering Branch of the US Department of the Interior. Copies of the

blueprint plans are in the Field Records of this report. They are copied from drawings redrawn in 1964 from the originals, by BIA engineers with the same details as the 1934 blueprints.

At this writing, no specific data on the Yellowman Siphon construction personnel are available, however such information is of historic interest.

III. THE SIPHON

A. DESCRIPTION

The 36 inch outside, 34 inch inside diameter 10 gage steel pipe sits above ground on reinforced concrete cradles. When first constructed, the pipe carried 40 cfs (cubic feet/second) of water. However, due to increasing loss from leaks, the pipe was coated with .5 inch thick cement mortar lining in 1964 and with this reduced diameter the pipe currently carries only 35 cfs at maximum flow capacity. Leaks resulted from inadequate knowledge of the need for soil compaction and supporting foundation under the reinforced concrete cradles. Subsequent to use, the heavy water - filled pipe and heavy cradles began to sink into the sandy loam of the San Juan River bottomland. The pipe was assembled in 30 foot sections welded together and equipped with expansion joints every 500 feet. These allowed for as much as 6 inches of thermal induced expansion/contraction over a temperature range of -30 to +140 degrees Fahrenheit. Only 4 inches of expansion/contraction has ever been observed.

The Yellowman Siphon is not a true siphon but rather an inverted siphon, necessitated by the change in elevation across the topographic features traversed by the siphon. It begins at 5170 feet above mean sea level on the east end, drops to 5063 feet across the San Juan River bottomland, and ascends to 5137 feet on the west end where it enters a tunnel. The intakes at the east and west ends are standard for the period of construction, changing from an open concrete lined trapezoidal ditch to a circular pipe at the east end and from circular pipe to a rectangular tunnel at the west end. The water is not under pressure but flows according to gravitational pull.

B. MODIFICATIONS

According to Mr. Joe Wexler, General Engineer, Bureau of Reclamation, considerable time and effort have been used in planning ways to rehabilitate the Yellowman Siphon. Among the plans from BOR's Denver office was the replacement of 1200 to 1400 feet of existing above ground pipe with underground pipe. This would appear to be undesirable because of factors impacting the original above ground construction. The underground pipe would require passing beneath two arroyos, with excavation cuts approximately 14 feet deep. This could result in de-watering; that is, influx of ground water from the San Juan River. Below ground pipe would be much more difficult, time consuming and expensive to install and future repair needs would be difficult to access. An underground pipeline of this size

would create environmental impacts from construction that would be unacceptable. The Yellowman Siphon was constructed above ground to obviate these problems in the first place [6].

REFERENCES CITED

1. Bingham, Sam 1979 Navajo Farming. Rock Point Community School, Chinle, Arizona.

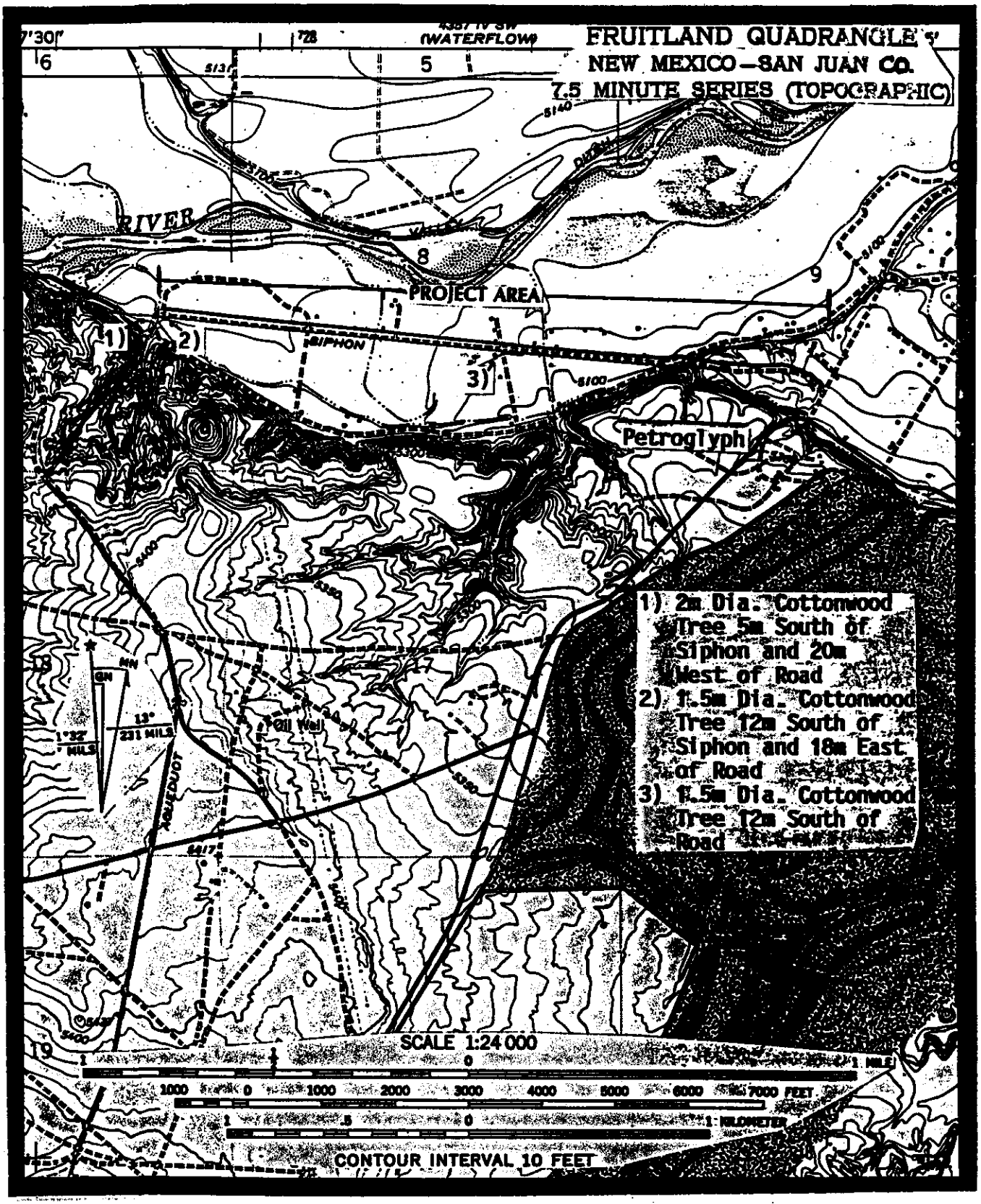
2. Jones, Stephen M. 1986 Inventory of Navajo Indian Irrigation Projects. USDA Soil Conservation Service, Flagstaff, Arizona.

3. Cohen, Felix S. 1982 Handbook of Federal Indian Law. Bobbs-Merrill, New York.

4. Collins, Richard B. 1984 Basic Concepts of Indian Reservation Resource Ownership in the Federal System. Paper read at Conference on Natural Resources Development on Indian Lands. Albuquerque, New Mexico.

5. Helmich, William T. 1983 Basics of Indian Law. American Training and Technical Assistance, Publishers.

6. Wexler, Joe 1994 Comments to B. Miles Gilbert during interview on November 30, 1994.


FRUITLAND QUADRANGLE
NEW MEXICO—SAN JUAN CO.
7.5 MINUTE SERIES (TOPOGRAPHIC)
WATERFLOW
PROJECT AREA
SIPHON
RIVER
Petroglyph
1) 2m Dia. Cottonwood Tree 5m South of Siphon and 20m West of Road
2) 1.5m Dia. Cottonwood Tree 12m South of Siphon and 18m East of Road
3) 1.5m Dia. Cottonwood Tree 12m South of Road
SCALE 1:24 000
CONTOUR INTERVAL 10 FEET