



# WATER-RIGHT DOCKET

## Glen Canyon National Recreation Area

Docket No: 2

LEE'S FERRY.

Land History

00-00-0000: warranty deed

WHEN RECORDED, MA TO:  
Robert H. Carlock  
516 Luhrs Bldg.  
Phoenix, Az. 85003

4

Escrow #02027636-3 PF

### WARRANTY DEED

The GRANTORS, DENVER E. EVANS, an unmarried man, an undivided one-sixth interest; ALLEN LUHRS, JOHN LUHRS and ALMA LUHRS, doing business as LUHRS & LUHRS, a partnership, an undivided one-sixth interest; ROBERT L. BROWN and CHARLOTTE BROWN, husband and wife, an undivided one-sixth interest; E.R. FRYER and IONE FRYER, husband and wife, an undivided one-sixth interest; JOSEPH LOUIS REFSNES, also known as Joseph Lewis Refsnes, husband of Earlene B. Refsnes, as his sole and separate property, an undivided one-sixth interest; and JACK WHITEMAN and EDYTHE WHITEMAN, husband and wife, an undivided one-sixth interest, for the consideration of THREE HUNDRED THOUSAND DOLLARS (\$300,000.00) to them in hand paid, receipt of which is hereby acknowledged, do hereby CONVEY and WARRANT to the UNITED STATES OF AMERICA, for the NATIONAL PARK SERVICE, and its assigns, GRANTEE, the fee simple title to the following described property located in Coconino County, Arizona:

OLD TR. 01-100  
NEWTN 07-102  
GLCA

The East half of the Northwest quarter and the West half of the Northeast quarter of Section 13, Township 40 North, Range 7 East of the Gila and Salt River Base and Meridian, Coconino County, Arizona.

TO HAVE AND TO HOLD the above granted and described premises together with all and singular the tenements, hereditaments, and appurtenances thereto belonging, or in any wise appertaining unto the UNITED STATES OF AMERICA, and its assigns, forever.

The Grantors further remise, release and forever quitclaim to the UNITED STATES OF AMERICA, and its assigns, all right, title and interest which the Grantors may have in water rights, banks, beds, and waters of any stream or river bordering or traversing the said land to be conveyed and also all interest in any alleys, roads, street, ways, strips, gores or other rights-of-way abutting or adjoining said land and in any means of ingress or egress appurtenant thereto.

INDEXED AND  
7184 MICROFILMED

No. \_\_\_\_\_  
RECORDED AT REQUEST OF TRANSAMERICA TITLE CO.  
June 28 A.D. 1974 At 9:40 o'clock A.M.  
In Docket 511 Pages 400-403

Records of Coconino County, Arizona  
PAT FABRITZ County Recorder  
By: [Signature] Deputy

DOCKET 511 PAGE 401

UNDER and SUBJECT, HOWEVER, to those reservations and conditions as contained in the patent from the UNITED STATES OF AMERICA No. 1064367 dated May 23, 1933, and further subject to existing easements for public roads and highways, public utilities, railroads and pipelines as the records may reveal at the date of conveyance.

In WITNESS WHEREOF, the said Grantors have hereunto set their hand and seal this 11th day of June, 1974.

Denver E. Evans

Denver E. Evans

Robert H. Carlock

By: Robert H. Carlock, President  
PAGE LAND & CATTLE CO.  
as his Attorney in Fact

Jack Whiteman

Jack Whiteman

Robert H. Carlock

By: Robert H. Carlock, President  
PAGE LAND & CATTLE CO.  
as his Attorney in Fact

Robert L. Brown

Robert L. Brown

Robert H. Carlock

By: Robert H. Carlock, President  
PAGE LAND & CATTLE CO.  
as his Attorney in Fact

Edythe Whiteman

Edythe Whiteman

Robert H. Carlock

By: Robert H. Carlock, President  
PAGE LAND & CATTLE CO.  
as her Attorney in Fact

Charlotte Brown

Charlotte Brown

Robert H. Carlock

By: Robert H. Carlock, President  
PAGE LAND & CATTLE CO.  
as her Attorney in Fact

Allen Luhrs

Allen Luhrs

Robert H. Carlock

By: Robert H. Carlock, President  
PAGE LAND & CATTLE CO.  
as his Attorney in Fact

Joseph Louis Refsnes

Joseph Louis Refsnes

Robert H. Carlock

By: Robert H. Carlock, President  
PAGE LAND & CATTLE CO.  
as his Attorney in Fact

John Luhrs

John Luhrs

Robert H. Carlock

By: Robert H. Carlock, President  
PAGE LAND & CATTLE CO.  
as his Attorney in Fact

Alma Luhrs

Alma Luhrs

Robert H. Carlock

By: Robert H. Carlock, President  
PAGE LAND & CATTLE CO. as her Attorney in Fact

DOCKET 511 EMM 401

STATE of ARIZONA )  
County of MARICOPA ) ss.



This instrument was acknowledged before me this  
11th day of June, 19 74 by

Robert H. Carlock, President of PAGE LAND & CATTLE  
CO., an Arizona Corporation as Attorney in Fact  
for Denver E. Evans

My commission will expire December 18, 1976.

Denver P. Carlock  
Notary Public

STATE of ARIZONA )  
County of MARICOPA ) ss.



This instrument was acknowledged before me this  
11th day of June, 19 74 by  
Robert H. Carlock, President of PAGE LAND & CATTLE  
CO., an Arizona Corporation as Attorney in Fact  
for Robert L. Brown

My commission will expire December 18, 1976.

Denver P. Carlock  
Notary Public

STATE OF ARIZONA )  
County of MARICOPA ) ss.



This instrument was acknowledged before me this  
11th day of June, 19 74 by  
Robert H. Carlock, President of PAGE LAND & CATTLE  
CO., an Arizona Corporation as Attorney in Fact  
for Charlotte Brown

My commission will expire December 18, 1976.

Denver P. Carlock  
Notary Public

STATE OF ARIZONA )  
County of MARICOPA ) ss.



This instrument was acknowledged before me this  
11th day of June, 19 74 by  
Robert H. Carlock, President of PAGE LAND & CATTLE  
CO., an Arizona Corporation as Attorney in Fact  
for Joseph Louis Refsnes

My commission will expire December 18, 1976.

Denver P. Carlock  
Notary Public

STATE OF ARIZONA )  
County of MARICOPA ) ss.



This instrument was acknowledged before me this  
11th day of June, 19 74 by  
Robert H. Carlock, President of PAGE LAND & CATTLE  
CO., an Arizona Corporation as Attorney in Fact  
for Jack Whiteman

My commission will expire December 18, 1976.

Denver P. Carlock  
Notary Public

FORM C-17

DOCKET 511 PAGE 402

STATE OF ARIZONA )  
County of MARICOPA ) ss.



This instrument was acknowledged before me this  
11th day of June, 19 74 by  
Robert H. Carlock, President of PAGE LAND & CATTLE  
CO., an Arizona Corporation as Attorney in Fact  
for Edythe Whiteman

My commission will expire December 18, 1976.

James P. Kuper  
Notary Public

STATE OF ARIZONA )  
County of MARICOPA ) ss.

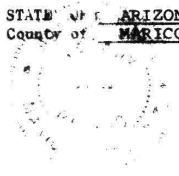


This instrument was acknowledged before me this  
11th day of June, 19 74 by  
Robert H. Carlock, President of PAGE LAND & CATTLE  
CO., an Arizona Corporation as Attorney in Fact  
for Allen Luhrs

My commission will expire December 18, 1976.

James P. Kuper  
Notary Public

STATE OF ARIZONA )  
County of MARICOPA ) ss.

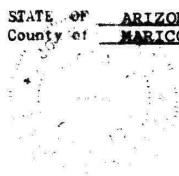


This instrument was acknowledged before me this  
11th day of June, 19 74 by  
Robert H. Carlock, President of PAGE LAND &  
CATTLE CO., an Arizona Corporation as Attorney  
in Fact for John Luhrs

My commission will expire December 18, 1976.

James P. Kuper  
Notary Public

STATE OF ARIZONA )  
County of MARICOPA ) ss.



This instrument was acknowledged before me this  
11th day of June, 19 74 by  
Robert H. Carlock, President of PAGE LAND & CATTLE  
CO., an Arizona Corporation as Attorney in Fact  
for Alma Luhrs

My commission will expire December 18, 1976.

James P. Kuper  
Notary Public

DOCKET 511 PAGE 403

Supporting Hydro Data

FORM 9-1367 (9-1960)  
U. S. DEPT. OF INTERIOR  
GEOLOGICAL SURVEY

ANALYTICAL STATEMENT - GW

COUNTY Coconino (Ariz) ✓  
LAB NO. 54354

40N.7E NPS

Location Lees Ferry, Glen  
Canyon Natl. Recreation  
Area. Well No. 1

Date of collection May 17, 1964

Source (type of well) \_\_\_\_\_  
Owner NPS, P.O. Box 1507  
Page, Ariz.

Residue at 180°C 1,730  
Calculated (Sum) 1,610  
Yards per Acre Foot 2.19

Date driled \_\_\_\_\_ Cased to \_\_\_\_\_ ft  
Depth \_\_\_\_\_ Diam \_\_\_\_\_  
VW \_\_\_\_\_ T No 29 SAR 2.4 pH 7.3

Water level 25 ft  
Sampled after pumping 5 min.  
Yield \_\_\_\_\_ GPM (mean or max)  
Ft of coll. Pump  
Appearance Clear  
Temp (°F) \_\_\_\_\_  
Collector W.B. Corbit  
Chemist JON  
Date completed June 11, 1964  
Checked by EFW  
Date transmitted \_\_\_\_\_

Hardness as CaCO<sub>3</sub> 880  
Non-carbonate Hardness 640  
Specific Conductance (micromhos at 25°C) 2,030

|                  | epm   | ppm    |
|------------------|-------|--------|
| SiO <sub>2</sub> |       | 12     |
| Fe (total)       |       | 2.8    |
| Ca               | 11.38 | 228    |
| Mg               | 6.22  | 76     |
| Na               | 7.18  | 165    |
| K                | 0.15  | 5.8    |
| Na + K           | 24.93 |        |
| HCO <sub>3</sub> | 4.79  | 292    |
| CO <sub>3</sub>  | 0.00  | 0      |
| SO <sub>4</sub>  | 19.65 | 944    |
| Cl               | 0.85  | 30     |
| F                | 0.02  | 0.4    |
| NO <sub>3</sub>  | 0.02  | 1.3    |
|                  | 25.33 | B 0.22 |

Provisional records, subject to revision.

Other Supporting Information

Southwest Region  
P. O. Box 728  
Santa Fe, New Mexico 87501

C3823

OCT 30 1969

Memorandum

To: Director

From: Regional Director, Southwest Region

Subject: Contract - Fort Lee Company, Glen Canyon

This is in response to the October 9 memorandum from Assistant to the Director, Hugh C. Cannon, requesting our recommendations regarding this contract.

We think the Fort Lee Company should continue to operate under an extended contract for the present. The one shallow well, which provides water for both Service and Concessioner facilities is not adequate for additional development. At the most, it supplies only 10-15 gallons per minute, and the Superintendent informs us that recently the well supplied only seven (7) gallons per minute, making it necessary to haul water in order to keep present operations going.

Studies are underway to find a solution to the water supply problem. Until this problem is resolved, additional development is out of the question. Therefore, it is our recommendation that the proposed contract be held in abeyance until the water problem is settled.

*/s/ James M. Eden*

cc:  
Superintendent, Glen Canyon  
Bill Fields, SWRO

154

March 15, 1968

# Memorandum

From: Superintendent, Glen Canyon

Subject: Lees Ferry Well

This past winter we became aware that the Lees Ferry well was barely producing adequate water to provide for the domestic wintertime needs of that area.

Under the present system of using a gas pump which must be operated manually and must be manned during the 30 to 40 minute daily pumping operation, approximately 30 gallons per minute are produced before the well runs dry. The total amount pumped during a pumping operation has been decreasing since last fall thus indicating a lowering water table or reduction of the aquifer. In order to determine just what is happening to the well, and if possible to make the operation more efficient, a pump test was run by park personnel.

The method used was as follows:

The well was first pumped dry, then at approximate 20-minute intervals thereafter, the well was pumped until it again became dry. The water pumped during this interval was measured so that during the 8-hour test, a complete drawdown was obtained and the total flow of water into the well was accurately measured.

Total elapsed time for pumping test = 8 hours  
and no minutes

Total amount of water pumped during the above interval = 3,341 gallons

$$\text{Recovery rate of well} = \frac{3241}{8(60)} = 6.96 \text{ gpm}$$

One method that is suggested by this office as an improvement to the existing well is to install a submersible pump with a high, low automatic cut off so that all water coming into the well can be pumped. This would increase the amount of water available. With an automatic pump, with inflow remaining as it is now, it appears possible that 10,000 gallons per day could be produced. This would require extension of secondary wiring from the Arizona Public Service pole located 50 feet from the well house and the purchase and installation of the pump.

The initial cost of this improvement will be realized in maintenance savings by eliminating the labor cost because someone has to remain at the pump in order to turn off the motor so that the pump will not be damaged if the well goes dry. Although a weight-type shut off could possibly be devised, this would still not solve the problem of starting the gas motor the number of times necessary in order to pump all available water from the well which we feel is of the utmost importance. We are in the process of obtaining pump information now to determine the total cost of this improvement but estimate that the pump and controls, completely installed, will run approximately \$2,000.

The final answer for adequate water for this and proposed developments will be an additional well which we have programed in FY 1970. However, it is felt that even with a proposed second well, we must still have a functional first well. Thus, the proposal for installation of the submersible pump at this time.

If you agree with our proposal, we will need fund assistance from reserves held in your office as area E&U funds are not available.

(sgd) William J. Briggles

William J. Briggles

cc:

William E. Fields, Supervisory Hydraulic Engineer, DC-SSC

Form 10-174  
(June 1962)UNITED STATES DEPARTMENT OF THE INTERIOR  
NATIONAL PARK SERVICE

## FACE SHEET FOR COMPLETION REPORT

|                                                                                                                                  |  |                                        |                                             |
|----------------------------------------------------------------------------------------------------------------------------------|--|----------------------------------------|---------------------------------------------|
| Park<br><b>Glen Canyon National Recreation Area</b>                                                                              |  | Region<br><b>Southwest</b>             | Work Order No.<br><b>UC B-27 GLCA</b>       |
| Location in Park<br><b>Lees Ferry</b>                                                                                            |  | State(s)<br><b>Arizona</b>             | Fund Symbol<br><b>14X0682(10)</b>           |
| <input checked="" type="checkbox"/> Contract and/or <input type="checkbox"/> Day Labor                                           |  | County or Counties<br><b>Coconino</b>  | Year Programmed<br><b>1964</b>              |
| Work Order Title<br><b>Water System, Including Well U-4-1<br/>Sewer System, U-5 Gasoline Storage Tank, M-9<br/>LP Gas System</b> |  |                                        | PCP No.<br><b>U-4-1, U-5, U-23, M-9</b>     |
|                                                                                                                                  |  |                                        | Master Plan No.<br><b>NRA-GC-3021, 3139</b> |
|                                                                                                                                  |  |                                        | Master Plan Corrected By                    |
|                                                                                                                                  |  |                                        | As Built Drawings By                        |
|                                                                                                                                  |  |                                        | Date Started<br><b>Feb. 25, 1964</b>        |
|                                                                                                                                  |  |                                        | Date Completed<br><b>Feb. 28, 1965</b> ✓    |
| DESCRIPTION OF FIXED ASSETS<br>(For completion by employee in charge of project)                                                 |  | TOTAL COSTS<br>(For completion by FFO) |                                             |
| Account 100.8, Utilities                                                                                                         |  |                                        |                                             |
| Water System, C# 14-10-0333-1147,<br>C# 14-10-0333-1252 & C# 14-10-0333-1253 \$94,203.74                                         |  | 111,160.41                             |                                             |
| Sewer System, C# 14-10-0333-1252 38,770.00                                                                                       |  | 45,748.60                              |                                             |
| LP Gas System, C# 14-10-0333-1252 4,735.00                                                                                       |  | 5,587.30                               |                                             |
| Gasoline Storage Tank, C# 14-10-0333-1347 950.00                                                                                 |  | 1,121.00                               |                                             |
| (See copies of attached final estimates)                                                                                         |  |                                        |                                             |
| TOTAL                                                                                                                            |  | \$ 163,617.31                          |                                             |

|                           |             |                                                                                                                                 |                                                       |
|---------------------------|-------------|---------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------|
| DISTRIBUTION              |             | THE FIXED ASSET DESCRIBED ABOVE HAS BEEN COMPLETED IN ACCORDANCE WITH APPROVED DRAWINGS, SPECIFICATIONS, AND AUTHORIZED CHANGES |                                                       |
| No.                       | To          |                                                                                                                                 |                                                       |
| 1                         | WASO        | Submitted <i>Robert T. Hafferman</i>                                                                                            | Title: <b>Project Supervisor</b> Date: <b>5/12/65</b> |
| 1                         | WODC        | By: <b>Robert T. Hafferman</b>                                                                                                  |                                                       |
| 1                         | SW Region   | Approved <i>James W. Mardis</i>                                                                                                 | Title: <b>Superintendent</b> Date: <b>5/12/65</b>     |
| 1                         | FFO         | By: <b>Gustav W. Muehlenhaupt</b>                                                                                               |                                                       |
| 1                         | Glen Canyon |                                                                                                                                 |                                                       |
| COSTS VERIFIED            |             | Title: <b>James W. Mardis</b>                                                                                                   | Date: <b>6/8/65</b>                                   |
| BY <i>James W. Mardis</i> |             | <b>Supervisory Accountant</b>                                                                                                   |                                                       |

11340

C# 14-10-0333-1252

Construction of L.P. Gas, Water and Sewer Systems

Lees Ferry

Work under this contract consisted of constructing an LP Gas system, including container assembly and distribution piping; a water system including mains, valve boxes, fire hydrants and a pumphouse; and a sewer system including mains, manholes, septic tanks, distribution boxes and disposal fields.

Bids were opened January 7, 1964, with 13 bidders responding to the invitation. The low bidder was Murdock Plumbing and Heating, Albuquerque, New Mexico, for \$67,949.25. However, he failed to acknowledge the addendum so his bid was rejected and the second low bidder, Stratton Brothers Construction Co., Box 367, Hurricane, Utah, was accepted for \$74,608.70, and was so notified by a letter of Notice of Award, dated January 29, 1964.

A Notice to Proceed was issued dated February 19, 1964, with the first calendar day of a 90 calendar day contract period being recorded as February 25, 1964. The final date of the contract was therefore established as May 24, 1964.

Over-runs on this contract amounted to \$13,756.04, this being attributed mainly to under estimation of the percolation rate for the sewage leaching fields. An estimated rate of 5 minutes per inch was anticipated, but actual field tested showed a range varying from 1" in five minutes for the leaching field at the boat ramp, to 1" in 16 minutes for the residence leaching field. This necessitated the installation of additional 4" V.C. pipe, a distribution box, and absorption trench.

No change orders were issued.

The Contractor began construction on March 4, 1964, and progressed at a uniform and steady rate until completion on May 23, 1964. All work was accepted on that date.

C# 14-10-0333-1253

Construction of 150M Gallon Elevated Steel Reservoir

Lees Ferry

The work under this contract consisted of furnishing any and all engineering personnel to investigate field conditions and design and erect a steel water tank of 150,000 gallon capacity, elevated 85' above top of foundation to low water level, at the Lees Ferry Area.

Bids were opened January 16, 1964, with 3 bidders responding to the invitation. Universal Grading Co., Station B, Box 6008, Albuquerque, New Mexico submitted the low bid which was accepted by the Government. Pittsburg - Des Moines Steel Company, a large business, was sub-contractor since the specifications limited the bidding to small business. A Notice of Award dated January 20, 1964, was issued to the low bidder.

A Notice to Proceed was issued dated February 25, 1964, and the first day of a 120 calendar day contract period was established as March 3, 1964, making the expiration date June 30, 1964.

One difficulty encountered was in the soil investigation stage of the work. The Contractor submitted shop drawings based on a 4,000 lbs/sq ft soil bearing capacity. The sub-contractor had Northern Arizona Testing Laboratories of Flagstaff, Arizona, make the test, and the first time up only a cursory visual examination was made of the site. The Contractor was notified that a soil bearing capacity based on actual field test would be required. On March 30 such test was made, using a jack of 40,000 lbs capacity and a D-9 Caterpillar tractor as a load. The full 40,000 lbs was applied with no settlement. The subcontractor, through the Contractor, put in a claim for an additional \$172.30 and 18 days extension in time, in order to make this test. The claim was denied in a letter to the Contractor dated June 10, 1964, which accompanied a Find of Fact. A letter dated June 18, 1964 from the Contractor stated that an appeal would be made, but as yet the Contractor has not made such an appeal.

One Change Order dated April 8, 1964, was issued to change the inlet - outlet piping to 6" in lieu of the 3" specified and delete the 40 foot section of 3" pipe from the tank to the existing pipeline. The contract amount was increased \$44.00 by reason of this change order with no change in contract time.

On May 5, after all foundations and center pier were poured, the Contractor started to hoist the center column using the center concrete pier for a base. The pier tipped due to the unbalanced load. The center pier was hoisted up, the underlying rock cleaned, and four inches of grout placed on the bed-rock, and the pier set into

the grout. Additional guys were placed all around the center columns to eliminate any chance of re-occurrence of this problem.

All work on this contract was completed on June 30, 1964, and accepted.

C# 14-10-0333-1147  
(POR)  
Construction of Comfort Stations  
Wahweap (2) and Lees Ferry  
Water Station Lees Ferry Only

Work under this portion of the contract consisted of constructing a water station for the campground loop A, near the comfort station at Lees Ferry.

Bids were opened November 12, 1963, and award was made to the low bidder, Baldwin & McCarty, Inc., P. O. Box 484, Show Low, Arizona, in a Notice of Award dated November 21, 1963. A Notice to Proceed was issued dated December 11, 1963, and the first calendar day of a 150 calendar day contract period was established as December 14, 1963, which made the completion date May 11, 1964. No change orders were issued.

This project was a minor portion of the overall contract which the Contractor began actual construction on December 28, 1963, and completed on May 28, 1964. Liquidated damages for 17 days at \$15.00 per day were charged to the overall project. Slow, inept progress was made throughout the contract period due to the Contractor's opinion he had lots of time, so why hurry.

Contract No. 14-10-0333-1347 (Portion)  
Construction of Marine Facilities  
(1,000 Gallon Gasoline Tank at Lees Ferry)

Work under this portion of the project consisted of installing a 1,000 gallon gasoline tank at Lees Ferry to be utilized as a storage of fuel for NPS boats. The tank was located near the entrance to the parking area servicing the temporary facilities near the U.S. Geological Survey area.

The gasoline tank was a part of the contract for construction of a refueling station for Lake Powell, a repair dock for Wahweap and a boat dock for Lees Ferry. The first bid opening was on June 17, 1964, but all bids were rejected because the low bidder, Standard Marine Manufacturing Co., failed to furnish a bid bond with their bid. Bids were again opened on July 29, 1964, with Standard Marine Manufacturing Co., again low, and awarded on the basis of low bid. A Notice to Proceed was issued dated September 1, 1964, with the first calendar day of a 180 day contract period being established as September 6, 1964, making the original expiration date February 2, 1965.

Three Change Orders were issued to this contract but they were not related to this project. The final expiration date of the contract was therefore established as February 28, 1965.

All work on this contract was completed on February 26, 1965, and acceptance was made on that date.

**NARRATIVE REPORT**  
**Contract No. 14-10-0333-1101**

**Construction of Utilities for Ramp and Beach**

This project consisted of installing an underground power line in an existing conduit to serve the beach area; installing a water supply line, a sewer force main and an underground power supply line, including conduit, to serve the visitor ramp; and installing a water supply line, an underground power supply line, including conduit, and two fuel lines to serve the NPS ramp. The work included installation of necessary power poles, metering and power control devices, underground fuel storage tanks and valve pits for water, sewer, power and fuel take-off points.

Bids were opened July 16, 1963, in the Southwest Regional offices. Four bids were received and award was made dated July 23 to Murdock Plumbing and Heating Co., 149 San Fidel N.W., Albuquerque, New Mexico, the low bidder. The Notice to Proceed was issued dated August 8, 1963, and the first day of the contract period was recorded as August 13, 1963, with the specifications carrying a 90 day contract period. However, two Change Orders were issued extending the contract period as follows:

1. Change Order No. 1 which provided for changing the meter services for the beach and NPS ramp power for 480 to 120/240 and then transform up to 480 to supply the lines down to the beach and ramp use areas, install a 2" valve in the NPS ramp water supply line, and fill the end of all conduit ends at the outlet boxes with a moisture-proof compound, increased the contract period 5 days.
2. Change Order No. 2 which provided for removal of four broken pull boxes in the beach conduit line and replacing with heavy duty cast iron pull boxes extend the contract period an additional 1 day.

The final contract completion date was established as November 16, 1963.

Mr. Murdock, owner, personally supervised the work involved with the contract and he was very efficient in obtaining supplies and making the installations.

First installation was the water line of the Visitor Ramp, followed by the installation of the electrical and sewer line and pouring of concrete valve pits for the same area.

Excavation of the water and fuel trenches for the NPS ramp were started next with the installation of the fuel tanks made concurrent with the NPS ramp work.



UNITED STATES  
DEPARTMENT OF THE INTERIOR  
GEOLOGICAL SURVEY  
Ground Water Branch  
P. O. Box 4070  
Tucson, Arizona 85717

| RECEIVED                      |              |
|-------------------------------|--------------|
| NPS SOUTHWEST REGIONAL OFFICE |              |
| NOV 5-1963                    |              |
| IN REPLY REFER TO:            |              |
| Regional Director             | Summers Date |
| Cons., Interp. & Use          |              |
| Administration                |              |
| Resource Planning             |              |
| Public Affairs                |              |
| Program Coord.                |              |
| Operations                    |              |
| Concessions                   |              |
| Natural History               |              |
| Historic Archaeology          |              |
| Ranger Services               |              |

October 31, 1963

*Reels  
11/5  
Fields*

MEMORANDUM

To: Acting Regional Director, Region Three, National Park Service  
P.O. Box 1728, Santa Fe, New Mexico

From: District Engineer, GW, Tucson, Arizona

Subject: Test drilling for water at the Glen Canyon National Recreational Area (Lees Ferry).

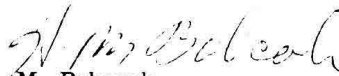
Following is a summary of the results of the test drilling program at Lees Ferry that was undertaken by the National Park Service based on recommendations given in Mr. P. Eldon Dennis' memo of February 25, 1963:

The first test was drilled in August 1963, on the north bank of the Colorado River near the U.S.G.S. Surface Water Station at Lees Ferry. This well was drilled to test the alluvium. E. McGavock, Geologist, Ground Water Branch, visited the site after the driller reached a total depth of 203 feet and found the water had a specific conductance of greater than 10,000. During the drilling of this test, casing was driven with the drilling to check the quality of each water horizon encountered. The well was abandoned because of poor quality (see schedule well # 1).

The second test hole was drilled in September 1963, on the east side of the Paria River, 600 feet north of well # 1. The site for no. 2 well was recommended in order to test the alluvium and the Shinarump Sandstone. E. Gillespie, Engr. Tech., Ground Water Branch, visited the site after the driller had a total depth of 200 feet. Water in the alluvium was encountered from 84 to 103 feet. This was of poor quality and was cased off. A small amount of water was encountered in the Shinarump, but was of poor quality. The hole was filled and abandoned (see schedule well # 2).

*L. S. Gleason*

At this time a third test hole was recommended further north along the Paria River to try to duplicate conditions in an existing private well. This private well produces water of fair quality which was thought to come from the alluvium. During the drilling of this test, water was encountered in the alluvium from 20 to 39 feet, but it was of poor quality. The Moenkopi Shale was reached at a depth of 39 feet. Casing of 8-inch diameter was driven to a depth of 44 feet, and the drilling was continued. Suitable water was encountered from 50 to 60 feet. In September 1963, bail test of 50 gpm was conducted for one hour with five feet of drawdown. The driller was instructed to drill to a total depth of 80 feet and stop. He then installed 6-5/8-inch diameter casing from 0 to 80 feet, attaching the 6-5/8-inch casing to the 8-inch casing at ground surface (see schedule well # 3).

  
H. M. Babcock

Enclosures



IN REPLY REFER TO:

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
NATIONAL PARK SERVICE  
Glen Canyon National Recreation Area  
Box 1507  
Page, Arizona

October 11, 1963

Memorandum

To: Regional Director, Southwest Region  
From: Superintendent, Glen Canyon NRA  
Subject: Drilling of Water Well at Lee's Ferry

The third and last test well at Lee's Ferry was located by Dr. Gillespie of USGS, Holbrook office, approximately 600 feet south of the Gus Griffin ranch well on the west side of the Paria River Channel, approximately 50 feet inside Government land boundary. Unusable water was found at 25' deep in a sand-gravel formation; 8 inch casing was used to prevent caving through the gravel and sand formation to 39 feet.

At 39 feet a hard dry sandstone was found and drilled into, to 44 feet depth. We then drove the 8 inch casing to the 44 foot depth and cleaned the hole for test of sealing off of the contaminated water; after 18 hours with no seepage in the hole, drilling was resumed. This hard formation held to the 50 foot depth where we hit water bearing red shale. When drilled to 60 feet depth overall, water raised to 18 feet of the surface and bailing of 60 gallon per minute would not lower the water level in the well.

The driller shut down and contacted Dr. Gillespie at Holbrook, Arizona by USGS radio and he advised him to drill approximately 20 feet below the water bearing formation for pump setting basement.

Dr. Gillespie, USGS Geologist, and Frank Brown, WODC Construction Representative arrived at the well at 12:30 P.M. The contractor had finished drilling the well to 81 feet by this time and we again ran a bailing test, and could not lower the water level below 18 feet from the surface. Dr. Gillespie advised we leave the 8" casing in place as a permanent cut off of the contaminated water.

The following is a lab report as run for us by the U. S. Bureau of Reclamation water treating plant at Page City Water Works:

Well No. 3 50' to 60' water table that will be used for the Lee's Ferry Water System.

| RECEIVED                                           |               |
|----------------------------------------------------|---------------|
| NPS SOUTHWEST REGIONAL OFFICE                      |               |
| OCT 14 1963                                        |               |
|                                                    | Received Date |
| <input type="checkbox"/> Regional Director         |               |
| <input type="checkbox"/> Cons., Interp. & Use      |               |
| <input type="checkbox"/> Administration            |               |
| <input type="checkbox"/> Resource Planning         |               |
| <input checked="" type="checkbox"/> Public Affairs |               |
| <input type="checkbox"/> Program Coord.            |               |
| <input type="checkbox"/> Operations                |               |
| <input type="checkbox"/> Concessions               |               |
| <input type="checkbox"/> Natural History           |               |
| <input type="checkbox"/> Hist. & Archaeology       |               |
| <input type="checkbox"/> Ranger Services           |               |

*Kell*

| OPNS & MAINT             |             |
|--------------------------|-------------|
| <input type="checkbox"/> | Chief       |
| <input type="checkbox"/> | Land Arch.  |
| <input type="checkbox"/> | Engineer    |
| <input type="checkbox"/> | Architect   |
| <input type="checkbox"/> | Maintenance |

*DSO 39 Glen*

2

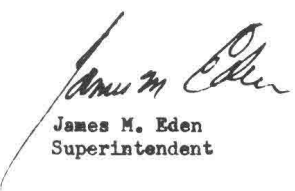
CACO<sub>3</sub> = 90 PPM  
CACO<sub>4</sub> = 140 PPM = 230 PPM CA

Mg. SO<sub>4</sub> = 215 PPM  
Mg. Cl. = 105 PPM = 760 PPM Mg.  
Mg. as Mg. = 440 PPM

= 990 PPM  
Pos. Hardness

Alk. = 90 PPM  
SO<sub>4</sub> = 350 PPM = 570 PPM Neg. Hardness  
Cl = 130 PPM

Summary of Well = 8 inch casing set to 44' depth  
6 inch casing set 81 feet bottom 40 feet of 6 inch  
Perforated for water feed  
Pump unit set at 72 feet



James M. Eden  
Superintendent



IN REPLY REFER TO:

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
NATIONAL PARK SERVICE  
Glen Canyon National Recreation Area  
Box 1507  
Page, Arizona

October 2, 1963

Memorandum

To: Regional Director, Southwest Region

From: Superintendent, Glen Canyon NRA

Subject: Drilling of exploratory water wells at Lee's Ferry  
as per telephone conversation of September 26, 1963  
with Bill Fields

| RECEIVED                      |      |
|-------------------------------|------|
| NPS SOUTHWEST REGIONAL OFFICE |      |
| OCT 7-1963                    |      |
| Surname                       | Date |
| Regional Director             |      |
| Cons., Interp & Use           |      |
| Administration                |      |
| Resource Planning             |      |
| Public Affairs                |      |
| Program Coord.                |      |
| Operations                    |      |
| Concessions                   |      |
| Natural History               |      |
| Min & Archaeology             |      |
| Ranger Services               |      |

*Kelly*  
*10/8*

*\*F. Fields*  
*10/10/63*

Well No. 1 was drilled to a depth of 203', depth allowable by specifications 200'; 35 gal. of water produced between 183' and 200'. This water was a heavy salt content. Too strong to even consider treating for use.

Well No. 2 located approximately 600 feet northwest of Well No. 1 was spotted by U.S.G.S. Geologist. This well was drilled to a depth of 115' where some water was found and by bailing test, produced 27 gallons per minute. Lab test by U.S.B.R. water lab in Page showed the following:

Chloride's = 1390 P.P.M. - 38 E.P.M.

Calcium = 232 P.P.M. - 12 E.P.M.

Mg = 528 P.P.M. - 42 E.P.M.

Alk = 278 P.P.M. - 5.6 E.P.M.

SO<sub>4</sub> = 2720 P.P.M. - 48 E.P.M.

Hardness = 760 P.P.M., PH 7.5, TDS = 10,400 P.P.M.

We decided this water was not usable and continued drilling to 200 ft. 6 inches and found we had (1) gallon of water per minute of the following characteristics:

Chlorides = 3300 P.P.M. - 62 E.P.M.

Calcium = 318 P.P.M. - 16 E.P.M.

Mg = 262 P.P.M. - 21 E.P.M.

Alk = 214 P.P.M. - 4.8 E.P.M.

SO<sub>4</sub> = 2620 P.P.M. - 47 E.P.M.

Hardness = 580 P.P.M., PH 8.2, TDS = 10,420 P.P.M.

This well was also of unusable water and was plugged and abandoned. The Gus Griffith Ranch on the west side of the Paria River has a well of usable water of the following test for comparison:

Chlorides = 225 - 6 E.P.M.

Calcium = 214 - 10.2 E.P.M.

Mg = 688 - 50 E.P.M.

Alk = 214 - 4.3 E.P.M.

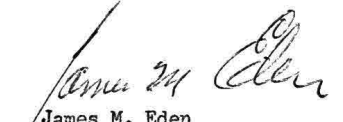
SO<sub>4</sub> = 740 - 13 E.P.M.

Hardness = 912 P.P.M. PH 7.7 TDS 1468 P.P.M.

*L54*  
*DS-39* *Alca*

2

It was recommended by Doctor Gillespe, USGS Geologist, that we locate as near this Griffith well as possible and try to pick up the same water source. By locating the private property boundary we were able to make a location on Government property approximately 600 feet South of the Griffith well, and on the location recommended by Doctor Gillespe, and advised by Mr. Fields by telephone September 26, 1963.



James M. Eden  
Superintendent

Docket Information

Number of Documents in Docket 21

Documents Dated from 10/2/1963 to 10/30/1969

Docket Compiled: 3/22/2011