

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
UPPER COLORADO REGION
SALT LAKE CITY, UTAH

REVIEW OF SPRINGS BETWEEN GLEN CANYON DAM
AND LEES FERRY
GLEN CANYON UNIT
COLORADO RIVER STORAGE PROJECT

REPORT NO. G-392

12/14/84

Upper Colorado Region
Regional Office
Division of Design and Construction
Geology Branch

Report Number G-392
Written by: Daniel E.
Grundvig
Reviewed by:
Fred Thompson
Regional Geologist

Subject: Review of Springs Between Glen Canyon Dam and Lees Ferry,
Glen Canyon Unit, Colorado River Storage Project

On December 14, 1984, three springs below Glen Canyon Dam were inspected. The inspection was in response to a memorandum from the National Park Service Superintendent of the Glen Canyon National Recreation Area reporting two apparently "new" springs in the lower canyon walls below the dam. A copy of the memorandum is attached.

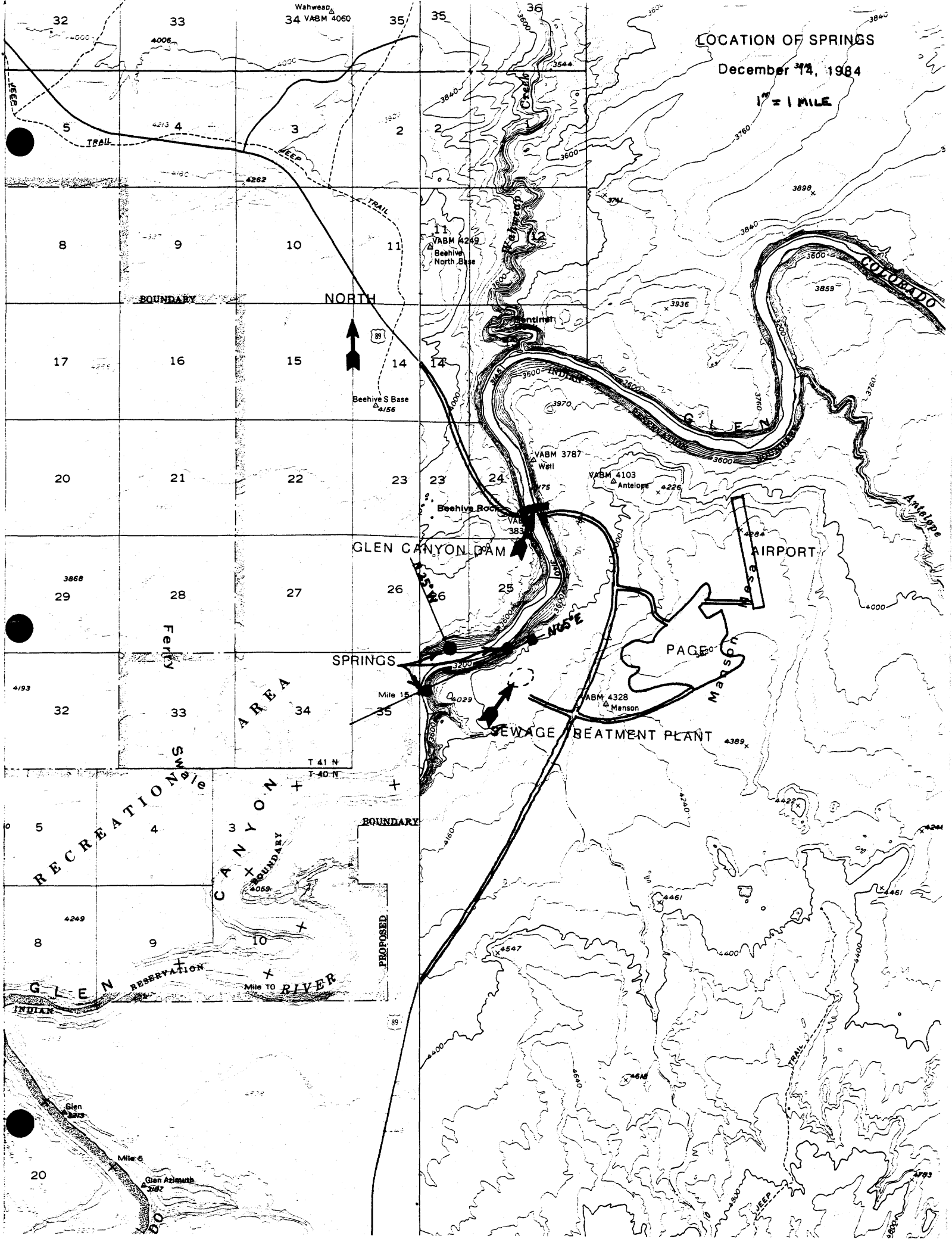
The locations of the three springs are shown on the attached map. Spring No. 1 is located approximately 1-1/3 miles downstream from the dam on the east (left) canyon wall. The total discharge from the spring is approximately 200 gallons per minute. See Photo No. 1. Although the source of the spring is somewhat obscured by talus and muck from the access tunnel, it is probable that the water is flowing from an open, vertical joint set which trends North 65° East. See Photo No. 2. Water has been flowing from this area for some time as evidenced by the extensive growth of vegetation.

Spring No. 2 is located approximately 1-3/4 miles downstream of the dam on the west (right) canyon wall near the base of the "Ropes" trail. Water flows from a single, high angle joint which trends North 25° West. See Photo Nos. 3 and 4. The spring flows approximately 50 gallons per minute. Tamarack growth indicates that the spring has been flowing for some time.

Spring No. 3 is located approximately 2 miles downstream of the dam on the east (left) canyon wall not far from Honey Dew Draw. Approximately 100 gallons per minute flows from an open, vertical joint at a point about 12 feet above the river. See Photo Nos. 5 and 6. The joint set trends North 65° East and is believed to be connected to the joint set that feeds spring No. 1. Because of the proximity of Page's sewage treatment plant, it was thought that the spring's source could be the sewage ponds. Water quality analysis and joint set trends indicate that this is probably not the case. Park Service personnel indicate that this spring may have been in existence for some time but the outlet had been obscured by a large sand bar. High river flows in 1983 and 1984 washed away the bar exposing the spring.

The source of the springs is believed to be Lake Powell. Available data indicates that the springs are less than 25 years old. A bank storage report prepared during the spring of 1969 states that inspections made to that date had shown no ground water or seepage returning to the river between the dam and Lees Ferry. Because of the distance from the dam and the small quantity of flow, the springs are not considered to constitute any safety hazard to the dam. Continued monitoring of the springs and reporting of any increase or decrease in discharge will, however, aid in understanding the affect large impoundments have upon the regional groundwater environment.

Daniel E. Sundberg
Jan 11, 1985



LOCATION OF SPRINGS

December 14, 1984

1" = 1 MILE

NORTH

AIRPORT

PAGE-MASON

SPRINGS

SEWAGE TREATMENT PLANT

RECREATION AREA

CANYON

GLEN INDIAN RESERVATION

MILE TO RIVER

BOUNDARY

PROPOSED

20

Mile 5

Glen Azimuth

3787

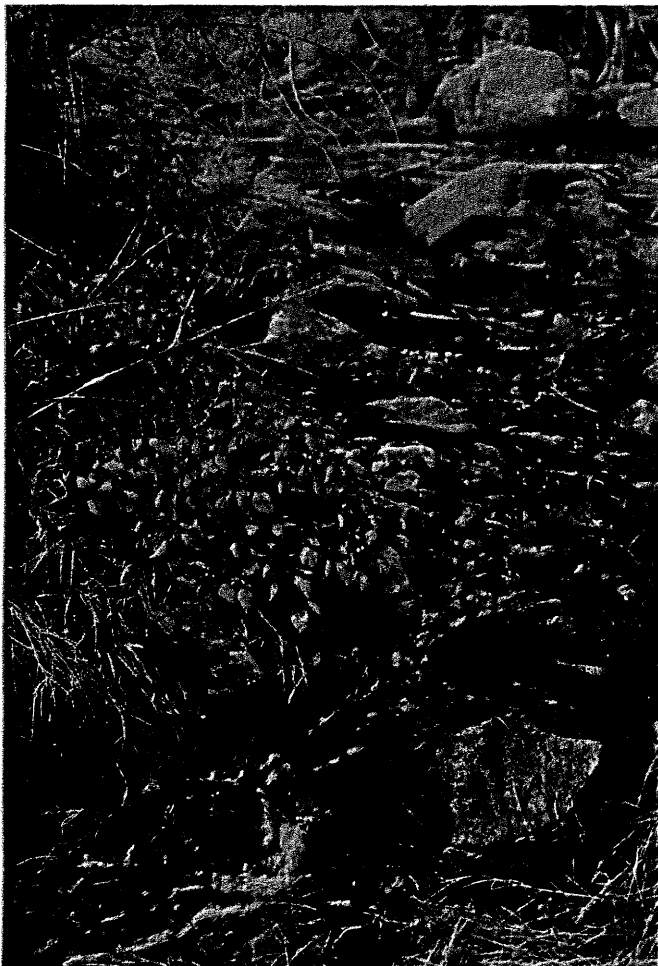
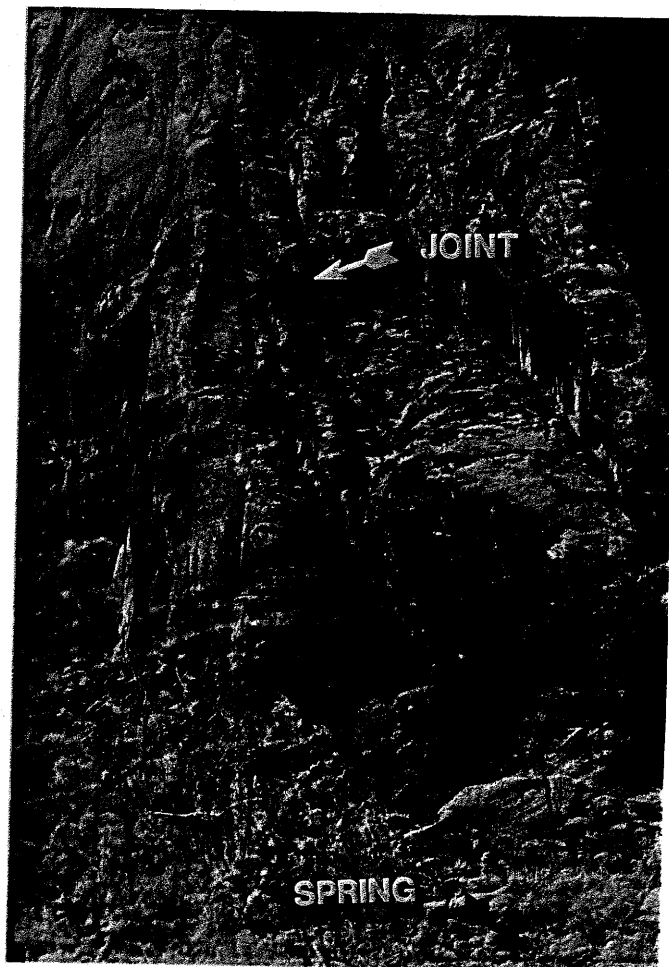


Photo No. 1: Spring No. 1 is located approximately 1 1/3 miles downstream from the dam on the east (left) canyon wall. Total discharge from the spring was approximately 200 gallons per minute on December 14, 1984.

Photo No. 2: Although the source of spring No. 2 is obscured by talus and muck from the access tunnel, it is probable that the water is flowing from the open, vertical joint set which trends N.65°E.



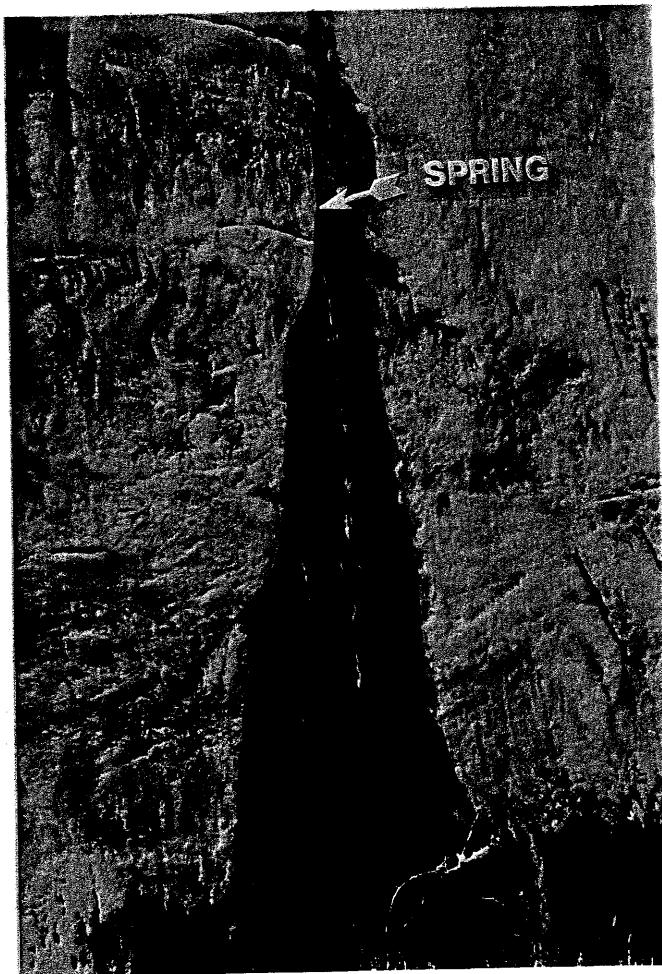
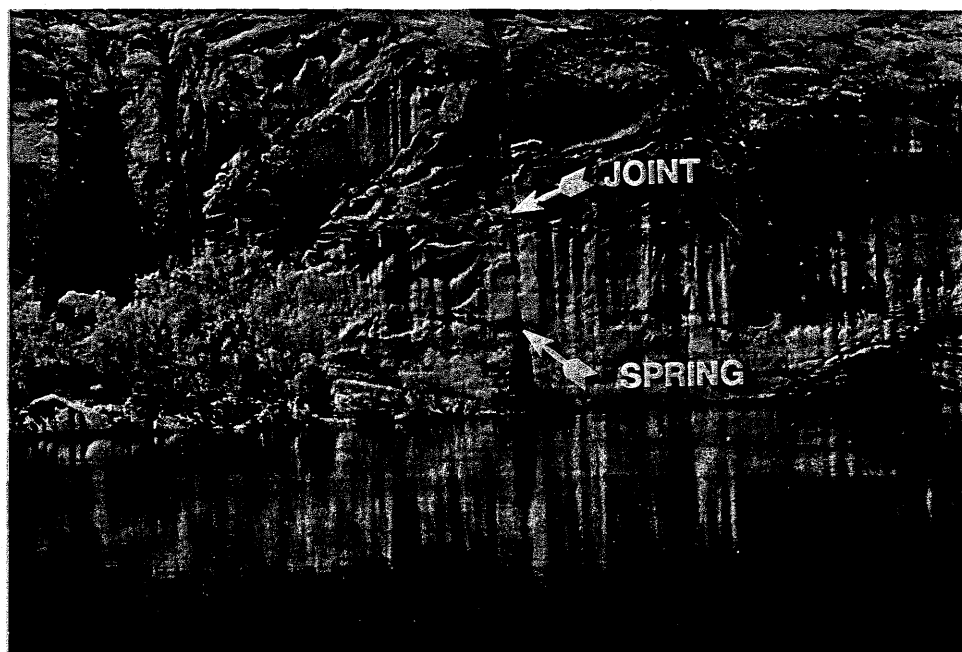


Photo No. 5: Spring No. 3 is located approximately 2 miles downstream of the dam on the east (left) canyon wall not far from Honey Dew Draw. The spring was flowing approximately 100 gallons per minute on December 14, 1984.

Photo No. 6: Spring is flowing from an open vertical joint which trends N.65°E. Park Service personnel believe that spring has existed for some time but was obscured by a large sand bar. The bar was washed away during the high river flows of 1983 and 1984.



WASTEWATER ANALYSIS

ient Glen Canyon Nat'l. Rec. Area
Box 1507
Page, Arizona 86040

Job No. _____
Lab./Invoice No. 25241167
Date of Report Aug. 24, 1984
P.O. # _____

Project Inorganic analysis

Type of Samples Water Sampled By Sally Rhodes Date 08-21-84

Source of Samples Springs Submitted By Sally Rhodes Date 08-22-84

Test Procedure Accepted Authorized By Sally Rhodes Date 08-22-84

[illegible]

Comments:

Respectfully submitted,
WESTERN TECHNOLOGIES , INC.

Copies to: (3) Addressee



United States Department of the Interior

NATIONAL PARK SERVICE

Glen Canyon National Recreation Area

Box 1507

Page, Arizona 86040

IN REPLY REFER TO:

L54

October 12, 1984

Memorandum

To: CRSP Power Operations Manager, Bureau of Reclamation

From: Superintendent, Glen Canyon National Recreation Area

Subject: New springs in the canyon below the dam

This past spring my staff observed two apparently "new" springs in the lower canyon walls below the dam. We thought documentation of the springs might be of use to Bureau of Reclamation since one of the possible sources of the springs is the lake.

One spring pours from a fissure in the east canyon wall about 1½ miles below the dam, and not far above Honey Dew Draw. It flows from a fissure in the Navajo sandstone at a point 12 feet above the river; and flows at a rate of approximately 3 cubic feet per second. The second spring emanates from the west wall near river level at the base of the "Ropes" trail. It flows at a rate of 6 cubic feet per second. Attached are the results of a water sample analysis from each spring.

If Bureau of Reclamation has or collects any additional information about these two springs, we would appreciate copies. Please contact Chuck Wood at 645-2471 should any questions arise.

Sincerely,

John O. Lancaster
Superintendent

Enclosure

RECEIVED

CRSP Police Department Office

OCT 15 '84

Reply _____

Dt.	Time	Remarks
11-14	14	100
16	14	400
17	14	481
16	SW	600

REF: