



WATER-RIGHT DOCKET

Great Smoky Mountains National Park

Docket No: 2

SPRING & WELL BAHL HOUSE #487

Preliminary Docket Information

00-00-0000: see great smoky mountain docket no. 1 for map and preliminary map showing locations of water sources within the p

SEE GREAT SMOKY MOUNTAIN DOCKET NO. 1 FOR MAP
AND PRELIMINARY MAP SHOWING LOCATIONS OF
WATER SOURCES WITHIN THE PARK.

WATER RIGHTS DOCKET

Bahl House #487 (Indian Camp Creek)

Great Smoky Mountains National Park

Supporting Hydro Data

21.

INDIAN CAMP CREEK

Situation: This area is located just off Tennessee Highway 73 some 4 miles west of Cosby. There is a single residence located at the area which is referred to locally as the Bahl House. Present spring supply that serves this residence is inadequate during certain periods of the year.

Proposed: A deep well with a minimum capacity of 10 g.p.m. would be desirable.

Progress to Date: Project included in contract awarded for drilling test wells in Tennessee. Work in progress.

(09/28/67)

NAME OF SYSTEM: The Bahl House, Residence #487LOCATION: Well is located on a
park road $\frac{1}{2}$ mile south
of Tenn. 73 and 2 miles
from Cosby.LOCATION: STATE: Tennessee COUNTY: CockeA. Source of SupplyLocation - Reference to Permanent LandmarkCoordinates

1. A Small Spring

Due east of residence about 75 feet.

Lat. N $35^{\circ}45'44.2''$
Long. W $83^{\circ}16'33.5''$

This system is a force system from a spring located at the foot of a steep bank adjacent to Indian Camp Creek. The spring is enclosed in a 5' x 5' concrete box which provides about 200 gallons of storage. From the box there is a $1\frac{1}{2}''$ pipe which serves as a combination overflow and drain. The jet type electrically operated pump and a 30 gallon pressure tank are located on top of the bank about 70 feet away. From the pump runs two force lines to the spring box. From the pressure tank runs a $\frac{3}{4}''$ line to the residence. There is no water treatment.

2. Deep Well

Due east of residence about 40 feet

Lat. N $35^{\circ}45'44.2''$
Long. W $83^{\circ}16'35.0''$

A test well was drilled to 188 feet. The pump tests yielded 60 gallons per minute with a drawdown of 30 feet. Water is of excellent quality but has pH of 5.8.

B. Consumption:

The system is not metered. The estimated quantity is 146,000 gallons per year.

C. Mains and Laterals:

<u>Size</u>	<u>Type</u>	<u>Length</u>
3/4"	Galvanized Iron	100 Lineal Feet

D. Additional Information:

A deep well was drilled; the yield is adequate; and the quality is good. This well was put into production as the main source of supply in the summer of 1969. The system involves a hydrocel type pressure tank, a submersible pump, and necessary new distribution line.

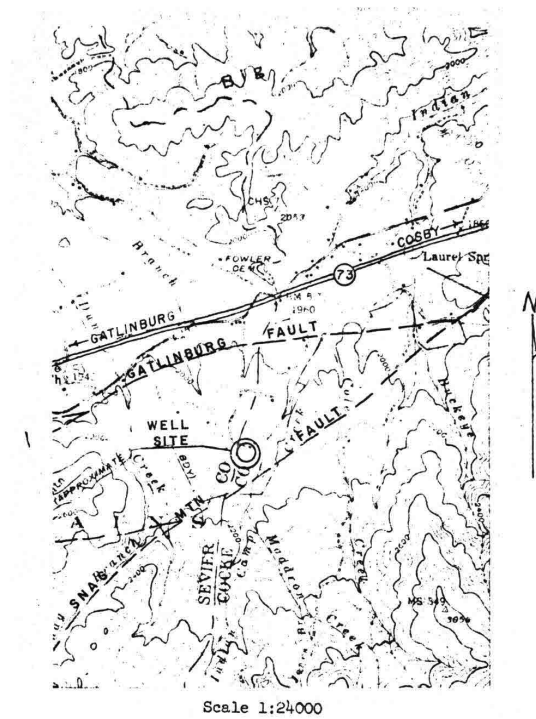
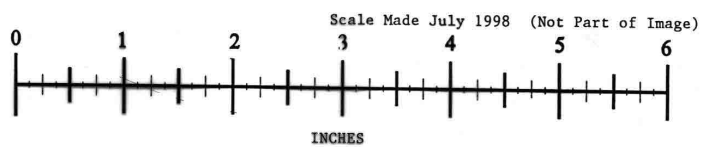


Figure 1. Map of Indian Camp Creek area showing location of test well.





PUMP HOUSE AT RESIDENCE



SPRING ENCLOSURE AND INTAKE

Other Supporting Information

PROPOSED SITES FOR WATER RESOURCES INVESTIGATION

1. Park Headquarters
2. Green Mountain (Foothills Parkway)
3. Newfound Gap
4. Cades Cove
5. Deep Creek
6. Smokemont
7. Abrams Creek
8. Twin Creeks
9. Collins Creek
10. Metcalf Bottoms
11. Cataloochee
12. Elkmont
13. Cosby
14. Chimneys
15. Rocky Mountain (Foothills Parkway)
16. Webb Mountain (Foothills Parkway)
17. Little Greenbrier
18. Greenbrier
19. Sinks
20. Towstring
21. Indian Camp Creek
22. Tremont Ranger Station
23. Round Bottom Campground
24. Balsam Mountain Campground
25. Main Oconaluftee Residential Area
26. Old Oconaluftee Residence Area (Ravensford)
27. Big Creek Ranger Station
28. Cataloochee Ranger Station
29. Cataloochee Maintenance Area
30. Twentymile Ranger Station
31. Cherokee Orchard
32. Sugarlands

(09/28/67)

5010-108 (Rev. 1-1-64)
GSA FPMR (41 CFR) 101-11.6

UNITED STATES GOVERNMENT

Memorandum

TO : Gerald Rowe, Chief of Maintenance
Great Smoky Mountains National Park
Gatlinburg, Tennessee 37738

DATE: September 7, 1967

FROM : W. M. McMaster, USGS, WRD
Knoxville, Tennessee

SUBJECT: Summary of work plans for study of water resources of Great Smoky Mountains
National Park, North Carolina and Tennessee Districts

As I promised you on August 11, I am sending you our plans for the study of water resources of Great Smoky Mountains National Park that have been modified as a result of a meeting between North Carolina and Tennessee U. S. Geological Survey personnel July 6-7, 1967.

W. M. McMaster
W. M. McMaster
Hydrologist

cc: Edward J. Kennedy, Chief, Tenn. District
Ralph C. Heath, Chief, N. C. District



5010-108

Buy U.S. Savings Bonds Regularly on the Payroll Savings Plan

Summary of work plans for study of water resources of Great Smoky Mountains
National Park, North Carolina and Tennessee Districts

Sept. 7, 1967

At a meeting in Knoxville during July 6-11, 1967, North Carolina and Tennessee personnel discussed modification of plans in the study of water resources of the Great Smoky Mountains National Park. Those who attended the meeting were: Ralph C. Heath, North Carolina District Chief; Edward J. Kennedy, Tennessee District Chief; D. R. Rima, Assistant District Chief for Tennessee; Nat Thomas, G. C. Goddard, and E. F. Hubbard of North Carolina; and W. M. McMaster of Tennessee.

At the meeting it was agreed that the effort in both districts should be combined under leadership of one individual; McMaster was delegated project leadership. McMaster will be responsible for ground water interpretive aspects of the study and Hubbard will be responsible for surface water interpretive aspects.

The final product will be a hydrologic atlas of the Smokies area, published by the Geological Survey, that will consist of the 1:125,000 base map upon which will be delineated ground water and surface water information. Ground water occurrence and availability will be shown as a series of patterns, each defining a range between a minimum, a maximum, and an average of expected well yields within the area covered by the pattern. These areas are expected to be established by topographic criteria, geologic location, estimated soil thickness, and background information provided by test wells drilled during the course of the study. If a test well appears capable of yielding the desired quantity of water for water supply at the drilling site, a pumping test will be run.

Surface water information will be indicated by isopleths of minimum flow in cubic feet per second per square mile at the 2-year 7-day recurrence interval, based on a series of low-flow measurements made during the course of the study, at a total of about 100 sites throughout the Park distributed so as to define variations in flow with location and altitude. It is hoped that these sites can be measured a total of 6-8 times following periods of about 7 days of no rainfall.

Ground water and surface water chemical quality will be described, based on results of analysis of water from test wells and samples collected from streams. A series of coliform analyses of stream water is planned to define possible areas of contamination.

An explanatory text and supplementary illustrations will be included. The atlas is expected to provide the NPS engineer a basis for planning future developments of any kind in the Park for which knowledge of water resources is required.

Consideration will be given to popular-type brochure for distribution to Park visitors, describing and illustrating the occurrence of water in the area and its role in shaping the mountains.

Test drilling and reporting will continue to be handled by the District in which the site is located.

Plans are to complete the text of the final report by May 1969 for transmission through final review prior to publication. However, if insufficient opportunities to collect low-flow measurements occurs during the remaining time through November 1968, it is hoped that supplementary funds will be available from NPS to make additional measurements during the following year.

775-7-17-65-

L54 SER (OLW)

SEP 14 1965

Reed
ERC 9/17
WRR

Memorandum

To: Superintendent, Great Smoky Mountains

From: Acting Assistant Regional Director, Operations,
Southeast Region

Subject: Water Resources Investigations, Great Smoky Mountains
National Park

We will be glad to assist you in developing a detailed water resources study at Great Smoky Mountains National Park during the 1966 fiscal year as requested in your memorandum of August 23. The results produced from such a study should provide us with the basis for a full and most effective development of all water resources located within the Park boundaries. It is evident that new sources of water are needed to meet the demands of future and existing Park facilities.

We believe the investigative work should include the following:

(1) The first and most pressing problem involves the need to expand several water supply systems in order to provide more water to take care of a greater number of Park visitors and increased Park uses. This requires an evaluation of the probable capacity of the present sources of supply and the locating of possible new sources of water supply of acceptable quality for increased demands of the future and (2) The second phase of the project (extending over a period of several years) would be to conduct surface and ground water studies throughout the Park in order to obtain a general knowledge of all water resources. With such information at hand, the Park staff will be able to plan efficiently for new or expanded developments.

An ever-ceiling item was included in the 1966 F.Y. Regional Water Resources Program in the amount of \$26,000 to initiate a study of domestic water supply needs and test well drilling work at the Park. Mr. E. W. Reed, Chief, Water Resources, has recently advised that at present the Washington Office reserve contains sufficient funds to finance this study.

We agree a meeting and field reconnaissance should be held at the Park between representatives of the U. S. Geological Survey, the Regional Office and the Park staff to properly formulate a logical approach to this water resources project. In early October, we will take the necessary action to firm up a satisfactory date for the meeting with all those concerned.

(SIGNED)

W. Mikkell

cc:

Director, w/c of inc.

Chief, ROEC (2), w/c of inc.



IN REPLY REFER TO:
L54

UNITED STATES
DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

Great Smoky Mountains National Park
Gatlinburg, Tennessee 37738

August 23, 1965

SOUTHEAST REGION	
AUG 26 1965	
Regional Director	
Asst. Dir. (Adm.)	26
Asst. Dir. (AI)	
Asst. Dir. (CA)	
Asst. to Reg. Dir. (PA)	
Asst. to Reg. Dir. (DI)	
Resource Studies Act.	

X *Land & Water*
Main

Memorandum

To: Regional Director, Southeast Region

From: Superintendent, Great Smoky Mountains *lost file*

Subject: Water Resources Investigations, Great Smoky Mountains National Park

Over the past couple of years, continued increases in demands on the numerous surface water supplies have gradually developed into a problem that needs immediate attention. While it is recognized that in the past we have shown little or no interest in water resources investigations, it now appears that well supplies may not only be a desirability but a necessity. During periods of prolonged drouth such as we are now experiencing in the Park, the surface supplies diminish to the point of nearly drying up, and supplemental supplies of low quality water are heavily treated and pumped into the supply lines.

During USPHS Engineer Henderson's recent trip to the Park, we had occasion to closely observe several of our major supplies. For example, we found that the Ash Hopper Branch gravity supply that ordinarily supplies headquarters was providing 19 gallons per minute (actual meter readings) over a period of a week. The consumption at this time was metered at 35,000 to 37,000 gallons per day and so, needless to say, we had to pump a supplemental supply out of a branch of Fighting Creek which runs through the residential area. We actually were only able to obtain a maximum of 15 gallons per minute from this supply. Incidentally, this creek pumping station is only a couple of hundred feet from the first domestic user and less than 1,000 feet from our major development area which definitely does not allow the desired chlorine retention time for safe water treatment. Also, when you realize that our actual usage exceeded an average of 25 gallons per minute and all available water in the system amounted to 34 gallons per minute, it is easy to see there is little margin for any emergency whether it be a leak in the line, any type of fire drawdown or allowance for any consideration of lawn sprinkling. If either of these supplies decrease further, we do have several alternatives in order to retain a minimum supply on hand.

By metering, we have determined that we are wasting 13,000 gallons per day through our Visitor Center dehumidifier system. This is quite a luxury and one that needs some study as to the possibility of re-circulation of this water. If our present supply should decrease any further, we would of course have to shut down the dehumidifier system which would have rather detrimental effects on artifacts storage as well as causing the Visitor Center to be rather uncomfortable.

Further checks on other major supplies in the Park showed similar conditions but none as critical as that that exists in the Headquarters area. If at all possible, and if it can be worked into your Water Resources Investigation program as an emergency measure, we would like to suggest the programming of an exploratory well for this fall. While we have little information on the characteristics of wells in this area, Mr. Henderson felt that a well programmed for 100-foot depth with rotary drill method (possible heavy river boulder sub-surface) should provide a plentiful supply for the area. On this basis, it appears that funds in the construction amount of \$2,500 would be needed to drill, case and test the well.

In an August 19 telephone conversation between Hydraulic Engineer Vick of your office and Chief of Maintenance Rowe, Mr. Vick had mentioned that he had put an over-ceiling item in his 1966 F.Y. Water Resources budget in the amount of \$24,000 to initiate a study of Park domestic water supply needs. We support this program whole-heartedly and hope that a necessary field inspection involving personnel from the USGS, the Regional Office, and the Park can be set up for the month of November. | |

As suggested to Mr. Vick in the abovementioned telephone call, the following listing is a tentative priority list of well investigations which we would like to see programmed:

1. Headquarters -- As soon as possible.
2. Green Mountain Picnic Area, Foothills Parkway -- 1967 F.Y.
3. Cades Cove -- 1967 F.Y.
4. Cataloochee -- 1967 F.Y.
5. Rocky Mountain -- 1967 F.Y.
6. Chilhowee, Foothills Parkway -- 1968 F.Y.

7. Cades Cove -- 1968 F.Y.
8. Deep Creek -- 1968 F.Y.
9. Smokemont -- 1968 F.Y.
10. Chimneys -- 1969 F.Y.
11. Elkmont -- 1969 F.Y.
12. Cosby -- 1969 F.Y.
13. Webb Mountain, Foothills Parkway -- 1969 F.Y.



George W. Fry

Preliminary Report,
Test Well at Indian Camp Creek,
Great Smoky Mountains National Park

The Indian Camp Creek site consists of a ranger's residence located about 3 miles west of Cosby and about 0.5 mile south of Tennessee Highway 73 (see fig. 1). The residence has been supplied by a small spring that reportedly is inadequate at times.

A test well was drilled in July 1967 to obtain a reliable water supply. The well site is at an altitude of about 2,040 ft and about 30 ft higher than the bed of Indian Camp Creek, which is about 300 ft to the east of the well.

Geology

The area is underlain by the Roaring Fork Sandstone of the Ocoee Series, which lies between the Snag Mountain and the Gatlinburg faults. Surficial material is alluvial and colluvial silt, sand, and boulders, to a depth of about 2½ ft at the well site. Bedrock is mostly weathered siltstone or low-grade phyllite containing vein quartz in places.

Drilling

Drilling of the well was done by Caldwell Well Drilling Company of Hot Springs, N. C., using an air rotary rig. The well was drilled with a 6 1/4-inch rotary bit. Standard black 6 1/4-inch casing was set to a depth of 38 ft and drilling was completed at a measured depth of 192 ft. At a depth of 75 ft the rig was blowing 25 gpm from the hole; at 103 ft, 50 gpm; at 160 ft, 80 gpm; and at completion, 150 gpm. The water enters the well from zones of shattered milk quartz 0.7 to 2 ft thick (see figure 2). Because of the nature of the rock there was some concern that the hole walls might be unstable; but the violent air action during and after drilling blew nearly clear water from the well and after completion of an 8-hour pumping test at discharges up to 60 gpm, depth of the hole was remeasured at 194 ft, indicating that no caving or slumping occurred, and that the hole should be satisfactorily stable.

Pumping

The well was test pumped on October 10, 1967, using a gasoline-powered generator to operate a 5-hp submersible pump set at a depth of 75 ft. Static water level was 29.2 ft below the measuring point, which was 2.0 ft above land surface.

Discharge began at 30 gpm; after a period of difficulty in adjustment of the gate valve, the water level stabilized at a depth of 43.5 ft or a drawdown of 14 ft (see fig. 3). After 3 hrs 20 mins discharge was increased to 40 gpm, causing an additional 5 ft of drawdown. After 1 hr 40 mins discharge was increased to 50 gpm, for 1 hr 50 mins, resulting in a drawdown of 24 ft. The final stage at 60 gpm and lasted 1 hr 10 mins, causing a drawdown of 29 ft or a pumping water level of 58.5 ft. Specific capacity at each stage was nearly constant at 2.0 to 2.1 gpm/ft drawdown.

The pump was stopped after 8 hrs pumpage. Recovery was rather slow; after 1 hr 25 minutes the water level was 5 ft below static level. About 19,500 gallons was removed from the aquifer during the test. It will yield at least 29,000 gallons in an 8-hour period.

The water is of high quality, containing only 29 ppm dissolved solids. A copy of results of analysis of water taken from the well after 4-hrs pumpage is attached.

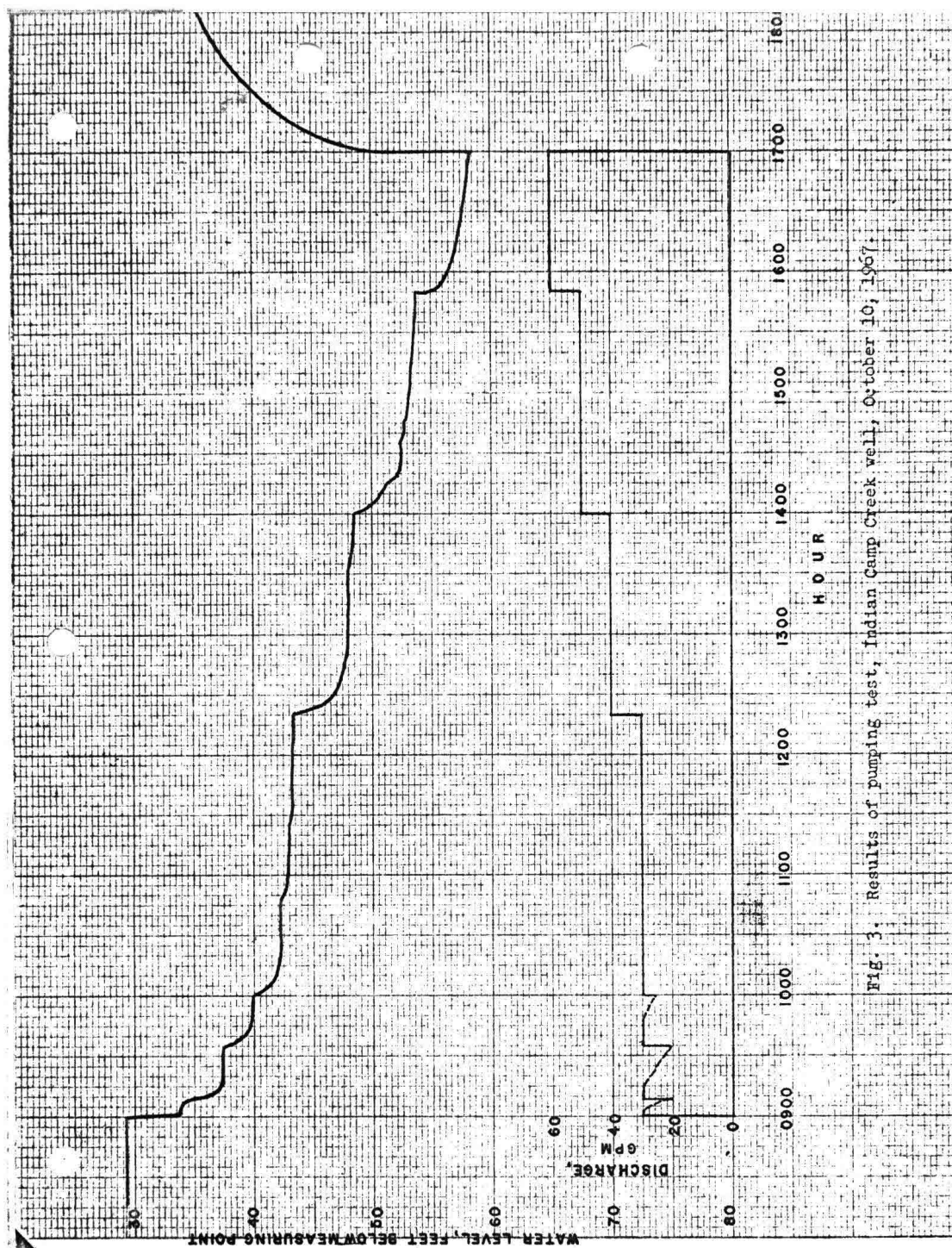
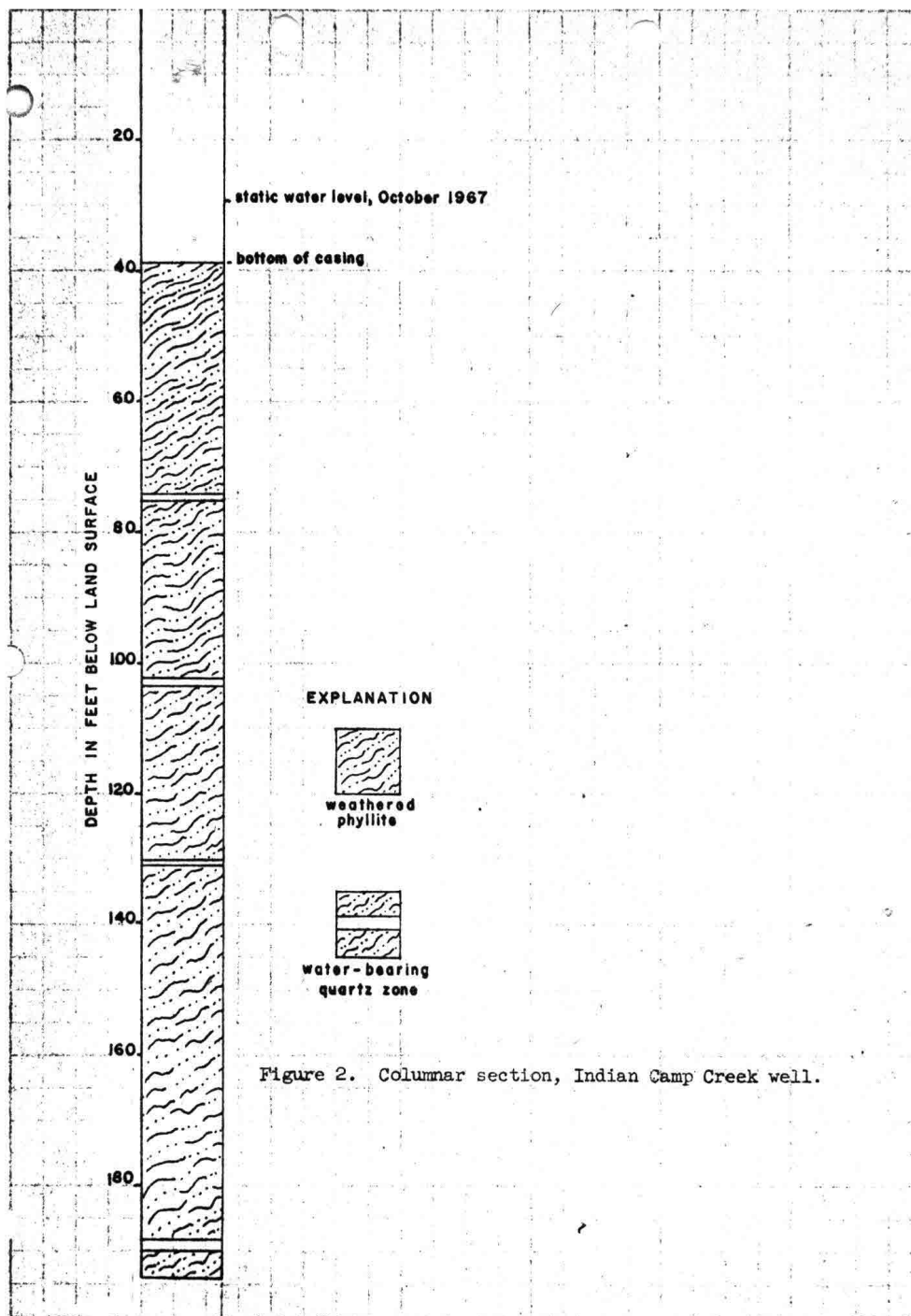


FIG. 3. Results of pumping test, Indian Camp Creek well, October 10, 1967.



UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
WATER RESOURCES DIVISION
WATER ANALYSIS

7

DEC 8 Rec'd

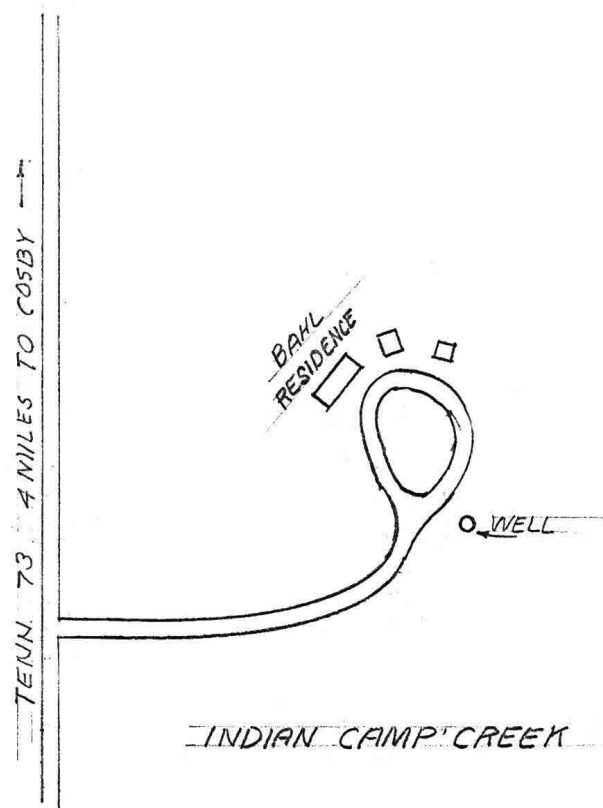
W.R. Lab. No. NC 49432

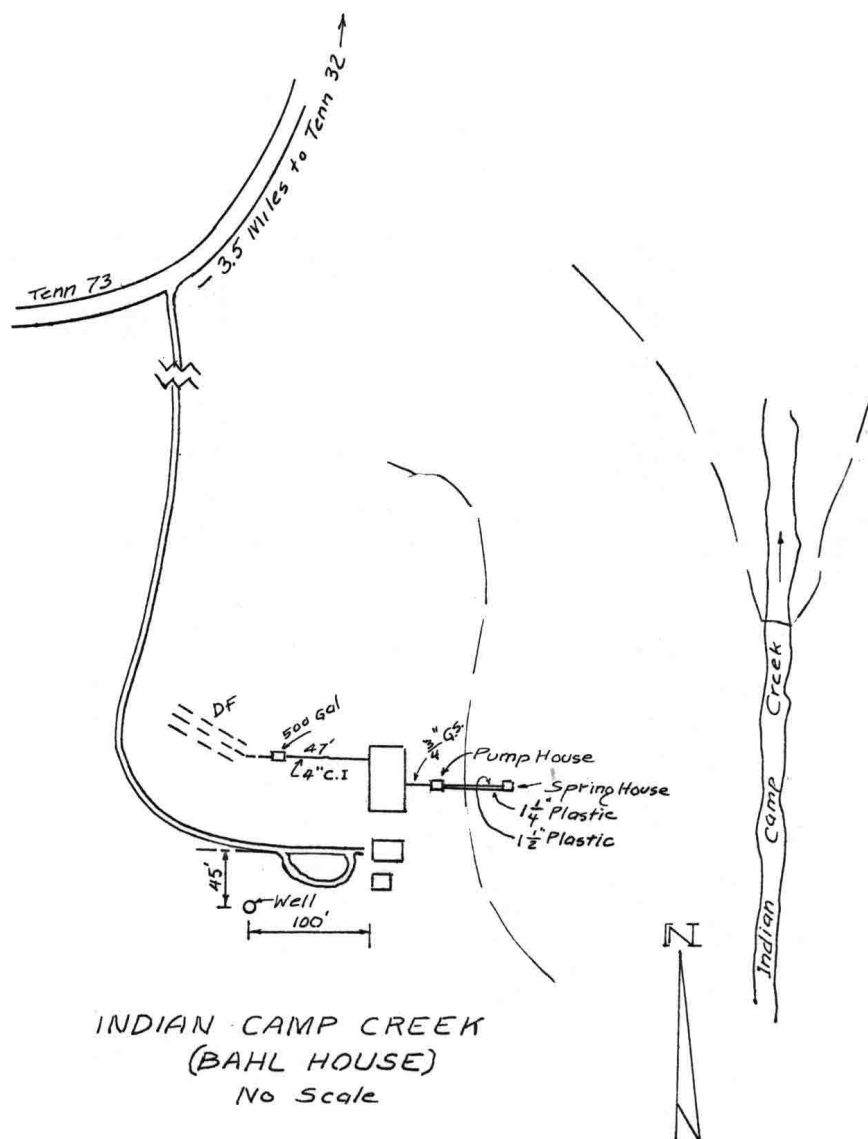
Location <u>Near Cosby, Tenn.</u>			
Source <u>Indian Camp Creek Well</u> <u>190' WL 43' below L.S.D</u>			
<u>30 g M pump nics</u>			
Date of collection <u>10-13-67</u>			
Gage height (ft.) _____		Discharge (sec. ft.) _____ Temp. (°F) <u>13</u>	
(Parts per million) (in milligrams per liter)			
Silica (SiO ₂).....	13	Carbonate (CO ₃).....	0
Aluminum (Al).....	.1	Bicarbonate (HCO ₃).....	17
Iron (Fe).....	.02	Sulfate (SO ₄).....	.4
Manganese (Mn).....	.00	Chloride (Cl).....	.6
Calcium (Ca).....	3.0	Fluoride (F).....	.1
Magnesium (Mg).....	.8	Nitrate (NO ₃).....	.1
Sodium (Na).....	2.0	Phosphate (PO ₄).....	.00
Potassium (K).....	.4		
Lithium (Li).....			
(Parts per million) (in mg per liter)			
Dissolved solids:		ABS.....	
Sum.....	29	Color.....	4
Residue upon evapo- ration @ 180°C.....	27		
Hardness as CaCO ₃	* 11		
Noncarbonate.....	0		
pH.....	5.8	Specific conductance (micromhos at 25°C).....	29

* INCLUDES HARDNESS OF ALL
POLYVALENT CATIONS REPORTED.

Unpublished records subject to revision

Maps and Miscellaneous Information





Docket Information

Number of Documents in Docket 23

Documents Dated from 8/23/1965 to 9/7/1967

Docket Compiled: 3/29/2011