



WATER-RIGHT DOCKET

Great Smoky Mountains National Park

Docket No: 27

SPRING ROUND BOTTOM CAMP

Preliminary Docket Information

00-00-0000: water right/source docket information

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

WATER RIGHTS DOCKET
Round Bottom Campground

Supporting Hydro Data

WATER SUPPLY

Round Bottom Primitive Campground

Well site No. 1 is located near the east edge of the gravel road, about 100 feet north of the concrete ford crossing on Straight Fork Creek and about 1/5-mile north of Round Bottom primitive campground. Altitude of the general area is roughly 3,100 feet (from topographic map).

Drilling began June 16, 1967 at site No. 1 using an 8-inch tri-cone bit. After drilling through 22 feet of alluvium and 8 feet of bedrock, an attempt was made to ream and case the hole. Caving, however, was so prevalent in the upper part of the hole that all efforts were futile, and the hole was abandoned. The driller then moved his rig to site No. 2, which is about 300 feet south of No. 1. Excessive ground water and poorly consolidated alluvium caused this hole to cave also, and it was abandoned at 12 feet. Since susceptibility to caving increased with an increase in diameter, permission was granted from the National Park Service office in Gatlinburg to drill a 6-inch hole instead of the proposed 8-inch. The rig was again moved back to site No. 1, about 15 feet west of the first hole. No major problems were encountered during this third attempt, and the well was completed on June 22. Both abandoned holes were filled with drill cuttings. The hole at site No. 2 was capped with concrete as it contained some casing which could not be retrieved. A hydrogeologic log of the well, drilled in alluvium and the Longarm Quartzite, follows:

- 0-12 ft., Soil cover and alluvium consisting of sand, cobbles, and scattered boulders.
- 12-18 ft., Highly decayed bedrock. The well yield estimated at 5 gpm at 18 feet.
- 18-25 ft., Hard, slightly weathered, bedrock consisting of layers of quartzite and mica-quartz schist. Installed 18 feet of 6 inch diameter steel casing.
- 25-35 ft., Some quartzite but predominately mica-quartz schist. The yield increased to 15 gpm.
- 35-50 ft., Alternating zones of weathered and unweathered schist. The yield increased to about 18 gpm.
- 50-60 ft., Gradational zone with the schist phasing out and biotite-quartz gneiss predominating. The yield at 55 feet is 24 gpm.
- 60-70 ft., Biotite-quartz gneiss. The yield measured 45 gpm at 60 feet and 60 gpm at 70 feet.
- 70-88 ft., Biotite-quartz gneiss with some traces of white feldspar.
- 88-89 ft., Very soft and weathered zone of fractured gneiss. The well yield increased to about 90 gpm.
- 89-99 ft., Fine-grained gneissic granite composed of biotite, pink feldspar, and quartz. No further increase in yield and drilling terminated at 99 feet.

On June 29, 1967 a 6-inch, 5-horsepower test pump was installed at a depth of 67 feet. Static water level was 9.6 feet below the top of the casing which was 1.7 feet above ground surface. The pump was operated at a maximum output of 112 gpm for the entire 8-hour test period. During the first hour of testing, the water level declined to 34.4 feet, and for the last 4 hours of the test, it remained steady at about 36.5 feet (see fig. 1). Specific capacity of the well is 4.2 gpm per foot of drawdown after 8 hours of pumping at 112 gpm.

Chemical analysis of a water sample taken at the end of the pump test indicates a specific conductance of 38 and a pH value of 6.2 (see table 1). This is an excellent well, both in yield and quality of water, and it should sufficiently meet the requirements of the proposed camping area.

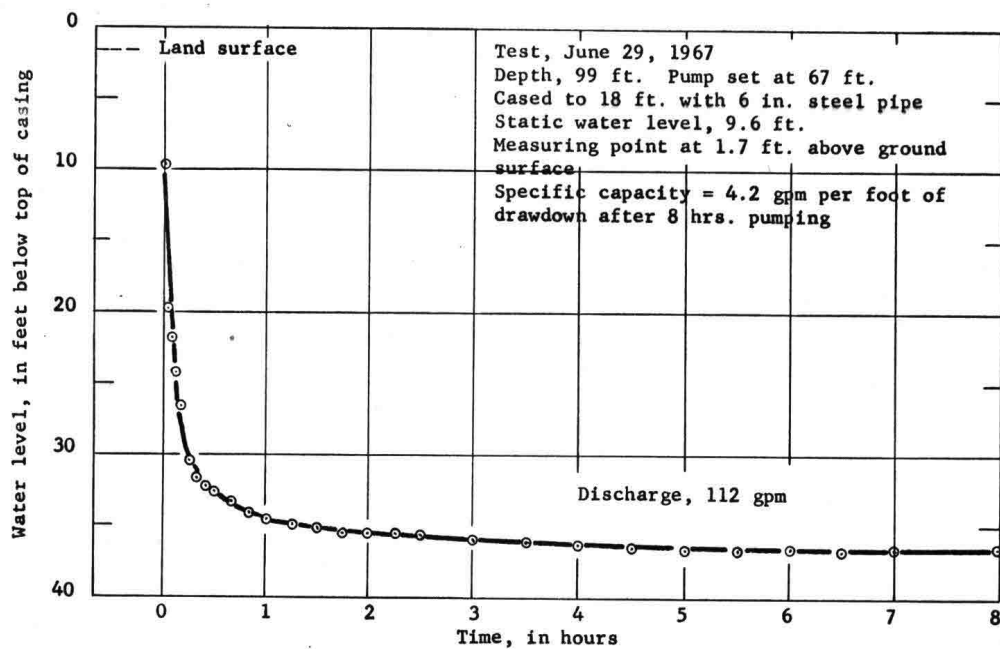


Figure 1. Drawdown of well at Round Bottom Primitive Campground.

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

W.R. Lab. No. NC 48655

Location <u>Round Bottom</u> <u>Swain County</u>			
Source _____			
Pt. of collection: <u>Orifice</u>			
Date of collection <u>6/29/67</u>			
Gage height(ft.) _____		Discharge(sec.ft.) _____ Temp.(°F) <u>52</u> <i>f</i>	
(Parts per million)			
Silica (SiO ₂).....	14	Carbonate (CO ₃).....	
Aluminum (Al).....	.0	Bicarbonate (HCO ₃).....	19
Iron (Fe).....	.02	Sulfate (SO ₄).....	2.8
Manganese (Mn).....	.02	Chloride (Cl).....	.9
Calcium (Ca).....	4.2	Fluoride (F).....	.1
Magnesium (Mg).....	.1	Nitrate (NO ₃).....	.1
Sodium (Na).....	2.9	Phosphate (PO ₄).....	.00
Potassium (K).....	.6		
Lithium (Li).....			
(Parts per million)			
Dissolved solids:		ABS.....	
Sum.....	35	Color.....	1
Residue upon evapo- ration @ 180°C.....	34		
Hardness as CaCO ₃	11		
Noncarbonate.....	0		
pH.....	6.2	Specific conductance (micromhos at 25°C).....	38

Table 1. Chemical quality of water from the Round Bottom Primitive Campground.

Unpublished records subject to revision

23.

ROUND BOTTOM CAMPGROUND

Situation: Present water supply for the existing primitive campground is inadequate and not approved. Future proposed expansion deems necessary an approved water system.

Proposed: Drill well for investigation.

Progress to Date: Contract awarded April 14, 1967. Well drilled to 99' yielding 80-100 g.p.m.

(09/28/67)

NAME OF SYSTEM: Round Bottom CampgroundLOCATION: Park Route #10LOCATION: STATE: North Carolina COUNTY: Swain

- | <u>A. Source of Supply</u> | <u>Location - Reference to Permanent Landmark</u> | <u>Coordinates</u> |
|--|---|---|
| 1. A small spring | 200 feet northwest of campground | Lat. N 35°37'07.5"
Long. W 83°12'38" |
| <p>This is a small spring enclosed in a concrete box without a cover. There are no pipes connected to it and no treatment for the water. There is a sign adjacent to the spring which states "Boil all Drinking Water". This spring serves a little used primitive campground.</p> | | |
| 2. Deep Well | 100 feet north of bridge on Route #10
across Straight Fork Creek | Lat. N 35°37'19.2"
Long. W 83°12'41" |
| <p>A deep well was drilled in the area in 1967 for the proposed expanding of this area into a 200 site campground. The well has a capacity of 112 gallons per minute and will provide an excellent source once construction of a new campground is scheduled.</p> | | |
| <u>B. Consumption:</u> | | |
| Estimated consumption - 8,000 gallons per month during season | | |
| <u>C. Mains and Laterals:</u> | | |
| None | | |

D. Problems:

The primitive campground was obliterated in the spring of 1968, but the small system remains intact for use by people using a large parking area at the site.

E. Proposed:

Future planning for the area involves the construction of a 200-unit campground and a 100-unit picnic area, but this work is of low priority at this time.

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)

MAY 1962 EDITION
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 6-7, 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.

775-9-17-65-

L54 SER (OLW)

SEP 14 1965

~~Read~~
ARC 9/17
WAA

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 over-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. Mikell

cc:

Director, w/c of inc.
Chief, EODC (2), w/c of inc.



UNITED STATES
DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

Great Smoky Mountains National Park
Gatlinburg, Tennessee 37738

Y REFER TO:
L54

August 23, 1965

EAST REGION	
AUG 26 1965	
Regional Director	
Asst. Reg. Dir. (A)	
Asst. Reg. Dir. (CA)	
Asst. to Reg. Dir. (PA)	
Asst. to Reg. Dir. (DI)	
Resource Studies Asst.	
X <i>Land & Water</i>	
<i>Main</i>	

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.

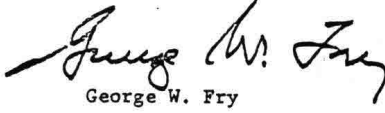
Further checks on other major supplies in the Park showed similar conditions but none as critical as that that exists in the Headquarters area. If at all possible, and if it can be worked into your Water Resources Investigation program as an emergency measure, we would like to suggest the programming 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.

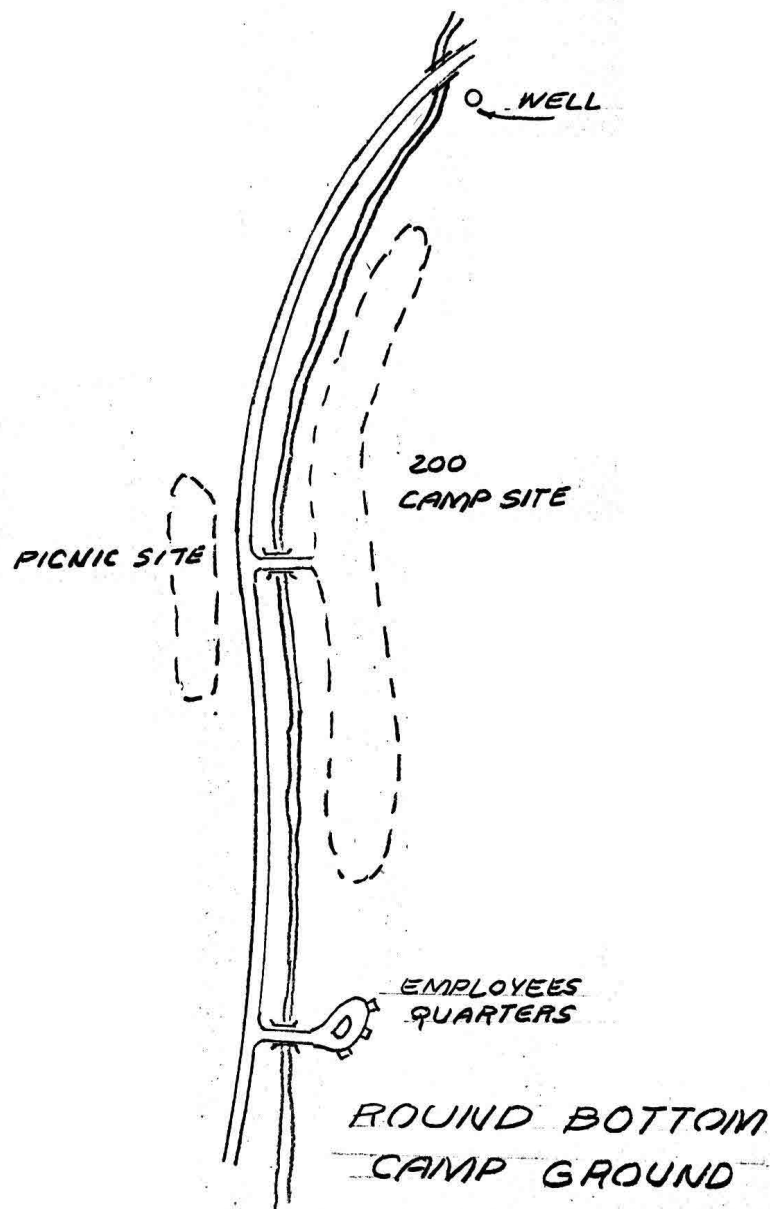
In an August 19 telephone conversation between Hydraulic Engineer Vick of your office and Chief of Maintenance Rowe, Mr. Vick had mentioned that he had put an over-ceiling item in his 1966 F.Y. Water Resources budget in the amount of \$24,000 to initiate a study of Park domestic water supply needs. We 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



Docket Information

Number of Documents in Docket 20

Documents Dated from 8/23/1965 to 9/28/1967

Docket Compiled: 3/30/2011