



WATER-RIGHT DOCKET

Great Smoky Mountains National Park

Docket No: 6

MILL CREEK. CABLE MILL SYSTEM

Preliminary Docket Information

00-00-0000: water rights docket cover sheet

WATER RIGHTS DOCKET

Cable Mill

Great Smoky Mountains National Park

Supporting Hydro Data

NAME OF SYSTEM: Cable Mill

LOCATION: Park Route 3BCC

LOCATION: STATE: Tennessee COUNTY: Blount

<u>A. Source of Supply</u>	<u>Location - Reference to Permanent Landmark</u>	<u>Coordinates</u>
1. Mill Creek	2,200 feet S 70°E from the bridge at the intersection of Forge Creek Road and Mill Creek	Lat. N 35°34'54" Long. W 83°49'55"

This is a gravity flow system with the intake structure located in Mill Creek in an isolated area prohibited to park visitors. The intake structure consists of a concrete dam and a collection box. The collection box is a short section of 30" diameter VCT set vertically in the creek bed and surrounded by stones. The intake filter consists of stones and gravel around and under the collection box and of a 6" perforated metal screen mounted on the end of the intake pipe within the collection box. From the collection box runs a 2" line 63' to a reducer. From the reducer runs a 1½" line for an additional 1,471' to a chlorinator and a 2,000 gallon reinforced concrete reservoir. The chlorinator is an Aerofeed Hypochlorinator and is mounted on the intake of the reservoir. A 2" galvanized iron main runs from the reservoir to the comfort station.

B. Consumption:

This system is not metered. The estimated yearly consumption is 500,000 gallons. (Daily consumption - Maximum 3,500 gallons) The amount of water available at the source is estimated at 150 gallons per minute.

C. Distribution Mains and Laterals:

<u>Size</u>	<u>Type</u>	<u>Length</u>
4"	Galvanized Iron	30 Lineal Feet
2"	Galvanized Iron	1,938 Lineal Feet
1½"	Galvanized Iron	1,471 Lineal Feet
1"	Plastic	<u>418 Lineal Feet</u>
	TOTAL	3,857 Lineal Feet

D. Problems:

The difference in elevation between reservoir and use area is about 23 $\pm$ feet, not enough for fire protection, etc.

E. Proposed Improvements:

In the tentative 1970 F.Y. Water Resources Program, there is a well investigation scheduled for this area. If the well is of sufficient capacity, it should be developed as the ultimate area supply. There is a construction project in a tentative 1972 F.Y. program for improving this system which will involve construction of a new 20,000 gallon reservoir at a higher elevation and necessary mains to the area from the reservoir.

(Cable Mill - Addendum No. 1)



Existing 2,000 Gallon Concrete Reservoir Serving Cable Mill Area

(Cable Mill - Addendum No. 1)
(5/1969)



DAM AND INTAKE STRUCTURE

Other Supporting Information

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

Test Wells at Cable Mill and Cosby Creek
Campground, Great Smoky Mountains
National Park

Drilling of test wells at Cable Mill, Cades Cove, Great Smoky Mountains National Park, by Jack Terry Well Drilling Co., Sevierville, Tennessee, ended on July 14, 1971. Three holes were drilled as follows (see figure 1 for locations):

	<u>Total Depth</u>	<u>Casing</u>
No. 1.	228 ft	15 ft (pulled
No. 2.	300 ft	not cased
No. 3.	<u>200 ft</u>	not cased
TOTAL	728 ft	

Well No. 1 was abandoned and backfilled. Yield was about 5 gpm. It penetrated 10 ft of overburden and 218 ft of sandstone and phyllite. Well No. 2 was drilled to a depth of 300 ft through yellow-red clay without reaching bedrock. Well No. 3 was drilled through 200 ft of yellow-red clay without reaching bedrock. All holes were abandoned and backfilled.

On July 15, 1971, Jack Terry Well Drilling Co. completed a test well near the Cosby Creek campground (figure 2). Total depth: 228 ft; casing: 31 ft; grout, 31 ft; yield: 50 gpm, as indicated by an 8-hour pumping test run on July 20, 1971. The well penetrates weathered brown phyllite, fresh blue-gray phyllite, and fine-grained

blue-gray sandstone. Several small water-bearing fracture zones were penetrated, the deepest being at 207 ft. A plot of the pumping test is attached. Static water level before pumping began was 10.3 ft below the top of casing which is about 1.5 ft above ground surface. On the previous day, before a 3.5-inch rainfall, the water level was 11.7 ft below the top of casing.

As indicated on figure 3, there was considerable difficulty in adjusting the gate valve to a steady discharge. The well was pumped at 10 gpm, 20 gpm, 30 gpm, 38 gpm and 50 gpm. A brief pumping rate of 70 gpm resulted in such a steep decline in water level that pumping was cut back to 50 gpm and held there.

This well will yield 50 gpm on a continuous basis. Maximum pumping head to ground surface in times of low water table probably will not exceed 80 ft at 50 gpm.

Lernand Fredrick
for: William M. McMaster
Hydrologist

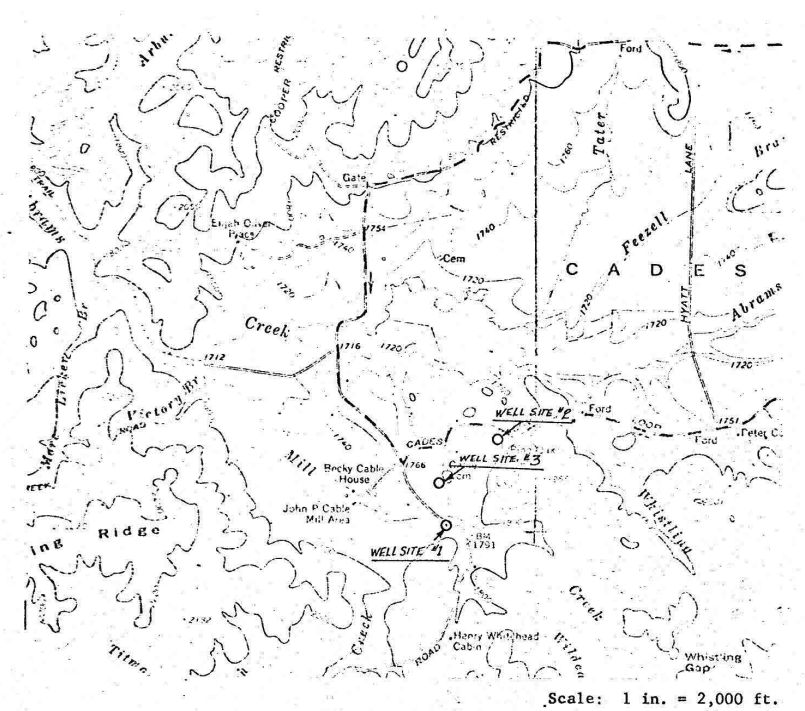
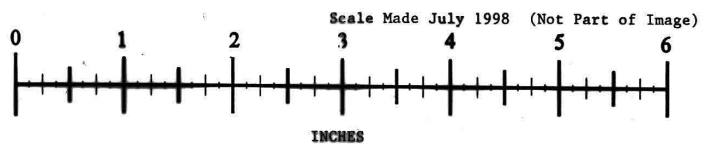
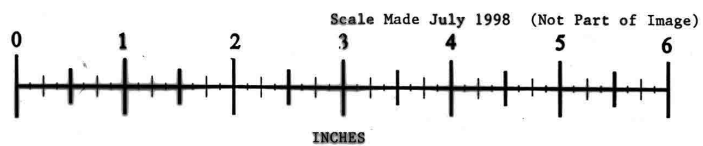
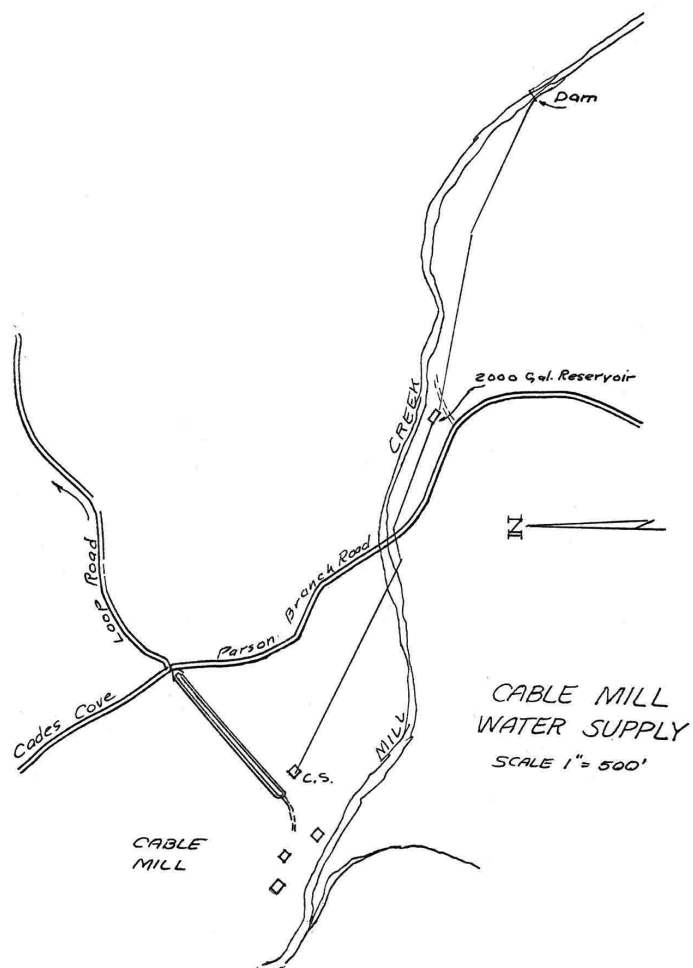
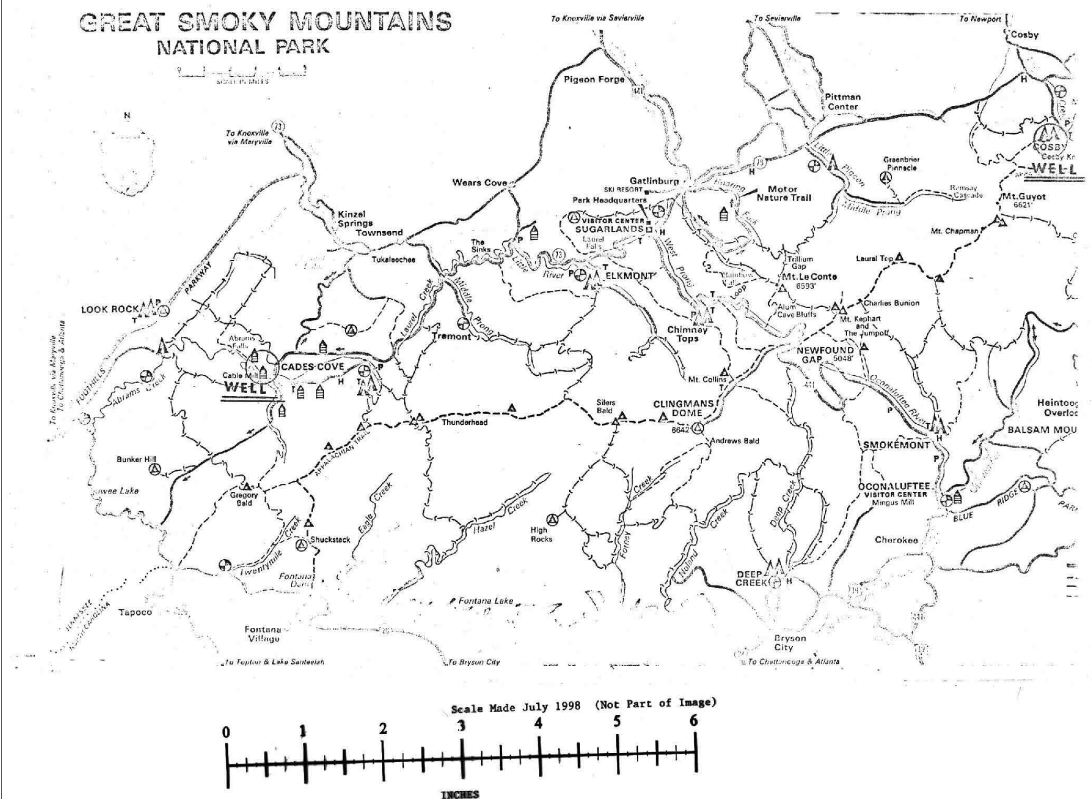


Figure 1. Map of Cable Mill area, Cades Cove, showing locations of wells.







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)

OPTIONAL FORM NO. 10
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.

Bill
W. M. McMaster
Hydrologist

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



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.

775-9-17-65-

L54 SER (OLW)

SEP 14 1965

[Handwritten signature]
EWC 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 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

Memorandum

To: Regional Director, Southeast Region
From: Superintendent, Great Smoky Mountains
Subject: Water Resources Investigations, Great Smoky Mountains
National Park

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

X *South Water*
Point

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 5/15/1969

Docket Compiled: 3/29/2011