



WATER-RIGHT DOCKET

Great Smoky Mountains National Park

Docket No: 8

UPPER DOUBLE BRANCH, CATALOOCHEE CAMPGROUND

Preliminary Docket Information

00-00-0000: intro to docket: see grsm docket 1 for map and preliminary map for water sources in park

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

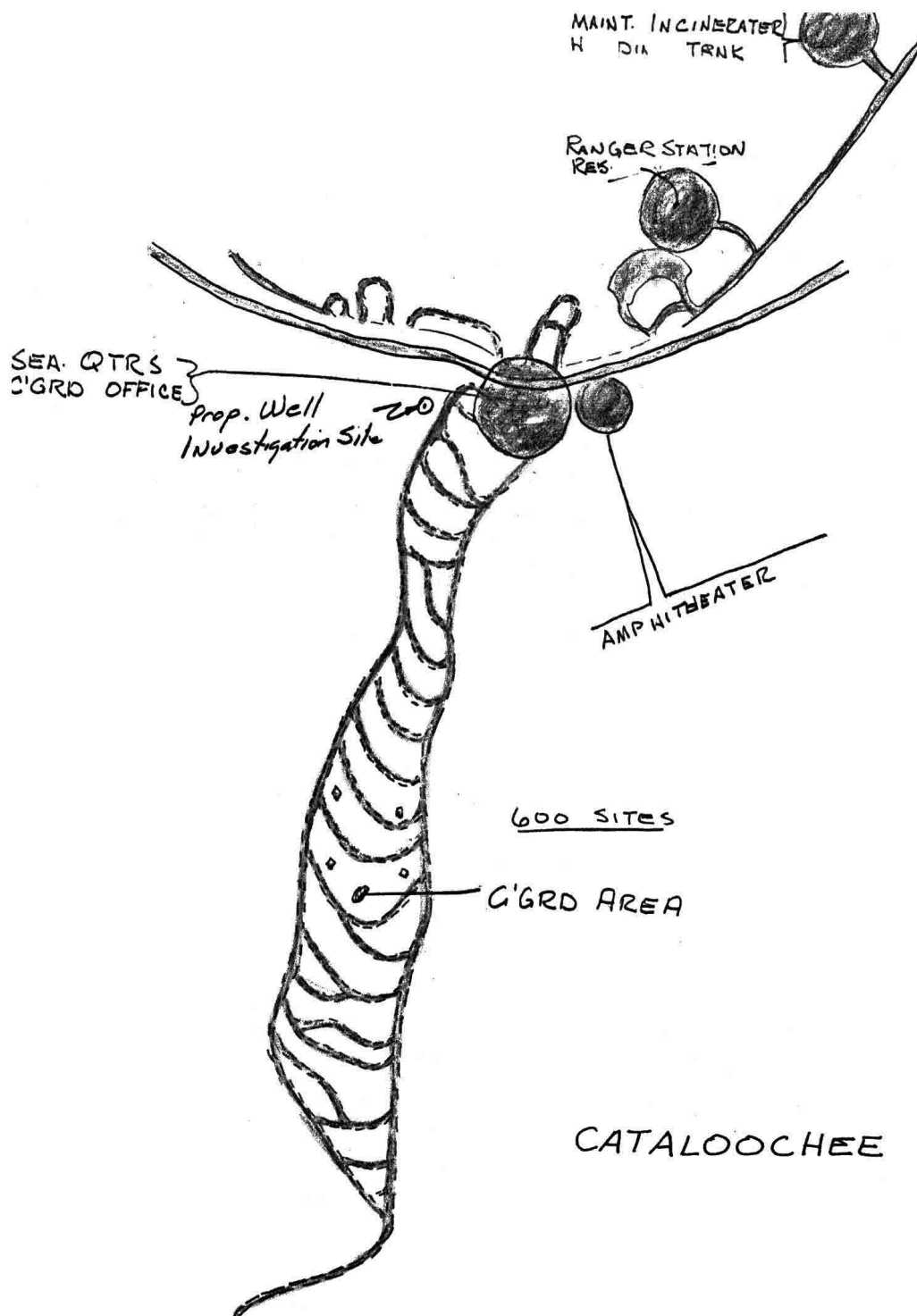
WATER RIGHTS DOCKET
Cataloochee Campground
Great Smoky Mountains National Park

CATALDOOCHEE

Situation: The present developed area consists of several old farmstead areas now occupied by park employees and a small primitive campground. However, this area is not involved in the complex being considered by this study. With the completion of Interstate 40 and our access road to the area, the park plans on a major development in the area. The development will include a 600-site campground, a 400-site picnic area, a Park Service residential area, a visitor center, campground store and other visitor-oriented facilities. It is estimated that the daily water consumption may approximate 100,000 gallons. The first phase or stage construction will probably involve some 300 campground sites and 200 picnic sites.

Proposed: That we drill several exploratory 8" wells to determine availability of a water supply for the area. It appears that well/or well combination with a capacity of 50 g.p.m. is the minimum required for our first stage of construction.

Progress to date: This Water Investigation Study is a very important phase of preplanning needed within the next year or so. In the 1968 F.Y. program, we expect to complete the access road from Interstate 40 and a development schedule will need programming starting about 1969 F.Y. This Water Investigation project is listed in the proposed 1967 F.Y. program as submitted by the park.



WATER SUPPLY

Cataloochee Campground

The well site is located about 100 feet west of Rough Fork road, 0.8 mile southwest of Palmer Chapel, and about 2.9 miles southwest of the Cataloochee Ranger Station. The altitude of the site is approximately 2,820 feet (from topographic map).

Drilling of an 8-inch test well began on June 23, 1967. A hydrogeologic log of the well drilled in the Roaring Fork Sandstone follows:

- 0-15 ft., Soil cover and alluvium ranging from pebbles to boulders. Yield estimated at 3 gpm.
- 15-20 ft., Highly weathered, soft, fine-grained bedrock. Slight increase in yield.
- 20-27 ft., Bedrock is weathered phyllite. Yield increased to about 5 gpm. (The well was cased to 27 feet, sealing off all encountered water-bearing zones.)
- 27-35 ft., Slightly weathered fine-grained phyllite. No water encountered.
- 35-40 ft., Fine-grained phyllite containing some iron sulfide. Yield is about 5 gpm.
- 40-50 ft., Alternating layers of phyllite and mica-quartz schist containing some chloritic mica. No change in yield.
- 50-70 ft., Predominately mica-quartz schist. The yield increased to about 15 gpm after penetrating a fracture zone at 52 feet, and 20 gpm was measured after drilling to a depth of 60 feet.
- 70-72 ft., Chloritic mica-quartz schist having a high percentage of iron sulfide. Water was green and had H_2S odor. Yield increased to about 30 gpm.
- 72-80 ft., Gray phyllite interbedded with schist. Iron sulfide decreased to only a trace at 80 feet. Yield measured 36 gpm, and water is clear.
- 80-110 ft., Mica-quartz schist, and a trace of chloritic mica and iron sulfide. No change in yield.

110-150 ft., Mica-quartz schist containing scattered flakes of chloritic mica and a trace of iron sulfide. No change in yield.

150-165 ft., Same type rock with a pronounced increase in iron sulfide and chlorite. Yield measured 36 gpm; drilling terminated at 165 feet.

The water from the zone at 70-72 feet produced the familiar "rotten-egg" smell of hydrogen sulfide and much green chloritic mica. There was no significant increase in yield from 70 to 165 feet.

On June 28, 1967, a submersible test pump was installed at a depth of 126 feet. The static water level was 9.1 feet. The pump was operated at maximum discharge (100 gpm) for 5 minutes, then the discharge was reduced to 30-35 gpm (see fig. 1). After four hours the discharge was increased to 100 gpm for 15 minutes, then reduced to 30-35 gpm. During the last 3½ hours of the test, the water level remained relatively steady at about 69 feet with a discharge of 35 gpm. The specific capacity of the well is about 0.9 gpm per foot of drawdown at 35 gpm after 8 hours of pumping.

A chemical analysis of a water sample taken at the end of the pumping test is shown in table 1. The water is of good quality except for a slightly low pH value and the presence of hydrogen sulfide. Chemical treatment and/or aeration would probably correct these conditions. An alternative to treatment of the water would be the back-filling of the well with concrete to a depth of about 65 feet. This would seal the zones that yield the hydrogen-sulfide, and the well yield would be reduced to about 20 gpm. However, it is possible that the well would continue to yield water with hydrogen sulfide even if the lower part were sealed.

Considering the above mentioned conditions and the needed quantity of water, it is apparent that another well should be drilled, at a new site, to replace or supplement the well described in this report.

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

W.R. Lab. No. NC 48653

Location <u>Haywood County - Great Smoky Mountains National Park</u>			
Source <u>Cataloochee Campground. Drilled well, 165', 8" diameter. Cased to:</u>			
<u>27 ft. Collected at pump after 8 hrs. of pumping.</u>			
Date of collection <u>6-28-67</u>			
Gage height(ft.) _____ Discharge(sec.ft.) _____ Temp.(°F) _____			
(Parts per million)			
Silica (SiO ₂).....	13	Carbonate (CO ₃).....	0
Aluminum (Al).....	.1	Bicarbonate (HCO ₃).....	26
Iron (Fe).....	.16	Sulfate (SO ₄).....	1.6
Manganese (Mn).....	.02	Chloride (Cl).....	6.5
Calcium (Ca).....	4.6	Fluoride (F).....	.6
Magnesium (Mg).....	.3	Nitrate (NO ₃).....	.1
Sodium (Na).....	7.9	Phosphate (PO ₄).....	.00
Potassium (K).....	1.0	.....	
Lithium (Li).....		.....	
(Parts per million)			
Dissolved solids:		ABS.....	
Sum.....	49	Color.....	2
Residue upon evapo- ration @ 180°C.....		.....	
Hardness as CaCO ₃	14	.....	
Noncarbonate.....	0	.....	
pH.....	6.1	Specific conductance (micromhos at 25°C).....	65

Table 1. Chemical quality of water from the Cataloochee Campground well.

Unpublished records subject to revision.

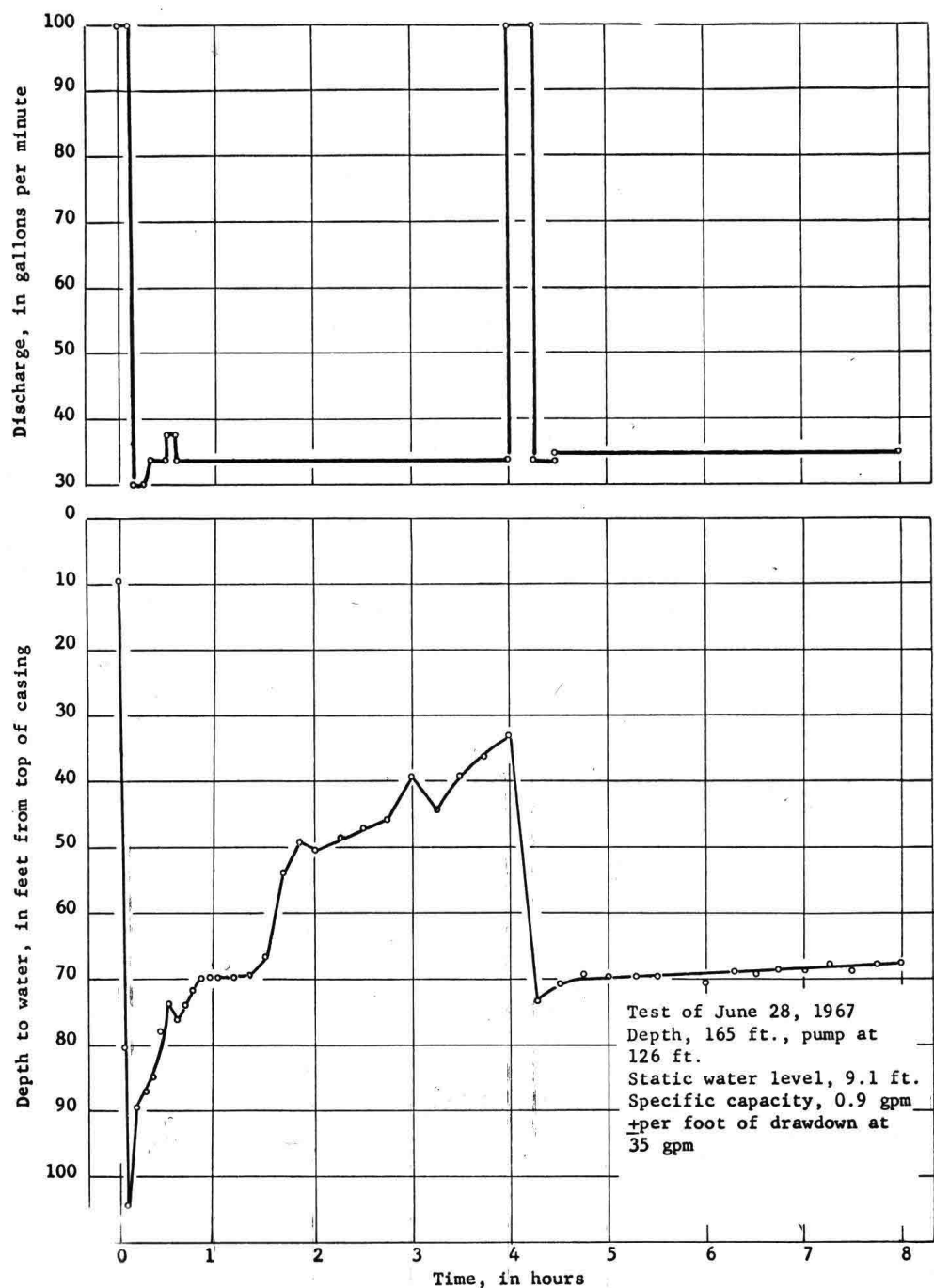


Figure 1. Discharge and depth to water in well at Cataloochee Campground.

Cataloochee New Area

As a part of the cooperative program between the U. S. National Park Service and the U. S. Geological Survey, a well site was selected in October 1968 in the vicinity of a proposed campground designated as the Cataloochee New Area in Haywood County, N. C.

At the Cataloochee New Area, the National Park Service is planning an eventual 600 site campground, a 400 site picnic area and complimenting residential and other necessary facilities. At present the area does not contain facilities for recreation. A source of water has not been developed, although surface water is abundant as tributaries to Cataloochee Creek, and a test well was drilled in the area in 1967. The National Park Service estimates that a minimum of 50 gpm (gallons per minute) will be needed for the first phase of development, and that the ultimate development will require about 100,000 gallons per day.

In an effort to obtain water for this major development, a well was drilled at the site (designated as site No. 2 in our letter of October 17, 1968). The site is in an open field, on a slope about 600 feet northwest of the Park road, about 3,500 feet northeast of the test-well drilled in 1967, about 750 feet southwest of an abandoned school building, and about 50 feet north of a small stream that parallels an old road (fig. 1.1).

The Cataloochee New Area is in the valley of the Rough Fork of Cataloochee Creek. Flood plains occur along the west side of Rough Fork at an altitude of about 2,750 feet above sea level, but the well site is on a slope about 20 feet above the bed of Rough Fork.

(Cataloochee Campground - Addendum No. 1)

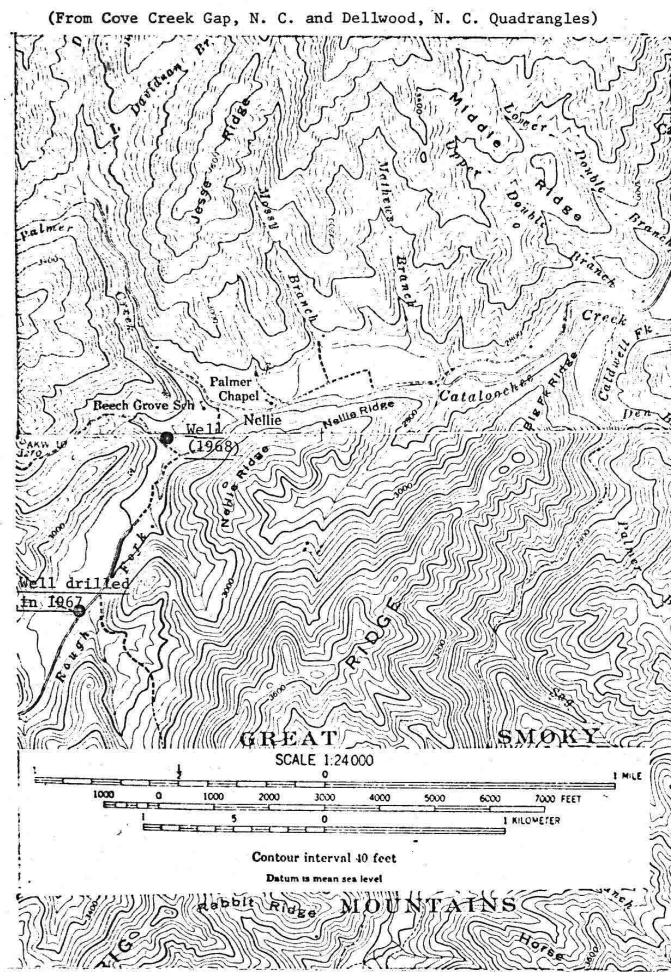
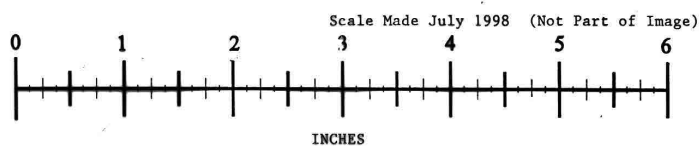


Figure 1.1.--Location of wells at Cataloochee New Area.



Several large faults cross the Cataloochee Creek valley, and rocks of different kinds and ages crop out within short distances. Cataloochee New Area is underlain by alluvial sand, gravel, and boulders. The alluvium is underlain by the Roaring Fork Sandstone of the Snowbird Group of the Ocoee Series. The Roaring Fork Sandstone consists of dark, fine-grained sandstone beds separated by nearly equal thicknesses of argillaceous and silty rocks (King and others, 1968, p. 4). Joint or fracture systems are well developed in the area, and provide paths more susceptible to erosion for the stream channels to follow. The water-yielding characteristics of these rocks depend largely on the degree to which fractures are open to the flow of ground water. The wells drilled in the Cataloochee Creek valley tapped fractures at considerably greater depths than are commonly found in wells drilled in the Great Smoky Mountains.

Using an air-percussion type of rotary drill, a six-inch well was drilled to a depth of 184 feet and reamed to a diameter of 8 inches on November 6-8, 1968, at this site. A log of the well follows:

<u>Depth</u>	<u>Description</u>
0 - 18 feet	Alluvium and boulders.
18 - 58	Brownish, soft, probably weathered schist. Attempted to set casing at 65 feet, but wall of well would not hold; casing set at 73 feet.
65 - 70	Brown schist. Small amount of water.
70 - 90	Soft brown schist and quartz. Yield about 5 gpm.
90 - 100	Hard sandstone. Yield increasing.
100 - 110	Hard sandstone. Yield 25 gpm.
110 - 130	Soft, brown sandstone. Yield 35 gpm.
130 - 140	Soft, brown sandstone. Yield 40 gpm.
140 - 150	Hard, brown schist. Yield 50 gpm.
150 - 184	Hard, brown phyllite and soft streaks. No increase in yield below 150 feet.

Prior to the pumping test, on December 10, 1968, the static water level was 5.7 feet below land surface. A three-horsepower submergible test pump was installed in the well at a depth of 150 feet. The well was pumped for 3-1/2 hours in order to develop the well. Mechanical trouble with the generator furnishing power to the pump made it necessary to discontinue pumping. However, the water being discharged was clear before pumping was stopped.

On December 11, 1968, another generator having been obtained, the well was pumped at several different rates for a total of eight hours. Figure 1.2 is a graph showing the drawdown in the well related to time since pumping began. The well was pumped at 65 gpm for four hours in the first step. The total drawdown at the end of this step was 61 feet, the specific capacity was slightly more than one gpm per foot of drawdown, and the transmissibility was calculated to be about 2,000 gallons per day per foot.

At the end of the four-hour period the pump was stopped for ten minutes in order to check the oil in the generator engine. The water level recovered to about 12 feet below static level. When the pump was started again the valve was opened for maximum yield. The well yielded 80 gpm for a short period, but then the yield declined to 66 gpm. During this period the water level gradually declined to a few feet below the bottom of the casing. Toward the end of the period the water level was fluctuating within a narrow range.

At the end of seven hours of pumping the valve was partially closed, thus reducing the yield to 23 gpm. The water level recovered to 27 feet below the static water level by the end of the eight hour pumping test. The pump was stopped and the recovery of the water level was measured for one-half hour.

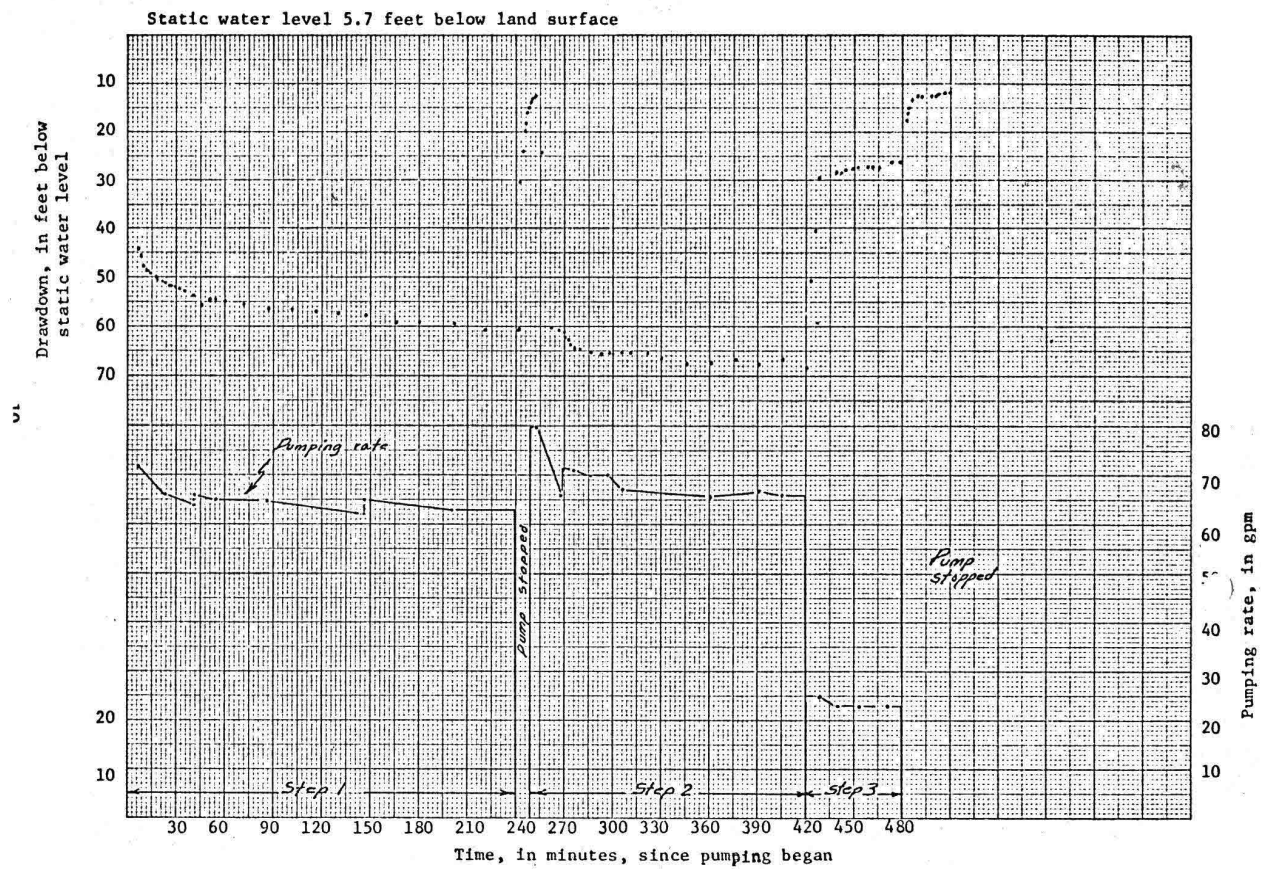


Figure 1.2.--Cataloochee New Area pumping test, December 11, 1968.

The water level reached the bottom of the casing while pumping 65 gpm. At higher pumping rates, dewatering of the rock fractures will occur, thus resulting in lower yield and increased pumping costs. In view of the low specific capacity it probably is not desirable to pump the well in excess of 50 gpm for extended periods.

Samples of the water at the beginning and at the end of the test were analyzed by the U. S. Geological Survey laboratory in Raleigh, North Carolina. The results are shown in tables 1.1 and 1.2.

The water is of excellent quality except that it is slightly acidic and may be somewhat corrosive to metal. This condition can be effectively treated with a commercially available pH correction system.

DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
WATER RESOURCES DIVISION
WATER ANALYSIS

W.R. Lab. No. NC 50572

Location Cataloochee New Area, 8 miles northwest of Delwood, N. C.			
County: Haywood.			
Source Drilled well. Depth: 184 ft. Drilled: November 8, 1968. Collected at discharge pipe. Owner: National Park Service, Gatlinburg, Tennessee. Use: Public supply. Water-bearing formation: Crystalline rocks. Pumping water level: 52 ft. below measuring point. Yield: 72 gpm. Appearance when collected: Turbid. Producing intervals: 73 to 150 ft. Sampled after pumping 6 minutes.			
Date of collection December 11, 1968			
Gage height(ft.)		Discharge(sec.ft.) Temp.(°C) 13	
(milligrams per liter)			
Silica (SiO ₂).....	18	Carbonate (CO ₃).....	0
Aluminum (Al).....	.6	Bicarbonate (HCO ₃).....	26
Iron (Fe).....	1.0	Sulfate (SO ₄).....	1.2
Manganese (Mn).....	.05	Chloride (Cl).....	.4
Calcium (Ca).....	4.4	Fluoride (F).....	.0
Magnesium (Mg).....	.6	Nitrate (NO ₃).....	.2
Sodium (Na).....	2.9	Phosphate (PO ₄).....	.31
Potassium (K).....	.7	.....	
Lithium (Li).....		.....	
(milligrams per liter)			
Dissolved solids:		ABS.....	
Sum.....	43	Color.....	5
Residue upon evapo- ration @ 180°C.....	43	.....	
Hardness as CaCO ₃	14	.....	
Noncarbonate.....	0	.....	
pH.....	7.3	Specific conductance (micromhos at 25°C).....	40

Table 1.1.--Chemical analysis of water sampled at beginning of test.

Unpublished records subject to revision

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

W.R. Lab. No. NC 50564

Location <u>Cataloochee New Area, 8 miles northwest of Delwood, N. C.</u>			
County: <u>Haywood.</u>			
Source <u>Drilled well. Depth: 184 ft. Drilled: Nov. 8, 1968. Collected at</u> <u>discharge pipe. Owner: National Park Service, Gatlinburg, Tennessee. Use: Public</u> <u>supply. Water-bearing formation: Crystalline rocks. Pumping water level: 74 ft.</u> <u>below measuring point. Yield: 66 gpm. Appearance when collected: Clear. Producing</u> <u>intervals: 73 to 150 ft. Sampled after pumping 6 hours.</u>			
Date of collection <u>December 11, 1968</u>			
Gage height(ft.) _____		Discharge(sec.ft.) _____ Temp.(°C) <u>12</u>	
(milligrams per liter)			
Silica (SiO ₂).....	18	Carbonate (CO ₃).....	0
Aluminum (Al).....	.0	Bicarbonate (HCO ₃).....	42
Iron (Fe).....	.04	Sulfate (SO ₄).....	1.2
Manganese (Mn).....	.01	Chloride (Cl).....	.5
Calcium (Ca).....	10	Fluoride (F).....	.2
Magnesium (Mg).....	.5	Nitrate (NO ₃).....	.2
Sodium (Na).....	2.6	Phosphate (PO ₄).....	.29
Potassium (K).....	.8	.....	
Lithium (Li).....		.....	
(milligrams per liter)			
Dissolved solids:			
Sum.....	55	ABS.....	
Residue upon evapo- ration @ 180°C.....	59	Color.....	5
Hardness as CaCO ₃	27	.....	
Noncarbonate.....	0	.....	
pH.....	6.8	Specific conductance (micromhos at 25°C).....	65

Table 1.2.--Chemical analysis of water sampled at end of test.

NAME OF SYSTEM: Cataloochee Campground

LOCATION: Park Route #14 about
3 miles from N.C. 284

LOCATION: STATE: North Carolina COUNTY: Haywood

A. Source of Supply

Location - Reference to Permanent Landmark

Coordinates

1. A small stream

The intake is located about 250 feet upstream
from Route 14 on Upper Double Branch Stream.

Lat. N 35°37'54"
Long. W 83°05'15"

This gravity flow system serves a small primitive campground consisting of 23 campsites. A small concrete dam across the stream impounds water for the system. Storage consists of a 500-gallon rectangular aluminum tank located 200 feet down line from the intake. From the storage tank runs a one-inch line 300 feet to a single spigot in the campground. No treatment is provided and all drinking water must be boiled.

B. Consumption:

This system is not metered. The estimated annual consumption is estimated at 307,000 gallons. During the 1967 season, this area served 9,198 campers and 5,951 picnickers. During the 1968 season, this area served 8,869 campers and 5,322 picnickers.

(Cataloochee Campground - Addendum No. 1)

C. Distribution Mains and Laterals:

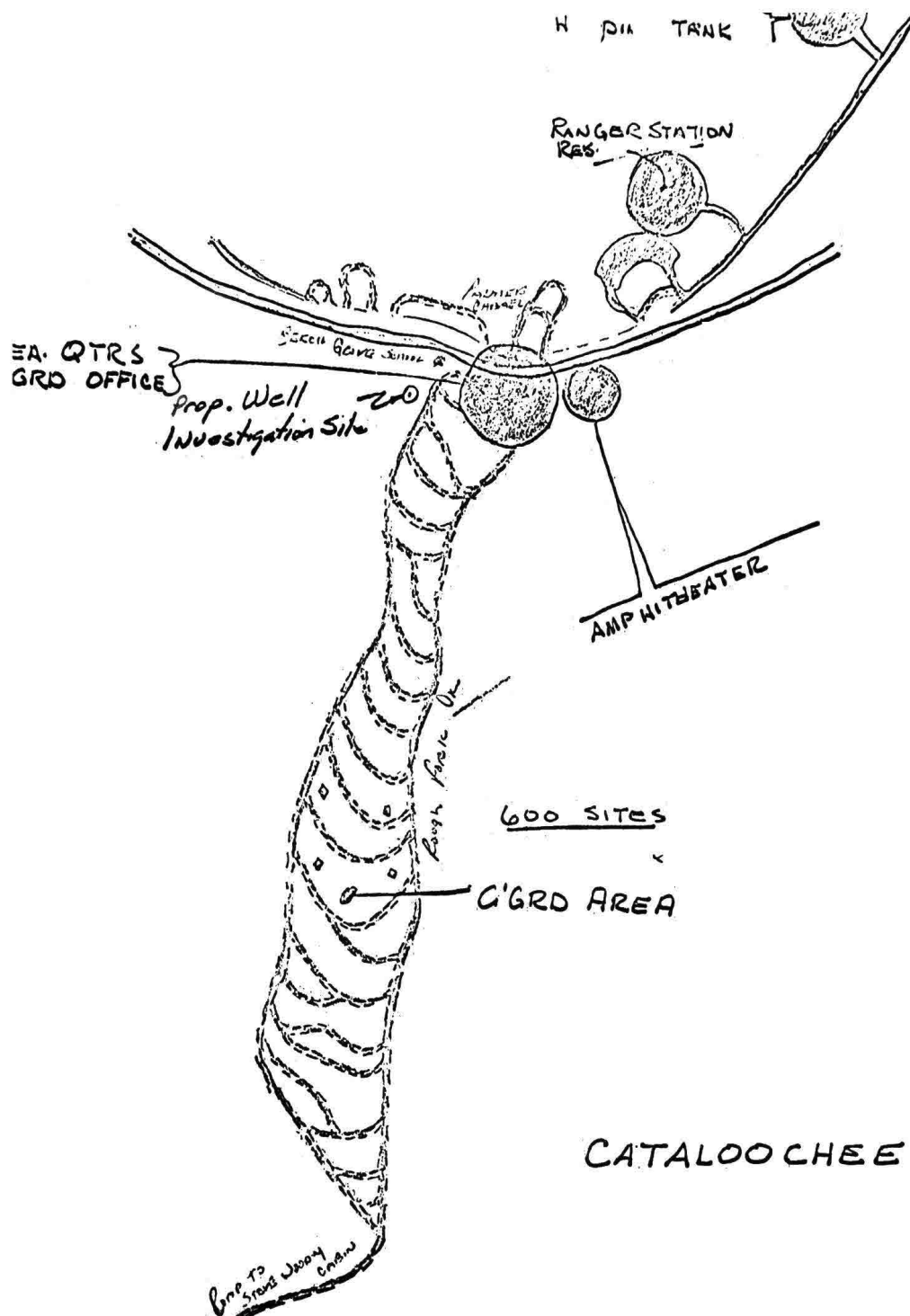
<u>Size</u>	<u>Type</u>	<u>Length</u>
1"	Galvanized Steel	500 Linear Feet

D. Problems and Proposals:

This system, at present, is not adequate for the usage it is experiencing, and the open stream is subject to contamination during the visitation period.

The Park Master Plan indicates that this campground is to be obliterated and a new site developed about one and one-half miles further down Route 14. This new site will probably involve 200 picnic sites in the first phases of development with initial construction schedules in the 1974 F.Y. A test well for a water source has already been drilled in the proposed area in June 1967; the pump test of this well indicated an output capacity of 35 gallons per minute, which would be adequate for the first phase of development except that the water is of questionable quality (See U.S.G.S. report). This well is located about 100 feet west of Rough Fork Road and 0.8 mile southwest of Palmer Chapel. In November 1968 a second 6-inch test well was drilled to a depth of 184 feet and reamed to 8 inches. The 8-inch hole was cased to 73 feet and sealed with cement. The pump test of this well indicates a possible sustained yield of 50 gallons per minute. For complete information on this well see the accompanying geologist's report. The ultimate development will include a 250 site campground, the 200 site picnic area, a residential area, campground store and visitor center.

(Cataloochee Campground - Addendum No. 1)



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)

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.

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 6-10, 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. T. 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 analyses 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.

OPTIONAL FORM NO. 10
MAY 1962 EDITION
GSA FPMR (41 CFR) 101-11.6

UNITED STATES GOVERNMENT

Memorandum

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Gatlinburg, Tennessee 37738

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5010-108

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775-7-17-65-

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SEP 14 1965

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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:
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August 23, 1965

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

Water
Grain

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.

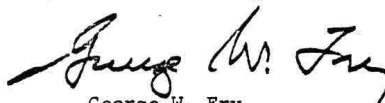
Further checks on other major supplies in the Park showed similar conditions but none as critical as that that exists in the Headquarters area. If at all possible, and if it can be worked into your Water Resources Investigation program as an emergency measure, we would like to suggest the programming 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 32

Documents Dated from 8/23/1965 to 12/11/1968

Docket Compiled: 3/29/2011