



WATER-RIGHT DOCKET

Great Smoky Mountains National Park

Docket No: 7

ANTHONY CREEK CADES COVE CAMPGROUND

Preliminary Docket Information

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

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

WATER RIGHTS DOCKET
Cades Cove Campground Area
Great Smoky Mountains National Park

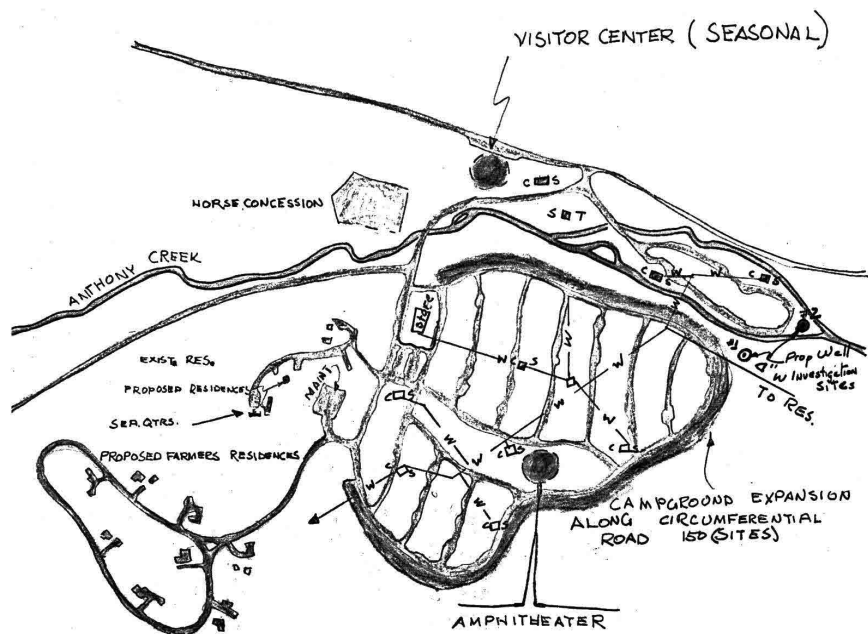
Supporting Hydro Data

CADES COVE

Situation: The Cades Cove area consists of a 224-site campground, an 84-site picnic area, a campground store, horse concessioner and employees quarters. This is a heavily used area visited by approximately 750,000 people annually. At the present time, the water supply is from an open creek that flows by gravity to a storage reservoir. Water consumption runs as high as 45,000 gallons per day and present source is sufficient (line from intake to reservoir needs replacement as it is of insufficient capacity to meet demand). The present creek source is highly vulnerable to contamination because of proximity to visitor usage and private residences that exist in vicinity of intake. There is an ultimate plan to add another 150 campground sites to this area as a Job Corps project.

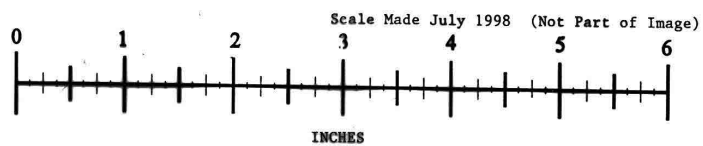
Proposed: That we drill an 8" well or combination of wells with a capacity of 50 g.p.m. minimum. If we can get this quantity, we may decide to utilize the well source for our water supply. If we receive a lesser amount, we may decide to use it to supplement existing source.

Progress to date: Wage rates have been requested for this work and we are hopeful that we can get this investigation under contract by mid-May 1966. The actual depth and location to be based on recommendations by U.S.G.S. geologists.



CADES COVE

SCALE 1"=400'



OPTIONAL FORM NO. 10
5010-104

UNITED STATES GOVERNMENT

Memorandum

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

DATE: September 20, 1966

FROM :William M. McMaster, Geologist, USGS
Knoxville, Tennessee

SUBJECT: Preliminary report, drilling and testing of Cades Cove Well.

Drilling of the Cades Cove well began on July 11, 1966, by the Jack Terry Drilling Company of Sevierville, Tennessee, using an air rotary rig with a six and one-quarter inch bit. The well site is about 150 ft northwest of the campground access road and about 0.5 mi east of the Cades Cove ranger station, at an altitude of about 1960 feet (see enclosed location map, fig. 1).

General Geologic Setting

The floor of Cades Cove is underlain by the Jonesboro Limestone of lower Ordovician age. A blanket of alluvium covers most of this area and exposures of the limestone are sparse. The surrounding mountains are underlain by much older pre-Cambrian rocks which have been thrust-faulted over the Jonesboro Limestone along the Great Smoky fault. At the well site the surface is covered by alluvial and colluvial material underlain by the Metcalf Phyllite. According to a structure-contour map in the recent report "Geology of the Western Great Smoky Mountains, Tennessee" (Neuman and Nelson, 1965: U. S. Geol. Survey Prof. Paper 349-D pl. 6) in the general area of the well site the Great Smoky fault surface should be at an altitude of about 1,900 feet.

It was anticipated that the well would penetrate perhaps 10 to 20 ft of alluvial and colluvial material above bedrock, 20 to 80 feet of Metcalf Phyllite, pass through the Great Smoky fault, and penetrate the Jonesboro Limestone, in which it was thought that sufficient solution openings might be penetrated to yield the 50 gpm desired. The static water level was not expected to be more than 20 ft below land surface, which is only a few feet higher than the bed of Anthony Creek, less than 200 ft away.

Drilling

Contrary to expectation, the well penetrated 40 ft of alluvial and colluvial material and 65 ft of residual clay (see enclosed lithologic log and columnar section (fig. 2), before reaching the top of bedrock, which consisted of fairly fresh to very weathered phyllite. At a depth of 185 feet, which was to have been the maximum depth, the well was still in phyllite and was yielding only about 10 gpm. The weathered nature of the phyllite indicated that additional water might be gained with depth and permission was obtained to continue drilling to 350 ft.

A water-bearing zone of quartz sand and gravel was penetrated between 295 and 307 ft. The material appeared to be nearly unconsolidated and very weathered but there was no indication of caving during drilling. At this depth, the drilling rig was blowing a measured 20 gpm from the well. Between 307 and 349 ft the well penetrated weathered phyllite. Mixed with the cuttings of phyllite were thin plates of white quartz that showed evidence of fault movement. At a depth of 349 ft the well penetrated a zone of fluid sand and gravel. This material began to flow into and accumulate in the well. Its hydrostatic pressure was great enough to stop the operation of the rig's air hammer. The material was blown and washed from the hole for about four hours in an attempt to get back to the 350-ft depth, but this was unsuccessful since the air hammer was unable to function. At this time the rig was blowing a measured 30 gpm from the hole. The drilling operation was stopped on July 14.

On July 21 a gamma-ray log was made on the well and in logging the well it was found that the fluid sand and gravel had accumulated to within 302 ft of land surface. The water level was 185 ft below land surface.

On August 2, a cable tool rig was used in an effort to remove the accumulated material. A total of 10 hours was spent in attempting to agitate the material with the drilling tools and pick it up in the bailer bucket. The material was so coarse that it settled before the bucket could pick it up, and the well was deepened only to 311 ft. At this time a gravel pack, consisting of 8 cubic feet of limestone gravel was placed in the well and tamped, as a means of preventing further accumulation. This brought the bottom of the hole to 302 ft.

Pumping

Considerable difficulty was had in pumping the well, largely because of inadequate pump capacity against the 175 to 190 ft head and an improperly-adjusted generator. The following is a summary of the pumping history.

After burning out a 5-hp pump in the well on August 4, the driller replaced it with a 2-hp pump, set at 250 ft. This pump was used on August 5 for developmental pumping although it would deliver only 30 gpm against the 186-ft head. Some development apparently occurred, as indicated by the erratic water levels in the first hours of pumping (fig. 3). The discharge of 30 gpm caused a drawdown of only 1.3 ft and the driller was told that a pump capable of delivering at least 50 gpm must be installed for the pumping test.

August 15.--The driller informed the USGS representative that a 5-hp pump had been placed in the well, and that he had run the pump at 60 gpm for less than one-half hour. According to the driller this pumpage had caused an inflow of sand and gravel which accumulated up to the pump intake set at a depth of 250 ft. He had pulled the pump and cleaned the well with a cable-tool rig, to the top of the original gravel pack. He had then reset the pump, which had been run for a short while at 30 gpm. According to the

driller the well should not be pumped at more than 30-35 gpm; otherwise it would refill with sand and gravel.

On August 15 the well was pumped at the valve setting left by the driller, which was 30 gpm. After four hours of pumping water with no sediment or turbidity it was decided to increase the discharge. It was found that the gate valve was completely open. The driller's representative did not know how the reported discharge of 60 gpm had been obtained. Pumping was continued for four more hours and a water sample for chemical analysis was taken. Results of this pumpage are shown in fig. 4.

On August 16, the driller and the USGS representative met with Mr. Rowe to discuss billing by the driller for work performed and future work on the Cades Cove well. It was learned during this meeting that the driller had misinformed the Geological Survey about conditions in the Cades Cove well. What had actually occurred was that rocks from the wall of the hole at a depth of about 200 feet had prevented setting of the pump. The pump had been removed and a cable tool rig was used to drive the rocks to the bottom of the hole, break them up, and bail out the cuttings. No inflow of sand and gravel had occurred.

It was agreed at this meeting that the driller would install another pump of at least 50 gpm capacity and pump the well for one hour, without charge. It was also agreed that he would install 302 ft of 5-1/2 inch galvanized slotted casing to stabilize the walls of the hole.

A 5-hp pump was set in the well and on September 6, the well was pumped again. This pump would lift only 40 gpm (see fig. 5). Two other pumps were installed before it was discovered that the generator was improperly adjusted.

On September 15, the well was tested for one hour at 60 gpm. Results of this test (fig. 6) showed a drawdown of only 3.5 ft, or a specific capacity of 17 gallons per minute per foot of drawdown at 60 gpm.

After completing the hour of pumping, the pump was pulled and 302 ft of 20-gauge galvanized slotted casing was installed. The lower 192 ft of this casing is slotted, and is in 3-ft sections, joined by threads. The upper 110 ft is in 10-ft sections and is not slotted.

Water Quality

Measurement of the specific conductance of the water sample obtained on August 15 showed a value of 48. The pH was 6.2. A copy of the chemical analysis will be sent to National Park Service when it is received from the Geological Survey's Water Quality Laboratory.

Summary

The Cades Cove well will yield at least 60 gpm on a continuous basis. The static water level during the period July-September varied between 175 and 185 ft below land surface. It is believed that the well is now safe for use; as there has been no further evidence of inflow of sand and gravel from the bottom of the hole since the gravel pack was placed. Also, there has been no further evidence of unstable walls following the difficulty in setting the third pump. If in the future the pumping water level declines, it will probably occur because of corrosion or encrustation of the slotted casing. It is believed that in this event, the slotted casing can be permanently removed without danger of further accumulation of material in the hole.

William M. McMaster

William M. McMaster

OPTIONAL FORM NO. 10
5010-104

UNITED STATES GOVERNMENT

Memorandum

TO : Gerald A. Rowe, Maintenance Superintendent DATE: November 30, 1966
Great Smoky Mountains National Park

FROM : William M. McMaster, Geologist, USGS, WRD
Knoxville, Tennessee

SUBJECT: Test pumping Cades Cove Well, November 28, 1966

Final test pumping of Cades Cove Well was done on November 28, 1966. The test pump, a 5-hp submersible, was set and operated by the Jack Terry Drilling Company of Sevierville, Tennessee. The pump was set at a depth of 210 feet.

Although the work order called for a discharge of 50 gpm, the pump could deliver 90 gpm, so I decided to run the test at pump capacity. As shown on the enclosed plot, the drawdown was about 6.5 feet. The static water level was 167.7 feet below land surface, higher than those of previous tests, but I am sure the drawdown would be very similar regardless of seasonal position of the water table. The pumping water level in this well is quickly established, is stable, and recovery is rapid. Almost 40,000 gallons was removed from the aquifer during the test. It is evident that the well can provide, if necessary, the total present maximum requirement of 45,000 gpd for the Cades Cove Campground.

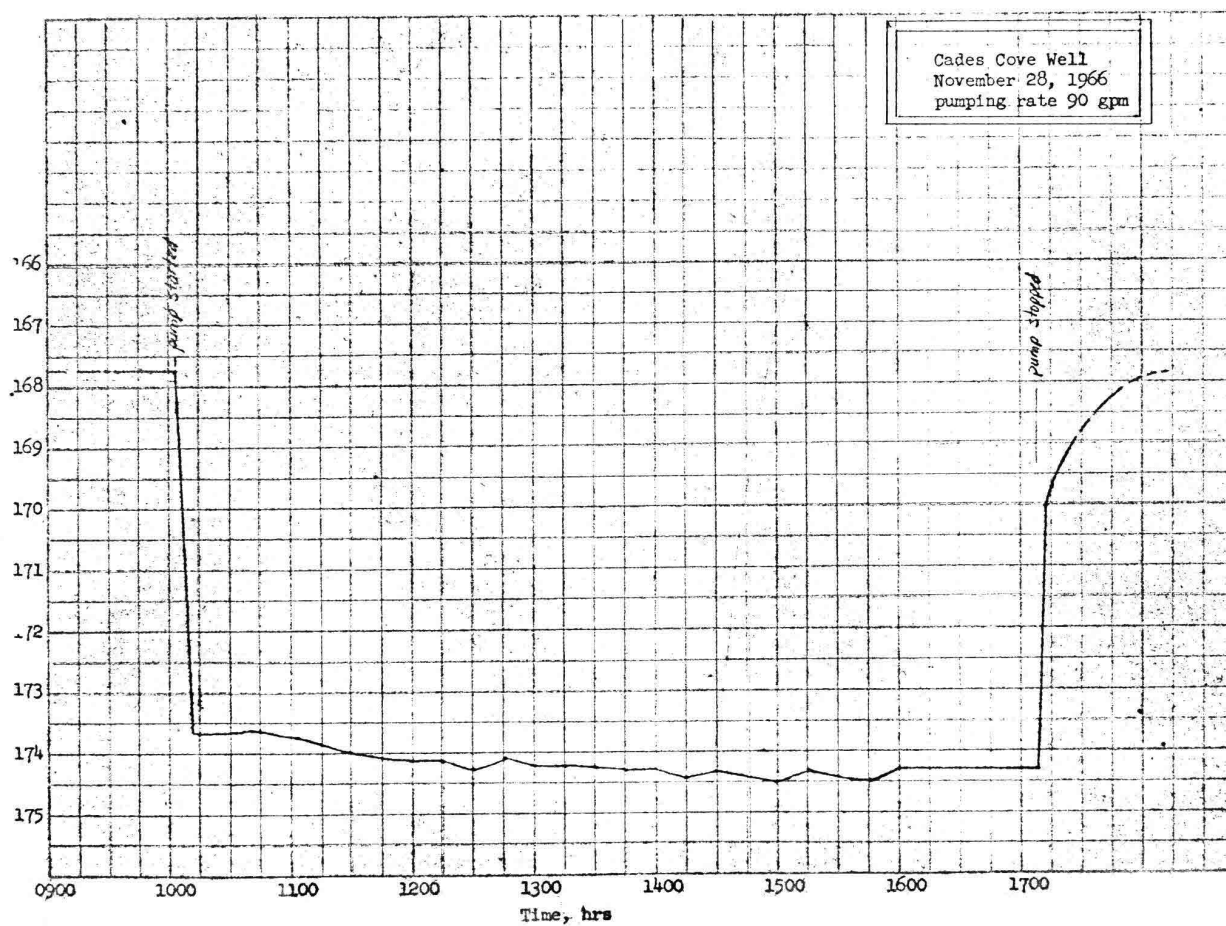
I am enclosing a plot showing drawdown of the well for the four levels of discharge at which it has been pumped. I am planning to put a continuous recorder on the well to find out how it responds to rainfall and to get some idea of the range of variation in water level.

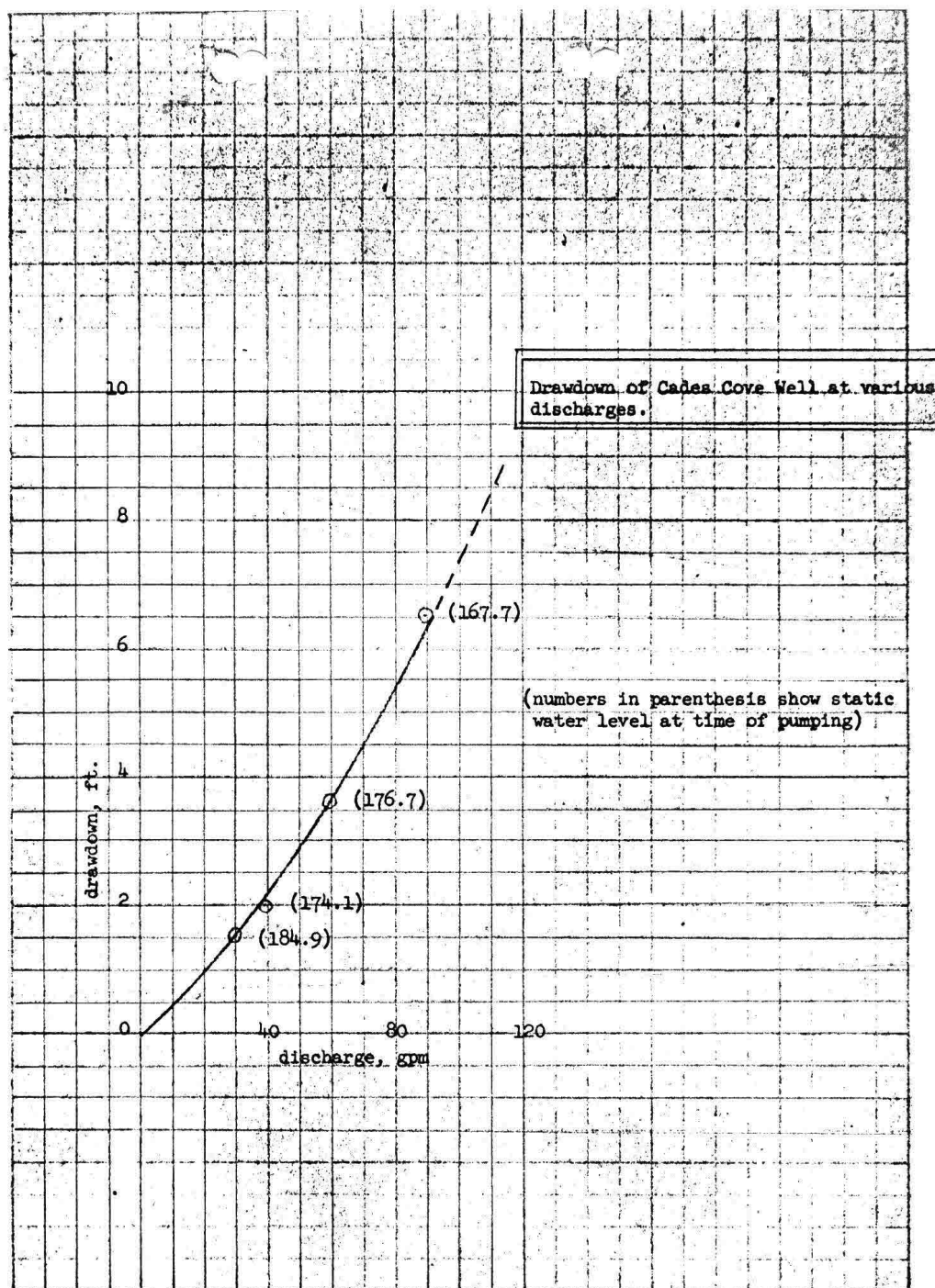
The pumping time on the 28th was 7 hrs 10 minutes. I stopped the test at 1715 hrs because of darkness and snowfall. I believe that Terry should be paid the full amount, however, as it was my decision to stop.

WMM

William M. McMaster

WMM
GREAT SMOKY MOUNTAINS
NATIONAL PARK
GATLINBURG, TENNESSEE
RECEIVED
DEC 1 1966





NAME OF SYSTEM: Cades CoveLOCATION: Cades CoveLOCATION: STATE: Tennessee COUNTY: BlountA. Source of SupplyLocation - Reference to Permanent LandmarkCoordinates1. Anthony Creek

Approximately 1,300 feet upstream from bridge crossing to the reservoirs.

Lat. N 35°35'43"
Long. W 83°45'52"

Gravity system with intake connected to three reservoirs (51,000 gallon capacity) by 2,548 feet of 2" galvanized pipe. The intake is at elevation 2,155 with reservoir at elevation 2,083 which allows inflow of 28 gallons per minute. There is a second 2" galvanized line that is old and fairly encrusted which reduces its capacity to about 18 gallons per minute. These lines are parallel and cross connected, and it is possible to get a total inflow into the reservoir at an estimated flow of 38 gallons per minute (54,000 gallons per day). Chlorination is the only treatment.

2. Deep Well

1,200 feet east of Cades Cove Store just left of campground road in proximity of Anthony Creek at elevation 1,960

Lat. N 35°36'17"
Long. W 83°46'12"

Deep well drilled to 311 feet, reduced to 302 feet with gravel packed well cased with 302 feet of 5" ID casing (lower 192 feet is slotted) to stabilize walls of well. Pumping water level at 90 gallons per minute, pump test was at elevation 1,785; water has a pH of 6.2.

B. Consumption:

Maximum daily - 54,000 gallons

Maximum monthly - 1,117,000 gallons

Maximum annual - 7,187,000 gallons

METER READINGS - 1966 OPERATING SEASON

Breakdown according to usages:

Month (Consumption in 1,000 gal.)	<u>Jan</u>	<u>Feb</u>	<u>Mar</u>	<u>Apr</u>	<u>May</u>	<u>June</u>	<u>July</u>	<u>Aug</u>	<u>Sept</u>	<u>Oct</u>	<u>Nov</u>	<u>Dec</u>	<u>Totals</u>
Campers (110,900)	5	6	11	117	168	450	617	533	176	110	15	8	2,216
Picnickers (92,300)	2	3	7	26	38	69	85	63	30	36	7	3	369
Residents	40	36	32	51	54	87	91	95	87	90	51	48	762
Unaccounted	<u>30</u>	<u>20</u>	<u>10</u>	<u>176</u>	<u>442</u>	<u>352</u>	<u>218</u>	<u>239</u>	<u>270</u>	<u>284</u>	<u>66</u>	<u>55</u>	<u>2,162</u>
TOTALS	77	65	60	370	702	958	1,011	930	563	520	139	114	5,509

During the 1966 season, this system served 110,900 campers and 92,300 picnickers as well as
8 trailers, 3 residences, a campground store, and a horse concession.

(Cades Cove Campground Area - Addendum No. 1)

METER READINGS - 1967 OPERATING SEASON

Breakdown according to usages:

Month (Consumption in 1,000 gal.)	<u>Jan</u>	<u>Feb</u>	<u>Mar</u>	<u>Apr</u>	<u>May</u>	<u>June</u>	<u>July</u>	<u>Aug</u>	<u>Sept</u>	<u>Oct</u>	<u>Nov</u>	<u>Dec</u>	<u>Totals</u>
Campers (94,302)	7	3	49	98	119	376	427	465	186	125	27	3	1,885
Picnickers (92,904)	1	2	7	34	16	78	74	96	26	32	4	1	371
Residences	50	48	33	31	33	63	65	65	21	33	31	33	506
Unaccounted	<u>25</u>	<u>12</u>	<u>43</u>	<u>406</u>	<u>357</u>	<u>259</u>	<u>273</u>	<u>316</u>	<u>336</u>	<u>405</u>	<u>128</u>	<u>50</u>	<u>2,610</u>
TOTALS	83	65	132	569	525	776	839	942	569	595	190	87	5,372

During the 1967 season, this system served 94,302 campers and 92,904 picnickers as well as 8 trailers, 3 residences, a campground store, and a horse concession.

METER READINGS - 1968 OPERATING SEASON

Breakdown according to usages:

Month (Consumption in 1,000 gal.)	<u>Jan</u>	<u>Feb</u>	<u>Mar</u>	<u>Apr</u>	<u>May</u>	<u>June</u>	<u>July</u>	<u>Aug</u>	<u>Sept</u>	<u>Oct</u>	<u>Nov</u>	<u>Dec</u>	<u>Totals</u>
Campers (95,402)	3	2	12	145	129	343	435	451	198	174	14	--	1,906
Picnickers (135,869).	--	--	1	14	31	103	116	118	84	71	5	--	543
Residences	33	30	33	31	33	31	33	33	31	33	31	33	385
Unaccounted	<u>160</u>	<u>493</u>	<u>254</u>	<u>258</u>	<u>313</u>	<u>310</u>	<u>441</u>	<u>515</u>	<u>498</u>	<u>574</u>	<u>140</u>	<u>397</u>	<u>4,353</u>
TOTALS	196	525	300	448	506	787	1,025	1,117	811	852	190	430	7,187

During the 1968 season, this system served 95,402 campers and 135,869 picnickers as well as an 11-unit trailer court, 3 residences, a campground store and a horse concession.

(Cades Cove Campground Area - Addendum No. 1)

C. Distribution Mains and Laterals:

<u>Size</u>	<u>Type</u>	<u>Length</u>	<u>Size</u>	<u>Type</u>	<u>Length</u>
6"	Cast Iron	1,515 Lineal Feet	3"	Galvanized	100 Lineal Feet
4"	A. C.	1,685 Lineal Feet	1"	Galvanized	147 Lineal Feet
4"	Cast Iron	274 Lineal Feet	3/4"	Galvanized	1,014 Lineal Feet
4"	Galvanized	2,068 Lineal Feet	1"	Plastic	831 Lineal Feet
2"	Galvanized	7,038 Lineal Feet	3/4"	Plastic	202 Lineal Feet
TOTAL 14,874 Lineal Feet					

D. Problems involving present system:

The maximum daily demand for Cades Cove Area exceeded 45,000 gallons per day during the 1966 season, and the new intake line (installed in 1964) was capable of only 28 gallons per minute, so the park cross-connected this line with the old line and was able to increase reservoir inflow to 38 gallons per minute (54,000 gallons per day). The creek supply, while more than ample, is highly vulnerable to visitor contamination, heavy damage to intake during high water, etc.

(Cades Cove Campground Area - Addendum No. 1)

E. Proposed Improvements:

If we are to retain the gravity system, it is apparent that we will have to increase the water line capacity, between the intake and the reservoir before long. However, with the excellent producing deep well, it appears desirable that we consider the development of this as our supply and retain the gravity system for stand-by. This improvement is now in a tentative 1970 F.Y. construction program.

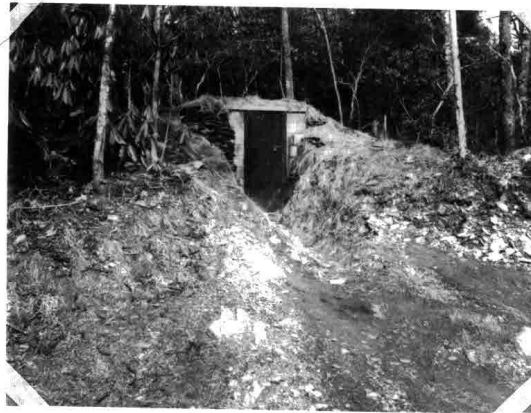
F. Benefits expected from above improvements:

The capacity of the deep well system should be more than sufficient to handle all future anticipated loads and should eliminate numerous operational problems brought on by spring floods, etc.

G. Ultimate Annual Consumption:

The Master Plan calls for increasing the campground size by another 26 group sites (200-300 capacity) and 8 more units of seasonal quarters. These new facilities along with other increased loadings will result in an ultimate annual water consumption of 8,000,000 gallons for the area. During the 1968 season, an 11-unit employee trailer court was constructed and put into service. It is estimated that this facility adds approximately 3,500 gallons per day to area usage, when full.

(Cades Cove Campground Area - Addendum No. 1)



NEW CHLORINATOR HOUSE SERVING
CADES COVE CAMPGROUND



THREE RESERVOIRS WITH A COMBINED CAPACITY OF 51,000 GALLONS
SERVING CADES COVE CAMPGROUND



WATER INTAKE ON ANTHONY CREEK
SERVING CADES COVE CAMPGROUND

B. Consumption:METER READINGS - 1969 OPERATING SEASON

Breakdown according to usages:

Month (Consumption in 1,000 gal.)	<u>Jan</u>	<u>Feb</u>	<u>Mar</u>	<u>Apr</u>	<u>May</u>	<u>June</u>	<u>July</u>	<u>Aug</u>	<u>Sept</u>	<u>Oct</u>	<u>Nov</u>	<u>Dec</u>	<u>TOTALS</u>
Campers (73,991).....	--	--	--	--	31	337	353	363	189	184	20	2	1,479
Picnickers (98,929).....	--	--	--	--	25	69	80	78	69	73	2	--	396
Residences (3).....	33	29	33	32	33	32	33	33	32	33	34	34	391
House Trailers (7).....	43	39	43	42	43	42	43	43	42	43	40	43	506
Unaccounted.....	889*	157	6	27	418	449	343	389	440	588	7	99	3,812
TOTALS.....	965	225	82	101	550	929	852	906	772	921	103	178	6,584

During the 1969 season, this system served 73,991 campers, 98,929 picnickers, 3 residences, 7 house trailers, a campground store and a horse concession.

*Large volume of water due to excessive leaks which were repaired during the following month.

METER READINGS - 1970 OPERATING SEASON

Breakdown according to usages:

Month (Consumption in 1,000 gal.)	<u>Jan</u>	<u>Feb</u>	<u>Mar</u>	<u>Apr</u>	<u>May</u>	<u>June</u>	<u>July</u>	<u>Aug</u>	<u>Sept</u>	<u>Oct</u>	<u>Nov</u>	<u>Dec</u>	<u>TOTALS</u>
Campers (91,351).....	2	2	19	84	179	307	384	367	234	199	50	10	1,837
Picnickers (99,451).....	--	--	--	17	23	59	72	85	61	72	8	--	397
Residences (3).....	33	29	33	32	22	21	22	11	21	33	32	33	322
House Trailers (7).....	43	39	43	42	43	42	43	43	42	43	42	43	508
Unaccounted.....	21	70	117	339	236	275	273	299	328	356	17	4	2,335
TOTALS.....	99	140	212	514	503	704	794	805	686	703	149	90	5,399

During the 1970 season, this system served 91,351 campers, 99,451 picnickers, 3 residences, 7 house trailers, a campground store and a horse concession.

(Cades Cove Campground Area - Addendum No. 2)

(2/8/71)

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.

Bill

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 6-8, 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
ARC 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

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

X *Laurel + Water*
Point

Memorandum

To: Regional Director, Southeast Region

From: Superintendent, Great Smoky Mountains *lost side*

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.

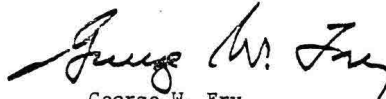
Further checks on other major supplies in the Park showed similar conditions but none as critical as that that exists in the Headquarters area. If at all possible, and if it can be worked into your Water Resources Investigation program as an emergency measure, we would like to suggest the programming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



UNITED STATES
DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

Great Smoky Mountains National Park
Gatlinburg, Tennessee 37738

Y REFER TO:
L54

August 23, 1965

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

X *East Water*
Point

Memorandum

To: Regional Director, Southeast Region

From: Superintendent, Great Smoky Mountains *East Side*

Subject: Water Resources Investigations, Great Smoky Mountains National Park

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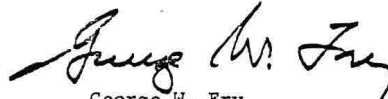
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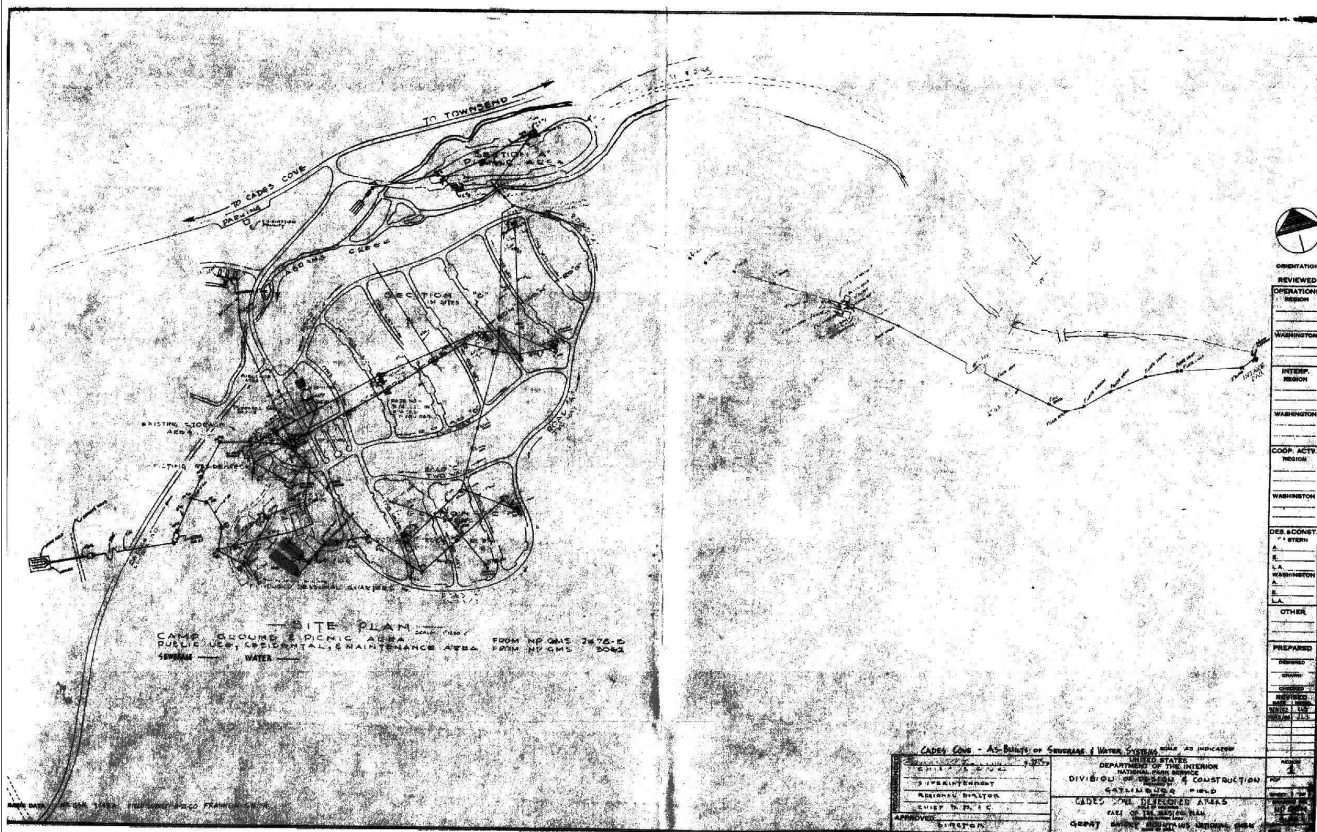
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George W. Fry



Docket Information

Number of Documents in Docket 32

Documents Dated from 8/23/1965 to 2/8/1971

Docket Compiled: 3/29/2011