



WATER-RIGHT DOCKET

Jewel Cave National Monument

Docket No: 2

HEADQUARTERS AREA WELL.

Preliminary Docket Information

00-00-0000: water right record

WATER RIGHT RECORD

Park: JECA

Docket Number:
Federal #2

IDENTIFICATION NO: JECA W 0 2 0 4 0 2 B F 0 2

DITCH/WATER SYSTEM: Headquarters Area

SOURCE OF SUPPLY: Well

LOCATION: 1200 ft. from the E½ Cor. Sec. 2, T4S, R2E, at an angle of
55°05'NW from the sec. line between the E½ Cor. and the NE Cor.

WATER RIGHT:

Appropriator: United States of America, National Park Service

Application/Permit Number: 522-2

Certificate Record Number:

Date of Priority: February 25, 1959

Quantity of Water: ~~0.11 c.f.s.~~ 0.02 awarded by State (see enclosed documents)

Purpose: Domestic and public primary combination

Irrigated Land Description:

SUMMARY OF STATUS: This is a Federal water right consisting of a well, reservoir and distribution system.

The well was completed September 26, 1959, cased and capped. There was a drought in July, 1961, which necessitated hauling water. A pump was purchased in 1962. This water system is now being used in place of the spring.

Note To File:

This docket was reviewed on 4-3-96, by A. Hutzinger. Since 50 documents were deemed superfluous to the docket. These documents were removed and filed in the WRD-Resource Room, under title of "JECA: Miscellaneous Documents, Removed from JECA W.Rights Docket No. 2"

DOCKET INFORMATION SHEET

Docket Identity	JEGA W 02 04 02 B F 02
Region	ROCKY MOUNTAIN
Area	JEWEL CAVE NATIONAL MONUMENT
Site	HEADQUARTERS AREA
State	SOUTH DAKOTA
County	CUSTER
Docket	JEGA WATER RIGHT DOCKET 2
Location	T4S R2E SEC 2
Acquired by	APPROPRIATION
Application	522-2
Permit	
Certificate	
Priority	FEBRUARY 25 1959 - 0.11 CFS
Reservation	FEBRUARY 7 1908
Status	ACTING FEDERAL
Source	GROUND WATER
Use	DOMESTIC AND PUBLIC PRIMARY COMBINATION
Quantity	0.11 CFS
Hydrologic Unit	10120107
Remarks	WELL COMPLETED ON SEPTEMBER 26 1959 CASED AND CAPPED A PUMP WAS PURCHASED IN 1962 THE WATER SYSTEM IS NOW BEING USED IN PLACE OF THE SPRING

No. 522-2



**Department of
Water & Natural Resources**

Joe Foss Building Water Rights Division
Pierre, South Dakota 57501

(605) 773-3352

June 17, 1981

7

US Nat'l Park Service
Wind Cave Nat'l Park
Hot Springs SD 57747

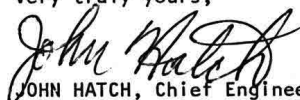
Dear Sirs:

Enclosed herewith are, Water License No. 522-2 and Certificate of Construction.

Water License No. 522-2 is the final water right document completing your process of obtaining a water right.

As long as you use the water beneficially, as stated in the Water License, the State Water Laws provide that you have a continuing right to use the water.

Very truly yours,


JOHN HATCH, Chief Engineer
Water Rights Division

JH: kw

enclosures

WNR-817-7/79
Transmittal of Water License

Permit No. 522-2

Water Division No. 2 Upper Cheyenne Water District

CERTIFICATE OF CONSTRUCTION

This is to Certify, That the U.S. National Park Service, Wind Cave National Park,
Hot Springs, SD

the holder s. of
Permit No. 522-2, issued upon Application No. 522-2, bearing date of priority of February 25,
1975 authorizing the diversion of .02 cu. ft. per second of the waters of groundwater (one well) County of Custer, State of South Dakota at a point 1200 feet from E $\frac{1}{4}$ Corner, Section 2, T4S, R2E at an angle of 55°
05' northwesterly from the section line between E $\frac{1}{4}$ corner and the NE corner
of the same Sec 2, for domestic and public recreational

purposes, ha^{ve} complied with the provisions of the laws of the State of South Dakota relating to proof of completion of the works of diversion set out and described in said Permit; that said works are found in satisfactory condition for diverting and conveying to the place of intended use .02 cu. ft. per second of water.

Date March 16, 1981


JOHN HATCH, Chief Engineer
Water Rights Division

Form 16.

STATE OF SOUTH DAKOTA

WATER LICENSE NO. 522-2

(1) WHEREAS, On the 25th day of February A. D. 19 59
the US National Park Services, Wind Cave National Park,
Hot Springs, SD
 made Water Right Application No. 522-2 for a permit to use .11 cubic feet per second of the waters
 of groundwater (one well)
 County of Custer, State of South Dakota, for domestic and public
purposes; and
 (2) WHEREAS, On the 8th day of April A. D. 19 59
 Permit No. 522-2, with a date of priority of February 25, 1959
 was issued to said applicant S for the diversion of said water, and provided for the completion of construction of the water
 supply system therein described on or before the 8th day of April A. D. 19 60 and for the
 application to beneficial use of said water on or before the 8th day of April A. D. 19 61

and:

(3) WHEREAS, It is hereby certified that the applicant has complied with the provisions of the laws of the State of South Dakota
 relating to completion of the construction of the water supply system and is entitled to divert .02 cubic feet
 per second of water for beneficial use and,

(4) WHEREAS, It is hereby certified that the applicant has complied with the provisions of the laws of the State of South Dakota
 relating to the application of water to beneficial use of the following extent,
water supplies for domestic, public recreational, fire protection, wildlife
watering for use at Jewel Cave National Monument

(5) NOW, THEREFORE, By the virtue of the authority vested in us by the laws of the State of South Dakota, We hereby grant and confirm to U.S. National Park Service, Wind Cave National Park

_____ of Hot Springs
the holder S and owner S of said permit No. 522-2 a water right, dating from February 25, 1975
_____ to use of .02 cubic feet per second of the waters
of groundwater (one well)

in the County of Custer and State of South Dakota, or so much thereof as may be necessary for the purposes hereinbelow mentioned, to be diverted at a point 1200 feet from E $\frac{1}{4}$ corner, Section 2, T4S, R2E
at an angle of 55° 05' northwesterly from the section line between E $\frac{1}{4}$ corner and
the NE corner of the same Section 2

and conducted ~~to and upon~~ through the Jewel Cave National Monument's distribution
system.

for the purpose of domestic and public recreational use

Subject to any limitations listed in Water Right Permit No. 522-2 and subject to the laws of the State of South Dakota.

WITNESS, My hand and seal of our office at Pierre, South Dakota
this 16th day of March A. D.
Nineteen Hundred and Eighty-One

WATER MANAGEMENT BOARD

By:

John Hatch
Chief Engineer, Executive Officer
JOHN HATCH

RECEIPT

WATER RIGHTS COMMISSION
State of South Dakota

No 4 7975

PIERRE, February 9, 1981RECEIVED OF U.S. of America, Nat'l Park Service, Wind Cave Nat'l Park, Hot Springs, SD
the following amount in fees for services rendered as provided for by law: 57747

Fee for Application for Permit to Appropriate Water No. (examination, processing, recording and filing)	
Fee for inspecting Construction, and issuing Cert. of Construction No. <u>522-2</u>	----- 12.00
Fee for inspecting Beneficial Use, and issuing Water License No. <u>522-2</u>	
Fee for issuing Location Certificate-Dry Draw, No.	
Fee for filing	
Fee for certified copy of	
Fee for Print copy of map	
Fee for Certifying	
Fee for	
(any other work as provided by law)	
TOTAL	12.00

WATER RIGHTS COMMISSION

By John Hatch
Chief Engineer, Executive Officer
JOHN HATCH / CH

COMMISSION

A. E. Bierwagen, Mitchell
E. M. Brady, Mitchell
Carl Cronin, Gettysburg
Lauren A. Davis, Belle Fourche
John Morrison, Wakonda
Paul Russell, Edgemont
John Sutton, Onida

522-2

WR copy

J. W. GRIMES
Chief Engineer
and
Executive Officer

SOUTH DAKOTA

State Water Resources Commission

STATE OFFICE BUILDING

PIERRE, SOUTH DAKOTA

September 30, 1959

Mr. Earl M. Semingsen
Wind Cave National Park
Hot Springs, South Dakota

Reference L 54

Dear Mr. Semingsen:

As requested in your letter of September 18, 1959 (Application for Permit to Appropriate Water #522-2, Jewel Cave National Monument), four copies of Application and Permit 522-2 are enclosed. The name of the water right holder has been changed to "United States of America, National Park Service."

The map supplied as part of Application 522-2 shows Drawing No. NM-JC 5300-C.

Fees required for issuing the copies of the above Application and Permit are \$1.75 each. Please send voucher or check in amount of \$7.00 to cover.

Sincerely,

J.W. GRIMES
Chief Engineer

JWG:pt

Form 2--Application for Permit to Appropriate Water--Original

No. 522-2Water Division No. 2 Fall River District
(Blanks to be filled by the Engineer for the W. R. C.)

APPLICATION FOR PERMIT

Map No. 507-2

To Appropriate Water within the State of South Dakota

1. Name of applicant United States of America, National Park Service
Jewel Cave National Monument, South Dakota
 Postoffice address Wind Cave National Park
Hot Springs County Custer State South Dakota

I. If a corporation U.S. Government(a) Name of same National Park Service, Department of Interior(b) Date and place of incorporation Monument established 1908(c) Amount of capital stock Does not apply(d) Amount paid in Does not apply(e) Names and addresses of directors Conrad L. Wirth, Director, NPS, Washington, D.C.,
Howard W. Baker, Regional Director, Region Two, Omaha, Nebraska, Earl M. Semingsen,
Superintendent, Wind Cave National Park, and Superintendent, Jewel Cave National
Monument.

(NOTE--A certified copy of articles of incorporation must accompany the application.)

II. Method of accomplishing the work and financial resources of the applicant:

(a) Method of accomplishing work (Whether by contract, employment of others, or by direct labor)

By contract to lowest and responsible bidder(b) Cash on hand, \$ -----(c) Treasury stock, \$ -----(d) Bonds to be issued, \$ -----(e) Other resources, \$ -----2. Name of diversion work Jewel Cave National Monument well3. Amount of water claimed 50 G.P.M. or 0.11 cubic feet per second4. Source of water supply Deep well5. Location of point of diversion 1200 feet from the E₁ Cor., Sec. 2, T 4S, R 2E at an angle of
52°05' northwesterly from the section line between the E₁ Cor.,
and the NE Cor., of the same Sec. 2. In Hell Canyon or near it on Jewel Cave
National Monument, Sec. 2 T 4S, R 2E on Custer County.6. Annual period or periods during which water is to be used All year depending on use of National
Monument.

7. To be used for:

I. Irrigation or domestic use: Gravity, overhead sprinkling or combination system? Domestic and Public
Primary combination(a) Number of acres to be irrigated less than one acres.(b) Legal subdivisions to be irrigated see map, Headquarters Area(NOTE--A list of lands to be irrigated, giving each subdivision and fraction with acreage thereof, should be written here, or may be
appended as a part of this application. Same must also be shown on accompanying map.)(c) Statement as to domestic use (giving location, etc.) For public visitor use and domestic
use for Monument employee staff

II. Stockwatering, mining, milling, power, fish culture, fire protection and public recreation:

(a) Nature of use Fire protection, Wildlife watering, Public visitor use and
domestic use.(b) Amount of power to be generated None horse power.Amount claimed for engine cooling None(c) Location of plant None(d) Method of developing power Black Hills Electric Cooperative power now at Monument;
Line will be run to well by Government(e) Point where water will be returned to stream Sewage disposal system to operate in
tributary gulch of Hell Canyon.

for A. W. K. H. H.
R. J.

8. Estimated cost of work:

(a) Head Gates, \$----- (b) Pumping plant, \$-----
 (c) Fluming, \$----- (d) Canal-earth, \$----- Rock, \$-----
 (e) Other structures Costs not known \$----- Total, \$2,000 Approx.

9. Description of diversion works:

I. Nature of works: (Reservoir, dam, ditch, flume, pumping plant, etc.)

Water well and reservoir planned

II. Dimensions of works:

(a) Dam: Height, ----- feet; length at bottom ----- feet; length at top ----- feet; thickness at bottom ----- feet; thickness at top ----- feet; slope at front water face -----; slope at back face -----
 material used in construction -----
 (b) Reservoir: Capacity when filled depends on well/ production ----- acre feet. Surface area at highwater mark ----- acres.

DEPTH AT OUTLET- FEET	SURFACE AREA AT EACH DEPTH AT OUTLET--ACRES	FEET ACRE- FEET CAPACITY
	Does not apply	

(c)* Head gate: Width ----- feet; height ----- feet;
 Material -----

(d) Canal: Total length ----- miles.

LOCATION BELOW HEADGATE	DEPTH	BOTTOM WIDTH	WIDTH AT WATER-LINE	GRADE PER MILE
At ----- Mile	----- feet	----- feet	----- feet	----- feet
Does not apply				
At ----- Mile	----- feet	----- feet	----- feet	----- feet
At ----- Mile	----- feet	----- feet	----- feet	----- feet
At ----- Mile	----- feet	----- feet	----- feet	----- feet
At ----- Mile	----- feet	----- feet	----- feet	----- feet
At ----- Mile	----- feet	----- feet	----- feet	----- feet

(Give dimensions where reductions in size are made.)

10. Time required for completion of work 90 days 1 ----- years.

11. Time required for complete application of water to the proposed beneficial use one ----- years.

12. Choice of newspaper for publication of notice of intention to appropriate Custer County Chronicle

STATE OF SOUTH DAKOTA

County of ----- } ss.

I, Earl M. Semingsen, Supt., Wind Cave National Park, being first duly sworn on my oath depose and say: That my relation to the above described undertaking is that of owner, that I have read the above foregoing statement, examined the map accompanying the same, and that I know of my own personal knowledge that the matters therein stated and shown are true.

Signed /s/ Earl M Semingsen, Supt.

Subscribed and sworn to before me this 20 day of February 1959

Legally appointed representative of the
 Notary Public (or other qualified officer.)
 Department of the Interior

*Each diversion must have a headgate or measuring device.

Form 2A — Wells (Supplement to Form 2)

9. (Continued)

III. Well Specifications

(a) Hole and casing

Size of drill hole or excavation 6-inch, Depth up to 700' max.Type of casing Black steel pipe
(wood, concrete, steel, etc.)Size of casing 6-inch (I.D.)
12-inch, Thickness of casing Nominal 0.280
0.375Length of casing If collection gallery, length, size and depth of
gallery

(b) Screens

Type of perforated screen NoneSize of perforated screen None
(diameter) (length)Thickness of gravel pack unknown, length of gravel pack unknown

(c) Water Bearing Materials

Distance to water unknown, Character of water bearing materials Deadwood FormationThickness of water bearing material unknown

(d) Pump and Motor

Type of pump Submersible, planned for installation
(centrifugal, propeller, mixed flow, etc.)Name of pump Not yet purchased, size ---Kind of motor Electric
(gasoline, electric, diesel, etc.)Horsepower Not known, Name of Motor Not purchased

(e) Complete well

Capacity Not known at drawdown of ---, Estimated cost Not known(f) Owner of land upon which well is located National Park Service, Jewel Cave National
Monument, Supt. Earl M. Semingsen, Wind Cave National Park, Hot Springs, South Dak.
Name

Address

(g) Distance to nearest existing wells

On same owner's property No rods. On property owned by others rods

Remarks by State Water Resources Commission:

STATE OF SOUTH DAKOTA }
County of Hughes } ss.

Pierre, South Dakota, March 7, 1959

This is to certify that the foregoing application was received by the Commission at 9:00 o'clock
a.m. upon the 25 day of February, 1959.

State Water Resources Commission

By: /s/ J.W. GRIMES

Chief Engineer, Executive Officer

Number of permit 522-2

Date of first receipt of application February 25, 1959

Date of return to applicant for correction, amendments or changes required as follows: March 3, 1959

Date of receipt of corrected application March 26, 1959

Date from which applicant may claim right February 25, 1959

Approved April 8, 1959, Recorded in Book 5 Page 148

This is to certify that we have examined the foregoing application for a permit to appropriate water of the State of South Dakota, and we hereby grant the same as stated herein, subject, however, to the following limitations and conditions:

1st. The equivalent of at least one-fifth of the work above specified is to be completed on or before
October 8, 1959.

2nd. The whole of said work is to be completed on or before April 8, 1960.

3rd. The limit of time for proof of beneficial use of water appropriated in accordance herewith is
April 8, 1961.

4th. The water appropriated shall be used for the purpose of public recreation, fire protection,
wildlife watering, and domestic use

5th. The prior right of all persons who, by compliance with the laws of the State of South Dakota, have acquired a right to the use of water must not be injuriously affected by this appropriation.

6th. The amount of the appropriation herein granted shall not exceed 0.11
cubic feet per second; neither shall it exceed the capacity of the above described system of diversion works, nor the least amount of water that experience may hereafter indicate as necessary ~~for the production of crops in the exercise of the best husbandry and further, said appropriation must be limited to not more than one-seventh (1/70) of said appropriation, public recreation, fire protection, wildlife watering, and domestic use.~~
and beneficially applied for ~~irrigation~~ on or before April 8, 1961; said water to be used during the following described annual period:

Continuously

Witness my hand this 15 day of May, 1959.

State Water Resources Commission

By: /s/ J.W. GRIMES

Chief Engineer, Executive Officer

Certificate of Construction issued _____, 19____

Water License issued _____, 19____

Remarks by the Applicant:

COMMISSION

M. E. Marwagen, Mitchell
E. M. Brady, Mitchell
Carl Crona, Gettysburg
Lauren A. Davis, Belle Fourche
John Morrison, Wakonda
Paul Russell, Edgemont
John Sutton, Onida

522-2

J. W. GRIMES
Chief Engineer
and
Executive Officer

SOUTH DAKOTA

State Water Resources Commission

STATE OFFICE BUILDING

PIERRE, SOUTH DAKOTA

September 30, 1959

Mr. Earl M. Semingsen
Wind Cave National Park
Hot Springs, South Dakota

Reference L 54

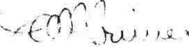
Dear Mr. Semingsen:

As requested in your letter of September 18, 1959 (Application for Permit to Appropriate Water #522-2, Jewel Cave National Monument), four copies of Application and Permit 522-2 are enclosed. The name of the water right holder has been changed to "United States of America, National Park Service."

The map supplied as part of Application 522-2 shows Drawing No. NM-JC 5300-C.

Fees required for issuing the copies of the above Application and Permit are \$1.75 each. Please send voucher or check in amount of \$7.00 to cover.

Sincerely,



J.W. GRIMES
Chief Engineer

JWG:pt

254
~~2507~~

Wind Cave National Park
Hot Springs, South Dakota

April 22, 1959

Memorandum

To: Regional Director, Region Two
From: Superintendent, Wind Cave National Park
Subject: Drilling of Water Well, Jewel Cave National Monument

Attached for your information is a photo copy of
Proof of Publication of Appropriation of Water No. 522-2 for
Jewel Cave National Monument, as published in CUSTER COUNTY
CHRONICLE, Custer, South Dakota.


Earl M. Semingsen
Superintendent

In duplicate

Attachment - Proof of Publication

with note of 5/7/59

PROOF OF PUBLICATION

STATE OF SOUTH DAKOTA }
County of Custer } ss.

----- Carl H. Sundstrom ----- being duly sworn, deposes and says the annexed printed copy of Notice of Intention to Appropriate Water was taken from the ----- CUSTER COUNTY CHRONICLE, ----- a newspaper which during the whole time of publication of said notice herein after stated, has been and is printed and published in the ----- City ----- of Custer ----- County of ----- Custer ----- and State of South Dakota; that the said notice was published in said newspaper on the following dates:

----- March 12, 1959 -----

----- March 19, 1959 -----

----- March 26, 1959 -----

----- April 2, 1959 -----

in each and every issue of the full number thereof, the first publication being made on the ----- 12 ----- day of March ----- 1959 ----- and the last publication on the ----- 2 ----- day of ----- April ----- 1959, upon which days or times of publication aforesaid the newspaper was regularly published, and that during the whole time of said publication he was ----- ~~XXXXXX~~ ----- publisher ----- of the said newspaper.

----- *Carl H. Sundstrom* -----

Subscribed and sworn to before me this ----- 2 ----- day of April ----- A. D. 1959.

----- *George G. Sundstrom* -----
Notary Public ----- Custer ----- County, S. D.

APPROPRIATION OF WATER

20 2074 State Water Resources Commission

21 Pierre, S. Dak., March 7, 1959

22 Notice is hereby given that Carl H. Sundstrom, Sept. 1, 1959, whose post-office address is Wind Cave National Park, Hot Springs, S. Dak., has made an application in accordance with the provisions of the water laws of South Dakota for a permit to appropriate for beneficial use 0.11 cubic feet of water per second of time from ground water through the Jewel Cave National Monument well, the point of diversion of which is to be located in the NE 1/4 of the NW 1/4 of Section 1, Twp. 13 N Range 12 E. Said water to be used for the purpose of public recreation, fire protection, wildlife watering and domestic use at Jewel Cave National Monument.

This application will be taken up by the State Water Resources Commission at their office at Pierre for consideration upon the 30th day of April, 1959, at 9:00 P.M. All interested persons may appear and be heard.

Appropriate action will be taken by the State Water Resources Commission.

Witness my hand and the seal of the State Water Resources Commission at Pierre, S. Dak., this 7th day of March, 1959.

----- *George G. Sundstrom* -----
Notary Public

L54 *gaca*
McT
10/14/59

OCT 1 1959

John E. Powell, District Engineer
United States Geological Survey
Huron, South Dakota

Dear Sir:

Subject: Pump Testing of Test Well,
Jewel Cave National Monument

This letter is to advise you that following your attendance at Jewel Cave National Monument on September 21-23, the contractor was able to pump test the well using the larger cylinder and water column pipe, setting the cylinder at varied elevations until the operation pumped air at each elevation.

The drawdown data was not as accurate as if the electrical cable had been employed; however, the data is reasonable for use in analyzing the yield. Enclosed is a copy of the field data obtained during pumping operations on September 24 and 25. Although some of the data indicates some irregularities with regard to the characteristics of drawdown, it shows the potential supply available to be between 18 and 19 gallons per minute.

Samples of the water were taken and will be analyzed. A copy of the report will be forwarded to your office.

I brought a sample of the water to Omaha and had a brief analysis made of it. The test indicates a pH of 7.5, and a total hardness of 12 grams per gallon or 200 P.P.M.

Perhaps this information will assist you with your report, if you have not already issued the report from your office.

Signed

William A. Mott
Hydraulic Engineer

Enclosure

Copy to: Director (2), w/1 cy encl
Chief, WODC (2), w/1 cy encl
Supt., Jewel Cave NM, w/1 cy encl

WAMott/etb

FIELD DATA ON PUMP TESTING TEST WELL
JEWEL CAVE NATIONAL MONUMENT

<u>HOUR</u>	<u>STROKES per MINUTE</u>	<u>TIME MINUTES</u>	<u>D I S C H A R G E</u>		<u>REMARKS</u>
			<u>GALS.per MINUTE</u>	<u>GALS.per STROKE</u>	
					Sept. 22, 1959 - depth of pump 517 ft. below ground surface. Static water at 414 ft. depth.
3:11 PM	41.5		10.75		
3:26		.49	10.20		
3:35					Lowered Cylinder 32 ft., Depth 549 ft.
4:05	32		15.7		
4:12	37		23.8		
4:15	38.5		22.2		
4:16	40		22.1		
					Pumped air at 4:23 PM; nut on sucker-rod broke, made repair but no discharge as cylinder was damaged. Had to pull the pump. Sept. 24, 1959; depth of 581 ft. started pumping.
3:40 PM					
3:55	29.4	.18	16.1	.548	
4:01	28.6	.18	16.1	.563	
4:06	30.3	.19	15.25	.507	
4:15		.185	15.7		
4:22	41.7	.115	26.2		Speeded up pumping rate.
4:25	38.5	.135	21.5	.557	
4:30	40.0	.140	20.7	.518	
4:37	40.0	.140	20.7	.518	
4:43	38.1	.170	17.05	.448	Pumping air.
4:47	39	.180	16.1	.413	Pumping air. Cylinder set at 617 ft. depth., started pumping at 5:32 PM
5:40 PM	31.3	.19	15.3	.49	
5:49	37.8	.14	20.7	.547	
6:03	36.4	.155	18.7	.513	
7:18 PM	35.8	.156	18.6	.520	
7:29	41.7	.13	22.3	.535	Speeded up pumping rate.
7:45	41.7	.17	17.1	.410	
7:56	42.5	.17	17.1	.403	
8:33	40.0	.185	15.65	.392	

HOUR	STROKES per MINUTE	TIME MINUTES	DISCHARGE		REMARKS
			GALS. per MINUTE	GALS. per STROKE	
9:05 AM			6.0		<u>September 25, 1959.</u> Lost discharge; - intermittent operation produced approx. 6 gpm. Pulled pump and replaced leathers. Reset at 617 ft. depth. Started pumping operations. Discharge begins.
5:35 PM					
5:43					
7:05 PM	29.8	.20	14.5	.487	
7:20	29.4	.204	14.2	.484	
7:30	28.6	.226	12.8	.448	
7:40	29.7	.203	14.3	.481	
7:50	29.4	.200	14.5	.493	
8:00	29.2	.214	13.5	.463	
8:20	29.6	.210	13.8	.465	
8:26 PM	31.8	.174	16.65	.524	Speeded up pumping rate.
8:36	31.8	.174	16.65	.524	
8:49	32.3	.176	16.42	.508	
9:00	31.8	.187	15.5	.488	
9:30 PM	31.8	.173	16.78	.527	
9:55	31.3	.185	15.7	.501	
10:15	31.2	.195	14.85	.476	
10:22	35.1	.148	19.6	.557	Speeded up pumping rate.
10:30	35.7	.1515	19.2	.539	
10:45	34.5	.1566	18.5	.537	
10:55	34.5	.157	18.6	.540	
11:10	34.2	.1615	17.95	.525	
11:20	42.2	.1565	18.5	.439	
11:24	41.7				Pumped Air. Slowed down the pump to protect the leathers.
11:28	28.2	.231	12.5	.443	
11:46	28.6	.248	11.7	.410	
11:52 PM	31.8	.174	16.67	.523	Speeded up pumping rate.
12:00 Mid- night	32.3	.1715	16.9	.523	
					<u>September 26, 1959.</u>
12:15 AM	32.3	.179	16.2	.501	
12:45	31.5	.180	16.1	.512	
12:49	34.0	.163	17.8	.523	
1:00	34.5	.1635	17.8	.515	
1:15	32.8	.198	14.65	.461	
1:22	35.7	.157	18.5	.518	Speeded up pumping rate.
1:32	35.7	.153	19.0	.532	
1:35	42.5	.1665	17.4	.410	
1:42	31.7	.180	16.1	.508	Pumped Air. Slowed down the pump.
2:10	33.4	.175	16.55	.498	
2:25 AM	32.6	.173	16.75	.515	
11:00 AM	30.3	.1935	15.0	.495	Pumped continuously - water clear of suspended material - temper- ature cold.



WE TEST NEARLY EVERYTHING UNDER THE SUN

Omaha Testing Laboratories

511 So. 20th Street
Omaha 2, Nebraska

REPORT OF TEST
September 30, 1959

Test Number
A 2619

Test made for William A. Mott
307 Federal Office Building
Omaha, Nebraska

Report on Analysis of Water from Jewel Cave for pH and Hardness.

Test Results:

pH - - - - - 7.5

Total Hardness - - - - - 12 grams./gallon (=200 P.P.M.)

OMAHA TESTING LABORATORIES

By J. R. Smith
J. R. Smith, Chief Chemist

In dup

JRS:mm

(1 copy filed w/ blues)

Form 10-174
(Rev. 8-56)UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
COMPLETION REPORT OF CONSTRUCTION PROJECT

WODC

REGION Two	AREA Jewel Cave National Monument	COUNTY Custer	STATE South Dakota
PROJECT OR JOB TITLE Drill and pump test a test well 6" diameter, JECA			PCP NO.
LOCATION IN AREA Headquarters Area		MASTER PLAN NO.	BUILDING NO.
WORKING DRAWING NO. AND TITLE MASTER PLAN CORRECTED BY: <i>[Signature]</i> AS-BUILT DRAWING BY: <i>[Signature]</i> 3 WR-60 - 8,907.32			
APPROPRIATION TITLE AND SYMBOL 14X1035 (0343)			WORK ORDER NO. 23 WR-59 - 1,045.30
CONTRACT NO. 14-10-232-351		DATE WORK STARTED Apr. 27, 1959	DATE WORK COMPLETED September 26, 1959
NAME OF CONTRACTOR Fall River Drilling Co., Richard Lawrence, Owner		ADDRESS Hot Springs, South Dakota	

COST ANALYSIS

CONSTRUCTION ITEMS	QTY.	UNIT COST IN PLACE	TOTAL COST IN PLACE
Personal Services			25.98
Contract Payments			9,757.75
Supplies and Materials			12.22
Other Direct Expenses			142.37
Depreciation of Equipment			14.30
TOTAL			9,952.62

See
memo
6/29/60

COST AGREES WITH FFO RECORDS
C. D. VAN KIRK, SUPERVISORY ACCT
REGION TWO OFFICE FFO
DATE MAR 28 1960

SUMMARY OF EXPENDITURES

PERSONAL SERVICES 25.98	EQUIPMENT Deprn. 14.30	MATERIALS AND SUPPLIES 12.22
OTHER Direct 142.37		

ORIGINAL CONTRACT AMOUNT \$ 8,285.00	FIRST 2,872.50	SECOND	THIRD
FINAL CONTRACT AMOUNT 9,757.75	FOURTH	FIFTH	SIXTH

THIS PROJECT OR JOB HAS BEEN COMPLETED IN ACCORDANCE WITH
APPROVED DRAWINGS, SPECIFICATIONS, AUTHORIZED CHANGES

SUBMITTED BY (Name and Title) <i>[Signature]</i> Harold G. Gifford, Maint. Supervisor	DATE 4-19-60
APPROVED BY (Name and Title) <i>[Signature]</i> J. Elias Suter, Acting Superintendent	DATE 4-19-60

(ATTACH NARRATIVE STATEMENT, PHOTOGRAPHS, AND "AS BUILT" DRAWINGS TO THIS FORM)

NARRATIVE COMPLETION REPORT

for

Drill and Pump Test Water Well PCP U-7

Jewel Cave National Monument

Started -- April 27, 1959

Completed -- September 26, 1959

Contract No. 14-10-232-351

Final Contract Amount \$9,757.75

**Contractor -- Fall River Drilling Company
Richard Lawrence, Owner
Hot Springs, South Dakota**

WATER WELL PROJECT -- PCP U-7

JEWEL CAVE NATIONAL MONUMENT

PROJECT HISTORY AND CONSTRUCTION REPORT

History

A study of water development to supplement the developed spring water supply at Jewel Cave National Monument was started on September 11 and 12, 1958, with a brief reconnaissance of the area by Regional Forester Frank Childs and Mr. John E. Powell, District Engineer, U. S. G. S., Huron, South Dakota. Since no wells exist in this area, ground water level could not be determined and it was suggested that three test holes be drilled.

On October 30, Messrs. Mott, Region Two Hydraulic Engineer, and Mr. Powell set out four test sites. Two of the sites were located in Hell Canyon and two in the "use area" of the Monument. Site number four was located at an indefinite spot within the utility building area. This site was eventually selected as the site for the test well.

Mr. Powell was to furnish supervision for the project.

The March third opening of bids was cancelled to give WDC time to get topographic data needed to resolve Master Plan problems. Bids were opened first on March 11, with no bids being received. On March 31, a second invitation was circulated. No bids responsive to the invitation were received. A third effort was made and only one company, the Fall River Drilling Company, was willing to negotiate. A contract was given to Richard Lawrence, Individual, DBA Fall River Drilling Company, Hot Springs, South Dakota, on April 14, 1959. On April 27 an order to proceed was issued.

Work Project

The Fall River Drilling Company moved their drilling equipment onto the site on April 30 and started drilling operations on May 6. A 12" hole was drilled to a depth of 15' and 12" pipe was set to this depth. An 8" hole was started from this point.

Supervision of the well drilling operation was done periodically by Geologist Charles Byer and District Engineer J. E. Powell. Dr. Gries, Professor of Geological Engineering, School of Mines and Technology, Rapid City, South Dakota, and members of his staff were also consulted at various times during the drilling operations.

The Pahasapa limestone formation was encountered to a depth of 435 feet. This formation consisted of varying beds of dolomite, limestone, chert, spar and some clay with much intermixing. Cross-bedding was found quite prevalent and at 220 feet a hole was bridged necessitating a two-hour cleanout. Other holes were bridged at 270 feet and at 380 feet. By the end of the month a depth of 383 feet had been reached.

A small amount of water was present in the lower Pahasapa limestone from 380 feet to 390 feet, and the water level in the hole was approximately 385 feet below land surface at the beginning of drilling each day. Below 390 feet, there was no apparent increase in the amount of water entering the hole.

The Englewood formation was only 40 feet thick and the Deadwood formation was reached at 475 feet. A small bed of sandstone was encountered from 475 to 490 feet. Dolomite and limestone were interspersed to a depth of 602 feet where sandstone was again encountered.

An increase in water was discovered in the well on July 23. Well depth at this time was 486 feet. The water level was allowed to rise for a period of time. Total level was approximately 385 feet as shown by the bail line. The well was then bailed for 44 minutes at the rate of 12½ gallons per minute. Bailing at this rate lowered the water level to a point 19 feet above the bottom of the well. Bailing was stopped then for a period of 15 minutes, during which time the water level returned from the 467-foot to the 423-foot level--an approximate rise during the 15 minutes of 50 feet. A water sample was taken at this time which tested as follows:

PH 7.5
 FE 0.5 ppm
 Chloride .35 ppm
 Hardness 14 grains

On July 29, the drilling tools were lost at a taped depth of 535 feet. Fishing operations were then conducted until August 6 with a recovery of the tools. Water level at the time was 386 feet.

Drilling was completed through the Deadwood formation to a depth of 670 feet. At this point Precambrian rock consisting of quartz-mica schist and quartzite was reached. The well was drilled to the contract depth of 700 feet on August 25. A bailing test was again conducted at this time giving a draw down of 112 feet at 14 gallons per minute. Casing was then prepared with perforation at two different aquifers. One perforation was made between the 475 and 495-foot depth and the other at 605 to 685-foot depth. The casing was then set. A 6-inch (I.D.) black steel pipe having a nominal wall thickness of 0.280 inches and weighing not less than 18.97 pounds per foot was specified for the casing.

The driller experienced difficulty in obtaining a suitable pump for the pumping test. On September 1 and 2 a pumping test under the supervision of Mr. Mott, Region Two Hydraulic Engineer, and Messrs. Powell and Dyer was scheduled. As the driller had not procured the new pump unit which he had ordered, the pump test was not conducted. At this time, the static water level was determined by the use of an electrical cable to be at 400-foot depth. The well was bail tested and produced about 14 gpm. The bail test produced a draw down of 112 feet.

A stop work notice was given to the contractor to cease work at close of business September 18 until further notice. This order continued through September 20, and the final completion date of the contract was extended to September 26, 1959.

With the procurement of a pump, consisting of a cylinder pump, set initially at 517 feet and powered by the contractor's cable-tool drilling rig, a pump test was commenced at 10:50 a.m. on September 21. The test continued until 12:55 p.m., when it was established that the top valve of the cylinder had worn out and operations were suspended.

On September 22 at 10:30 a.m., the water level in the well was 414.6 feet below land surface. The pump was reset and pumping began at 1:45 p.m. using a larger (4-inch) cylinder. Pumping continued without obtaining water until 2:35 p.m. when the pump began producing water at a rate of 19.3 gpm. Pumping continued at decreasing rates until 3:22 p.m. when the pump was producing 10 gpm. The cylinder was then lowered to 549 feet. Pumping was resumed at 5:20 p.m. but the equipment again failed.

On September 23 at 10:03 a.m., the water level in the well was 414.6 feet below land surface. A new foot valve was installed and the cylinder lowered to 581 feet. Pumping began at 2:14 p.m., but the pump was not functioning properly and would not produce over 7.5 gpm. Attempts to determine the performance of the well were then discontinued.

The space between the pump column and the well casing was not large enough to permit passage of a water-level measuring device, so data on drawdown and recovery of the water level in the well were not obtainable.

Messrs. Dyer and Powell returned to Huron and Mr. Mott supervised the pumping tests conducted on September 24, 25, and 26.

On September 24 a pump test was started at 3:40 p.m. with the cylinder at 581 feet. Discharge varied between 16.1 and 26.2 gpm depending on the speed of the pumping rate, which was varied. At 4:43 p.m. air was being pumped and the cylinder was lowered to 617 feet

and pumping commenced at 5:32 p.m. Discharge during this time varied between 15.3 gpm and 22.3 gpm depending on the speed of the pumping rate, which was varied. At 9:05 on September 25, the discharge was lost and pump was pulled and leathers replaced. Pump was reset at 617 feet below the surface and pumping operations were started at 5:35 p.m. and continued until 11:00 a.m. on September 26. Discharge during this time varied between 11.7 gpm and 19 gpm, depending upon the pumping rate. The average gpm for this period was 16.2.

Mr. Mott stated that the pump test of the well was successful and the completion of the project was accomplished prior to the expiration of the contract period.

An extension was added to the well casing, as specified in Change Order No. 1, to project it above the fill proposed for the utility area and the top of the casing was plugged.

Subsequent data obtained on November 24, 1959, from the South Dakota State Department of Health, Pierre, in a Mineral Water Analysis Report on a water sample collected from the well is submitted with this report.

Keith E. Miller
Keith E. Miller
Supervisory Park Ranger

Attachment



South Dakota
State Department of Health

G. J. VAN HEUVELN, M.D., STATE HEALTH OFFICER

Pierre

November 24, 1959

Superintendent
Wind Cave National Park
Hot Springs, South Dakota

Dear Sir:

Enclosed please find a Mineral Water Analysis Report on the water sample collected from a well at Jewel Cave National Monument on September 25, 1959.

It will be noted on the attached report that the following mineral concentration is above the U. S. Public Health Service recommended concentration for potable water supplies:

1. The iron concentration is above 0.3 parts per million which may give rise to such red water problems as the staining of plumbing fixtures and the clothing which may be washed in this water.

This report is being forwarded to you for your information and files. If additional interpretive information is desired, please so advise.

FOR THE DIVISION OF SANITARY ENGINEERING

Very truly yours,

J. Darrell Bakken
Public Health Engineer
Water Sanitation Section

JDB:ah
Enclosure
cc: M. O. Nelson, District Engineer

SOUTH DAKOTA STATE DEPT. OF HEALTH
 Division of Sanitary Engineering
 PIERRE, SOUTH DAKOTA

MINERAL WATER ANALYSIS REPORT

TOWN Jewel Cave National Monument, Custer, S. Dak. DATE November
 OWNER OF SUPPLY _____ LAB. NO. _____
 COLLECTOR'S NAME U. S. Gov't. Dept. of the Interior MINERAL NO. 961
 DATE COLLECTED September 25, 1959 DATE RECEIVED 9-30-59
 REPORT TO: Superintendent cc: M. O. Nelson, District Engr.
Wind Cave National Park
Hot Springs, South Dakota

FIELD DATA

City or Town Jewel Cave National Monument, Custer, S. Dak.
 Source of supply Well Date source installed 9-25-59
 (For well sources only) Well number _____ Depth 700' Diameter 6"
 (Lake, River, Spring, Gallery sources and water treatment plants)
 Name _____
 Raw or Treated sample Raw Additional Information _____
 Water treatment processes, Remarks _____
 Date of Collection September 25, 1959
 Source pumped 36 Hours at 18 GPM
 Was sample free of turbidity when collected? Yes
 Temp. °C _____ Alkalinity—P _____ T _____
 pH _____ Iron _____

LABORATORY ANALYSIS
 (Parts Per Million)

Specific Conductance K @ 25 °C 47.62 x 10⁻⁴ Turbidity _____
 Insoluble Matter _____ Fe₂O₃ + Al₂O₃ + Mn₂O₃ (R₂O₃) 0.8
 Total Solids 278 Dissolved Solids _____ Total Iron (Fe) 0.55
 Alkalinity P 0 Total 262 pH 7.72
 Potassium as K 1.33 Nitrate as N 0.40
 Sodium as Na 4.14 Fluoride as F 0.10
 Calcium as Ca 54.47 Chloride as Cl 2.00
 Magnesium as Mg 31.59 Sulfate as SO₄ 6.91
 Manganese as Mn 0.00 Bicarbonate as HCO₃ 19.6

Calculated Hardness as CaCO₃ 267 ppm 15.6 gpg
 analyst F. Fliginger

Title

Charles E. Carl

DIRECTOR, DIVISION OF SANITARY ENGINEERING

June 1, 1959

Memorandum

To: Earl M. Samingsen, Contracting Officer
From: Richard Lawrence, Contractor
Subject: Driller's Daily Log - Test Well Drilling, Jewel Cave

4-27-59 Notice to proceed with work
4-30-59 Moving on location
5-1 Moved machine
5-2 Rigging up
5-3 No work
5-4 Rigging up and hauling water
5-5 Rigging up and hauling water
5-6 Started 12" hole
5-7 Drilling 12" hole
5-8 Set 12" pipe - 15 feet
5-9 Drilling 8" hole - 5 feet

5-10 Sunday - no work

5-11 Drilling and rigging forpe
5-12 Drilling and hauling water - 10' - hard lime
5-13 Drilling hard lime
5-14 Drilling hard lime & moved in trailer house
5-15 Drilling hard lime & moved in arc welder
5-16 Drilling hard lime & Naugle Electric made
electrical connections

5-17 Sunday - no work

5-18 Drilling 16 hours, dressing bits, 8"
5-19 Drilling, dressing bits, hauling water
5-20 No work - trip to Hot Springs, - picked up
contract at Wind Cave
5-21 Drilling 8 hours - Charles Dyer, Geologist, checked
5-22 Drilling 16 hours, dressed bits, geologist checked
5-23 Drilling 4 hours

5-24 Sunday - no work

5-25 Drilling lime, buff color, hauled water from
Lithograph Spring
5-26 Drilling lime, buff color
5-27 Drilling lime, lighter color, entry hard - Dyer
and Powell checked bottom of hole, 120 feet
5-28 Drilling lime, lighter color
5-29 Drilling lime, lighter color
5-30 Drilling lime, lighter color, 7 hours - bottom
hole 130'
5-31 No work

/s/ Richard Lawrence

July , 1959

Memorandum

To: Earl M. Semingsen, Contracting Officer

From: Richard Lawrence, Contractor

Subject: Driller's Daily Log - Test Well Drilling, Jewel Cave

6-1-59 Drilling lime - Meter reading 2350
6-2 Drilling lime, 4 hours - Timing gear on engine broke -
Charles Dyer checked job
6-3 Trip to Springs for repairs and work on engine
6-4 Drilling lime - visitors Powell, Dyer, and Gries
6-5 Drilling lime - Dyer left for Huron - taped hole 153'
6-6 Drilling 4 hr. - visitors from Omaha office

6-7 Sunday - no work

6-8 Lewis went home sick - drilling lime
6-9 3 hours work on engine & reset cable - drilling lime -
Mr. Semingsen visited
6-10 Drilling cross bedded clay, shale & lime, light brown
6-11 Drilling cross bedded clay, shale & lime, light brown
6-12 Pay day, \$864. - hole bridged at 220' - 2 hour cleanout -
drilling cross bedded lime
6-13 Drilling 4 hours - reset rope socket - bridged hole 270'

6-14 Sunday - visited cave

6-15 Drilling and rebuilding bits - Dyer checked T&S, 16th.
6-16 Check for \$828.50 - drilling broken formation
6-17 Drilling broken formation - run line on hole 289'
6-18 Drilling broken formation - Lacy visited job
6-19 Drilling broken formation
6-20 Drilling 4 hours, 2.8" bits - reset rope socket

6-21 Sunday - no work

6-22 Drilling hard lime - Dyer checked job
6-23 Drilling hard lime - Dyer checked - 506' of 6 1/2 casing arrived
6-24 Drilling hard lime
6-25 Drilling - formation change - 335' - softer - Dyer checked
6-26 Drilling - Dyer took samples & left for Huron
6-27 Drilling hard lime

6-28 Sunday - no work

6-29 Drilling hard lime, light buff color - bridged hole 380'
6-30 Drilling hard lime - run line bottom hole, 383'

/s/ R. Lawrence

August 5, 1959

Memorandum

To: Karl M. Semingsen, Contracting Officer
From: Richard Lawrence, Contractor
Subject: Driller's Daily Log - Test Well Drilling, Jewel Cave

7-1-59 Drilling Hard lime
7-2 Drilling hard lime
7-3 Drilling hard lime - B.H. by tape, 406 feet
7-4 No work
7-5 No work
7-6 Repaired starter on engine - 7 hours drilling
7-7 Changed drilling line - Wilkinson picked up samples
7-8 Drilling hard lime
7-9 Drilling hard lime
7-10 Drilling hard lime
7-11 Drilling -- lime softer, light buff color
7-12 No work
7-13 No work
7-14 Drilling lime, broken red clay shale
7-15 Drilling lime, broken red clay shale
7-16 Drilling lime, broken red clay shale
7-17 Drilling hard lime
7-18 Drilling hard lime, 4 hours
7-19 No work
7-20 Drilling hard lime
7-21 Drilling hard lime
7-22 Drilling hard lime
7-23 Drilling sand, more water - Dyer on job - B.H. 493 feet
7-24 1½ hour bailer test on well - water 12½ GPM
7-25 Drilling broken formation
7-26 Drilling broken formation, 2 hours
7-27 Drilling broken formation - spliced drilling line
7-28 Drilling - moving casing - Powell checked job
7-29 Lost drilling tools - fishing - trip to yard - Dyer on job
7-30 Fishing - trip to McKenna rig for tools
7-31 Fishing - trip to Hot Springs for tools - Dyer taped hole
533½ feet

/s/ Richard Lawrence

Septemb 11, 1959

Memorandum

To: Earl M. Sewingsen, Contracting officer
From: Richard Lawrence, Contractor
Subject: Driller's Daily Log - Test Well Drilling, Jewel Cave

8-1-59 Shut down for fishing tool.
8-2 Sunday -- No work.
8-3 Waiting for fishing tool. Mr. Gott checked lot.
8-4 Shut down for fishing tool.
8-5 Shut down for fishing tool.
8-6 Caught fish and rigged drilling tools.
8-7 Dyer on job - checked water 386, c. Bottom hole 539.4
8-8 Drilling broken formation.
8-9 No work.
8-10 Drilling broken formation
8-11 Drilling broken formation - Willard Ames driller,
8-12 Drilling broken formation
8-13 Drilling broken formation - red brown formation
8-14 Drilling broken formation - grey formation 12 feet.
8-15 Drilling hard sandy formation - 5 bits, 5 feet.
8-16 No work.
8-17 Drilling - Mr. Sewingsen picked up samples for School of Mines.
8-18 Drilling hard broken formation - talked to Mr. Sewingsen.
8-19 Drilling hard sand - taped at 642.
8-20 Drilling hard sand
8-21 Drilling hard sand - bottom 645 - samples sent by Miller to Rapid.
8-22 Drilling broken formation - dark purple color.
8-23 Drilling to 686, bottom hole.
8-24 Drilling permutite - Dyer and Powell arrived.
8-25 Drilling - changed bailer line - B.S. 700' - Dyer & Powell checked.
8-26 Rigged up to run casing and bailer test - 112' draw down
at 11:30 PM. - Dyer and Powell checked.
8-27 Hauled 200 ft. of casing from Monger - run casing 300' -
90 feet of perforation.
8-29 Casing - landed casing at 700'.
8-30 Making up tools - no pump on job.
8-31 Called driller supply in regards to pump.

/s/ Richard Lawrence

October 6, 1959

Memorandum

To: Earl M. Seadingsen, Contracting Officer
From: Richard Lawrence, Contractor
Subject: Driller's Daily Log - Test Well Drilling, Jewel Cave

9-1-59 Checked static water level. Mott, Dyer & Powell on job.
Static 401 feet.
9-2 Checked water level. Mott, Dyer & Powell on job.
9-3 Building gauge and milking slag out of perforator.
9-4 Milking perforator.
9-5 Ran gauge to top of lower perforator.
9-6 Ran gauge to bottom hole.
9-7 Ran gauge. Lost lower section.
9-8 Fishing for gauge.
9-9 Fishing for gauge. Mr. MacDonald visited from Omaha.
9-10 fished gauge and cleaned well. Pump arrived by
Wilson Transportation.
9-11 Called at Power Co. office. 3-phase wiring is out.
9-12 Developing well by pumping and bailing - 6 hours.
9-13 Trip to Lance Creek for rod and tubing.
9-14 Returned to job, noon, and rigged pump.
9-15 Pumped well 1½ hours at 20 GPM.
9-16 Pulled pump and bailed 4 hours.
9-17 Pumped well 9½ hours - average 15 GPM.
9-18 Pumped well 4 hours, pulled pump and replaced valves.
9-20 Trip to Springs for new valves and leathers.
9-21 Mott, Dyer & Powell on job. Pumping with 2½" pump.
9-22 No luck getting water level indicator down. Pumped
air at 517 feet with 4" pump.
9-23 Mr. Mott checked job at 7:30 a.m. Pulled pump.
9-24 Replaced valves. Started pump at 2:15 p.m. - 9 GPM.
Powell and Dyer left for home.
9-25 Pump test ended at midnight - 18 GPM.
Pump setting at 617 feet. Mr. Mott o.k. test.
9-26 Tearing down machine & moving tools. Grouted top 10 feet
of hole - 4 bags of cement mixed 3 to 1.
9-27 Moved machine.
9-28 Moved out.

/s/ Richard Lawrence

Other Supporting Information

LS4 JICA
D5039 JICA

Wind Cave National Park
Hot Springs, South Dakota

July 21, 1961

Memorandum

To: Regional Director, Region Two
From: Superintendent, Wind Cave
Subject: Water Supply, Jewel Cave

Supervisory Park Ranger Keith Miller in charge of Jewel Cave reports that the extended dry weather has resulted in the water supply at Jewel Cave almost drying up. There is estimated (as calculated) at less than 10 gallons per hour flowing into the small reservoir. The level of water in the reservoir (3,000 gal.) has dropped to half full.

We have purchased a 260-gallon tank so Jewel Cave employees can haul water from Newcastle, Wyoming, (Custer, South Dakota, was unable to supply us with water) in one of their one-ton trucks. This is an emergency measure and is admittedly uneconomical.

The well is drilled, cased, and capped. We believe that drought conditions justify considering programming part of PCP U-9-1, Water Supply and Water Line Extension, as an emergency for construction this fiscal year. The minimum work would be to install the pump and a certain amount of pipe to discharge into present small reservoir. Manual controls can be used temporarily until the water system is completed. Greatest construction economy would be realized by doing all the work proposed under PCP U-9-1, JECA, on the same contract.

We can get by after a fashion hauling water this season but believe we should proceed on an emergency basis with getting a pump on the well as soon as possible.

Jess H. Lombard
Superintendent

In duplicate

REC'D DEC 8 0 1961

Jewel Cave

WRG
a
B.

August 29, 1960

L54-INB

Memorandum

To: Acting Chief Naturalist

From: Geologist

Subject: A. van V. Dunn's memorandum of June 28, 1960 to Regional Director, Region Two and Attachments.

Questions about possible piracy of water between sandstone aquifers at Jewel Cave interest me because of my experience with the deep water well at Mesa Verde. I agree with U.S.G.S. Geologist Dyer's that little inter-aquifer flow can long as long as the combined static water level for both aquifers is about the same as the level of either taken separately. There is a chance, however, that the static water levels could differ considerably if there should be seasonal or longer range changes in amounts of water entering the two aquifers.

The correspondence does not comment on the relative quality of water from each aquifer. If the static level of the aquifer of poorer quality water should become quite high, the other aquifer could become extensively contaminated should the differential in static levels obtain for many years as might occur during a 20 year or longer dry cycle.

Since both aquifers are relatively deep beneath the surface and both are low in transmissibility, I consider it quite unlikely that piracy of any great magnitude can ever occur. I think it is desirable, however, to keep alert to any changes in static water level which might occur. Knowledge of changes would not be hard to come by, particularly if there are wells nearby which draw water exclusively from one or the other of these aquifers. Any sharp change in static water level of one aquifer relative to the other would signify that leakage from the higher to the lower pressure zone would already be in progress.

Robert H. Rose
Geologist

In duplicate

Attachments

Copy to ✓ A. van V. Dunn
Mr. Rose
RHRose:jfb 8/29/60

L-54

Jeca

7/15/60
action 4/15
Baggley 4/15

APR 15 1960

Memorandum

To: Superintendent, Wind Cave National Park
From: Regional Chief of Operations
Subject: Completion of Jewel Cave Test Well

Completion Report Form 10-174 for the above work has been brought to our attention by the Field Finance Office. These costs are not programmed under the construction appropriation in the same manner as those construction items which are developed to a specific program such as for actual water system construction. The reports of cost are therefore not handled in an exactly similar manner. This office should have all the available data for review, clearance, and transmittal to the Washington Office.

Will you therefore please complete the forms, attaching a narrative statement, signing and returning all copies, except the file copy which you retain, to this office for further action.

The narrative report should cover the items listed in the attached outline.

(SGD.) GEORGE F. BAGGLEY

George F. Baggley
Regional Chief of Operations

In duplicate

Attachment (in dup)

WAMott/JFA1ton/etb

*attachment
Apr 15/60 min
to Dept.*

NARRATIVE COMPLETION REPORT

for

WATER RESOURCES WORK ORDERS

1. General Description of the Project:

- a. Location
- b. Purpose
- c. Date work began
- d. Date work completed
- e. Reference Drawing Number - if any

2. Work Accomplished:

- a. By contract (contractor's name and address) and/or
- b. Area personnel (names and title)
- c. Contract price and number

3. Test Well Drilling:

- a. Type of rig employed
- b. Driller's log of well
- c. Interruptions in drilling operations:
 - (1) Cause
 - (2) Length of time involved
- d. Results of pump testing - gpm yield
- e. Chemical analysis of the water



UNITED STATES
DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
WASHINGTON 25, D. C.

NOV 23 1959

✓
IN REPLY REFER TO:
L54-OBL

REG. DIRECTOR	
ASST. REG. DIRECTOR	
CHIEF, DIV. OF ADMIN.	
CHIEF, DIV. OF OPERATIONS	
CHIEF, DIV. OF INTERP.	
CHIEF, REC. RES. PLANNING	
CHIEF, RANGER ACTIVITIES	
FIELD SOLICITOR	
X <i>Matt</i>	
<i>Anton</i>	
ACTION TAKEN	

Memorandum

To: Regional Director, Region Two
From: Assistant Director
Subject: Water Right Application 522-2, Well No. 1 Supply, Docket 1,
Part II, Jewel Cave

We have your memorandum of October 14 forwarding a copy of the application and permit, No. 522-2, for water for Jewel Cave National Monument. The water is to be obtained from a deep well.

It appears to us that the procedure followed in this instance was incorrect. We note that under Section 61.0123 of the State Water Laws, approved March 2, 1955, a procedure is set forth specifically for use of unappropriated waters by the United States. Apparently Application for Permit No. 522-2, as approved by State Chief Engineer J. W. Grimes, is the type of application that individuals or corporations would use. We suggest that, possibly with some amendment, the application can be considered as a notice of withdrawal under Section 61.0123 and thus already advertised and the priority date established. The date of completion of April 8, 1960, would, of course, be eliminated until plans for the system are filed. If we are correct in this belief and, upon further consideration you agree, we suggest that the matter be taken up further with Mr. Grimes with a view of following the procedure set forth in Section 61.0123, which we believe is both preferable and simpler.

We shall appreciate being kept informed on this.

Jonathan J. Price
Assistant Director

Copy to: Superintendent, Jewel Cave
Chief, WDC (2)

Wind Cave National Park
Hot Springs, South Dakota

September 18, 1959

WR Copy

L 54

*Dr. Lee
Pace*

Mr. J. W. Grimes, Chief Engineer
State Water Resources Commission
State Office Building
Pierre, South Dakota

Subj: Application for Permit to
Appropriate Water #522-2,
Jewel Cave National Monument

Dear Mr. Grimes:

Please refer to subject application, which was processed
and approved by your office May 15, 1959.

Mr. A. van V. Dunn, Chief, Water Resources Section, National
Park Service, Washington, D. C. asked by his memo dated May 21, 1959
that a change be made in subject application. The following paragraphs
are quoted from his memo and believed to be self-explanatory.

"From the published notice, I believe that Mr. Semingsen
should make an immediate request to the State Water Resources Commis-
sion to have the name of the claimant changed to the United States of
America, with copies of that letter and the subsequent acknowledgment
for all dockets. Any notice of protest should also be referred to this
office before any further communications with the State or the protestant."

"We should also have an exact copy of the "Application" or
"Notice of Federal Water Withdrawal", which was filed with the State
Water Resources Commission. This should include advise as to whether
Drawing NMJC 5300 (with Mr. Semingsen's memorandum) or NMJC 5300-C
(with Mr. Beggley's memorandum) was submitted."

Please furnish us with four copies of the application
changed to show the claimant in the name of the United States of
America rather than as shown on the existing permit. Sorry to trouble
you with this request. If there is a charge for this service, please
advise and we will remit payment promptly.

I was certainly shocked to read about Les Wyborny's
disappearance while fishing on the Missouri recently.

Sincerely,

cc: Region II, Mott
WASO, van V. Dunn
Miller, Jewel Cave

Bert M. Semingsen
Bert Semingsen

Water Resources Division
Ground Water Branch
P. O. Box 1412
Huron, South Dakota
September 28, 1959

Let's see!
P 5034

REG. DIRECTOR
ASST. REG. DIRECTOR
CHIEF DIV. OF ADMIN.
CHIEF DIV. OF OPERATIONS
CHIEF DIV. OF INTERP.
CHIEF REC. RES. PLANNING
CHIEF RAMBER ACTIVITIES
FIELD SOLICITOR
ACTION TAKEN
FILE

107

9/30/59

Mr. E. A. Semingsen, Superintendent
Wind Cave National Park
Hot Springs, South Dakota

Dear Mr. Semingsen:

In accordance with your request, following is an account of the performance test of the well at Jewel Cave National Monument, September 21 to 23, 1959.

Pumping equipment consisted of a cylinder pump set initially at 517 feet. Power was supplied by the contractor's cable-tool drilling rig. Pumping began at 10:50 a.m. on September 21 and continued until 12:55 p.m. at rates varying between 10 and 15.8 gpm. At 12:55 p.m. it was established that the top valve of the cylinder had worn out and operations were suspended. That afternoon the contractor removed the pump from the well and replaced the worn valve.

On September 22 at 10:30 a.m., the water level in the well was 414.6 feet below land surface. The contractor reset the pump and began pumping at 1:45 p.m., using a larger (4-inch) cylinder. Pumping continued without obtaining water until 2:35 p.m. when the pump began producing water at a rate of 19.3 gpm. Pumping continued at decreasing rates until 3:22 p.m. when the pump was producing 10 gpm. The cylinder was then lowered to 549 feet. Pumping was resumed at 5:21 p.m. but the equipment again failed.

On September 23 at 10:03 a.m., the water level in the well was 414.6 feet below land surface (same as the previous day). A new foot valve was installed and the cylinder was lowered 581 feet below land surface. Pumping began at 2:14 p.m. but the pump was not functioning properly and would not produce over 7.5 gpm. Attempts to determine the performance of the well were then discontinued.

Because the space between the pump column and the well casing was not large enough to permit passage of a water-level measuring device, data on draw-down and recovery of the water level in the well were not obtainable.

The considerable distance below land surface of the static water level (401 feet) caused difficulty with the contractor's pumping equipment. If another performance test were to be run, it would be advisable to equip the well with a turbine pump and to provide means of access to the water surface in the well. This could be accomplished by installation of an

2

Mr. E. A. Semingsen
September 28, 1959
Page 2

air line or by placing about 650 feet of small (1½-inch) diameter pipe within the well casing alongside the pump column. The latter method would prevent the measuring line from winding around the pump column as it is lowered or raised in the well and would permit a more accurate determination of water level than an air line. Whether or not such a method could be used would depend upon the diameter of the pump column of the turbine pump that is installed in the well.

Yours very truly,

J. E. Powell,
District Engineer

cc: Chief, Ground Water Branch, Code: 4055 0001
Branch Area Chief (GW)
✓ Mr. Wm. A. Mott

D-5039

SEP 21 1959

Memorandum

To: Director

From: Acting Regional Director

Subject: Test Well Drilling, Change Order No. 1 and Revised Work Order 23-WR-59, Jewel Cave National Monument

Attached is a copy of subject Change Order No. 1 and revised Work Order. This change order is to cover additional drilling and casing of the well from 500 feet to 700 feet depth.

The location of the well is adjacent to the Utility Building that requires $5\frac{1}{2}$ feet of earth fill. This will require the contractor to add 7 feet of casing above the original natural ground surface so as to extend it 18 inches above the finished grade.

The revised work order shows the amount paid on the contract during FY 1959 (\$1,045.30), also the amount of change order (\$2,872.75).

The \$1,000 for an electric log of the well is not included in the work order as we feel the benefit of the log to the Service does not justify the expenditure.

(Sgd.) M. H. HARVEY

Acting Regional Director

In duplicate

Attachment

Copy to: Chief, WODE (2)
Supt., Wind Cave NP

WAMott/etb

Wind Cave National Park
Hot Springs, South Dakota

September 18, 1959

REG. DIRECTOR	1-54
ASST. REG. DIRECTOR	
CHIEF, DIV. OF ADMIN.	
CHIEF, DIV. OF OPERATIONS	
CHIEF, DIV. OF INTERP.	
CHIEF, REC. RES. PLANNING	
CHIEF, RANGER ACTIVITIES	
FIELD SOLICITOR	
Mo-9 2100	
ACTION TAKEN 0	
FILE 1 7111	

Mr. J. W. Grimes, Chief Engineer
State Water Resources Commission
State Office Building
Pierre, South Dakota

Subj: Application for Permit to
Appropriate Water #522-2,
Jewel Cave National Monument

Dear Mr. Grimes:

Please refer to subject application, which was processed
and approved by your office May 15, 1959.

Mr. A. van V. Dunn, Chief, Water Resources Section, National
Park Service, Washington, D. C. asked by his memo dated May 21, 1959
that a change be made in subject application. The following paragraphs
are quoted from his memo and believed to be self-explanatory.

"From the published notice, I believe that Mr. Semingsen
should make an immediate request to the State Water Resources Commis-
sion to have the name of the claimant changed to the United States of
America, with copies of that letter and the subsequent acknowledgment
for all dockets. Any notice of protest should also be referred to this
office before any further communications with the State or the protestant."

"We should also have an exact copy of the "Application" or
"Notice of Federal Water Withdrawal", which was filed with the State
Water Resources Commission. This should include advise as to whether
Drawing NMJC 5300 (with Mr. Semingsen's memorandum) or NMJC 5300-C
(with Mr. Beggley's memorandum) was submitted."

Please furnish us with four copies of the application
changed to show the claimant in the name of the United States of
America rather than as shown on the existing permit. Sorry to trouble
you with this request. If there is a charge for this service, please
advise and we will remit payment promptly.

I was certainly shocked to read about Les Wyborny's
disappearance while fishing on the Missouri recently.

Sincerely,

Earl M. Semingsen
Earl M. Semingsen
Superintendent

cc: Region II, Mott
WASO, van V. Dunn
Miller, Jewel Cave

EMS:eiz

L 54 *of ca*

Mott
9/9/59

SEP 9 1959

Memorandum

To: Superintendent, Jewel Cave National Park
From : Hydraulic Engineer, Region Two
Subject: Water Rights - Well Supply, Part II, Docket 1,
Jewel Cave National Monument

Mr. Dunn in his memorandum of May 21, 1959, copy to your office, requests in the third paragraph that the name of the claimant be changed to the United States of America as the applicant to the State for a water right. Please supply copies, changing the claimant's name and the State's acknowledgment of the change, for all docket.

We should have copies of the application filed with the State Water Resources Commission (reference paragraph four).

Please advise as to the particular drawing that was submitted to the State and attached to the application.

replied

William A. Mott
Hydraulic Engineer

Copy to: Director (2)

WAMott/etb

L54 OEL

May 21, 1959

Memorandum

To: Regional Director, Region Two
From: Chief, Water Resources Section

Subject: Water Rights - Well Supply, Part II, Docket 1, Jewel Cave

Your copies of dividers for the subject docket are attached. Docket 1 is supposed to include records of rights for the water system. Hence, I see no need for a second docket. The second docket was suggested in the memorandum of May 7, with which Mr. Mott forwarded a copy of the Proof of Publication of notice for the appropriation of well water.

The tab on the docket folder should ultimately have additions, but some further records and clarification of existing ones, should be obtained first. All records should be filed in Part II of the docket for the time being.

From the published notice, I believe that Mr. Semingsen should make an immediate request to the State Water Resources Commission to have the name of the claimant changed to the United States of America, with copies of that letter and the subsequent acknowledgment for all dockets. Any notice of protest should also be referred to this office before any further communications with the State or the protestant.

We should also have an exact copy of the "Application" or Notice of Federal Water Withdrawal, which was filed with the State Water Resources Commission. This should include advise as to whether Drawing NMJC 5300 (with Mr. Semingsen's memorandum) or NMJC 5300 C (with Mr. Baggeley's memorandum) was submitted.

I did not offer an immediate comment on the drafts of the "Application", either as submitted with the Superintendent's memorandum of February 20 or that of February 27 from Mr. Baggeley, because I considered the correspondence relating to the use of a Federal Water Withdrawal for the Grizzly Bear Spring, Mount Rushmore, sufficient as to South Dakota procedure.

The "Application" will only result in a somewhat more detailed requirement for proof and certificate, if accepted and not protested.

WESTERN OFFICE
DESIGN & CONSTRUCTION
MAY 25 1959
ACTION TAKEN - DATE

However, I consider the "Application" premature, and only the Water Withdrawal applicable for the proposed test well. As a matter of fact, I question whether more than the well driller's Notice of Intent to Drill, of which we should also have copies for the dockets, was needed for the test well, and I hope that the contractor has not deferred the start of work for lack of water right permit under the "Application".

While no change, other than name of applicant, is suggested pending further developments, it is requested that water right filings be cleared with this office in their final form before submission in accordance with memorandum DO 6-55 of April 8, 1955. There are still many cases in which this office is instructed not to comply strictly with a State water law.

SIGNED

A. van V. Dunn
Chief, Water Resources Section

Attachment

Copy to: /Superintendent, Jewel Cave, w/c attachments
✓Chief, WOBC (2), w/c attachments

Memorandum

Subject: Test Well Drilling, Work Order 23 WR 59, Acct. 14x1035 (0343),
Wind Cave

SIGNED

Copy to: Supt., Wind Cave - w/c of work order
WDC

Western Office
Design & Construction
APR 29 1959

CHIEF	
ADMIN. ASSIST.	
PERSONNEL	
PLANS & PROPS.	
SAFETY	
ARCHITECT	
ENGINEER	
LAND. ARCH.	

100-441100-14

ACTION TAKEN - DATE

Phone

10 May 1959

Form 10-556
(June 1956)UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

WORK ORDER

No. 23 WR 59	
Date 4/24/59	
Area or Office Washington Office	Division Two
General ~~198-1~~ Acct. No. 198-1	
Fund Sy 1411035 (0343)	
Statutory Authority (where necessary)	
Plan No.	
Title and/or Description of Project or Service to be Performed Drill and pump test a test well, 6" diameter, about 700' deep to facilitate water supply design.	
PCP No.	
Year Programmed	
Est. May 1959 Date	
Est. Completion Date August 1959	

Location of Work Requested **Jewel Cave National Monument**

ESTIMATE OF COSTS				
Components of Costs	Amount	Acctg. Code	Project Features	Amount
Contract	\$8,285		Test well drilling to locate water supply for new Headquarters development.	
Electric Log of Well	1,000			
Other NPS participation	515			\$9,800
TOTAL	\$9,800		TOTAL	\$9,800

Distribution of Copies	Remarks	
No. TO		
1 Accounts, WASO	Drilling contract to Fall River Drilling Co., Richard Lawrence, Box 871, Hot Springs, South Dakota Supervision to be supplied by USGS.	
1 Budget, WASO		
1 Water Res Sec		
2 Region Two		
1 Wind Cave	Approved by (Signature, Title, & Date) 4/24/59	ALLOTMENT ACTION
1 WDC	A. van N. Dunn, Chief, Water Resources Section	Allotment Advice No.
	Regional Office Clearance when Required (Signature, Title, & Date)	Allotment Advice Date
		Amount for Work Order

If Additional Space is Necessary, Use Reverse in Tumble Fashion

101621



UNITED STATES
DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
Wind Cave National Park
Hot Springs, South Dakota

April 22, 1959

IN REPLY REFER TO:

254
JCL

REG. DIRECTOR
ASST. REG. DIRECTOR
CHF. DIV. OF ADMIN.
CHF. DIV. OF OPERATIONS
CHF. DIV. OF INTERP.
CHF. REC. RES. PLANNING
CHF. RANGER ACTIVITIES
FIELD SOLICITOR

ACTION TAKEN *Memo 5/6/59*
to Waso - cy to work
FILE *5/7/59*

Memorandum

To: Regional Director, Region Two
From: Superintendent, Wind Cave National Park
Subject: Drilling of Water Well, Jewel Cave National Monument

Attached for your information is a photo copy of
Proof of Publication of Appropriation of Water No. 522-2 for
Jewel Cave National Monument, as published in CUSTER COUNTY
CHRONICLE, Custer, South Dakota.

Earl M. Semingsen
Earl M. Semingsen
Superintendent

In duplicate

Attachment - Proof of Publication

C. C. MAILED TO:
Director
BY *Matt* DATE *5/6/59*

WR Lofy
L 54

March 13, 1959

P. E. Smith

Memorandum

To: Superintendent, Wind Cave National Monument
From: Supervisory Engineer, WODC
Subject: Location of Test Wells at Jewel Cave National Monument

Please refer to my memorandum to the Regional Director, Region Two, with the same subject, dated February 20, 1959.

Mr. Baggley informed me by telephone, on March 9, that the bid for drilling this well would be opened on March 27. He also asked that I send you the measurements for locating this well.

Attached is a print showing the distances from survey hubs Numbers 2, 3, and 4 to the well site. By the method of intersection Mr. Waller can locate the well within reasonable accuracy.

(Sgd) P. E. Smith

P. E. Smith
Supervisory Engineer

In duplicate

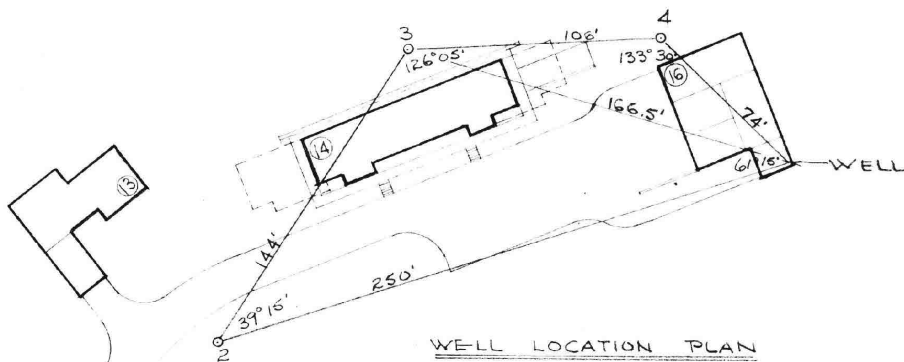
Attachment

Copy to: Chief, DAC (In duplicate)
Reg. Dir., Region Two
Mr. Van Dunn, Chief, Water Resources Section } each w/attachment

Wich

NOTE ON BUILDING # 14.

SOLID LINES INDICATE ONE STORY 4 UNIT OR
TWO STORY 8 UNIT. DASH LINE INDICATES
TWO STORY TEN UNIT AS MT. RUSHMORE.

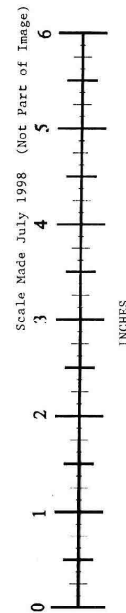


WELL LOCATION PLAN

POINTS 2, 3, & 4 ARE 2" X 2" HUB
WITH 1" X 2" GUARD.

JEWEL CAVE NATIONAL MONUMENT
SCALE 1" = 40' W.S.R. 3/13/59

SEE DRAWING NM-IC 8106.



FEB 27 1959

Memorandum

To: Director

From: Regional Chief of Operations, Region Two

Subject: Authority to Publish Legal Notice for Appropriation of
Water at Jewel Cave National Monument

Attached copy of a proposed Application for Permit to
Appropriate Water at Jewel Cave and Drawing No. NM-JC-5300-C were
forwarded to this office with Mr. Symington's memorandum of
February 20, 1959. We have shown in green ink some proposed amend-
ments and additions, as follows:

Item 9 II (b), Reservoir: Capacity.... We believe this
item is not applicable to the type of reservoir we will use in
this installation.

Item 9 III (a), Size of casing. The size should be given
as 12"; and, Thickness of casing should be Nominal 0.375. These
may be the final dimensions of the supply well.

We understand from our Field Solicitor there is legisla-
tion whereby the Superintendent has the authority, by delegation, to
publish the Legal Notice which is required by State Law.

After receiving your comments on this application we will
authorize the Superintendent of Wind Cave National Park to publish
the Legal Notice and file the application with the State.

(Sgd) George F. Baggley

George F. Baggley
Regional Chief of Operations

In duplicate

Attachments

Copy to: Supt., Wind Cave NF

(2)

WAMott/etb

LS 4
B 5039
changed
6/1/59
2/27/59
attn - 27
moy
Baggley 2/27



UNITED STATES
DEPARTMENT OF THE INTERIOR

NATIONAL PARK SERVICE
Wind Cave National Park
Hot Springs, South Dakota

February 20, 1959

REPLY REFER TO:
5039

REG. DIRECTOR
ASST. REG. DIRECTOR
CHf. DIV. OF ADMIN.
CHf. DIV. OF OPERATIONS
CHf. DIV. OF INTERP.
CHf. REC. RES. PLANNING
CHf. RANGER ACTIVITIES
FIELD SOLICITOR

Mr. Mott it must be should be \$54 each

ACTION TAKEN 2/27/59 *to Director by 2/27/59*
FILE

Memorandum

To: Regional Director, Region Two

From: Superintendent, Wind Cave National Park

Subject: Authority to Publish Legal Notice for Appropriation of Water at Jewel Cave National Monument

The attached copy of Application for Permit to Appropriate Water within the State of South Dakota at Jewel Cave National Monument is furnished for your information.

While at Pierre, South Dakota, on February 17, a draft of the application was reviewed by State underground water Engineer Driscoll. Mr. Driscoll informed me that the application will be approved and that state law requires legal advertisement notice published in the Custer County Chronicle, which is the authorized newspaper within Custer County.

Authority is requested for publishing the notice as furnished us by Chief Engineer J. W. Grimes.

It is our plan to pay for the \$5.00 examination fee and the publication of legal notice from the Imprest Cash fund.

Earl M. Semingsen
Earl M. Semingsen
Superintendent

In Duplicate

Attachment

cc: WASO
WODC

C. C. MAILED TO:
Director
BY *W. A. Mott* DATE *2/29/59*

Wind Cave National Park
Hot Springs, South Dakota

February 20, 1959 *att*
(Registered Mail)

Mr. J. W. Grimes, Chief Engineer
S. D. State Water Resources Comm.
Pierre, South Dakota

Dear Mr. Grimes:

While in your office February 17, I reviewed the attached Application for Permit to Appropriate Water with your underground water Engineer, Mr. Driscoll, who was very helpful in making suggestions in preparing the final draft for your approval.

Form 2, Form 2A, and our drawing #NM-JC 5300-C are enclosed in duplicate, together with our receipt for the \$5.00 cash payment for the examination fee.

Please sign the receipt and return it with your regular receipt and the permit.

In the event that the application is not approved by March 18,, we should like your letter approval to authorize drilling operations pending approval of the permit.

We are asking our Washington Office for authority to publish the legal advertisement in the Custer County Chronicle as required by State Law.

Sincerely yours,

Earl M. Semingsen
Earl M. Semingsen
Superintendent

In Duplicate

Attachments - Form 2 (2)
Form 2A (2)
Drawing #NM-JC 5300-C (2)
Receipt

cc: *X* Region Two
WODC
WASO

L-54

DEC 2 1958

Memorandum

To: Director

From: Regional Chief of Operations

Subject: Water Investigations, Jewel Cave National Monument

Attached is a copy of Mr. Hill's memorandum, dated November 24, 1958, expressing a preference for deep well sites 1 and 4 over sites 2 and 3 due to the excessive costs incident to installation of a pipe line over steep cliffs and their remoteness from the power source.

Deep well sites 1 and 4 are proposed to tap water in the Deadwood formation. This formation would probably be reached at a depth somewhere between 300 and 700 feet. We are advised that the supply of water at this level would be influenced very little by seasonal precipitation. We were also advised by Mr. Powell, U.S.G.S., that he would be available to observe the necessary pump tests should we be able to arrange drilling this winter.

Well sites 2 and 3 were proposed to investigate a possible source of water in the alluvium at depths of approximately 50 feet. It is believed, should a source be found at this level, that it may be necessary to drill several wells to insure the collection of an adequate supply. Seasonal precipitation should be considered a factor in analyzation of such a source. Additional cost of development is also a consideration as indicated by Mr. Hill.

The development of this area is programmed for 1960. It is important that a satisfactory source of water be located as far in advance of July 1, 1959, as possible for planning purposes if the MISSION 66 program is to proceed on schedule. Postponement of pumping tests until the fall of 1959 as indicated by Mr. Dunn in his memorandum of November 17, 1958, would result in a delay which we would prefer to avoid if possible. In view of the information now available from U.S.G.S., there appears to be no need to arrange for the services of Dr. Gries.

In view of the above points, we propose going ahead with the drilling of the test well at Site No. 1 as soon as we can get a drilling contractor into the area. We propose that the project be bid on the basis of mobilization and demobilization, then so much per foot for the first hundred feet of drilling and prorated per foot for each additional hundred feet, for each authorized hole. Where casing is required it would be bid per foot installed. Provisions for test pumping will be included along with other provisions recommended by the U.S.G.S.

We would appreciate your comments as soon as possible so that details may be ironed out and final arrangements completed.

(Sgd) George F. Baggley

George F. Baggley
Regional Chief of Operations

In duplicate

Attachment 1

WAMott/etb

L-54 *2 R 607*

NOV 17 1958

Memorandum

To: The Director
From: Hydraulic Engineer
Subject: Location of Test Wells at Jewel Cave National Monument

On October 31, 1958, I met with Mr. Powell, District Engineer of the U.S. Geological Survey, Huron, South Dakota, and with Mr. Nat Lacy, Ranger from Wind Cave National Park, and looked over the possible areas at Jewel Cave to drill test holes in pursuit of developing a water supply.

We drove into Hell Canyon and there Mr. Powell stated that we could get water at most any location if we go deep enough, but suggested that the drilling be done in the center of the Canyon to determine the amount of alluvium on top of the rock. He also stated that the water would be found at the same elevation if the drilling is undertaken at a site near the new residential development at a higher elevation and would require additional drilling equivalent to the difference of the ground surface elevations. It was suggested by Mr. Powell that the test hole drilling not be limited to within certain depths but should be carried to such depth to intercept the Deadwood formation, a distance of 10 feet to 20 feet.

I contacted the Forest Service Office in Custer, South Dakota and Mr. Hendry called attention to various springs in the nearby area of Jewel Cave which I visited to note relative elevations and locations. They were:

1. Lithograph Spring which had an estimated flow of one gallon in 45 seconds.
2. Chokecherry Spring which had an estimated flow of three gallons per minute.
3. Perry Dog Spring which had an estimated flow of about two gallons per minute.

The location of these springs is indicated on the attached map. They are not especially likely sources of water supply for the development at Jewel Cave.

11/17/58
in
Jewel
Cave

In pursuit of information upon which to base an estimate, contact was made with two water well drillers:

1. Updike Brothers at New Castle, Wyoming, and
2. Joe Neff at Custer, South Dakota.

Each driller believed that we should get a good supply of water at Jewel Cave if we would drill through the Madison formation into the Deadwood formation. They also thought that a well drilled to a 500 foot depth would intercept the Deadwood formation and supply an adequate amount of water.

On November 2, 1958, I contacted Dr. J. P. Gries, Professor in Geological Engineering, School of Mines, Rapid City, South Dakota, and discussed with him the approximate depth of drilling necessary to intercept the Deadwood formation at Jewel Cave. He expressed belief that 500 foot depth of drilling would be sufficient.

According to Mr. Powell's expression that the water table lies pretty much in a horizontal plane, it is proposed to drill the first test hole at the most desired location to serve the development, and to drill into the Deadwood formation. Four locations proposed to drill test wells, concurred with by Mr. Powell, are indicated upon the attached map. Test well site No. 1 might be incorporated into one corner of the Utility building and eliminate one structure from the area.

We are awaiting Mr. Powell's report.

Signed

William A. Mott
Hydraulic Engineer

✓ In duplicate

Attachment

Copy to: Chief, WOEC (2)
Supt., Jewel Cave

COPY

L54

Wind Cave National Park
Hot Springs, South Dakota

October 17, 1958

J. W. Grimes, Chief Engineer
S. Dak. Water Resources Commission
State Office Building
Pierre, South Dakota

Dear Mr. Grimes:

Please send us three (3) sets of forms #2, "Application for Permit to Appropriate Water Within the State of South Dakota", as was furnished us for the water well drilled on Wind Cave Canyon at Wind Cave National Park in 1956.

For your information, we plan to drill a well at Jewel Cave National Monument, which project is programmed for the 1960 fiscal year beginning July 1, 1959. Our Washington Office initiated action on this project with Mr. Powell, District Engineer, U. S. Geological Survey, Huron, South Dakota. A few weeks ago Mr. Powell and our Regional Forester Frank W. Childs made a brief onsite study of the headquarters area at Jewel Cave.

Mr. Powell has recommended drilling three well test holes: two at 50', and one 500' to determine our best opportunities for a permanent well location to supply the Government's needs for water at this place. Mr. Powell has also consulted Dr. J. P. Gries, School of Mines, Rapid City, about water chances at Jewel Cave, and Dr. Gries' services may be contracted by the U. S. Geological Survey as a consultant to complete the research work required.

A copy of this letter is being furnished to each of the Government Offices and representatives concerned for their information. You will recall that in the case of the water well permit for Wind Cave, several of our offices corresponded with your office asking for the same water well application forms and state requirement information. Therefore, we wish to avoid similar confusion and duplication of effort in this case.

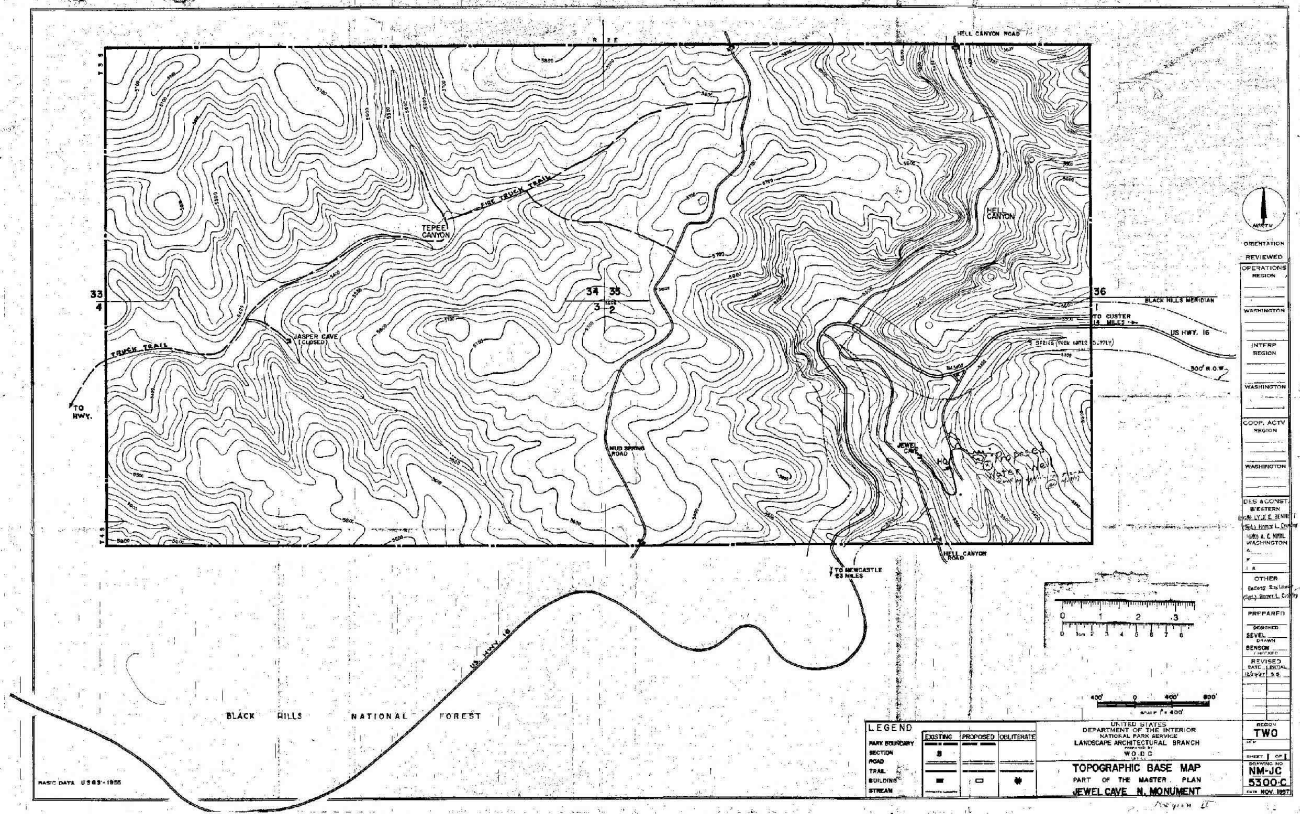
In the event that a separate application fee is charged for each test hole drilled, as well as the final well hole, please advise and we will issue purchase order for payment. A fee of \$1.75 was charged for the Wind Cave well permit.

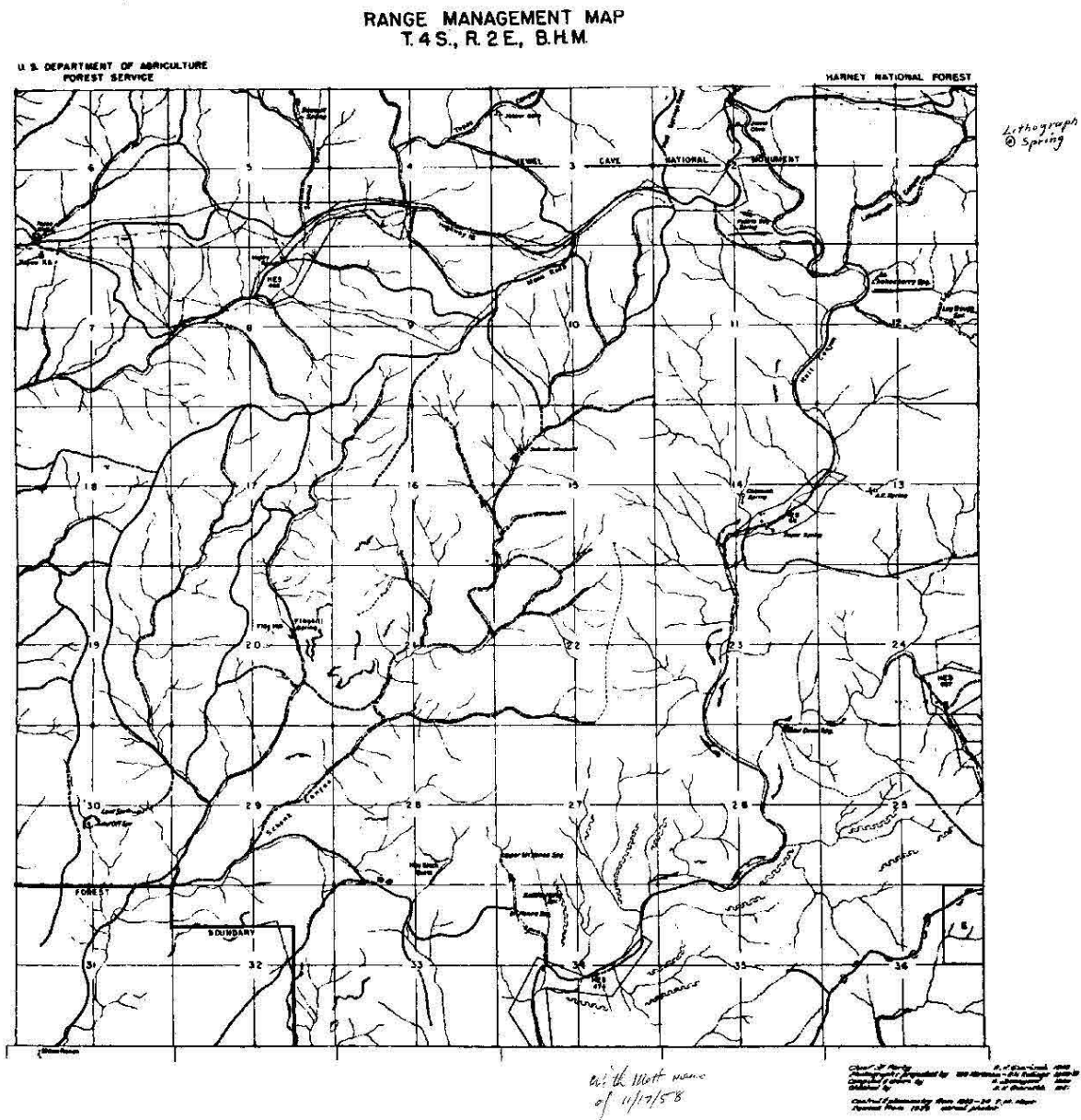
If you are in this vicinity this fall, I should like to visit with you again.

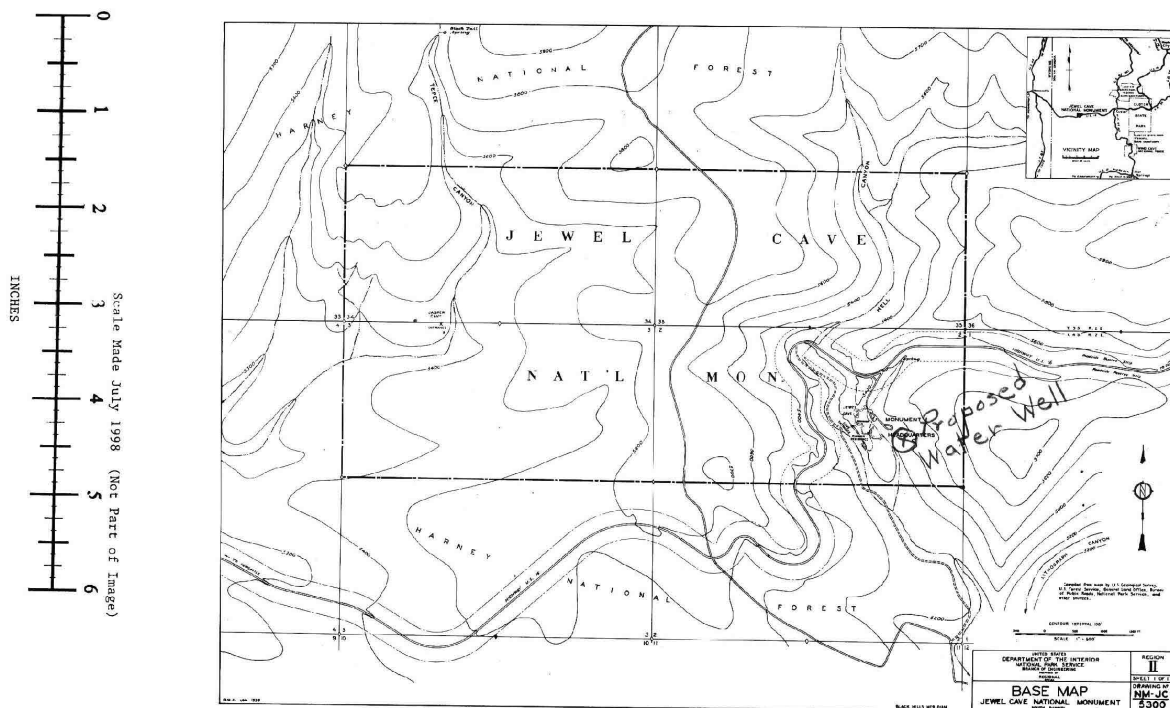
Sincerely yours,

/s/ Earl M. Semingsen
Earl M. Semingsen, Superintendent

Maps and Miscellaneous Information







Docket Information

Number of Documents in Docket 63

Documents Dated from 10/17/1958 to 11/15/1997

Docket Compiled: 4/19/2011