UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

Memorandum on ground-water investigation of four proposed stock wells in Puertocito Area, Socorro county and Canoncito Area, Bernalillo and Valencia counties, New Mexico

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C. A. Repenning and S. E. Galloway

Open-file report

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At the request of the Navajo Service, Office of Indian Affairs, a ground-water investigation of four proposed stock wells in the Puertocito Area, Socorro county and the Canoncito Area, Bernalillo and Valencia counties, New Mexico, was made in November, 1951 (see fig. 1). Although these areas are not on the Navajo Indian Reservation, they were included in the program of study of ground-water resources of the Navajo and Hopi Indian Reservations now being conducted by the Ground Water Branch of the United States Geological Survey. The work was financed by and was in cooperation with the Navajo Service, Office of Indian Affairs.

The Puertocito and Canoncito Areas are on government-allotted land, for the Navajo Indians, and the proposed well sites are a part of the Range Water Drilling Program prescribed by the Emergency Drought Relief appropriation. The proposed wells will provide a more adequate water-supply for these areas, and it is necessary that the water from these wells meet the requirements for stock use.

Each of the proposed well sites was assigned a Priority number by Indian Service Officials (see fig. 1). The selection of these priorities was based on the need and economic utilization. The following paragraphs summarize the information for each site.

Puertocito Area, Priority 1

Priority 1 is located in Section 13, T3N, R7W, preferably on the east side of the road, 3.5 miles north of Alamo Day School, Socorro County, N. Mex. Stratigraphic and structural studies indicate that the base of the middle sandstone in the Chinle formation lies about 500 feet below the land surface at the well site. It is believed that this sandstone will yield sufficient water suitable for stock purposes. Well number 146-PU-3, in Section 28, T3N, R6W, about 2 3/4 miles southeast of Priority 1 was inoperative at the time of the investigation. However, according to the driller's log of this well, 35 gallons of water per minute was encountered in the middle sandstone of the Chinle formation.

The stratigraphic section that will be encountered in a well at Priority 1 is as follows:

Formation	Age	Water-bearing character	Thickness (feet)	Depth to base (feet)
Alluvium	Quaternary	Fails in periods of drought	20-30	20-30
Mancos shale: (gray, sandy shale)	Cretaceous	Non-water-bearing	70-80	90-110
Dakota sandstone: (gray-tan sandstone)	do.	Possibly some water	50	140-160
Chinle formation:	Triassic	Non-water-bearing	125	265-285
Correo sandstone member: (red shale & sandstone)	do.			
Upper part middle shale: (blue shale)	do.	do.	125	390-410
Middle sandstone: (gray sandstone)	do.	Water-bearing	80-90	470-500
Lower part middle shale: (blue shale)	do.	Non-water-bearing	460	930-960

In order to insure an adequate and suitable water supply, it is necessary that a well be drilled to a depth of, at least, 500 feet.

Puertocito Area, Priority 2

Priority 2 is located in Section 31, T2N, R6W, about 5 miles south of Alamo Day School, Socorro county, N. Mex. There is an existing water supply at this location, consisting of a shallow dug well in the alluvium about 27 feet deep. The water level stands about 26 feet below the land surface and it is believed that the well is capable of producing 4 gallons of water per minute. However, the well is in very poor condition due to caving of the sides, and the windmill tower is near a state of collapse. Officials of the Indian Service desire to have a new well close-by in order to utilize the present storage facilities.

The proposed well should be drilled to a depth of 100 feet, or to the bottom of the alluvial material in order to obtain maximum production. It is believed that if a new well is drilled to this depth it will be capable of producing

e water than the present well and will be suitable for stock use.

Canoncito Area, Priority 1

Priority 1 is located about 6.5 miles north of Canoncito Day School on top of Herrera Mesa near the common corner of Section 3, 4, 9, and 10, T10N, R3W, Bernalillo county, N. Mex. (see fig. 1). Stratigraphically, this location is situated near the top of the Dakota group of Cretaceous age. As a result of structural features it is not considered possible to obtain sufficient water from the sandstones of the Dakota group in this area.

Stratigraphic and hydrologic studies indicate that water could be developed, at this well site, from the Cow Springs sandstone of Jurassic age at a depth of about 1,000 feet. While the Cow Springs sandstone has never been penetrated by wells in the area, several springs in the vicinity of Canoncito yield water from this sandstone.

The Jose Manuel spring, about 2.5 miles northwest of Canoncito Day School, issues from the base of the Cow Springs sandstone. This spring produces sufficient water suitable for local stock use.

The lithologic units that would be encountered in drilling a well at the Canoncito Area, Priority 1, would be as follows:

Formation	Age	Water-bearing Character	Thickness (feet)	Depth to base (feet)
Alluvium	Quaternary	Non-water-bearing	10-20	10-20
Dakota group: (tan & gray sandstone)	Cretaceous	Possibly some water	480-500	490-520
Morrison formation:	Jurassic			
Brushy Basin shale member: (gray, green & red sandy shales & sandstone)	do.	Non-water-bearing	250	740-770
Cow Springs sandstone: (white to tan sandstone)	do.	Water-bearing	200	940-970
Summerville formation: (red sandstone)	do.	Possibly water-bearing	120	1,060-1,090
Todilto formation:				
Gypsum unit: (white alabaster)	do.	Non-water-bearing	60	1,120-1,150

In order to obtain maximum yield from the aquifer, it will be necessary to drill a well to a depth of approximately 1,100 feet. Care should be taken not to penetrate the gypsum unit of the Todilto formation. Owing to the fine-grained character of the water-bearing sandstones, it is essential that the well be thoroughly surged prior to completion.

Canoncito Area, Priority 2

The site of priority 2 is located 4 3/4 miles southwest of Canoncito Day School, in Section 29, T10N, R3W, on top of Bell Rock Mesa, Valencia County, N. Mex. (see fig. 1).

Geologic and hydrologic conditions at this site are very similar to those at Priority 1, previously discussed. Therefore, to obtain a sufficient and suitable water-supply for stock purposes, it is necessary that a well be drilled to a depth of 1,100 feet. A well drilled at this site will penetrate the stratigraphic units as listed under Priority 1.

Samples of drill cuttings should be collected at 10-foot intervals, and water samples should be collected for analysis from each water-bearing zone from all wells that are covered by this report. These samples will aid in development of the wells and in future investigations of the area.

U. S. Geological Survey

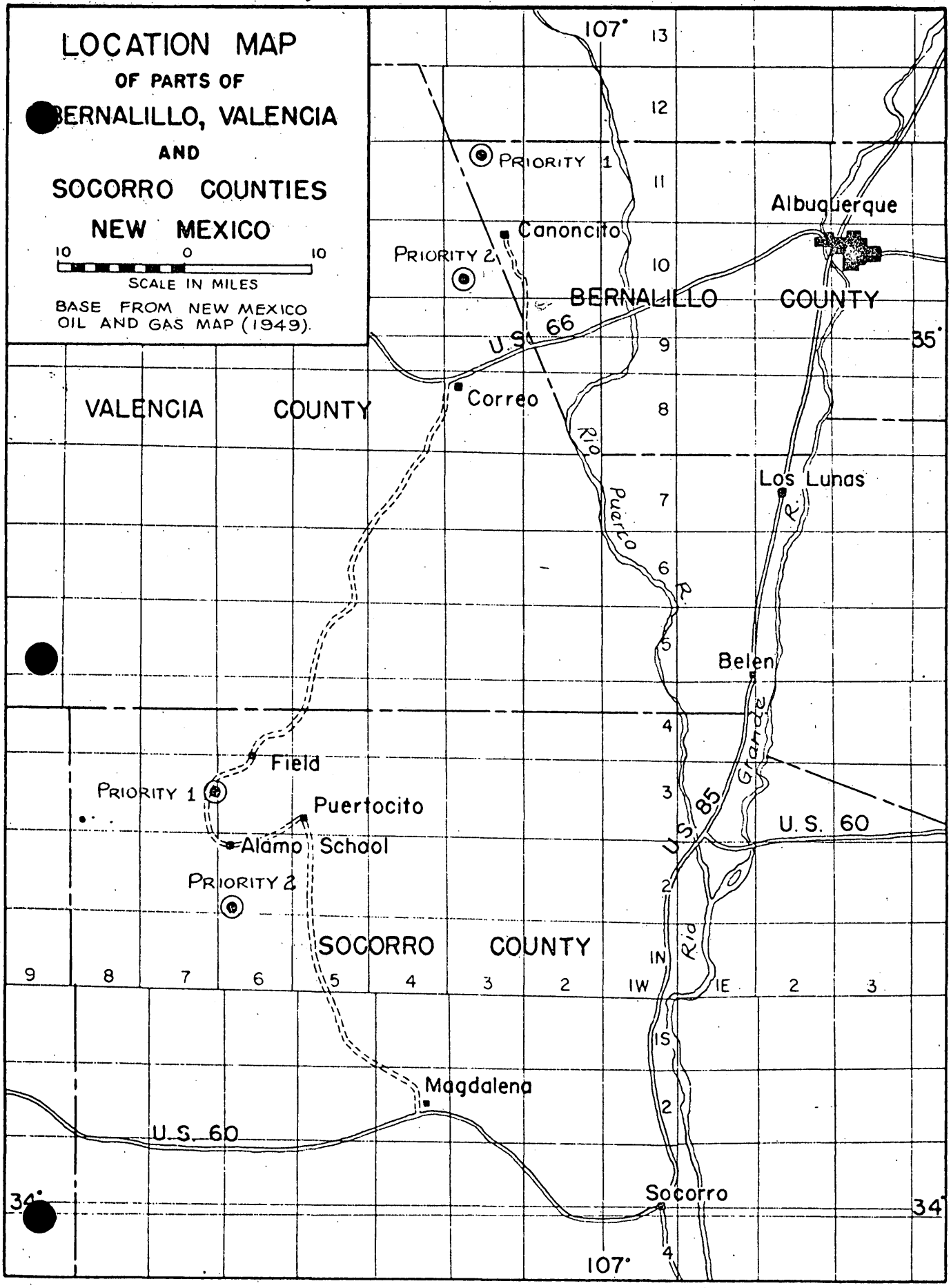

Figure 1. Index map showing location of proposed well sites in the Canoncito and Puertocito Areas, New Mexico.

OFF RESERVATION

LITHOLOGIC LOG

U. S. Geological Survey
Ground Water Branch
Navajo Project

Location: Canoncito #2 at Bell Rock Mesa, T 10 N., R 3 W., Sec. 29, N. Mex.

Samples described by: P. R. Stevens — Date: 3/2/53
Stratigraphic correlation by: E. A. Repenning — Date: 3/3/53
Well started: January, 1953
Well finished: February, 1953

	Thickness (feet)	Depth (feet)
UPPER & LOWER CRETACEOUS:		
DAKOTA GROUP:		
Grayish yellow, 5Y-8/4, sandy calcareous siltstone with muscovite	10	10
Yellowish gray, 5Y-7/2, sandy calcareous siltstone	20	30
Medium light gray sandy calcareous siltstone	60	90
Medium gray silty calcareous mudstone	40	130
Medium gray calcareous siltstone	20	150
Light gray medium to fine calcareous quartz sand sorting good	10	160
UPPER JURASSIC:		
MORRISON FORMATION:		
Brushy Basin member:		
Light gray sandy calcareous siltstone	30	190
Medium gray silty calcareous mudstone with gypsum	10	200
Very light gray medium to very fine calcareous quartz sand, sorting poor	10	210
Very light gray and medium gray medium to very fine calcareous quartz sand, sorting poor and silty calcareous mudstone	10	220
Medium gray silty calcareous mudstone	30	250
Medium light gray sandy calcareous siltstone	30	280
Light gray sandy calcareous siltstone and mudstone	60	340
Light gray and dark gray sandy calcareous siltstone, mudstone and claystone	10	350
Westwater Canyon member: ?		
Light gray silty medium to very fine calcareous quartz sand, sorting poor	30	380
Recapture member: ?		
Medium light gray calcareous mudstone	10	390
Medium light gray and medium dark gray calcareous mudstone and claystone	50	440
Pale brown, 5YR-5/2, calcareous mudstone and claystone	10	450
Grayish red, 10R-4/2, calcareous mudstone, claystone and siltstone	50	500
Grayish red, 10R-4/2, sandy calcareous siltstone and mudstone	30	530
Light gray and grayish pink, 5R-8/2, sandy calcareous siltstone and mudstone	10	540
~~BOK~~ SPRINGS SANDSTONE:		
Pale red, 10R-6/2, sandy calcareous siltstone	10	550
Pale red, 10R-6/2, medium to fine calcareous quartz sand, sorting good	77	627

HYDROLOGIC DATA:

Total depth - 627'
Water bearing formation - Cow Springs sandstone, Jurassic
Water bearing zone - 590-627'
Water level - 210'
Bailed at 35 gpm for 1 hour and 5 minutes
No appreciable drawdown
Additional aquifer reported at 200 feet with estimated yield at 5 gpm. Sample by driller was reported to be salty.
Gallons per minute - 35