UNITED STATES DEPARTMENT OF THE INTERIOR

GEOLOGICAL SURVEY

Geophysical Log Suite from Drill Holes No. 1 & 2 Mariano Lake-Lake Valley Drilling Project, McKinley County, New Mexico

by

U.S. Geological Survey

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Geophysical Log Suite from Drill Holes No. 1 and No. 2, Mariano Lake-Lake Valley Drilling Project, McKinley County, New Mexico

INTRODUCTION

In the fall of 1980, the U.S. Geological Survey contracted with Longman Drilling Company of Albuquerque, N. Mex. to rotary drill and core nine holes along a north-south line from Mariano Lake to the vicinity of Lake Valley, N. Mex. This report incorporates the logs from drill holes nos. 1 and 2.

The drilling project is funded under a reimbursable interagency agreement between the U.S. Bureau of Indian Affairs (BIA) and the U.S. Geological Survey (USGS). The program was designed by representatives of the BIA, USGS, and the Minerals Department of the Navajo Tribe.

PURPOSE

The principal objective of this project is to provide core samples and geophysical logs for petrologic, sedimentologic, geophysical, and geochemical studies of the Upper Jurassic Morrison Formation. Other objectives include the following: stratigraphic and coal studies of Upper Cretaceous rocks; hydrologic and water monitoring of well no. 2; control for a proposed seismic study of the same geographic area; and development of water wells by the Navajo Tribal Water and Sanitation Department.

ACKNOWLEDGEMENTS

The USGS wishes to acknowledge the cooperation of the following companies for permission to drill on company-owned mineral leases: Teton Exploration Drilling, Inc., and New Mexico and Arizona Land Corporation for drill hole no. 1; Wyoming Fuel Company, and New Mexico and Arizona Land Corporation for drill hole no. 2.

GENERAL DRILLING PLAN

The locations of all nine drill holes are shown on figure 1, which is a portion of the Gallup 1^{o} x 2^{o} Quadrangle. The drilling plan calls for eight of the nine holes to be rotary drilled into the Upper Cretaceous Dakota Sandstone and then cored into or through the Recapture Member of the Morrison Formation. The interval to be cored in each hole will be about 600 ft. Drill hole no. 2 will not be cored but will be rotary drilled into the Middle Jurassic Entrada Sandstone. Drill hole no. 6 will also be deepened by rotary drilling into the Entrada Sandstone.

Chip samples are to be collected at 10-ft intervals throughout each hole and sludge samples collected at 20-ft intervals throughout the cored interval.

The following suite of geophysical logs will be included in the drilling project: natural gamma, self potential, neutron-neutron porosity, resistivity, temperature, deviation, gamma-gamma density, caliper, magnetic susceptibility, gamma ray spectrometer (KUT), and conductivity. In addition, at least one hole will be logged with a high resolution 4-arm digital dipmeter.

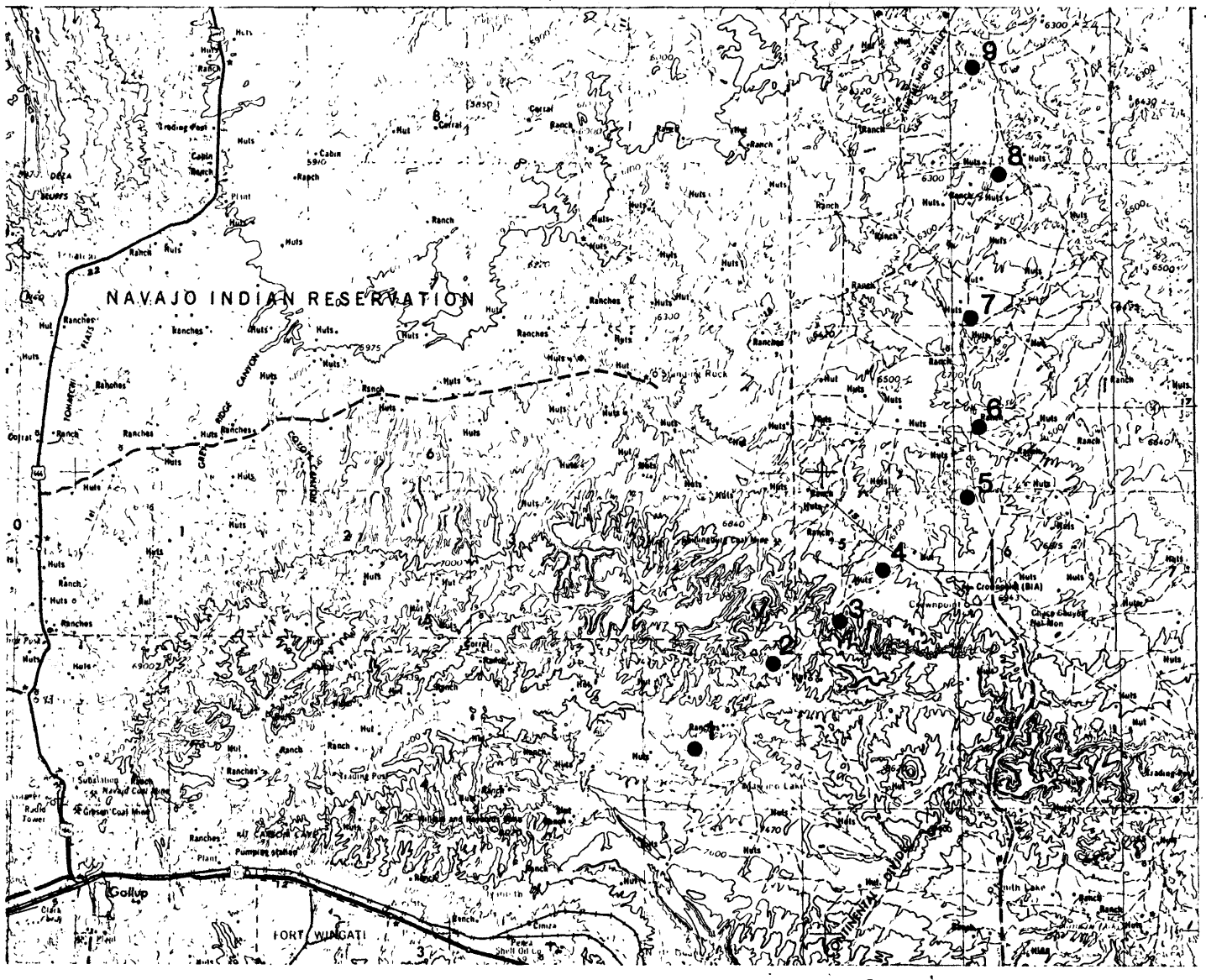

Figure 1. - Location of USGS Drill Holes, Gallup 1^{o} x 2^{o} Quadrangle

DRILL HOLE NO. 1.

The location of this well is shown on figure 2.

The vital statistics on this well include the following:

Location: T. 16 N., R. 14 W., NE1/4 sec. 29.		
Collar Elevation:	7238 ft	Mancos Shale (Cretaceous)
Core Point Top:	475 ft (depth)	Dakota Sandstone (Cretaceous)
Bottom Cored Interval	1076 ft (depth)	Cow Springs Sandstone (Jurassic)
Total Depth:	1076 ft (depth)	Cow Springs Sandstone (Jurassic)

Status of well: Abandoned, October 29, 1980.

The following suite of geophysical logs were run on this hole and accompany this report: natural gamma, self potential, neutron-neutron porosity, resistivity, deviation, gamma-gamma density, caliper, KUT, conductivity, and magnetic susceptibility (plates 1-5).

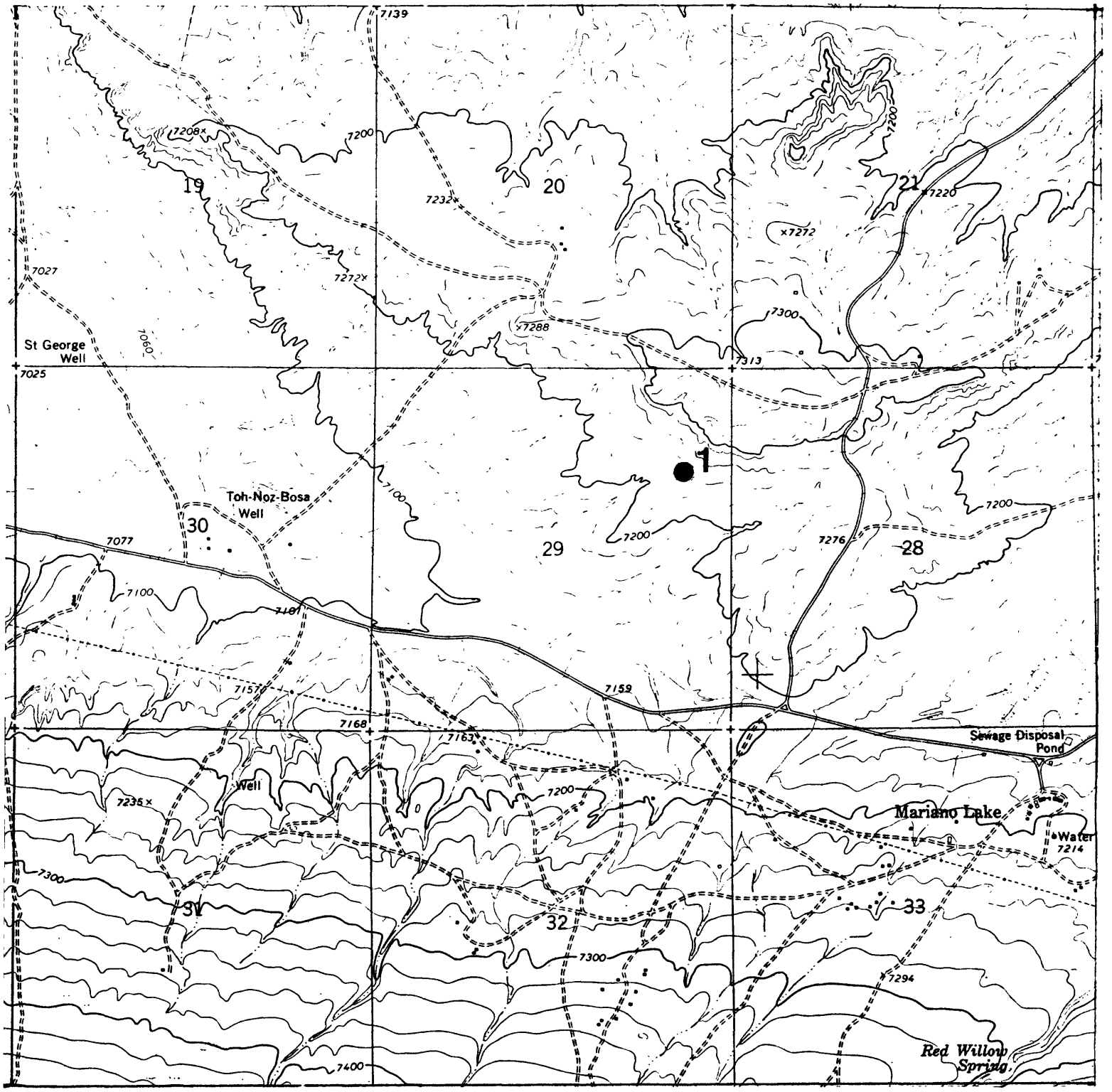

Figure 2. - Location of USGS Drill Hole 1, Mariano Lake 7 1/2' Quadrangle, T 16 N, R 14 W.

DRILL HOLE NO. 2.

The location of this well is shown on figure 3 below.

The vital statistics on this well are:

Location:	T. 16 N., R. 14 W., SW1/4 sec. 1	
Collar Elevation:	7355 ft	Mulatto Tongue of Mancos Shale (Cretaceous)
Core Point Top:	Not Applicable	
Bottom Cored Interval	Not Applicable	
Total Depth:	2460 ft (depth)	Entrada Sandstone (Jurassic)

The following suite of geophysical logs were run on this hole and accompany this report: natural gamma, self potential, neutron-neutron, porosity, resistivity, deviation, gamma-gamma density, and caliper (plates 6-7).

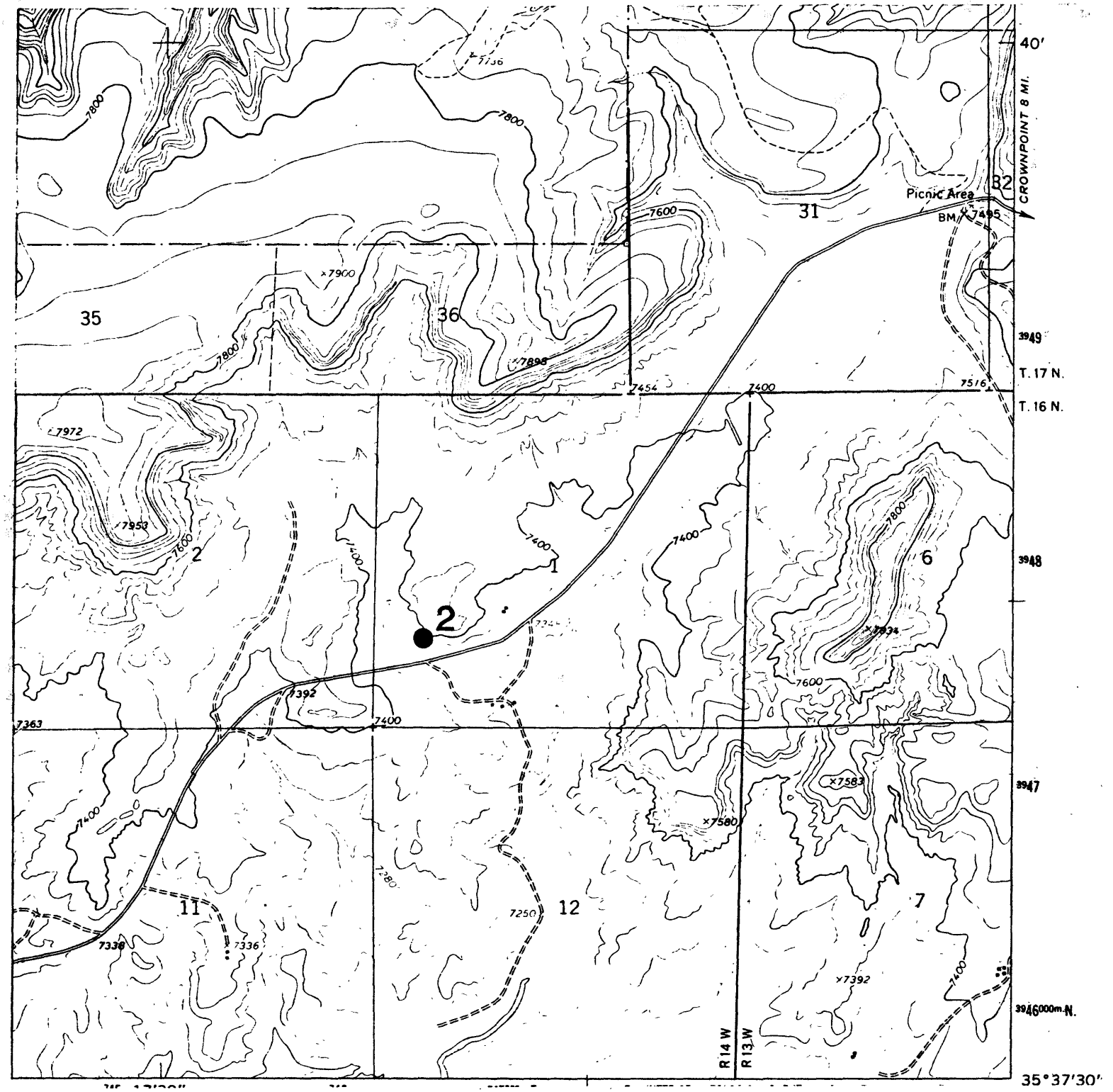

Figure 3. - Location of USGS Drill Hole 2, Dalton Pass 7 1/2' Quadrangle, T 16 N, R 14 W.