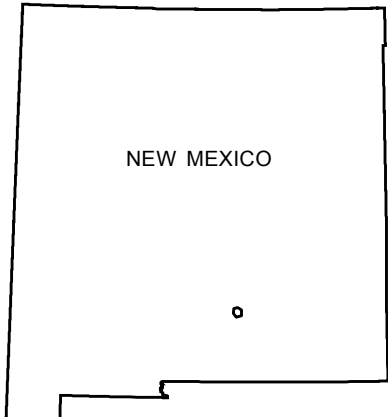


Base map from U.S. Geological Survey 1963, from photographs taken 1963, field checked in 1963.
1927 North American datum, UTM projection - zone 13N
1000-meter Universal Transverse Mercator grid, zone 13, shown in red

ELK SLIVER	TURKEY PEAK	CLEMENTS HATCH
HARVEY BENCH	Mayhill	ELK
SACRAMENTO	WOODSON CANYON	ROBERTSON CANYON

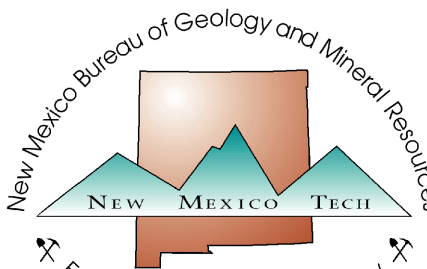


QUADRANGLE LOCATION

This draft geologic map is preliminary and will undergo revision. It was produced from either scans of hand-drafted originals or from digitally drafted original maps and figures using a wide variety of software, and is currently in cartographic production. It is being distributed in this draft form as part of the bureau's Open-file map series (OFGM), due to high demand for current geologic map data in these areas where STATEMAP quadrangles are located, and it is the bureau's policy to disseminate geologic data to the public as soon as possible.

After this map has undergone scientific peer review, editing, and final cartographic production adhering to bureau map standards, it will be released in our Geologic Map (GM) series. This final version will receive a new GM number and will supersede this preliminary open-file geologic map.

DRAFT



New Mexico Bureau of Geology and Mineral Resources
Open-file Geologic Map 155

Mapping of this quadrangle was funded by a matching-funds grant from the STATEMAP program of the National Cooperative Geologic Mapping Act, administered by the U. S. Geological Survey, and by the New Mexico Bureau of Geology and Mineral Resources, (Dr. Peter A. Scholle, Director and State Geologist, Dr. J. Michael Timmons, Geologic Mapping Program Manager). Additional funding made possible by the Otero County Soil and Water Conservation District.

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This and other STATEMAP quadrangles are (or soon will be) available
for free download in both PDF and ArcGIS formats at:

http://geoinfo.nmt.edu/publications/maps/geologic/ofgm/home.html

Geologic map of the Mayhill
quadrangle, Otero County, New Mexico

June 2007

by
Benjamin Hallett

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COMMENTS TO MAP USERS

A geologic map displays information on the distribution, nature, orientation, and age relationships of rock and deposits and the occurrence of structural features. Geologic and fault contacts are irregular surfaces that form boundaries between different types or ages of units. Data depicted on this geologic quadrangle map may be based on any of the following: reconnaissance field geologic mapping, compilation of published and unpublished work, and photogeologic interpretation. Locations of contacts are not surveyed, but are plotted by interpretation of the position of a given contact onto a topographic base map; therefore, the accuracy of contact locations depends on the scale of mapping and the interpretation of the geologist(s). Any enlargement of this map could cause misunderstanding in the detail of mapping and may result in erroneous interpretations. Site-specific conditions should be verified by detailed surface mapping or subsurface exploration. Topographic and cultural changes associated with recent development may not be shown.

Cross sections are constructed based upon the interpretations of the author made from geologic mapping, and available geophysical, and subsurface (drillhole) data. Cross-sections should be used as an aid to understanding the general geologic framework of the map area, and not be the sole source of information for use in locating or designing wells, buildings, roads, or other man-made structures.

The map has not been reviewed according to New Mexico Bureau of Geology and Mineral Resources standards. The contents of the report and map should not be considered final and complete until reviewed and published by the New Mexico Bureau of Geology and Mineral Resources. The views and conclusions contained in this document are those of the authors and should not be interpreted as necessarily representing the official policies, either expressed or implied, of the State of New Mexico, or the U.S. Government.

Mayhill Quadrangle Unit Descriptions:

Permian Rocks

Py: Permian Yeso Formation

A heterogeneous unit of mudstone, limestone, dolomite, and evaporates, the Yeso occurs mainly in canyon bottoms and lower slopes in the eastern part of the map area. The Yeso is best recognized by pinkish-red to yellow claystones and siltstones. Evaporite lithologies, mainly gypsum in surface exposures, are less common in the upper part of the Yeso exposed in the Mayhill quadrangle. Carbonate occurs throughout the Yeso, yet is more common near the top of the Yeso, generally above a thick package of mudstones. Yeso carbonate is generally more tan in color and more thinly bedded than the gray carbonates of the Rio Bonito member of the San Andres formation. Measured sections of the Yeso range from ~ 1200 to 1500 feet in thickness (Pray, 1961)

Psr: Rio Bonito Member of the Permian San Andres Formation

The Rio Bonito member of the San Andres formation is a gray to brownish gray locally fossiliferous micritic limestone and dolomite, similar to the younger Bonny Canyon member (Psb). A generally more thickly bedded and massive unit than the Psb, the Rio Bonito is characterized by 5-50 cm-thick beds. This unit occurs on slopes and lower ridgetops in the eastern part of the map area, as well as in canyon bottoms on the western part of the quadrangle where no Yeso is exposed. Near the base of the Rio Bonito member occur lenses of fine-medium grained rusty quartz arenite sandstone, believed to be equivalent to the Glorieta sandstone (Kelly, 1978). The Glorieta sandstone is not entirely continuous, but it can generally be found along strike within 500 feet of where it pinches out. As this is the only documented and recognized non-carbonate lithology within the San Andres formation, it was generally utilized to map the contact between San Andres and carbonate-bearing Yeso formation. The Glorieta sandstone commonly occurs 60-120 feet above the base of the San Andres formation (Pray, 1961). As little or no outcrop occurs in much of the map area, the location of this contact was generally estimated relative to the highest flat blocks of Glorieta sandstone. The Rio Bonito member thickens to the south, and in the Mayhill area it is approximately 400 feet thick (Kelly, 1978).

Psb: Bonney Canyon member of the Permian San Andres Formation

A gray to brownish gray locally fossiliferous micritic limestone and dolomite, the Bonney Canyon member of the San Andres formation is characterized by generally 2-20 cm-thick bedding. This is in contrast to the more massive Rio Bonito member. Fauna include crinoids and ammonites. As no distinct stratigraphically recognizable marker bed indicates the Bonney Canyon - Rio Bonito contact, mapping of this contact was primarily done by aerial photo analysis. Kelly (1978) suggests that the thinner bedding of the Bonney Canyon results in a greater permeability and thus greater tree cover in areas dominated by pinyon and juniper forest. As a result, in the map area this member shows a distinct bulls-eye pattern of tree cover that follows the outcrop of local beds. In general, the transition from the Rio Bonito member to the Bonney Canyon member was mapped as a light band just below the start of this bulls-eye pattern of denser tree cover. The Bonny Canyon member is nowhere completely exposed on the Mayhill Quadrangle, yet its thickness in the area is estimated at ~300 feet (Kelley, 1978).

Cenozoic Surficial Deposits

Qal: Quaternary Alluvium

Holocene and older stream and minor terrace deposits. This unit fills valley floors and is characterized as a sandy gravel composed of mainly carbonate clasts and minor quartz sandstone (Glorieta).

QTa: Older Alluvium

Terrace and alluvial fan deposits. This unit occurs mainly at the mouths of smaller side canyons where they run into James Canyon and the Rio Penasco valley. Composed of fine to coarse subrounded carbonate pebbles, most with calcic rinds, in a reddish silty sand matrix. Layers often alternate between more fine and more coarse, and commonly show clast imbrication. QTa is moderately consolidated and generally at a higher level than Qal.

QTdf: Debris Flow Deposit

Minor debris flow deposit in Browning canyon. A moderately to well consolidated matrix supported sandy gravel along the walls of Browning canyon. This unit is poorly exposed and recently incised. Clasts are subrounded carbonates

