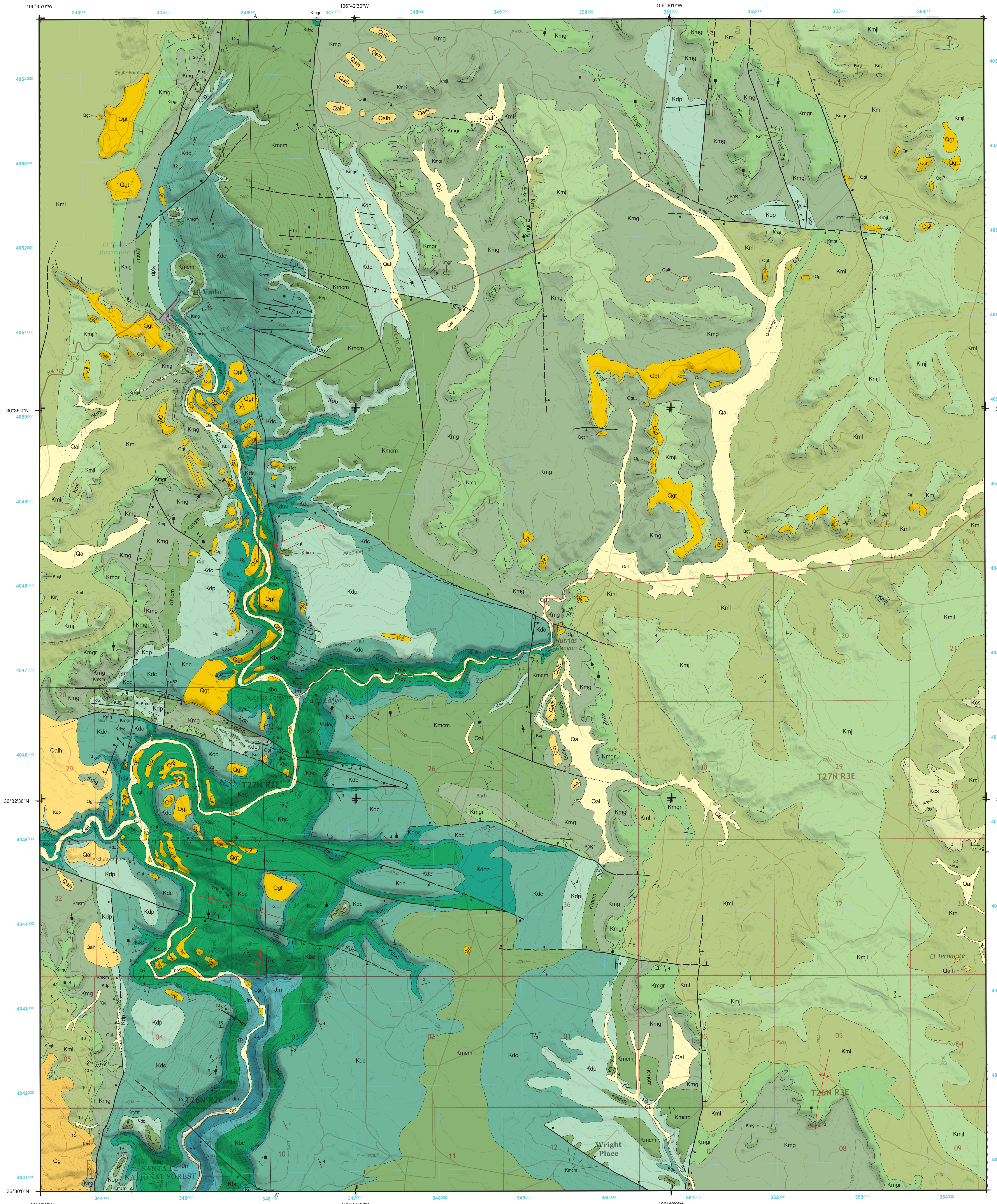
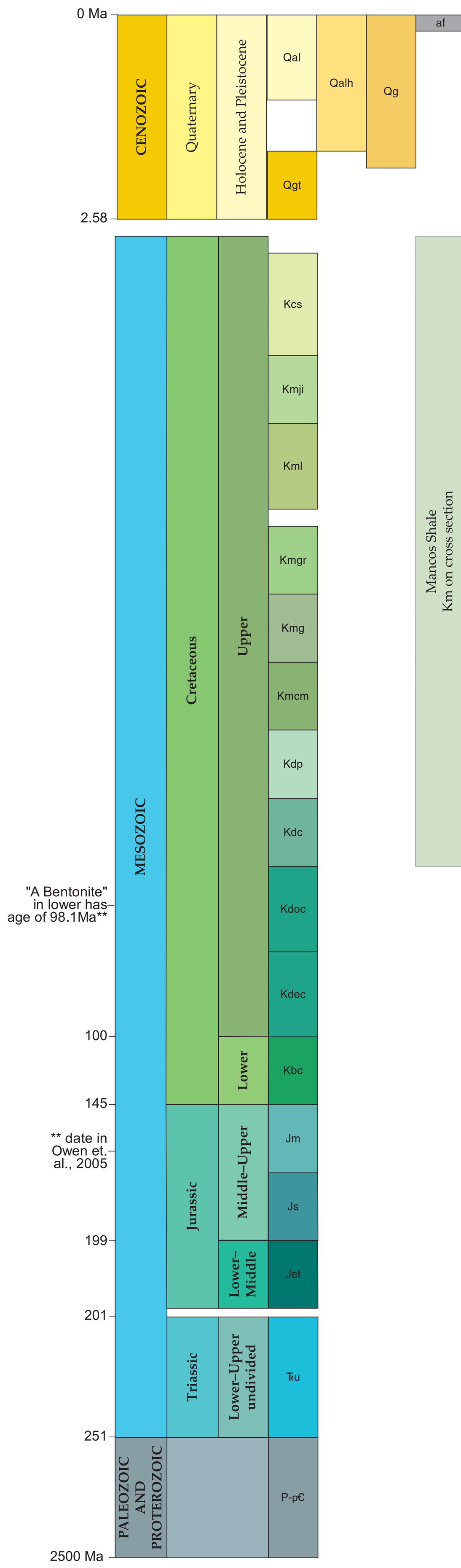
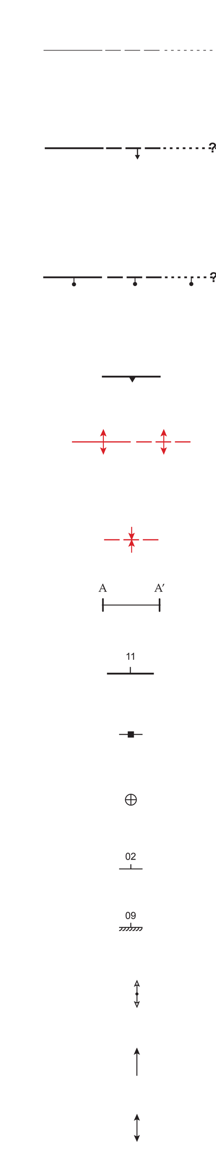
NMBGMR Open-File Geologic Map 257
Last Modified June 2016



Correlation of Map Units



Explanation of Map Symbols



Contact—Identity and existence certain. Location: accurate where solid, dashed where approximate, and dotted where concealed

Fault (generic; vertical, subvertical, or high-angle; or unknown or unspecified orientation or sense of slip)—Identity and existence certain. Location: accurate where solid, dashed where approximate, and dotted where concealed. Identity or existence questionable where queried.

Normal fault—Identity and existence certain. Location: accurate where solid, dashed where approximate, and dotted where concealed. Identity or existence questionable where queried.

Thrust fault—Identity and existence certain, location accurate

Anticline—Identity and existence certain. Location: accurate where solid, approximate where dashed.

Syncline—Identity and existence certain, location approximate

Cross section line and label

Minor inclined fault

Minor vertical or near-vertical joint

Horizontal bedding

Inclined bedding

Inclined bedding in crossbedded rocks

Inclined slickline, groove, or striation on fault surface

Inclined generic (origin or type not known or not specified) lineation or linear structure

Horizontal generic (origin or type not known or not specified) lineation or linear structure

Description of Map Units

Anthropogenic Fill

af — **Anthropogenic Fill**—Fill earth used to dam the Rio Chama resulting in the El Vado Reservoir.

Quaternary

Qal — **Holocene and Pleistocene Alluvium**—Mostly fine-grained, greyish and brownish valley-fill alluvium. Commonly developed over shale. Contact mapped from aerial imagery and presence confirmed in the field. Two to 15(?) m thick.

Qalh — **Holocene and Pleistocene Higher Alluvium**—Reworked(?) river cobbles/pebbles and fine-grained alluvium deposited on flat areas above modern drainages. Commonly overlying shale and "benches" developed on sandstones. Two to 10(?) m thick.

Qg — **Gravel**—Coarse-gravel and fine-grained alluvium in irregular patches overlying bedrock above modern drainages. Distinguished from Qtg by lack of flat upper surface. May represent erosionally modified terrace deposits and/or reworked Qtg sediments. Two to 5 m thick.

Qgt — **Terrace Gravel**—Coarse-river cobbles/pebbles commonly overlain by 1–5 m "overbank" silt and pebbly silt. Cobbles consist of Proterozoic quartzite, metaconglomerate and schistoze quartzite, Tertiary volcanic rocks, Quaternary basalt, and sometimes Cretaceous sandstone.

Cretaceous

Late-Cretaceous Macos Group–Km in cross section above surface.

Kcs — **Cooper Arroyo Sandstone of the Mancos Shale**—Tan, fine-grained, glauconitic, trough-cross-bedded, quartz sandstone found within the Carlile Shale. One to 2 m thick.

Kmjl — **Juana Lopez Member of Manco Shale**—Yellow/reddish, weathering grey, thinly bedded, shelly recrystallized limestone with shale interbeds. Approximately 3–10 m thick. Lower and upper contacts on this quad are first and last localy continuous limestonebeds. Thin limestone beds and lenses sometimes found up to 15 m above and below. Weathers to distinctive platy fragments containing sparce to common shell fragments, burrows, and ripple marks. Shaly fragments sometimes cover slopes below outcrops.

Kml — **Carlile Member of the Mancos Shale**—Dark-grey to light-grey, sometimes shelly, laminated to very thin-bedded shale and locally(?) hard, platy-weathering siltstone. Between 120–150 m thick. Lower contact is top of uppermost continuous limestone of Kmgr, upper contact not exposed on this quadrangle. Sometimes contains up to 2 m diameter septarian concretions that weather to distinctive, reddish to yellowish, prismatic fragments.

Kmgr — **Greenhorn Member of the Mancos Shale**—Light- to dark-gray, weathering to very light-grey to whitish; very thin- to medium-bedded, dense, finely crystalline, recrystalized; ridge-forming limestone with relatively thin-interbedded shale. Lower contact sharp. Upper contact with overlying Carlile Shale commonly not exposed. Ten to 25 m thick.

Kmg — **Graneros Member of the Mancos Shale**—Dark-gray to black, laminated to medium-bedded somewhat friable, slope-forming shale, containing locally abundant concretions. 40-50 m thick.

Kmcm — **Clay Mesa Member of the Mancos Shale**—Very dark-gray to light-bluish-gray; somewhat friable, laminated to thinly bedded; slope-forming shale. Upper and lower contacts sharp. Approximately 6–18 m thick; thinning from north to south.

Late-Cretaceous Dakota Group–Kd in cross section above surface.

Kdp — **Paguate Member of the Dakota Sandstone**—Yellowish to tan, moderately strong to strong, moderately well-sorted, subrounded, medium- to thick-bedded, very fine-grained, commonly burrowed, arkosic quartz sandstone. 18–20 m thick.

Kdc — **Cubero Member of the Dakota Sandstone**—Yellowish to tan, moderately strong to strong, moderately well- to well-sorted, subrounded to rounded, medium- to thick-bedded, very fine- to fine-grained, commonly burrowed, quartz sandstone and minor silt and shale. Regionally 15-20 m thick.

Cretaceous Oak Canyon and Encinal Canyon Members of the Dakota Sandstone; Undivided on map and cross sections

Kdoc — **Oak Canyon Member of the Dakota Sandstone**—Characterized by gray to blackish, sparsely fossiliferous mostly non-limey, laminated to medium-bedded shale and silty shale; and yellowish to tan, moderately strong, moderately well-sorted, subrounded, very thin- to medium-bedded, very fine- to fine-grained, sometimes bioturbated, sometimes ripple-laminated, quartz-dominated sandstone with characteristic, plant fragments. 12–20 m thick.

Kdec — **Encinal Canyon Member of the Dakota Sandstone**—Very light-tan to whiteish, moderately strong to strong, moderately well- to well-sorted, subrounded, thin- to thick-bedded, sometimes weakly bioturbated, very fine- to medium-grained sandstone. Approximately 8 m thick.

Burro Canyon Formation

Kbc — **Early-Cretaceous Burro Canyon Formation**—Whitish to tan, moderately strong to strong; poorly to moderately sorted; subrounded; medium- to thick-bedded; fine- to medium-grained, sometimes pebbly; cross-laminated and plane-laminated sandstone and red and/or green, sometimes mottled; laminated or massive clay and siltstone. Regionaly 35–55 m thick.

Jurassic

Jm — **Late-Middle Jurassic Morrison**—Variagated pale-greenish gray- to yellowish-brown, bentonic mudstone with a few beds of trough-crossbedded pebbly sandstone. Regionally 41–68 m thick.

Js — **Late-Middle Jurassic Bluff Sandtone/Summerville Formation**—The Bluff Sandstone is characterized by pale-yellowish-green to olive-gray, very fine-grained, well-sorted sandstone with thick-cross-bedded sets and pale-brown to greenish-gray gypsypferous silstone and mudstone. Regionally 44–47 m thick. The Summerville Formation is characterized by grayish-red to grayish-yellow-green siltstone. Regionally 74–111 m thick.

Jet — **Early-Middle Jurassic Entrada and Todilto Formations**—Undivided, cross section only.

Triassic

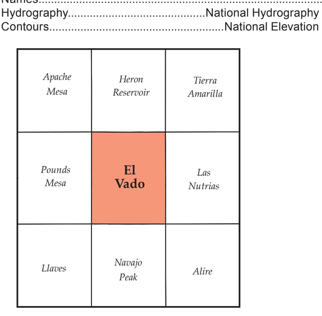
Tru — **Triassic Units**—Undivided, cross section only.

Permian and Proterozoic

P-pC — **Paleozoic and Precambrian Units**—Undivided, cross section only.

Base map from U.S. Geological Survey 2010.
North American Datum of 1983 (NAD83) World Geodetic System of 1984 (WGS84).
Projection and 1000-meter grid: Universal Transverse Mercator, Zone 12S
10 000-foot ticks: New Mexico Coordinate System of 1983(west zone), shown in blue.

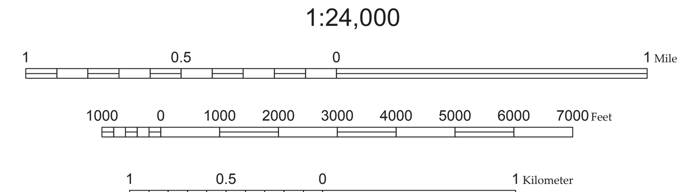
Roads....................©2006-2010 Tele Atlas
Names....................GNIS, 2008
Hydrography....................National Hydrography Dataset, 2005
Contours....................National Elevation Dataset, 2000



Magnetic Declination
July, 2011
9º 2' East
At Map Center

Quadrangle Location

1:24,000



Contour Interval 20 Feet
North American Vertical Datum of 1988

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This and other STATEMAP quadrangles are available for free download in both PDF and ArcGIS formats at:

http://geoinfo.nmt.edu

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New Mexico Bureau of Geology and Mineral Resources
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Geologic Map of the El Vado 7.5-Minute Quadrangle, Rio Arriba County, New Mexico

June, 2016

by
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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 may not be shown due to recent development.

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.

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Geologic Cross Section