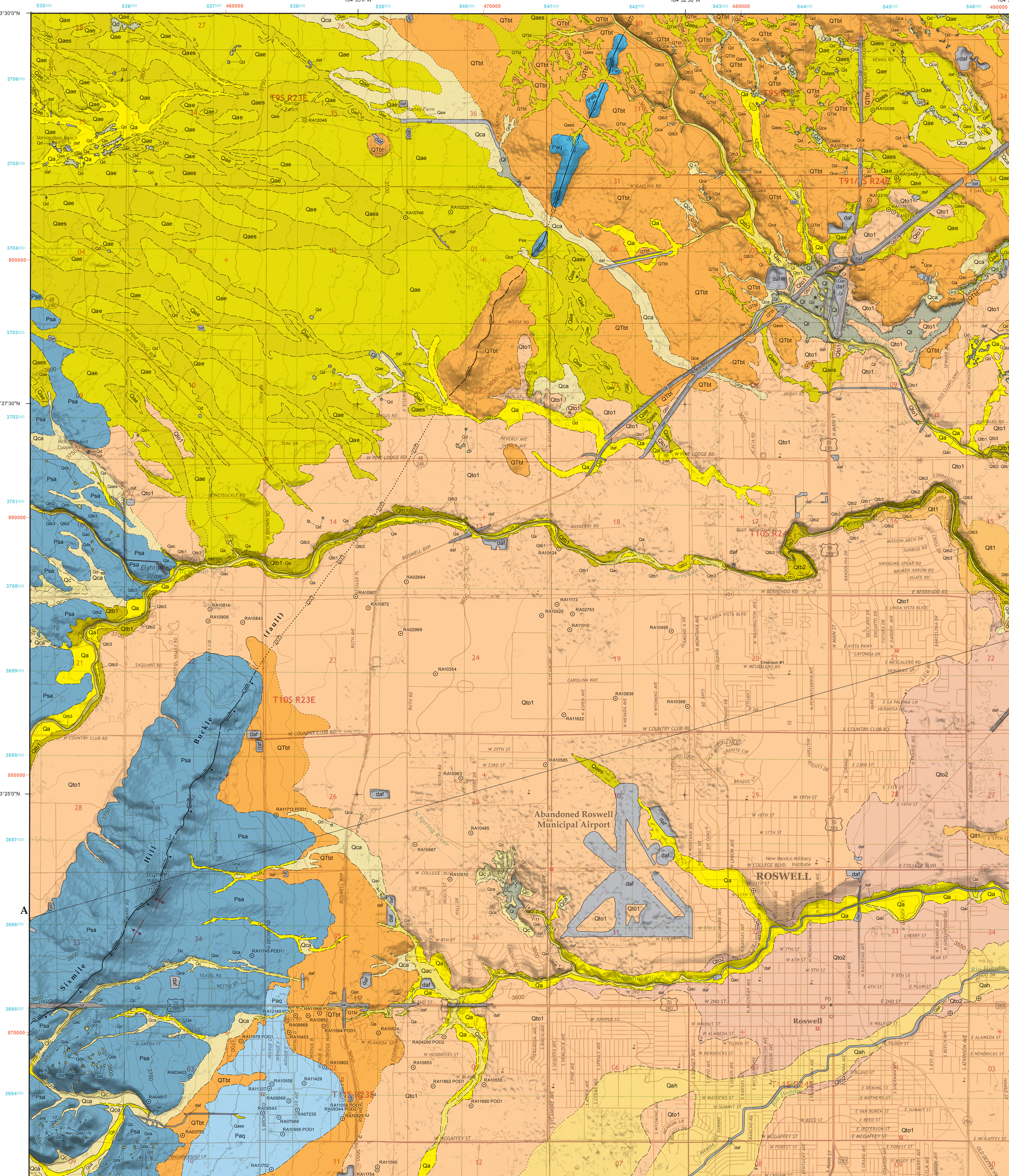



Base map from U.S. Geological Survey 2013.
North American Datum of 1983 (NAD83) World Geodetic System of 1984 (WGS84).
Projection and 1,000-meter grid: Universal Transverse Mercator, Zone 13S, shown in blue.
10,000-foot ticks: New Mexico Coordinate System of 1983(east zone), shown in red.

Roads....TomTom ©2006-2013
Names....GNIS, 2013
Hydrography....National Hydrography Dataset, 2011
Contours....IFSAR 4.5 m Digital Elevation Model, 2008

1:24,000

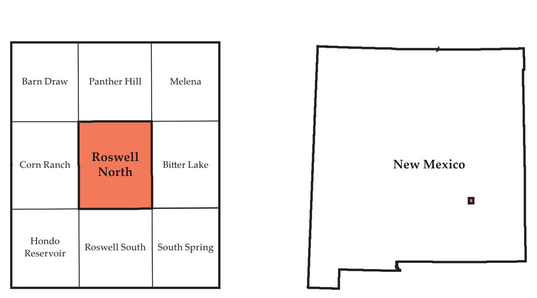
1 0.5 0 1 Mile

1000 0 1000 2000 3000 4000 5000 6000 7000 Feet

1 0.5 0 1 Kilometer

Contour Interval 10 Feet

North American Vertical Datum of 1988




Quadrangle Location


Magnetic Declination
March, 2014
7° 49' East
At Map Center

New Mexico Bureau of Geology and Mineral Resources
New Mexico Tech
801 Leroy Place
Socorro, New Mexico
87801-4796

[575] 835-5490

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

http://geoinfo.nmt.edu

New Mexico Bureau of Geology and Mineral Resources
Open-File Geologic Map 278

Mapping of this quadrangle was funded by a matching-funds grant from the STATEMAP program of the National Cooperative Geologic Mapping Act (Fund Number: G18AC00201), administered by the U. S. Geological Survey, and by the New Mexico Bureau of Geology and Mineral Resources, (Dr. Nelia W. Dunbar, *Director and State Geologist*; Dr. J. Michael Timmons, *Assoc. Director for Mapping Programs*).

# Geologic Map of the Roswell North 7.5-Minute Quadrangle, Chaves County, New Mexico

June 2019

By
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## Comments to Map Users

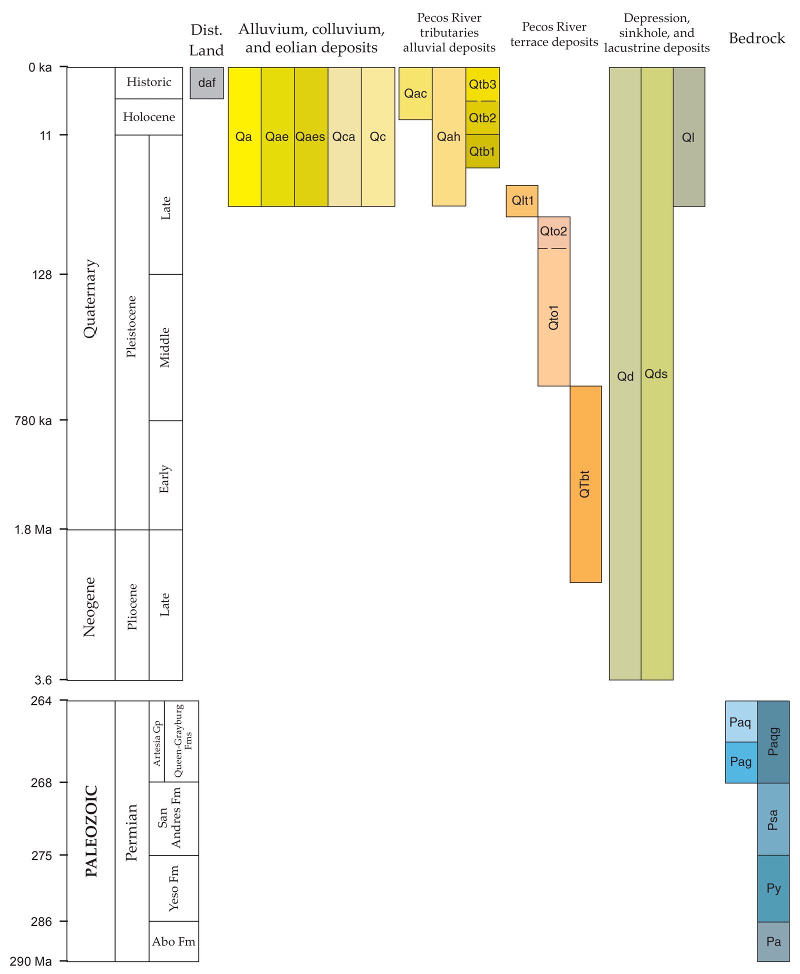
A geologic map displays information on the distribution, nature, orientation, and age relationships of rock and deposits and the occurrence of structural features. Geologic and fault contacts are irregular surfaces that form boundaries between different types or ages of units. Data depicted on this geologic 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.

The New Mexico Bureau of Geology and Mineral Resources created the Open-file Geologic Map Series to expedite dissemination of these geologic maps and map data to the public as rapidly as possible while allowing for map revision as geologists continued to work in map areas. Each map sheet carries the original date of publication below the map as well as the latest revision date in the upper right corner. In most cases, the original date of publication coincides with the date of the map product delivered to the National Cooperative Geologic Mapping Program (NCGMP) as part of New Mexico's STATEMAP agreement. While maps are produced, maintained, and updated in an ArcGIS geodatabase, at the time of the STATEMAP deliverable, each map goes through cartographic production and internal review prior to uploading to the Internet. Even if additional updates are carried out on the ArcGIS map data files, citations to these maps should reflect this original publication date and the original authors listed. The views and conclusions contained in these map documents 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.

Digital layout and cartography by the NMBGMR Map Production Group:
Phil L. Miller, Amy L. Dunn, Katherine J. Sauer, and Kelly K. Boyd

## Correlation of Map Units




## Explanation of Map Symbols

Contact—Identity and existence are certain and queried where questionable. Location is accurate where solid, approximate where dashed, and concealed where dotted.

Oblique-slip fault, right-lateral offset—Identity and existence are certain. Location is accurate where solid, approximate where dashed, and concealed where dotted. The arrows show the relative motion along the fault, and the bar and ball are on the downthrown block.

Anticline—Identity and existence are certain, and the location is accurate.

Internal contact (cross section)—Identity and existence are certain, and location is concealed.

Oblique-slip fault (cross section)—Relative motion along fault is represented by the circled plus, is away from the observer; the circled dot, is toward the observer.

Spring direction in 1937, and began flowing again in 1973; according to local reports (Michael McGee, personal comm.).

Extinct spring

Horizontal bedding

10 Inclined bedding

Drilling well or well location for hydrocarbon exploration or exploitation.

Water well

Collapse structure or sinkhole, hatchures point into the depression.

A A' Cross section line

## Description of Map Units

Anthropogenic

daf **Disturbed Surface and/or Artificial Fill**—Disturbed areas, dumped fill, and areas affected by other human disturbances. Mapped where deposits or extractions area really extensive. Includes the US285/285 By-Pass/70 interchange and the old, abandoned Roswell Municipal Airport, as well as numerous borrow or gravel pits.

QUATERNARY TO NEOGENE
Alluvium, Colluvium, and Eolian Deposits

Qa **Quaternary Stream Alluvium and/or Valley-Fill Alluvium**— Brown (7.5YR4/2) to pinkish gray (7.5YR6/2), unconsolidated, moderately sorted, pebbly sand, silt, and clay, often gypsiferous in the east. Varies considerably in thickness from <1 to ≈15 m in large valley-fill settings on the eastern side approaching the Pecos flood plain.

Qae **Quaternary Valley-Slope Alluvium with Eolian Sand and Silt**—Pinkish gray (7.5YR6/2) to light gray (2.5Y7/1), unconsolidated, medium-grained sand to silt (clay?) alluvial sediments intermixed with a significant eolian input. In the northwest, deposits contain many lithic, igneous grains derived from the Capitan Mountains pluton. Thicknesses vary considerably from 1 to ≈5(?) m.

Qaes **Quaternary Sheetwash Swale Channel Alluvium with Eolian sand**—Brown (7.5YR4/2) to pinkish gray (7.5YR6/2) to light gray (2.5Y7/1), unconsolidated, medium- to fine-grained sandy alluvium, intermixed with a finer-grained, eolian component. Deposits occur in lower-lying swales, within Qae deposits, and are predominantly derived from sheetwash flow and overland runoff. Thicknesses vary from 1 to 2+ m.

Qca **Quaternary Colluvial and/or Valley-Slope Alluvial Deposits, undifferentiated**—Boulders, rubble blocks, cobbles and gravels, to thin, channel alluvial sands in valley bottoms. In the south, clasts are mostly Psa limestones; unconsolidated, poorly sorted sediments vary from light gray (2.5Y 7/1) to pale brown (10YR 6/3). In the north, clast composition varies considerably from plutonic granitic gravels to Artesia Group dolomites and sandstones, in unconsolidated, poorly-sorted, pinkish gray (7.5YR 6/2) to light gray (2.5Y 7/1) sands. Thicknesses vary from <1 m in Psa upland settings to from 2 to 3 m.

Qc **Colluvium**—In Psa upland settings, boulders, rubble blocks, cobbles, and gravels are found on steep slopes, in unconsolidated, to poorly-consolidated, poorly-sorted, coarse- to medium-grained sands, varying from light gray (2.5Y 7/1) to brown (7.5YR 4/2). Surrounding North Spring, sediments generally consist of limestone gravels in unconsolidated, moderately to well-sorted, light gray (2.5Y 7/1) to very pale brown (10YR 7/4) sands and silty-sands. Thicknesses vary considerably from ≈1 to 6+ m in headslope to footslope settings in upland areas and <1 to 2 m, respectively, surrounding North Spring.

Pecos River Tributaries Alluvial Deposits

Qah **Quaternary Rio Hondo Alluvium**—Cobbles and gravels of predominantly limestone, with occasional chert, quartzite, and gray and green, porphyritic igneous rock clasts, in brown (10YR5/3) to dark yellowish brown (10YR3/4), unconsolidated, poorly to moderately sorted, coarse- to fine-grained sand, silty sand, silt (largely calcareous), sandy clay, and clay.

Qac **Quaternary Stream Alluvium in Active Channels**—Predominantly limestone gravels in brown (7.5YR 5/4) to light gray (10YR 7/1), unconsolidated, moderate to poorly sorted, gravel, pebbly sand, coarse- to fine-grained sand, silty sand, and silt. Often gypsiferous in the east. Thickness ranges from 1 to ≈8 m.

Qtb3 **Quaternary Stream Overbank Alluvium Deposited Along Lowest Berrendo Creek and Tributaries Terrace Surfaces**—Predominantly limestone gravels in brown (7.5YR 5/4) to light gray (10YR 7/1), unconsolidated, moderately sorted, pebbly sand, coarse- to fine-grained sand, silty sand, and silt. Forms first terrace at 0.6 to 1.2 m above channel. Gypsiferous sediments increase in abundance in the east, especially along Middle Berrendo Creek. Thickness ranges from <1 to 2 m.

Qtb2 **Quaternary Stream Overbank Alluvium Deposited Along Middle Berrendo Creek Terrace Surfaces**—Brown (7.5YR 5/4) to light gray (10YR 7/1), unconsolidated, moderately sorted, pebbly sand, and coarse- to fine-grained sand. Forms second terrace 1.4 to 2.2 m above the channel. Gypsiferous sediments increase in abundance in the east. Thickness ranges from <1 to 2.6 m.

Qtb1 **Quaternary Stream Overbank Alluvium Deposited Along Upper Berrendo Creek Terrace Surfaces**—Brown (7.5YR 5/4) to light gray (10YR 7/1), unconsolidated, moderately sorted, coarse- to fine-grained sand. Forms upper terrace and terrace-slope which grades to lower Lakewood terrace surfaces on the Bitter Lake quad, immediately to the east. In the highly entrenched eastern-third of the quadrangle, the terrace occurs at 2.5 to ≈4 m above the channel; while to the west, it can slope lower, extending from ≈1.8 to ≈4 m. Gypsiferous sediments increase in abundance in the east. Thickness ranges from 1.5 to 4 m.

**Depression, Sinkhole, and Lacustrine Deposits**

Qd **Depression Fill, Primarily Caused by Subsidence**—Unconsolidated, moderate- to well-sorted, fine-grained (fine sands to clay) complexes of alluvial, colluvial, eolian, and occasional lacustrine deposits within closed depressions created by either gradual subsidence or sudden collapse followed by gradual subsidence of underlying carbonate in the west and/or gypsum in the northeast. Usually 1 to 3 m thick but can reach thicknesses in excess of 10 m.

Qds **Sinkhole Fill, Primarily Caused by Karstic Collapse**—Slumped limestone blocks and rubble in unconsolidated, poorly- to moderately-sorted sand. Thickness ranges from <1 to 3? m.

Ql **Quaternary Lacustrine Deposits**—Unconsolidated, well-sorted, fine-grained silty sands, silt, and clay deposited primarily by lakes fed by artesian springs or runoff into depressions. May have a significant interbedded alluvial component in their composition. Thickness is 1 to 2 m.

**Pecos Valley terrace Deposits (generically Q on the cross section)**

Qlt1 **Quaternary Lakewood Terrace, Upper Surface**—Occasional gravels and pebbles (predominantly limestone) in a brown (7.5YR 5/3) to dark yellowish brown (10YR 3/4), unconsolidated, moderately sorted, coarse- to fine-grained sand, silty sand, silt and sandy clay. Stage I–II pedogenic carbonate. Surface tread ≈7 m above the Pecos River floodplain. Thickness ranges from ≈2 to 6? m.

Qto2 **Quaternary Orchard Park Terrace, Lower Surface**—Cobbles, gravels and pebbles of predominantly limestone, with clasts of dolomite, sandstone, and chert in a very pale brown (10YR 7/4) to reddish brown (5YR 4/4), unconsolidated, moderately sorted, coarse- to fine-grained sand, silty sand, silt, and sandy clay. Stage III pedogenic carbonate. Surface tread is ≈8 m above the Pecos River floodplain. Thickness ranges from 2 to ≈12 m.

Qto1 **Quaternary Orchard Park Terrace, Upper Surface**—Cobbles, gravels and pebbles of predominantly limestone, with clasts of dolomite, sandstone, and chert in a very pale brown (10YR 7/4) to reddish brown (5YR 4/4), unconsolidated, moderately sorted, coarse- to fine-grained sand, silty sand, silt, and sandy clay. Strong stage III pedogenic carbonate. Surface tread is ≈9 to 10.5 m above the Pecos River floodplain. Thickness ranges from <1 to 51 m.

QTbt **Quaternary-Upper Neogene Blackdom Terrace**—Cobbles, gravels and pebbles of limestone, chert, and quartzite in yellowish brown (10YR 5/4) to reddish brown (5YR 4/4), unconsolidated, moderately sorted, coarse- to fine-grained sand, silty sand, silt, and sandy clay. Strong stage III–III+ pedogenic carbonate. Western quadrangle surfaces tread is 18.3 to 24 m above the Pecos River floodplain. Isolated remnants on Orchard Park terrace are common. Thickness ranges from 15 to 30? m.

PERMIAN
*Artesia Group*

Paq **Queen Formation**—Pebbles of limestone, chert, and quartzite in an unconsolidated to loosely consolidated light yellowish brown (2.5YR 7/2) to strong brown (7.5YR 5/6) coarse to fine sand at surface. Unit described to the south comprised of red sandstone, mudstone, dolomite, and gypsum. Thickness ranges from 10 to 30? m.

Pag **Grayburg Formation**—Light- to dark-gray ridge-forming dolomite with relatively thin interbedded mudstones and muddy gypsum. Thickness ranges from 10 to 30? m.

Paqg **Queen and Grayburg Formations, undifferentiated**—Queen and Grayburg Formations, undifferentiated. Cross section only.

*San Andres Formation*

Psa **San Andres Formation**—Light- to dark-gray limestone with interbedded dolomite and gypsum. Thickness ranges from 10 to 150+ m.

*Yeso Formation*

Py **Yeso Formation**—Yeso Formation. Cross section only.

*Abo Formation*

Pa **Abo Formation**—Abo Formation. Cross section only.

Geologic Cross Section A–A'
(4x vertically exaggerated)