

Geologic Map of the Cutter Quadrangle, Sierra County, New Mexico

By

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Open-file Digital Geologic Map OF-GM 206

Scale 1:24,000

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Cutter Unit Descriptions

Quaternary

Ql: Playa deposits—mostly silt and clay; generally correlative with **Qpy** but may grade downward into deposits as old as **Qpo**.

Qpy: Younger piedmont-slope alluvium—Sand, gravel and silt and clay of modern, shallowly-incised drainageways; and thin sand and gravel veneers mantling broad bediments; as much as 20ft (6m) thick.

Qpo: Older piedmont-slope alluvium—Gravel and gravelly sand deposits of alluvial fans that are intermediate in geomorphic position between higher Palomas (**Qpg**) fans and lower (**Qpy**) arroyo alluvium; upper part of **Qpo** deposits are cemented by pedogenic carbonate that represents stage II to stage IV carbonate accumulation; as much as 25ft (7m) thick.

Qpa: Undifferentiated Qpy and Qpo

Qs: Eolian sand, coppice dunes—Pale-red to pale-orange sand, mostly in the form of coppice dunes, but also including thin sand sheets as well as mounds and aprons, the thickest of which may be nearly barren of vegetation. Best developed against the bedrock hills above the La Mesa surface, along the southeastern margins of Flat Lake playa, on the valley sideslopes of Rincon arroyo, along the western flanks of both the Upham Hills and Prisor Hill, and on the Jornada Draw fault escarpment west of Flat Lake. Widespread but discontinuous on the La Mesa surface and on the distal piedmont slopes (especially **Qcp**) of the San Andres Mountains. As much as 3m thick.

Qpg: Palomas Formation, piedmont-slope deposits—Boulder to cobble conglomerate, gravel, and sandy gravel of both high-level alluvial fans and erosion surface veneers. Upper beds are generally indurated by stage IV caliche. Unit forms relatively undissected alluvial fans as well as mesa-capping erosional remnants of fans or pediment veneers; as much as 20ft (6m) thick.

Tertiary

Tb, Tbc: Basalt—Flows (**Tb**) and cinder cones (**Tbc**) ; alkali-olivine basalt; single flows are generally less than 20ft (6m) thick.

Ti: Basaltic andesite dikes—Part of a system of dikes in the Caballo Mountains that locally can be traced upward into flows of 28Ma Uvas Basaltic Andesite.

Tlr: Love Ranch Formation—Fining-upward sequence of red, gray, and purple conglomerate, conglomeratic sandstone, sandstone and mudstone representing alluvial-fan and fluvial deposits in the Laramide Love Ranch Basin; the formation documents progressive erosional unroofing of Cretaceous intermediate- and silicic-composition volcanic rocks, Mesozoic and Paleozoic sedimentary rocks, and Precambrian granite from the Laramide Rio Grande uplift; poorly-exposed east of the Jornada Draw fault where it is mostly masked by a thin veneer of Palomas or younger pediment gravel; total thickness may exceed 3,000ft (914m).

Cretaceous

Kmh: McRae Formation, Hall Lake Member—Purple to grey shale and mudstone interbedded with tan, channel-form, volcanoclastic sandstone beds; only 10-20ft (3-6m) of the lower part of the member are exposed in the Cutter quadrangle.

Kmj: McRae Formation, Jose Creek Member—Brown to dark-gray boulder conglomerate in channel-form lenses; clasts are angular to sub-rounded, intermediate-composition volcanic and hypabyssal rocks ranging in size from 0.2 to 1 m in diameter; debris flow in origin; 20ft (6m) thick or less.

Kca: Crevasse Canyon Formation, Ash Canyon Member—Primarily thick-bedded, pale-tan to light-gray channel-form beds of cross-bedded gray, quartzose sandstone and conglomeratic sandstone interbedded with fewer beds of brown to greenish-brown sandstone, mudstone and shale, all of fluvial origin; maximum thickness is approximately 1,200ft (366m).

Kcat: Crevasse Canyon Formation—Tongues of Ash Canyon sandstone and conglomeratic sandstone within Kcl, each 30-50 ft (9-15m) thick.

Kcl: Crevasse Canyon Formation—Gray, tan, dark-brown, thin- to medium-bedded, cross-bedded or laminated sandstone interbedded with gray to brown mudstone; local large concretions in sandstone beds; fluvial in origin; approximately 1,000ft (305m) thick.

Kg: Gallup Sandstone—Massive to cross-bedded cream to gray marine sandstone and minor marine shale, gradational downward into D- Cross Tongue of Mancos; approximately 110ft (33m) thick.

Kdc: D-Cross tongue of Mancos Shale—Dark-gray, fissile marine shale with thin interbeds of fossiliferous sandstone. 60 ft (18 m) thick.

Kt: Tres Hermanos Formation—Lower Atarque Member consists of brown and greenish-brown fossiliferous, burrowed marine sandstone, followed upward by fluvial brown sandstone and olive-green mudstone of the Carthage Member, and capped by marine, brown, fossiliferous, burrowed sandstone of the Fite Ranch Member; total thickness is approximately 328 to 348ft (100-106m).

Km: Mancos Shale (cross section only)—Thin-bedded to fissile marine siltstone and shale with at least five ash beds, each 2 to 5in (6 to 12cm) thick. Total thickness is approximately 394ft (120m).

Kd: Dakota Sandstone (cross section only)—Lower yellow-brown, cross-bedded, fluvial, quartzose sandstone overlain by marine shale and marine, cross-bedded quartzose sandstone; grades upward into Mancos Shale; approximately 144ft (44m) thick.

Permian

Py: Yeso Formation (cross section only)—Orange siltstone, orange to yellow sandstone, thick gypsum beds, and medium- to light-gray limestone. Total thickness, including both upper and lower map units and all four members described in McLeod Tank and Alivio quadrangles, is approximately 1,300ft (390m).