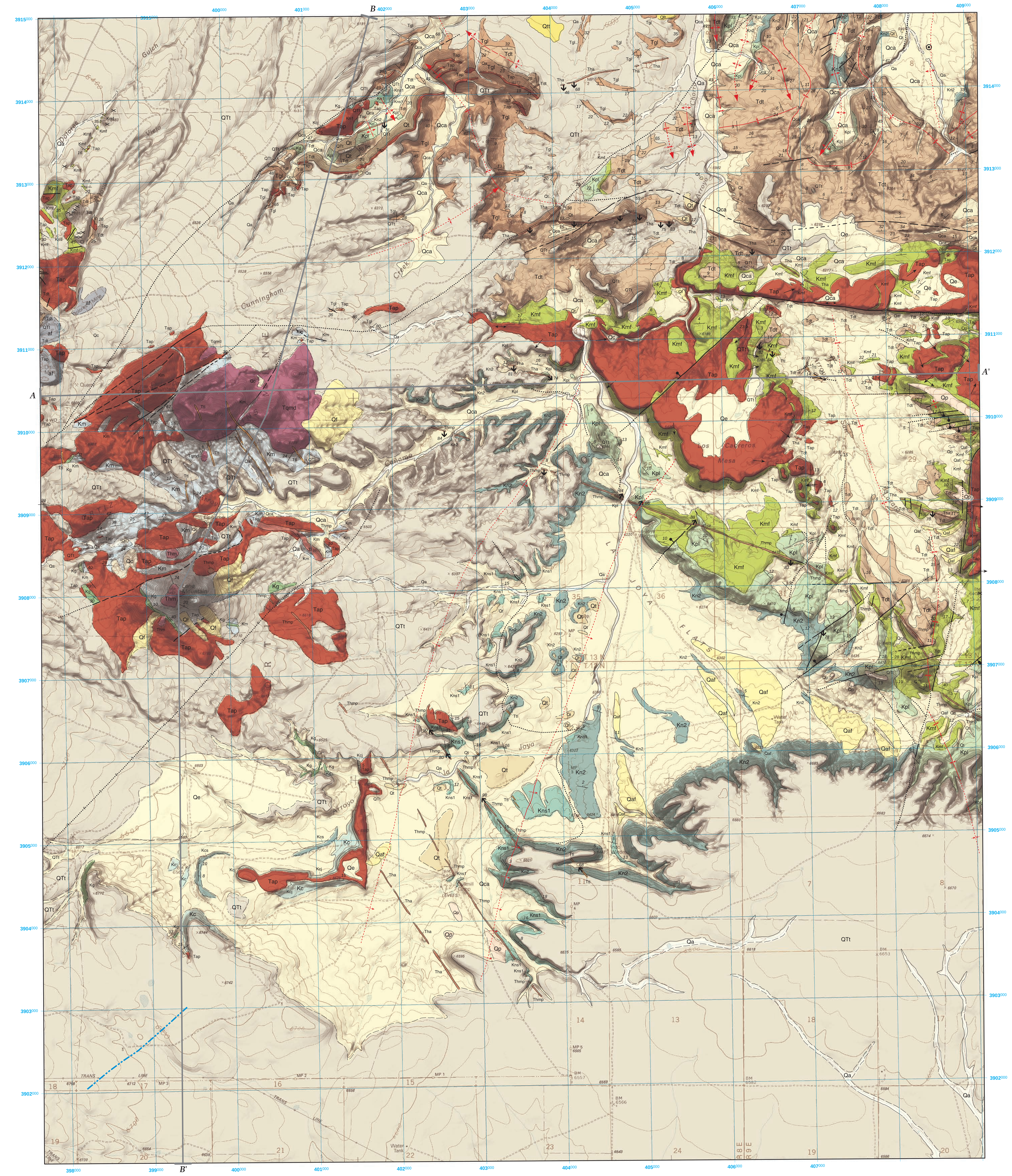


Base map from U.S. Geological Survey 1970, from photographs taken 1965, field checked in 1970, edited in 1993.
1927 North American datum, UTM projection -- zone 13N
1000-meter Universal Transverse Mercator grid, zone 13, shown in blue.

Map Units

Quaternary

Colluvial, eolian, and anthropogenic deposits

af **Artificial fill (Historic)**—Dumped fill and areas affected by human disturbances. Locally mapped where areally extensive or geologic contacts are obscured.

Qa **Alluvium**—Cobbles, sand, silt, and clay transported by seasonal flooding or in active channels. Coarser clasts are dominated by Tertiary porphyry and skarn.

Alluvium

Alluvium of Arroyo Cherro and tributaries

Qca **Colluvium/alluvium**—Sand, silt and clay in abandoned stream channels, flood plains, and lower valley slopes.

Qc **Colluvium**—Unconsolidated sand, silt and clay deposits along upper hill slopes or broad, flat hill crests. A few meters in maximum thickness on upland areas.

Qt **Colluvium/alluvium**—Sand, silt and clay in abandoned stream channels, flood plains, and lower valley slopes.

Qaf **Alluvial fan**—Boulders, gravel, sand, silt, and clay, deposited at the point of emergence of small, perennial streams from highland areas.

Qe **Eolian deposits**—Tan to light pink, wind blown silt and clay lying on gently inclined upland areas. Much of the area has a thin deposit of this material incorporated with the soil.

Qf **Alluvial Fan**—Poorly sorted, silt to gravel with subangular clasts of Tertiary igneous and Cretaceous sedimentary material. Some of the latter rock types are metamorphosed to hornfels.

Qtt **Terrace gravel**—Rounded pebbles and cobbles of variable composition including, Phanerozoic chert, sandstone, Tertiary igneous clasts and skarn, in a sand or silt matrix.

Basin-fill Deposits

Santa Fe Group (upper Oligocene-lower Pleistocene)

QTt **Tuerto Gravels of Stearns (1953) (lower Pleistocene to upper Pliocene)**—Yellowish to reddish-brown and yellowish-red moderately consolidated and caliche cemented, moderately to well stratified pebble to cobble conglomerate and pebbly to cobbly conglomeratic sandstone with scattered boulders and muddy sandstone interbeds. Matrix is fine- to very coarse-grained, very poorly sorted sandstone, and clasts include abundant subrounded to subangular clasts derived from the Ortiz Mountains (andesite porphyry and augite monzonite; black, reddish-brown, and banded hornfels; and lesser quartzite, chert, and petrified wood. Bedding in the Tuerto Gravel is subhorizontal. Thickness to 18 m (60 ft)

QTa **Santa Fe Group of the Estancia Basin**—Caliche-cemented gravels and sand composed of sedimentary, igneous, skarn and hornfels clasts derived from the Ortiz Mountains and granite, schist, quartz and feldspar clasts derived from the Sangre de Cristo Mountains (in the eastern outcrops). Sub-horizontal and massively bedded.

Oligocene

Igneous Rocks

Tap **Andesite porphyry**—Grayish green to gray on fresh surfaces, fine-to medium grained, porphyritic. In the Ortiz Mountains phenocrysts of plagioclase, lesser hornblende, and rare quartz make up 40 to 60 percent of the rock. Groundmass is gray and aphanitic. Subhedral andesine plagioclase makes up about 75 percent of the phenocrysts and ranges 0.5 to 2 mm. Black euhedral hornblende phenocrysts (0.6-5 mm) constitute nearly all the rest of the phenocryst assemblage. Clear, highly resorbed quartz makes up perhaps 1 % of the phenocrysts. Plagioclase, orthoclase, and quartz, and trace allanite, zircon, and rutile form the groundmass. Hornblende-rich (augite-cored?) xenoliths 2 to 10 cm in diameter are commonly found in the andesite porphyry (Coles, 1990). Andesite porphyry forms laccoliths, sills, dikes, and irregular masses. Thermal metamorphism of surrounding sedimentary rocks is limited to a narrow contact zone usually less than 10 cm wide.

Thm **Augite-hornblende+/-biotite monzonite**—Fine to medium grained. Holocrystalline. Magnetic studies indicate that small outcropping bodies on flanks of Lone Mountain may be apophyses of larger stock. Similar to large intrusive that holds up the central mass of the Ortiz Mountains (Maynard, 1995; 2000; in prep.).

Tl **Feldspar-porphyry latite and trachytic latite**—Gray to tan, with tabular euhedral orthoclase phenocrysts up to 1.0 cm long in light gray groundmass. Commonly shows a trachytic texture. Forms dikes on the southeastern part of Captain Davis Mountain.

Ttl **Trachytic latite**—See **Tl** description.

Tha **Hornblende andesite**—Light gray, aphanitic porphyritic dike. Phenocrysts of feldspar and highly altered hornblende comprise a few percent of the rock. Dikes to 4 m (13 ft) width weather to low ridges, even in shale country rock.

Thmp **Hornblende monzonite**—Dark purple-brown, aphanitic porphyritic dike. Phenocrysts of pyroxene and feldspar. Dikes to 7 m (23 ft) width stand as bold walls along much of their lengths.

Tqmd **Quartz monzodiorite**—Forms the eastern part of Captain Davis Mountain.

Eocene

Tgl **Galisteo Formation, Lower unit**—Alternating pink to red colored beds of arkosic sandstone, siltstone, and mudstone with conglomerate lenses comprised of rounded pebbles of Precambrian granite and schist and Paleozoic sedimentary. Thickness approximately 1,060 m (3,500 ft).

Paleocene

Tdt **Diamond Tail Formation**—Variegated sandstone, conglomerate, mudstone and local limestone beds. Sandstone beds are massive, friable, usually cross bedded and composed of medium- to coarse-grained, subrounded, poorly sorted quartz and lesser chert. Kaolin, limonite, or calcite commonly constitute the matrix. Colors are tan, brown, orange, pink, red and white. Mudstones are gray to red in color and poorly exposed. A thin, basal conglomeratic zone containing rounded, highly polished chert pebbles is commonly present. Maximum thickness approximately 90 m (300 ft). Overlies the Mesaverde Group with angular unconformity and is overlain disconformably by the Galisteo Formation. The Diamond Tail Formation of Lucas and others (1997) is the basal portion of the Galisteo Formation of Stearns (1943) and Lucas (1982). The Diamond Tail Formation was deposited in alluvial channels and broad floodplains in a northeast-trending Laramide basin.

Upper Cretaceous

Mesa Verde Group. Divided into 2 formations. The thickness decreases northward due to a regional erosional surface.

Kmf **Menefee Formation**—Sandstone, carbonaceous shale, claystone (mined), and coal. Thickness 0-85 m (0-280 ft). Pebble-sized siderite concretions in basal portion of section.

Kpl **Point Lookout Sandstone**—Dark brown to olive, fine- to medium- grained, massive bedded sandstone and fossiliferous brown mudstone containing calcite-cemented concretions. Interbedded thin gray shale. Thickness ranges from 0-121 m (0-400 ft) beneath angular unconformity. The lower contact with the upper Mancos shale is gradational.

Km **Mancos Group**—(Thicknesses from the Ojo Hedionda Quadrangle)

Kn **Niobrara Formation**—Comprised of two shale and one sandstone and sandy-shale sections. Thickness of the entire section cannot be determined directly, but probably exceeds 450 m (1,500 ft).

Kn1 **Shale**—Medium-gray calcareous and weathers olive-brown. Poorly exposed, mostly in arroyos. The uppermost shale section (**Kn2**) contains abundant concretions and ammonites and is gradational to the Point Lookout Sandstone (**Kpl**).

Kn2 **Shale**—See **Kn1** description.

Kns **Sandstone Member**—Light yellowish gray, even bedded, fine-grained sandstone and interbedded shale . The base lies approximately 90 m (300 ft) above lower contact of formation. Thickness approximately 100 m (330 ft).

Kc **Carlisle Shale**—Dark gray to black, laminated shale. Weathers to yellow-brown color. Poorly exposed. Thickness approximately 91 m (300 ft).

Kcc **Codell Sandstone Member**—An 8.5 m (28ft) thick exposure along Gavino Arroyo consists of: 1) A basal, 4.5 m (15 ft) thick section of fine- to very-fine grained, grayish-yellow to brownish-yellow, fining upward, bioturbated, cross-bedded sandstone; 2) 0.9 m (3 ft) of brownish-gray, non-calcareous, argillaceous sandstone with gypsum crystals and yellowish iron encrustations, and; 3) an upper, 2 m (7 ft) thick, fining upward section of very fine grained sandstone and siltstone interbeds.

Kcj **Juana Lopez Member**—Brown-gray platy, fossiliferous, arenaceous, crystalline limestone and calcareous gray shale and gray shale. Limestone is commonly composed of needle-like fragments of Inoceramus shells. Ratio of carbonate to sand varies greatly along strike. Thickness 6 m (20 ft).

Kg **Greenhorn Limestone**—Alternating beds of dark gray argillaceous micrite and medium- to dark-gray calcareous shale. Beds are usually less than 0.5 m (1.5 ft) thick. Weathers light-gray and forms a low ridge. Imprints of Inoceramus labiatus are common as are foraminifera. Thickness 15 m (50 ft).

Kd **Dakota Formation**—Undivided on the Captain Davis Mountain quadrangle. Tan to orange-brown, fine- to medium-grained quartz arenite and carbonaceous shale. Sandstone is commonly bioturbated. Gray shale and highly carbonaceous black shale are interbedded with thin lenses of tan sandstone, commonly containing fragments of coal. Thickness is 29 m (96 ft) in Hub Mesa in the adjacent (east) Ojo Hedionda Quadrangle.

The following units are not exposed in the quadrangle, but are shown on cross sections. Thicknesses are taken from log of the Trans-Ocean, McKee #1 well and from Booth (1977) for the area north of Lamy. Descriptions of the unit are from Booth (1977) and Bachman (1979). Some units combined in cross sections.

Upper Jurassic

Jm **Morrison Formation**—Variegated shale, tan and light red–brown sandstone and lenses of tan and white pebble conglomerate. Sandstone is fine–grained, subangular to subrounded quartz and minor chert and feldspar. Bedding is platy to massive and cross beds are common. Green, gray and maroon mudstone and interbedded tan sandstone are common in the upper portion of the section although a persistent, white kaolin–bearing sandstone underlies the upper contact. Thickness approximately 150 m (500 feet). Includes the Middle Jurassic Summerville Formation.

Middle Jurassic

San Raphael Group

Jt **Todilto Formation**—Light grayish–brown limestone: laminated and crenulated with fetid odor on fresh surface. Overlain by thin bedded, dark–gray limestone containing red jasper nodules. Thickness is 8 m (26 ft) along south side of Hub Mesa. West of the Captain Davis Mountain Quadrangle the formation contains a gypsum member. An unknown thickness of the gypsum member may be present in the subsurface of the Captain Davis Mountain Quadrangle.

Je **Entrada Formation**—Consists of upper white and lower brownish–pink units of cross–bedded, quartz arenite. Extremely friable, but weathers to bold cliff. Thickness 32 m (107 ft) along south side of Hub Mesa.

Triassic

Chinle Group

TRc **Chinle Group undifferented**—Red–orange, dark brown, purplish–gray and green, thick–bedded mudstone, buff to dark red–brown, cross–bedded sandstone and limestone pebble conglomerate. Thickness is probably on the order of 150 m (500 ft).

Permian

Pb **Bernal Formation**—Yellowish–gray to reddish–purple sandstone and siltstone and brown limestone pebble conglomerate. 15-33 m (50 to 110 ft) thick.

Psa **San Andres Limestone**—Medium to light gray, fine–grained, fetid limestone and interbedded calcareous sandstone. 4.5 to 12 m (16 to 40 ft).

Pg **Glorieta Sandstone**—Medium to light gray, medium to fine–grained, well sorted sandstone. 20 to 33 m (65 to 110 ft).

Py **Yeso Formation**—Medium reddish–brown to red mudstone, siltstone, fine grained sandstone and pale greenish purple limestone. 21 m to 42 m (70 to 140 ft).

Psc **Sangre de Cristo Formation**—Medium brown to dark reddish–brown mudstone and buff to dark brown, conglomeratic arkose. 91 to 910 m (300 to 3,000 ft) thick in the Canoncito area north of Lamy along Tijeras-Canoncito accommodation zone.

Pennsylvanian

IPm **Madera Formation**—Gray to light brown, thick–bedded limestone, gray to brown calcareous sandstone and buff and dark brown fossiliferous arkose. 248 m (820 ft).

Mississippian

Ms **Sandia Formation**—Buff to brown sandstone, interbedded gray shale and argillaceous limestone. 48 m (160 ft).

Mt **Terrero Formation**—Buff to dark brown, thick–bedded, coarse–grained limestone breccia in calcareous arkose matrix. 9 m (30 ft).

Proterozoic

p€ **Precambrian Basement**—Proterozoic granite and mica schist.

Correlation of Units

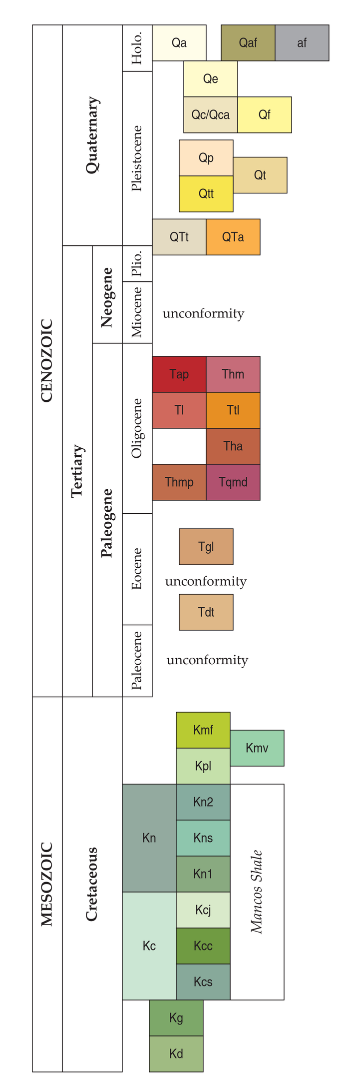
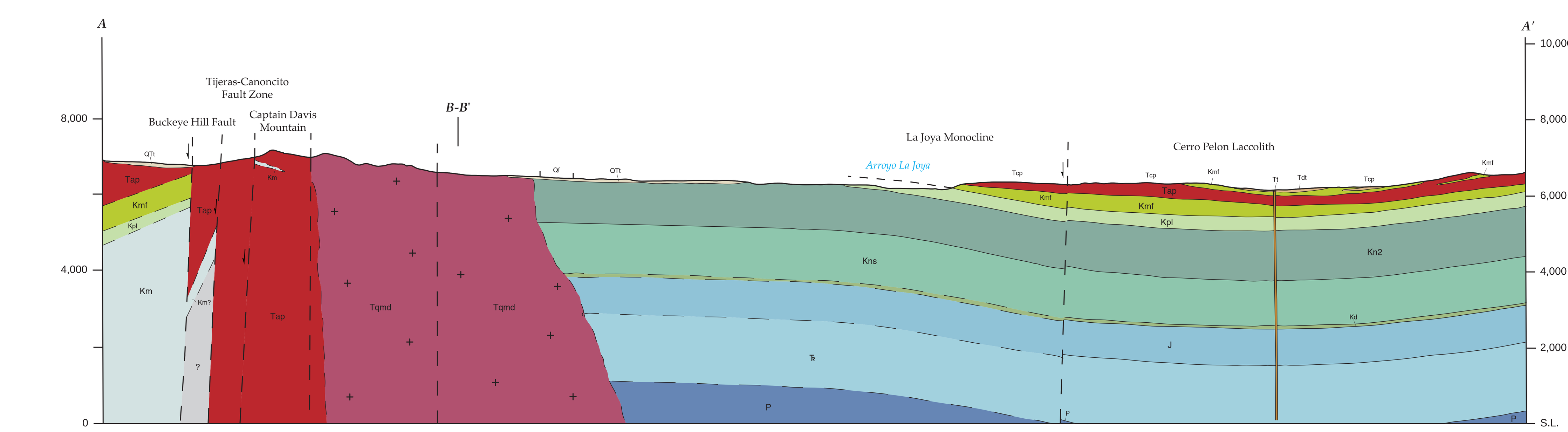
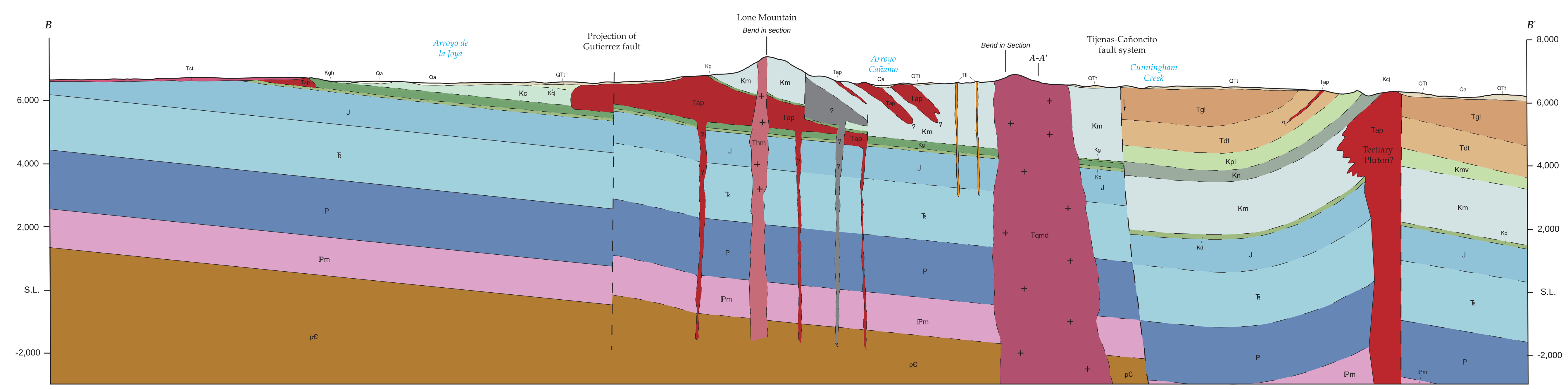
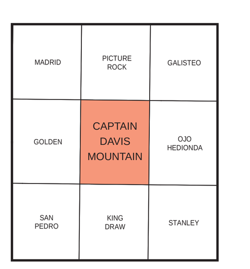


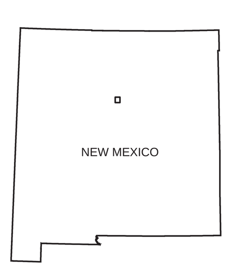
FIGURE 1—View to west of a hornblende monzonite porphyry dike intruded into the Niobrara Shale. From this outcrop at Comanche Gap in the Ojo Hedionda quadrangle, the dike, one of a swarm of radial dikes, extends for seven miles west to the eastern flank of Captain Davis Mountain.

FIGURE 2—View to northeast of mesoscopic-scale, fault-propagation anticline in limestone and calcareous shale beds of the Greenhorn Limestone. The fold is located southeast of Captain Davis Mountain. The north-northwest trend of the fold trace is compatible with Laramide trends, but may be related to the nearby Paleogene intrusive bodies.









QUADRANGLE LOCATION

Magnetic Declination
June 2002
10º 8' East
At Map Center

1:24,000

1 MILE | 1000 0 1000 2000 3000 4000 5000 6000 7000 FEET | 1 KILOMETER

CONTOUR INTERVAL 20 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

New Mexico Bureau of Geology and Mineral Resources
Open-File Geologic Map 48

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 Scholle, *Director and State Geologist*, Dr. J. Michael Timmons, *Geologic Mapping Program Manager*).

Map Symbols

- Contact: dashed where inferred, dotted where covered.
- Fault: dashed were inferred, dotted where covered.
- Bearing and plunge direction of hornblende lineation.
- Strike and dip of bedding. In areas of Qa or Qca, symbols indicate isolated outcrops in arroyos.
- Strike and dip of flow foliation in igneous rocks.
- Dip of fault or dike.
- Plunging anticline
- Plunging syncline
- Anticlinal flexure
- Synclinal flexure
- Water well
- Adit
- A |—| A' Geologic cross section

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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

Geologic map of the Captain Davis Mountain quadrangle, Santa Fe County, New Mexico.

May 2001

by

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COMMENTS TO MAP USERS

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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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