NMBGMR Open-File Geologic Map 14 NEW MEXICO BUREAU OF GEOLOGY AND MINERAL RESOURCES A RESEARCH DIVISION OF NEW MEXICO INSTITUTE OF MINING AND TECHNOLOGY **Last Modified: November 2022**

Correlation of Map Units

Surficial Deposits

ash

Qls

Qt5

Qtc

Qt5a

Qt4

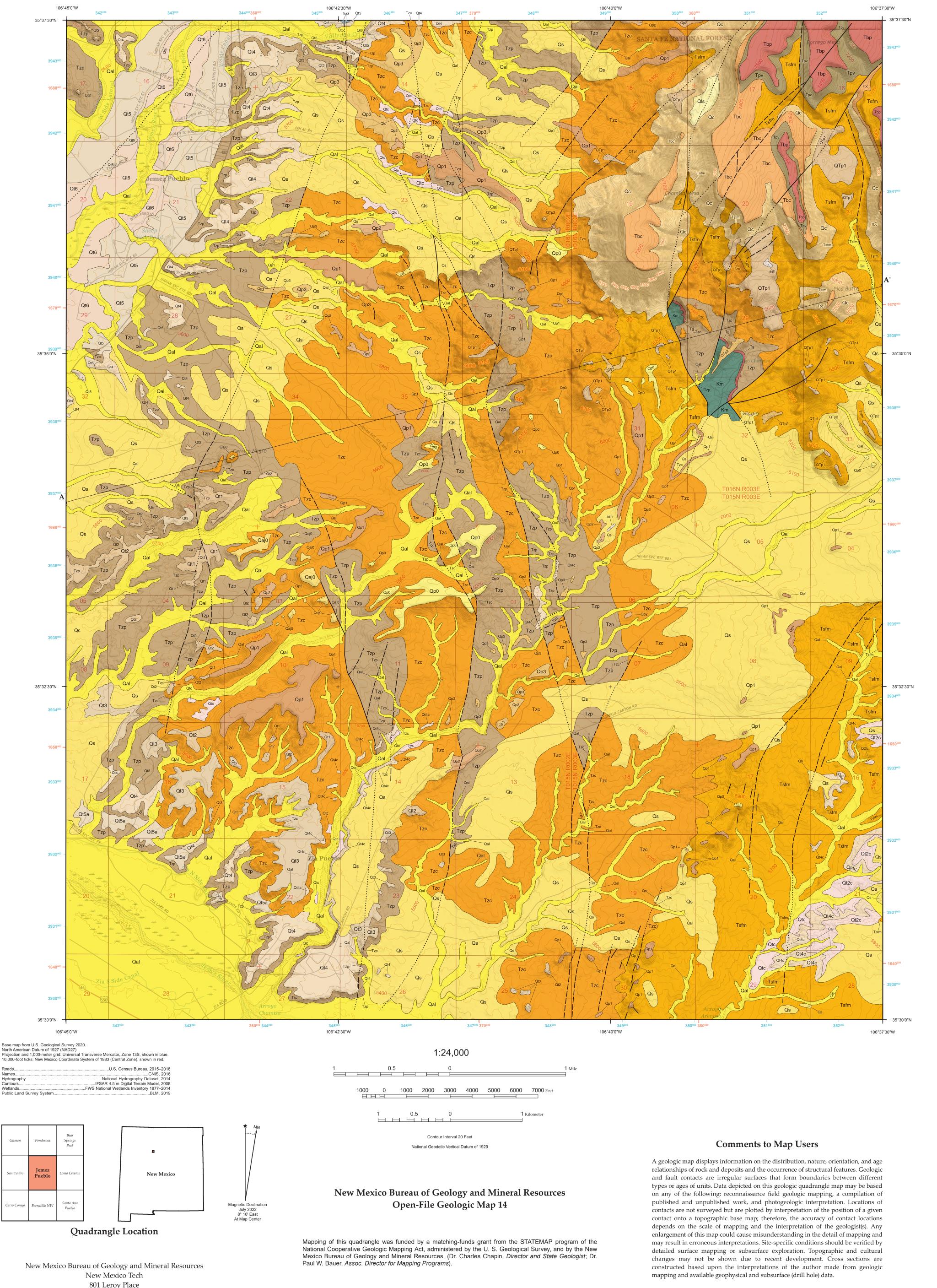
Qt4c

Qt2c

Qp0

Qaj0

Bedrock Deposits



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Cross sections should be used as an aid to understanding the general geologic Geologic Map of the Jemez Pueblo 7.5-Minute framework of the map area and not be the sole source of information for use in locating or designing wells, buildings, roads, or other human-made structures. Quadrangle, Sandoval County, New Mexico

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SURFICIAL DEPOSITS ash (Holocene)—Reworked El Cajete Ash (≈60 ka) is interbedded with **Os** in the vicinity of Oio Character

Quaternary alluvium (Holocene)—Predominantly gravelly sand with minor silt and clay in active channel bottoms; 1-3 m thick.

Quaternary eolian sand (Holocene)—Fine to medium-grained sand dunes with variable degrees of vegetative covzer. Some dunes, especially those in broad stable interfluve areas are well vegetated and inactive. Those immediately down wind of broad channels with **Qal** are active and not vegetated; 1-14 m thick.

Ouaternary landslide (Holocene)—Quaternary landslide.

Quaternary terrace alluvium (Holocene)—Jemez River valley bottom alluvium 1-5 m thick that underlies a terrace tread approximately 2 m above the bankfull channel. Terrace alluvium is predominantly sand and silt vertically-accreted as overbank sediments. Deposit is dated at 1660+70 y.b.p. (Formento-Trigilio, 1997; Beta 85445).

Quaternary terrace alluvium (Holocene)—Jemez River valley bottom alluvium, 1-5 m thick that underlies a terrace tread approximately 3-4 m above the bankfull channel. Terrace alluvium is predominantly sand and silt vertically-accreted as overbank sediments. Deposit is dated at 2290+70 and 2170+40 y.b.p. (Formento-Trigilio, 1997; Beta 85444 and 85446).

Quaternary terrace alluvium (Late Pleistocene to Holocene)—Arroyo Chamisa deposit 1-5 m thick underlying terrace treads in Chamisa Arroyo. Terrace alluvium is a medium-grained sand interbedded with subrounded basalt cobbles.

Quaternary colluvium (Late Pleistocene and Holocene)—Continuous, 1-5 m thick poorly-stratified, poorly-sorted hillslope deposits of 0.3-1.5 m wide angular basalt clasts that underlie steep hillslopes of Chamisa Mesa, Borrego Mesa, and Pico Butte.

Quaternary terrace alluvium (Late Pleistocene)—Jemez River valley deposit approximately 4 m thick that overlies a strath approximately 10 m above the Jemez valley bottom. Terrace is underlain by well-rounded cobbles of Jemez River and Rio Guadalupe provenance and locally contains clasts of the Banco Bonito flow. Terrace may be correlative to Qt5 of Rogers (1996) and Qt4a of Formento-Trigilio (1997) estimated at 60 ka.

Quaternary terrace alluvium (Late Pleistocene)—Jemez River valley deposit approximately 7 m thick that overlies a strath approximately 30 m above the Jemez valley bottom. Terrace is underlain by well-rounded cobbles of Jemez River and Rio Guadalupe provenance and is correlative to Qt4 of Formento-Trigilio (1997) estimated at 150 ka.

Quaternary terrace alluvium (Late Pleistocene)— Alluvium approximately 2-15 m thick, underlying a terrace tread of the Arroyo Chamisa drainage. The deposit is relatively thin (≈2-3m) in the upper parts of the drainage where it overlies a strath of low relief. The deposit thickens to 3-15 m near the mouth of Arroyo Chamisa where it buries a paleotopography with relief similar to the present. This deposit interfingers with Qt4.

Quaternary piedmont-derived alluvium (Middle to Late Pleistocene)—Alluvium, approximately 1-3 m thick, composed of subangular to subrounded basalt gravel and boulders. Deposits occur in close association with modern drainages, but now occupy interfluves that are graded to and locally interfinger with **Qt4** and **Qt3**. Deposit is sourced from the basalts of Chamisa and Borrego Mesas.

Description of Map Units

Quaternary terrace alluvium (Middle Pleistocene)—Jemez River valley deposit approximately 5-15 m thick that overlies a strath approximately 60 m above the Jemez valley bottom. Terrace is underlain by well-rounded cobbles of Jemez River and Rio Guadalupe provenance. Terrace is correlative to **Qt3** of Formento-Trigilio (1997) estimated at 300 ka (315-180 ka by ESR-electron spin resonance technique (S. Ikeda, University of Osaka, Japan, unpublished data).

Quaternary piedmoni-uerived unaviewed Pleistocene)—Alluvium, approximately 2-15 m thick, Quaternary piedmont-derived alluvium (Middle composed of subangular to subrounded basalt gravel and boulders. Deposits occur in close association with modern drainages, but now occupy interfluves that are graded to and locally interfinger with Qt2 and Qt3. Deposit is sourced from the basalts of Chamisa and Borrego Mesas.

Quaternary terrace alluvium (Middle Pleistocene) -Jemez River valley deposit approximately 5-15 m thick that overlies a strath approximately 90 m above the Jemez valley bottom. Terrace is underlain by well-rounded cobbles of Jemez River and Rio Guadalupe provenance. Terrace is correlative to Qt2 of Formento-Trigilio (1997) estimated at 400 ka.

Quaternary terrace alluvium (Late Pleistocene to Holocene)—Terrace in the Chamisa Arroyo drainage. Terrace is underlain by medium sand interbedded with subrounded basalt cobbles.

Quaternary piedmont-derived alluvium (Middle Pleistocene)—Alluvium, approximately 2-20 m thick, composed of subangular to subrounded basalt gravel and boulders. Deposits occur in close association with modern drainages, but now occupy interfluves that are graded to and locally interfinger with Qt1 and Qt3. Deposit is sourced from the basalts of Chamisa and Borrego Mesas.

Quaternary terrace alluvium (Middle Pleistocene)—Jemez River valley deposit approximately 5-10 m thick that overlies a strath approximately 120 m above the Jemez valley bottom. Terrace is underlain by well-rounded cobbles of Jemez River and Rio Guadalupe provenance. Terrace is correlative to Qt1 of Formento-Trigilio (1997) known to contain Lava Creek B ash dated at 0.602+0.004 Ma (Gansecki et al., 1998).

Quaternary piedmont-derived alluvium (Early(?) to Middle(?) Pleistocene)—Alluvium, approximately 2-20 m thick, composed of subangular to subrounded basalt gravel and boulders. Deposits occur in close association with modern drainages, but now occupy interfluves that are graded to and locally interfinger with Qajo. Deposit is sourced from the basalts of Chamisa and Borrego Mesas.

Quaternary alluvium (Early (?) Pleistocene)—Stratified and unstratified alluvium, 3-10 m thick, of Jemez River provenance. Deposit commonly contains large subangular blocks of Bandelier Tuff. Deposits mark the oldest paleochannel of the Jemez River established immediately following eruption of the upper Bandelier

Quaternary piedmont-derived alluvium (Early Pleistocene (?) to Pliocene (?))—Piedmont terrace and pediment deposits composed of subangular to subrounded basalt gravel and boulders. Deposits occur on interfluves and are graded to elevations above Qaj0. Deposit is sourced from the basalts of Chamisa and Borrego Mesas.

Quaternary piedmont-derived alluvium (Early Pleistocene (?) to Pliocene(?))—Piedmont terrace and pediment deposits composed of subangular to subrounded basalt gravel and boulders. Deposits occur on interfluves and are graded to elevations above QTp2. Deposit is sourced from the basalts of Chamisa and Borrego Mesas.

BEDROCK DEPOSITS

Olivine-pyroxene basalt of Borrego Mesa (Late Miocene)—Thin, 5-15 m dark gray massive to locally vesicular basalt of the Paliza Canyon Formation. Basalt is porphyritic and contains dark-colored olivine that is commonly altered to iddingsite, and ≈3% greenish augite. A whole-rock K-Ar date of 8.8+0.3 Ma is reported for **Tbp** to the northeast of this quadrangle on Borrego Dome (Leudke and Smith, 1978).

Olivine basalt of Chamisa Mesa Member of Zia Formation of Santa Fe Group (Late Miocene)—Thin, 5-15 m dark gray to black, massive to vesicular olivine basalt of the Paliza Canyon Formation. Basalt contains up to 2% olivine, a large portion of which is typically weathered to a reddish-brown iddingsite. A whole-rock K-Ar age for this rock is reported as 10.4+0.5 Ma (Leudke and Smith, 1978).

volcaniclastic deposits (Late Miocene)—Gray to brown volcaniclastic conglomerate, breccia, sandstone, and tuff, interbedded with Paliza Canyon Formation lava flows. The debris-flow and fluvial deposits contain locally derived clasts of andesite, dacite, basalt, basaltic andesite, and rhyolite lavas (Lavine, 1996; Lavine et al., 1996). This unit includes andesitic to dacitic block-and-ash flow deposits, dacitic pyroclastic flows, rare andesite scoria deposits, and primary and reworked andesitic-dacitic tephra deposits. The unit is intercalated with the ~10 Ma basalt of Chamisa Mesa, and is overlain by the ~7 Ma Peralta Tuff Member near Tent Rocks. A widespread andesitic tephra (Smith, 2001a), and a single outcrop of dacitic tephra within the Peralta Tuff Member that is between rhyolitic pyroclastic deposits, yielded dates of 6.95 \pm 0.13 Ma and 7.00 \pm 0.06 Ma, respectively. Smith (2001a) suggests the possibility of Paliza Canyon volcanism temporally overlapped the eruption of Bearhead Rhyolite. Maximum exposed thickness is >200 m on the slopes of St. Peter's Dome (Goff et al., 1990).

Middle Santa Fe Group (Late and Middle Miocene (late Barstovian-Claredonian))—Sandstone, mudstone, and minor gravel, up to 500 m thick, of the middle Santa Fe Group. Deposit is a feldspathic medium to coarse-grained sandstone that is predominantly brown to pink in color. Base of the deposit includes a red siltstone that may be correlative to the Cañada Pilares member of the Zia Formation (Tedford and Barghoorn , 1997). This map unit occupies the general stratigraphic location of the Cerro Conejo Formation and Navajo Draw Member of the Arroyo Ojito Formation described for the adjoining Sky Village NE and Loma Creston quadrangles. Deposit coarsens upwards considerably as fluvial facies above a more dominant eolian base.

Chamisa Mesa Member of Zia Formation of Santa Fe **Group (Middle Miocene (Hemingfordian))**—Deposit is a 200 m thick red, yellow, and buff-colored sand and silt interbedded with greenish silty sands. Locally, a lacustrine facies characterized by well-indurated carbonate and

Piedra Parada Member of Zia Formation of Santa Fe Group (Middle Miocene (Hemingfordian))—Deposit is a 100-150 m thick pinkish-white to yellow, quartz-rich, cross-stratified fine to coarse eolian sand.

Galisteo Formation (Eocene)—Reddish-brown coarse sandstone and conglomerate approximately 3-5 m.

Mancos Formation (Triassic)—Greenish-gray mudstone with minor, thin sandstone beds. Thickness unknown.

Agua Zarca Formation of the Chinle Group (Late Cretaceous)—Yellow and buff, coarse-grained sandstone with minor conglomerate and pebbly sandstone. Thickness unknown.

early Tertiary and Mesozoic rocks, undivided (Early **Tertiary and Mesosoic)**—Cross section, only. early Tertiary and Mesozoic rocks, undivided.

Explanation of Map Symbols

Contact—Identity and existence are certain and the location is accurate.

certain and the location is accurate.

Fault in cross section showing local up/down offset—The arrows show the relative motion along

Unconformable contact—Identity and existence are

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

the fault plane. Cross section line and label

Geologic Cross Section A-A' Southwest Cerrito Negro