

Geologic Map of the Jemez Pueblo Quadrangle, Sandoval County, New Mexico

By

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*Open-file Digital Geologic Map OF-GM 014***

Scale 1:24,000

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Legend

Jemez Pueblo 7.5 minute quadrangle.

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Surficial Deposits

- Qal *Alluvium – Holocene.* Predominantly gravelly sand with minor silt and clay in active channel bottoms; 1-3 m thick.
- Qs *Eolian sand – Holocene.* Fine to medium-grained sand dunes with variable degrees of vegetative cover. Some dunes, especially those in broad stable interfluvial areas are well vegetated and inactive. Those immediately down wind of broad channels with Qal are active and not vegetated; 1-14 m thick. Reworked El Cajete Ash (labeled “ash” on the map) (~60 ka) is interbedded with Qs in the vicinity of Ojo Chamisa.
- Qt6 *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).
- Qt5 *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).
- Qtc *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.
- Qtb *Terrace alluvium - Late Pleistocene to Holocene.* Arroyo Chamisa and tributary deposit 1-5 m thick, underlying terrace treads in drainages that head in the Chamisa Mesa region. Terrace alluvium is a medium-grained sand interbedded with subrounded basalt cobbles.
- Qc *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.

- Qt5a *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.
- Qt4 *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.
- Qt4c *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.
- Qp3 *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 interfluvial areas that are graded to and locally interfinger with Qt4 and Qt3. Deposit is sourced from the basalts of Chamisa and Borrego Mesas.
- Qt3 *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).
- Qp2 *Piedmont-derived alluvium - Middle Pleistocene.* Alluvium, approximately 2-15 m thick, composed of subangular to subrounded basalt gravel and boulders. Deposits occur in close association with modern drainages, but now occupy interfluvial areas that are graded to and locally interfinger with Qt2 and Qt3. Deposit is sourced from the basalts of Chamisa and Borrego Mesas.
- Qt2 *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.
- Qp1 *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 interfluvial areas that are graded to and locally interfinger with Qt1 and Qt3. Deposit is sourced from the basalts of Chamisa and Borrego Mesas.

- Qt1 *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).
- Qp0 *Piedmont-derived alluvium - Early (?) – 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 Qaj0. Deposit is sourced from the basalts of Chamisa and Borrego Mesas.
- Qaj0 *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 Tuff at 1.2 Ma.
- QTp2 *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.
- QTp1 *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

- Tbp *Olivine-pyroxene basalt of Borego 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).
- Tcc *Canovas Canyon Formation rhyolite and quartzo-feldspathic sandstone - Late Miocene.* In this quadrangle, the Canovas Canyon Formation is primarily a brown sandstone. No rhyolite was found in the map area and the deposit likely represents middle Santa Fe Group deposition following extrusion of the Chamisa Mesa basalt flows.
- Tbc *Olivine basalt of Chamisa Mesa - 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).

- Tsfm *Middle Santa Fe Group - Late and Middle Miocene (late Barstovian-Clarendonian).* Sandstone, siltstone, 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.
- Tzc *Chamisa Mesa Member (Galusha, 1966) of the Zia Formation - 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 opaline beds occurs.
- Tzp *Piedra Parada Member (Galusha, 1966) of the Zia Formation - Middle Miocene (Hemingfordian).* Deposit is a 100-150 m thick pinkish-white to yellow, quartz-rich, cross-stratified fine to coarse eolian sand.
- Tg *Galisteo Formation - Eocene.* Reddish-brown coarse sandstone and conglomerate approximately 3-5 m thick.
- Km *Mancos Formation – Late Cretaceous.* Greenish-gray mudstone with minor, thin sandstone beds. Thickness unknown.
- Traz *Agua Zarca Formation of the Chinle Group - Triassic.* Yellow and buff, coarse-grained sandstone with minor conglomerate and pebbly sandstone. Thickness unknown.

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