

meters ASL

1,500m

1,000m -

500m -

_4 __4 __4 _ White ash #4 of Skull Ridge Mbr. (SGWA4)

-3 -3 White ash #3 of Skull Ridge Mbr. (SGWA3)

2 — 2 — 2 — White ash #2 of Skull Ridge Mbr. (SGWA2)

Horizontal bedding.

Fossil locality site.

Proterozoic bedrock.

Domestic-water supply well.

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_a __a __a _ White ash #2a-c of Skull Ridge Mbr. (SGWA2abc)

Strike and dip of inclined bedding.

Altered bed east of Chimayo (ACWB)

Strike and dip of inclined bedding determined remotely.

Paleocurrent vectors; tail of arrow is located at measure-

ment. Measurements taken from: imbrication (i), channel-

axis (c), foreset dip direction (f), tool marks, grooves (t).

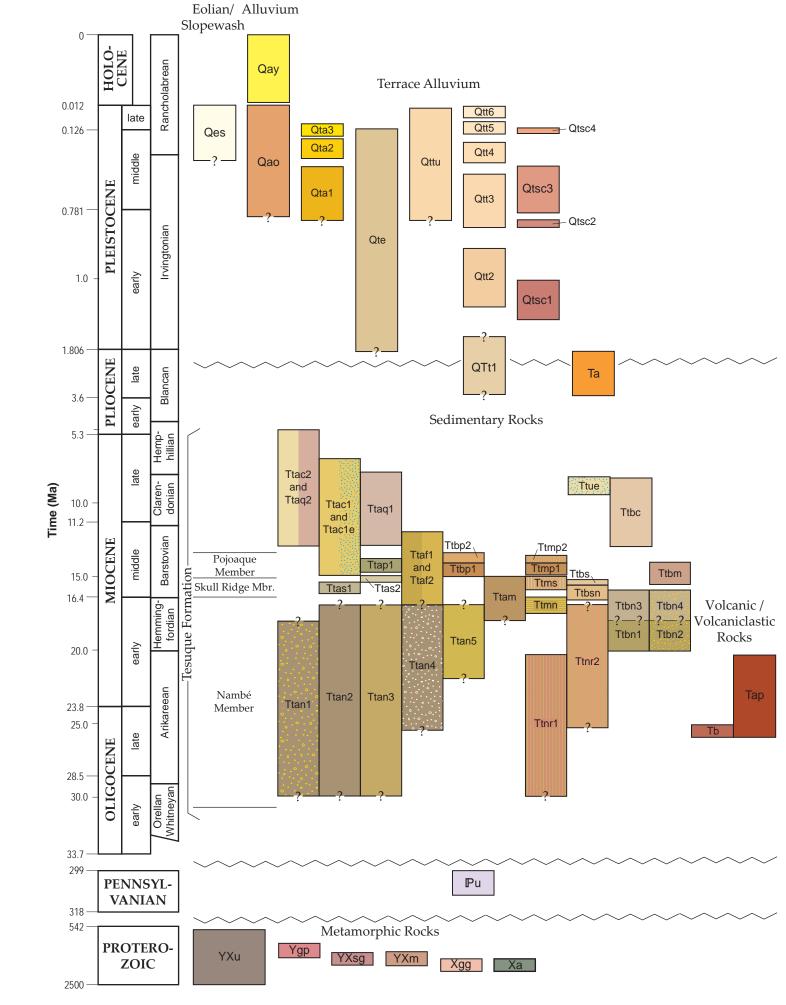
osed strath surface of exhumed basal Tesuque Fm. on

Strike and dip of inclined metamorphic foliation.

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CORRELATION OF MAP UNITS



is available for this unit; it likely correlates with the upper Nambé Member of Galusha and Blick (1971), whose stratigraphic interval probably has an age range of 20-16 Ma. 65-75 m thick. Coarse No. 1 unit of lithosome B of the Nambe Member (lower Miocene) — Sandy conglomerate to pebbly sandstone channel-fill (~65-% pebbles: 25-35% cobbles), about half of which is strongly cemented, but cementation is discontinuous. Gravel clasts are subrounded and poorly sorted. The unit underlies *Ttbn3* and overlies *Ttbn1*. No detailed age control is available for this unit; it likely correlates with the upper Nambé Member of Galusha and Blick (1971), whose stratigraphic interval probably has an age range of 20-16 Ma. 1-2 m thick. Fine No. 1 unit of lithosome B of the Nambe Member (lower Miocene) — Light brown (7.5YR 6/3) siltstone, mudstone, and sandstone; not well exposed; sand is very fine- to medium-grained. It was deposited on the floodplain adjacent to and beneath Ttbn2 channel eposits, and overlies *Ttbn3*. No detailed age control is available for this unit; it likely correlates with the upper Nambé Member of Galusha and Blick (1971), whose stratigraphic interval probably has an age range of 20-16 Ma. 13-16 m thick. Fine No. 2 unit of lithosome A of the Nambe Member (lower Miocene) — Light brown (7.5YR 6/4), with some reddish yellow (7.5YR 6/6), silty very fine- to medium-grained, subangular to subrounded, well to poorly sorted, arkosic arenite sandstone and siltstone to

nudstone. The unit overlies *Ttan3*, interfingers southwards with unit *Ttan4*, and generally underlies *Ttbn1* and *Ttbn2*. No detailed age control is available for this unit; it likely correlates with the middle(?) Nambé Member of Galusha and Blick (1971), whose stratigraphic interval probably has an age range of 22-17 Ma. 10-60 m thick Coarse No. 2 unit of lithosome A of the Nambe Member (upper Oligocene(?) to lower Miocene) — Extra-channel deposits with 25-% coarse channel-fill deposits near Arroyo de la Ancha; proportion of channel-fills increases to 80-100% southwards towards bedrock ighs. The extra-channel deposits consist of pink (7.5YR 7/4) to reddish yellow to brown (7.5YR 5/4) silty, very fine- to fine-grained, mostly subangular to subrounded, moderately to poorly sorted, arkosic arenite sandstone, moderately to well consolidated and weakly cemented, which coarsens southward towards bedrock highs. Channel-fill sediment consists of reddish yellow, strong brown, and light brown (7.5YR 5-6/6, 6/4) to pinkish white (5YR 8/2) pebbly sandstone and sandy, clast-supported, poorly sorted pebble-conglomerate, which also becomes redder and coarser southward. Channel-fill arkosic arenite sandstone is generally fine- to very coarse-grained (medium- to very coarse-grained near bedrock highs), subangular (mostly) to subrounded, moderately to poorly sorted, and moderately to well consolidated. It appears to interfinger northward with *Ttan5*, and likely correlates to the lower Nambé Member, probably within the age range of 25-17 Ma based on age data listed in Obradovich and Izett (2001), Smith (2000a), and discussion in Koning et al. (2002).

No. 2 mixed provenance, reddish, fluvial unit of the Nambe Member (Upper Oligocene(?) to lower Miocene) — Red to light reddish brown (2.5YR 5/6 to 5YR 6/4), medium- to very coarse-grained, subangular to subrounded, poorly to well sorted, and probably arkosic arenite pebbly sandstone to sandy pebble-conglomerate channel-fill deposits (cobbles locally comprise up to 60% of the gravel). Conglomerate is clast-supported, subrounded (granite clasts may be subangular), and poorly to moderately sorted. To the north, there is subordinate overbank sediment of pink to reddish yellow (7.5YR 7/4-6/6), muddy very fine- to medium-grained subangular, moderately to poorly sorted, arkosic arenite sandstone. The unit is intercalated within *Ttan4*, and likely correlates to the lower Nambé Member whose stratigraphic interval probably has an age range of 25-17 Ma. 75-90 m thick. Fine No. 1 unit of lithosome A of the Nambe Member (upper Oligocene to lower Miocene) — Light brown (7.5YR 5-6/4) to very pale

brown (10YR 6-7/4) extra-channel and overbank deposits consisting of silty very fine- to medium-grained, subangular, well to poorly sorted arkosic arenite sandstone with minor siltstone. Channel-fill complexes, consisting of pebbly fine- to very coarse-grained sandstone that locally grades downward into a sandy pebble-conglomerate make up less than 5%. West of the town of Rio Chiquito, unit consists of very fine- to very coarse-grained sandstone and muddy sandstone with ~5% granitic pebbles of probable local origin. The unit overlies, and may grade laterally into, unit Ttan2 and underlies Ttan5. It is weakly to moderately consolidated, non- to weakly cemented by calcium carbonate, and pebble-size calcium carbonate nodules occur locally. The unit likely correlates to the lower Nambé Member whose stratigraphic interval probably has an age range of 30-17 Ma. 210-230 m thick. Gradational unit between the coarse and fine No. 1 units of lithosome A of the Nambe Member (upper Oligocene to lower Miocene)

Extra-channel deposits interbedded with 25-60% channel-fill deposits. The extra-channel sediment consists of light brown to pink 7.5YR 6-7/4)and light yellowish brown (10YR 6/4), clayey-silty, very fine- to very coarse-grained, subangular to subrounded, poorly to moderately sorted arkosic arenite sandstone. It is weakly to well consolidated with weak to moderate cementation by calcium carbonate. The channel-fill deposits consists of pinkish white (7.5YR 8/2) to very pale brown (10YR 7/3), fine- to very coarse-grained, subangular, moderately to poorly sorted, arkosic arenite pebbly sandstone and sandy pebble-conglomerate. Clasts are moderately to poorly sorted and composed of granite (mostly subangular, some subrounded) with minor quartzite (subrounded). The unit underlies *Ttan3*, overlies Ttan1, and may also laterally grade into these two units. It likely correlates to the lower Nambé Member, whose stratigraphic interval probably has an age range of 30-17 Ma. 55-70 m thick.

No. 1 mixed provenance, reddish, fluvial unit of the Nambe Member (upper Oligocene to lower Miocene) — Channel-fill deposits comprised of red to light reddish brown (2.5YR 5/6 to 5YR 6/4), fine- to very coarse-grained, subangular to subrounded, poorly to well sorted, (probable) arkosic arenite pebbly sandstone (reddish clay coatings on grains makes the latter determination difficult and also accounts for the reddish hue) and sandy pebble-conglomerate (cobbles comprise up to 35% of the gravel). Conglomerate is clastsupported, subrounded (granite clasts may be subangular), and poorly sorted. Channel-fill trends and clast imbrication document paleoflow directions to the southwest and northwest. The unit is moderately consolidated and weakly to strongly cemented by CaCO₃, and is interbedded within *Ttan1*. It likely correlates to the lower Nambé Member, whose stratigraphic interval probably has an age range of 30-18 Ma. Thickness is up to 55 m.

Coarse No. 1 unit of lithosome A of the Nambe Member (upper Oligocene to lower Miocene) — Extra-channel deposits interbedded with 40% to 90%(?) coarse channel-fills, which increase towards the mountains and become redder (to yellowish red, 5YR 5/6) near roterozoic bedrock exposures due to clay coatings on the grains. The extra-channel deposits consist of light brown (7.5YR 6/4) to lesser amounts of reddish yellow (7.5YR 6/6), clayey, very fine- to very coarse-grained, subangular to subrounded, poorly sorted arkosic arenite sandstone, weakly to moderately consolidated. The channel-fill sediments consist of very pale brown to pink (7.5-10YR 7-8/3), mediumto very coarse-grained, subangular to subrounded, poorly to moderately sorted, arkosic arenite pebbly sandstone and sandy pebbleconglomerate in channel-fill complexes up to 1.5 m-thick. The conglomerate includes up to ~30% minor cobbles, is clast-supported, poorly sorted, and composed of granite (mostly subangular, some subrounded) with 5-10% quartzite (subrounded). It underlies Ttan2, and may grade laterally into it as well. It likely correlates to the lower Nambé Member, whose stratigraphic interval probably has an age range of 30-18 Ma. 30-45 m thick.

PROTEROZOIC IGNEOUS AND METAMORPHIC ROCKS

Granite and granitic pegmatite (likely Mesoproterozoic) — Granitic rock consisting of potassium feldspar + quartz + muscovite plagioclase feldspar + biotite. It varies in grain size from medium-grained to pegmatitic and commonly has a reddish to pinkish weathered surface. It is generally not foliated and intrudes into and cross-cuts older rocks. The unit includes minor pods or bodies of gneissic granodiorite(?) (Xgg). Biotite schist and granite (likely Paleoproterozoic and Mesoproterozoic, respectively) — Fine-grained, quartz-biotite-feldspar schist intruded by subequal Ygp. Foliation planes have an attitude of 021°\51° NW. Unit is only found in one exposure about 600 m north of

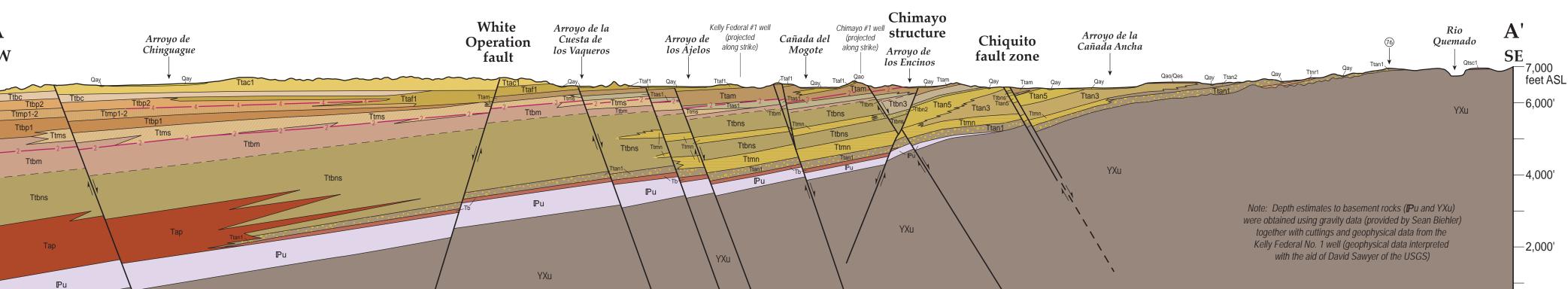
Mixed granodiorite(?), granite, and amphibolite (likely Paleoproterozoic) — Slightly more granodiorite(?) than granite and amphibolite. Granodiorite(?) is similar to that in unit *Xgg* but is not foliated. Gneissic granodiorite(?) (likely Paleoproterozoic) — Grayish white to pinkish white, fine- to medium-grained igneous rock consisting of potassium feldspar + quartz + plagioclase(?) + biotite; generally foliated but foliation ranges from very weak to strong. It locally contains pegmatitic veins of *Ygp*.

Amphibolite (likely Paleoproterozoic) — Very dark gray to black amphibole + plagioclase with minor quartz, fine- to medium-grained, weakly to strongly foliated. The unit contains minor feldspar-quartz-amphibole gneiss and local pegmatitic veins of Ygp. UNITS DEPICTED IN CROSS SECTION BUT NOT SHOWN ON MAP

Middle lithosome B unit of Tesuque Formation (middle Miocene) — Lithosome B fluvial sediment that correlates to units *Ttbp1* and Ttbs. May be interbedded with minor lithosome A sediment. The lower contact of this unit is close to the Nambe-Skull Ridge Member contact. Úp to approximately 410 m thick. Mixed and interbedded lithosomes A and B in the Skull Ridge Member, Tesuque Formation, undivided (middle Miocene) — Unit

consists of lithosome A and lithosome B map units in addition to mixed provenance map units; generally fine-grained. Includes units s2, Ttas1, and Ttms. Up to 120 m thick. Lower lithosome B unit of the Tesuque Formation, undivided (lower Miocene) — Fluvial channel-fills of sandstone and pebble- to cobble-conglomerate interbedded with floodplain deposits of siltstone, mudstone, and very fine- to fine-grained sandstone. Includes units Ttbn1, Ttbn2, Ttbn3, Ttbn4, and possibly Ttbs. This and the lower part of unit Ttbm are grossly similar in sedimentologic properties. On the surface near Chimayó, these two units are separated by a tongue of intervening *Ttam*. To the west in the subsurface, where this tongue of Ttam may not be present, the two units are probably not differentiable and thus the contact between the two is somewhat arbitrary at that location. The upper contact lies in the near-vicinity of the Nambe-Skull Ridge Member contact. Up to 900-930 m thick. Abiquiu and Picuris Formations, undivided (upper Oligocene to lower Miocene) — Volcaniclastic sandstone, pebble-conglomerate, and siltstone derived from felsic to intermediate volcanic centers to the north. Thickness is uncertain. Basalt flows (upper Oligocene to lower Miocene) — Black to dark gray basalt flows and basaltic volcaniclastic sediment, as observed in the Kelly Federal #1 well in the Cundiyó quadrangle to the south (see Koning et al., 2001, for location).

Undivided Paleozoic strata (Mississippian to Permian) — Limestone, siltstone, shale, and sandstone; under this quadrangle, most of this unit is probably the Madera Limestone (Pennsylvanian). Thickness is uncertain. Undivided Proterozoic rocks (Meso- to Paleo-proterozoic) — Probably granite, amphibolite, schist, gneiss, and quartzite.



COMMENTS TO MAP USERS

relationships of rock and deposits and the occurrence of structural features. Geologic and fault contacts are irregular surfaces that form boundaries between different pes or ages of units. Data depicted on this geologic quadrangle map are based on and photogeologic interpretation. Locations of contacts are not surveyed, but are plotte expretation 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 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 associated with recent development may not be shown. The map has not been reviewed according to New Mexico Bureau of Geology and Mineral Resources standards. Revision of the map is likely because of the ongoing nature of work in the region. The contents of the report and map should not be

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geologic map displays information on the distribution, nature, orientation, and age

Government. Cross-sections are constructed based upon the interpretations of the authors made from geologic mapping, and available geophysical (regional gravity and aeromagnetic surveys), 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.