

	Explanation	of Map	Sym
oction			

Location of measured stratigraphic sections showing stations.		Tephras of the Tesuque
Geologic contact. Solid where exposed or known, dashed where approximately known, dotted where concealed, queried where uncertain.		Arroyo de los Peñita Arroyo de los Peñita
Gradational geologic contact, location approximately known.		Chamita upper tuffa (dotted where concealed
Normal fault. Solid where exposed, dashed where approximately known, dotted where concealed. Bar-ball on downthrown side. Tic shows dip of the fault plane.	— w — w — w — w — — m — m — m — m — — b — b — b — b —	Upper coarse white a Middle mixed ash (C Basal black ashes (Cl
Right lateral strike-slip fault. Solid where exposed, dashed where approximately known.	— A — A — A —	Basal Alcalde tufface Black Mesa (ATZb) Fine, white pumice v
Right lateral oblique-slip fault. Solid where exposed, dashed where approximately known. Bar-ball on down- thrown side.	— E — E — E —	Española tephra zon Coarse white ash zon (dotted where concealed
Left lateral oblique-slip fault. Solid where exposed, dashed where approximately known, dotted where concealed. Bar-ball on downthrown side.	P P P	Fine white ash east c Pojoaque black ash s
Anticlinal fold. Dashed where approximately known.	r — r — r —	Pojoaque white ash 2
Synclinal fold. Dashed where approximately known,		

	Qtc1	Upper terrace deposit of Rio Chama-Rio Grande confluence near Chamita (middle Pleistocene) — 4-6 sandy gravel interbedded with subordinate (10-20%) floodplain deposits. Quartzite-rich gravel consists of with boulders present near base of deposit. Floodplain deposits are light yellowish brown siltstone sandstone. Strath is 71-75 m above the Rio Grande. Unit correlates to unit Qtgc2a and possibly Qtr1 . 250 thick.		
	Qtr2	<i>Rio Grande terrace deposits above the confluence of the Rio Chama</i> Lower terrace deposit of Rio Grande above confluence with the Rio Chama (upper to middle Pleistocen pebbles with 25-40% cobbles. Unit includes interbeds of unit Qao and laterally grades into Qao . Strath is Grande. Unit correlates to Qtc2 , Qtcg2c , and possibly Qtcg3 . Terrace deposit is 70-150 ka (probably 130-1 and Reneau, 1995). Loose. Up to 12 m thick.		
	Qtr1	Upper terrace deposit of Rio Grande above confluence with the Rio Chama (middle Pleistocene) — gravel consists of subequal pebbles and cobbles dominated by quartzite and basalt. Strath is 82-86 m above correlates to Qtcg2a and possibly Qtc1 . 250-350 ka old. Loose and 3-4 m thick.		
	QTse	Plio-Pleistocene volcanic and sedimentary rocks Slopewash and eolian deposits overlying down-dropped basalt flow blocks (upper Pliocene to Pleis light yellowish brown silt and very fine sand, with subordinate fine to coarse sand, interpreted to be win by slopewash processes that mixed in detritus from the Chamita Formation and Servilleta Basalt. ~3% of calcium carbonate. Loose to weakly consolidated.		
		Tertiary		
	Tgy	Pliocene basalt flows and subjacent river deposits Younger, upper gravel overlying Servilleta Basalt flows (lower to upper Pliocene) — Thin (\leq 1 m) grave latter is similar to QTse in physical characteristics and possibly in age. The gravel is composed of pebl 1-15% very fine to very coarse pebbles similar in composition to unit Tgo . Both gravel and finer, overly 0.5-4.0 m thick.		
	Tsb	Servilleta Basalt flows (Pliocene) — Dark gray, vesicular basalt forming an erosionally resistant, protect Vesicules are commonly in discrete zones. Unit has been deformed by Plio-Pleistocene tectonic activity at to Black Mesa. On the western margin, there is generally one flow 3-8 m thick; flows are commonly more margin. A sample of the basalt from this quadrangle (UTM NAD 27 zone 13 coordinates: 3996100 N, 400 of 3.32 ± 0.78 Ma.		
	Tgo	Lower, older gravel underlying Servilleta Basalt flows (lower Pliocene) — Sandy gravel, sand, and silvery pale brown and very fine- to very coarse-grained. The silty sand may reflect floodplain deposition. Gepebbles and cobbles with local minor (5-10%) boulders, and predominantly quartzite with minor granite characteristics suggest two differing source rivers: the western margin of Black Mesa contains 1-5 m or sediment, deposited possibly by the ancestral Rio Ojo Caliente, flowing towards the south to southeast; in overlain by up to 9 m of light brown to reddish yellow sediment very similar to unit Tccu , for a total thick axial river system interpreted to be derived from the Sangre de Cristo Mountains near the Peñasco embayr basin and may be the ancestral Rio Grande. This river may possibly have merged with an ancestral equinear the southern tip of Black Mesa.		
		Miocene Basin Fill Chamita Formation		
	Тсси	See the accompanying report for a discussion on the Chamita Formation, complete with measured stratige Coarse, upper lithosome A unit (upper Miocene) — Light brown to reddish yellow to pink, silty with subordinate channel-fill complexes of arkosic pebbly sandstone and sandy conglomerate. Sand is grained outside of the coarser channel-fill complexes; gravel consists of subrounded to subangular per and are composed of granite with about 15-40% quartzite. West-northwest paleocurrent flow data togeth composition of the gravel support derivation from the Sangre de Cristo Mountains south of the Peñasce Chama, this unit is composed of light brown to pink siltstone and very fine to fine-grained sandstone, silty Pebbles are generally granitic. Here, this unit was deposited on the distal alluvial slope in a relatively low-Ma old. The unit attains a maximum thickness of 200-250 m east of the south tip of Black Mesa.		
	Tccut	Coarse, upper lithosome A unit, tuffaceous (upper Miocene) — Coarse, upper lithosome A unit, as describe ash and interbedded with the Chamita upper tuffaceous zone (CUTZ). Individual CUTZ beds are not diff abundance and because of extensive mixing of ash with detrital sediment. Estimated maximum thickness		
	Тсс	Cejita Member (upper middle to upper Miocene) — Light brown to light yellowish brown to very pal siltstone-claystone and fine sandstone that are interbedded with various proportions of coarser channel-f dominated conglomerate. On the western slopes of Black Mesa within the fine-grained sediment, the coar up about 10% of the deposit, and the channel-fill gravels consists of pebbles and fine cobbles, dominated l green-gray Paleozoic limestone, sandstone, and siltstone. On the southern tip of Black Mesa, this unit f of interbedded floodplain and channel-fill deposits of sandstone, pebbly sandstone, and sandy pebble-intervals of deposits correlative to the Vallito member (Tcv), and locally much of the sand looks to b Sandstone (Tto). 5.8 to 12.8 Ma old. 150-200 m thick.		
	Tch	Hernandez member (upper Miocene) — Light yellowish brown to pale brown floodplain deposits sandstone, and mudstone, interbedded with about 10% medium to thick channel-fills of pebbly sandstone Channel-fill sand is light gray to light brownish gray and fine- to very coarse-grained; subrounded pel to intermediate volcanic clasts. 10-20% of channel-fills are strongly to moderately cemented by calcium deposition from river systems derived from the north-northwest, appearing to interfinger with the wester Up to 16 m thick.		
	Тсv	Vallito member (upper Miocene) — Pink to very pale brown, very fine- to medium-grained sandstone a with <30% light yellowish brown to very pale brown siltstone and claystone. Moderately to well conso primarily reflect low-energy river deposition on a flat basin floor, where most of the sandy strata wer channels of a river braidplain(?). Minor eolian deposits of sand sheets and sand dunes were also present. It the coarse white ash zone (CWAZ), and extends into the lowest part of the Chamita type section, giving i		
	Τανς	Interbedded Vallito and Cejita Members (upper Miocene) — Interbedded intervals commonly seve the west-central San Juan Pueblo (Ohkay Owingeh) reservation. It contains a bed of the CWAZ , but lies tuffaceous zone (CLTZ); estimated age is 10-13 Ma. Total thickness of approximately 170-250 m.		
	Ttac	Tesuque Formation Coarse, upper lithosome A unit (middle to upper Miocene) — Extra-channel and overbank sediment to complexes. The former consists of light brown to reddish yellow, very fine- to medium-grained arkosic with minor siltstone and mudstone. Channel-fill complexes consist of arkosic pebbly sandstone and sa minor cobbles. This unit both overlies and interfingers westward with unit Ttbc (which west of the Rio contact is gradational with Ttbc over 6-9 m. Age is inferred at 9-12.8 Ma. Approximately 100-180 m thick quadrangle.		
	Ttbc	Coarse upper lithosome B unit, Cejita member of Tesuque Formation (middle to upper Miocene) — FI proportions of coarse channel-fill deposits of sandstone and conglomerate. The former consists of light b grained sandstone and silty sandstone, occasionally containing beds of light brown to brown mudster sandstones are pale brown to very pale brown, fine- to very coarse-grained, and generally has an estim derived lithics to 20-50% pink potassium feldspar. Channel-fill conglomerate consists of pebbles with mir dominated by Paleozoic limestone, sandstone, and siltstone, with minor quartz, felsic to intermediate very composition becomes progressively more granitic to the east so that granite is about subequal. Ttbc re that flowed south-southwest from the Peñasco Embayment, and had a source in the Sangre de Cristo More The Cejita Member interfingers eastwards with unit Ttac, and westwards with unit Tto. Age is inferred at		
	Tto	Ojo Caliente Sandstone member (middle Miocene) — Very fine- to medium-grained, largely cross-stu a large, dune field, whose colors range from very pale brown to white; contains minor beds of siltstone, unit interfingers eastward with unit Ttbc , and probably interfingers with units Ttbp2 and Ttmp2 in the overlain by Tcv in the western part of the quadrangle. ~11 to 13.5 Ma old. Cross sections and well control is but possibly as thick as 440 m near the northern boundary of the quadrangle.		
	Ttap2	Upper lithosome A unit of the Pojoaque member, informal salmon-colored unit (middle Miocene) - sediment with 3-15% coarse channel-fills. The former two are generally light brown to reddish yellow, v sandstone and silty sandstone, with minor siltstone and mudstone. Channel-fills are composed of sam pebble-conglomerate; sand is arkosic, very fine- to very coarse-grained, and conglomerate clasts are gr include minor cobbles. Deposits are well to moderately consolidated and represent deposition on the dist with lithosome A. Its informal color designant is from Galusha and Blick (1971), due to the common redde Unit pinches out westward within unit Ttbp2 , and is underlain by the same. 13.0 -13.3 Ma old. 30-40 m the		
	Ttbp2	Upper lithosome B unit of the Pojoaque member (middle Miocene) — Generally floodplain deposits v of sandstone to pebble-conglomerate. Floodplain deposits are mostly light brown to brown mudstone subordinate very fine- to fine-grained sandstone to silty sandstone. Channel-fill sandstone is pale brown, v and contains an approximate ratio of 50-80% northeast-derived lithic grains to 20-50% pinkish potassiu conglomerate locally include up to 40% cobbles; gravel composition is dominated by Paleozoic limestone 10-20% quartzite, 5-15% quartz and chert, 1-10% granite, and 1-30% intermediate to felsic volcanic class south-southwest-flowing river system. It overlies Ttmp2 on this quadrangle. 13.2-13.6 Ma old. ~30 m thic		
	Ttmp2	Upper, mixed provenance unit of the Pojoaque member (middle Miocene) — This extensive unit is con- channel sandstone and siltstone, with minor channel-fills of sandstone and pebbly sandstone of either mix between the two. The former two are comprised of light brown to pink siltstone and very fine-t- minor mudstone (the sand has varying proportions of pinkish potassium feldspar from northeast-deri- are composed of very pale brown to pale brown, very fine- to very coarse-grained sandstone and spar lithosome A, lithosome B, or mixed provenances. Over most of the map area, this unit represents deposit the basin floor (lithosome B) and distal portions of the alluvial slope (lithosome A). It overlies Ttmp1 ar age of 13.2-14.0 Ma. 70-75 m thick.		
	Ttap1	Lower lithosome A unit of the Pojoaque member (middle Miocene) — Fine overbank and extra-char channel-fill deposits. The former is silty very fine- to fine-grained, arkosic sandstone; color ranges from Minor beds of mudstone and siltstone occur. The channel-fill is composed of light yellowish brown, ve arkosic sandstone with local gravel near the base; gravel consists of pebbles of granite, 20% quartite, carbonate-cemented nodules. Deposit is weakly to moderately consolidated; about half of channel-fil cemented by calcium carbonate. Found in a similar depositional environment as Ttap1 (i.e., distal alluvunderlies $Ttmp1$, and appears to grade laterally westward into unit Ttmp1. 14.7-13.7 Ma old. \leq 15 m thick.		
	Ttmp1	Lower, mixed provenance unit of the Pojoaque member (middle Miocene) — Very fine- to fine-grain siltstone, and minor silt-rich mudstone. Color ranges from pink to light brown. Sand generally contains		





