

DESCRIPTION OF MAP UNITS	Qrgt3	pale-bro	nde alluvium, youngest terrace deposits (middle Pleistocene) — Very own (10YR 7/3) to light brown, poorly consolidated, medium- to very grained sand and clast-supported cobble gravel beds. A distinct pinkish gray		
NEOGENE		(7.5YR) Rio Gra	6/2) cross bedded fluvial sand is seen in places. Deposit is inset below older inde terrace deposits and represents lowest preserved terrace deposit in this	QTsa	Sierra Ladrones Formation, a lower Pleistocene) —White t
slope, alluvial-fill, eolian, and anthropogenic deposits		valley v	orms fairly continuous low-lying terrace along margin of modern Rio Grande vith a surface tread of 27-29 m above the modern river. Finer- sand, silt, and clay overlying the gravel interfingers with the base of the		partially cemented cross-bed the ancestral Rio Grande. Gra
- Dumped fill and areas affected by human disturbances r extractions are areally extensive. Commonly includes floodplain, borrow pits for interstate road construction and		overlyin the east	ng younger and intermediate stream-valley alluvium (Qay, Qam3, Qam2) to . Base is exposed in both the southeast area of the quad where it		(25%), rounded orthoquartzit in composition from the more volcanic rocks, and sedimen
and and gravel quarries located on the lowest Rio Grande ely east of the Rio Grande floodplain.		where i	brmably overlies piedmont basin fill (QTsp) and in the northeast corner t rests on cemented fluvial cross bedded sands of axial-river basin fill Unit is approximately 22-27 m thick.		in the adjacent piedmont faci cemented and partially cemen
Iolocene to uppermost Pleistocene) — Unconsolidated ed, moderately to well sorted, light brown sand. Forms	Qrgt2	Rio Gra	nde alluvium, intermediate terrace deposits (middle Pleistocene) —		sandstone cropping out benea tentatively correlated to Sierr out from 4875- to 5020-ft ele
dunes along the rim of the Llano de Albuquerque. Deposits to about 3 m in thickness.		pebbly	o pale-brown (10YR 8/2-8/3), poorly consolidated, moderately sorted, to cobbly sand and clast-supported gravel. Unconformably overlies partially ed light-colored parallel-bedded sandstone of unit QTsa. Contains abundant		Quadrangle and contains Rab piedmont cobble and boulder
a Formation, undivided (Holocene to uppermost idated to very poorly consolidated, moderately to well		rounded and met	l orthoquartzite and polished chert pebbles and cobbles as well as igneous tamorphic extrabasinal clasts. Also contains well cemented slabby clasts of	QTsp	m thick. Sierra Ladrones Formation p
Forms extensive sheets in the central areas of the Llano de osits are less than 1 m to slightly greater than 1 m thick Ceja Formation (Tc).		Rio Gra	nbricated to the southeast. Exposed base of deposits is about 38 m above the unde floodplain. Top is truncated by eroded base of overlying tributary n Qam2. Preserved thickness is only about 3 m.		Group, lower Pleistocene-Pli well consolidated and modera
ided (Holocene) — Unconsolidated, moderately to well	Qrgt1	Rio Gra	nde alluvium, oldest terrace deposits (middle Pleistocene) — White to		sandstone, siltstone, conglom subhorizontal to gently dippin limestone, granitic, metamor
lunes. Common either as active or coppice dunes beneath ulosa) thickets. Covers approximately 1.5 km2 of the lano de Albuquerque. Dunes range in thickness from about		and class	own (10YR 8/2-8/3;7.5YR 5/4), poorly consolidated, pebbly to cobbly sand st-supported gravel. Unconformably overlies red sandstone, siltstone and nerate of unit QTsp. Cross-bedded gravels are generally pebbles smaller		from the southern Los Pinos imbrications, channel margin
		than 5 c well rou	m diameter, but a few clasts are up to 20 cm in diameter. Pebbles consist of inded extrabasinal clasts of igneous and metamorphic rocks, orthoquartzite, ished chert pebbles and cobbles. Sparse rounded pebbles of black obsidian		westerly paleoflow direction, deposits to the south in La Jo thickening wedge that overlie
er eolian deposits, undivided (Holocene to uppermost idated, moderately to well sorted, light brown sand dunes onsolidated to slightly consolidated eolian deposits. Unit is		are also and loca	found. Deposits sit between 50 and 65 m above the floor of the Rio Grande ally are inset against a well exposed bluff line. Deposits are approximately		Formation (de Moor and othe fluvial deposits of the ancestr rounded obsidian from Rabbi
Ibuquerque at the northern edge of the quadrangle and guita quadrangle, where it is more extensive. Commonly		15 m th	ick near the bluff line.		fossils in this unit were found south in Valle de la Parida an
sh alluvium, undivided (Holocene to uppermost			Alluvium of the Rio Puerco		mammal fossils (Connell and along the eastern margin of the exposed. This soil exhibits St
idated to very poorly consolidated, moderately to well n finer grained, light brown slope-wash alluvium. Unit is and sloping into a structural graben on the Llano de	Qarp		erco alluvium, undivided (Historic to middle Pleistocene) — olidated sand, pebbly sand, silt and clay with a range of pale brown and		morphology and represents a Treadwell (1996) reported so surface, a relict piedmont-slo
relief of the deposit is 20m on the east side. Commonly		reddish Puerco	brown colors (e.g., 7.5YR5/4). This unit makes up the bulk of the Rio valley floor and extends tens of m below the surface. Interfingers with Qae		SW quadrangle. Treadwell (1 (which she called Qp) to repr
ivided (Holocene to upper Pleistocene) — oorly consolidated, moderately to well sorted, light brown		Kelson	fy on valley margins. Generally corresponds to the unit Pfa of Pearce and (2004).Upstream unit is more than 40 m thick, but must be only as thick to Grande valley fill (Qrg) here, estimated to be 20-30 m thick.		that the uppermost gravels th northwestern margin of the m Santa Fe Group basin fill. Ere
clay alluvial fill occupying a structural graben on the major source of Qag sediments is derived from adjacent deposits of Qase. Possibly up to 10 m thick.			Modern channel facies (Historic) — Unconsolidated pale brown,		mantled by thick (less than 0, colluvium, alluvium, and eol
th eolian sand, undivided (Holocene to upper			medium sand, silt, and clay within the active channel of the Rio Puerco. Generally modified from the units W35, Rsb35, and Rcs35 (i.e., the channel in 1935) of Pearce and Kelson (2004) using the 1996 digital	QTst	about 10 m to well over 300 m Sierra Ladrones Formation in
idated to very poorly consolidated, poorly to moderately on to light-brown, fine- to medium-grained sand and silty es. Commonly forms a relatively thin mantle of alluvium		O arre al	orthophoto. Thickness varies with each waning flow event.		undivided (upper Santa Fe Gi is applied to areas where the
its shed off of broad upland areas, and locally can exhibit adjacent to floodplains or east of the Llano de		Qarpci	Modern channel facies and scroll-bar deposits (Historic to upper Holocene) — Unconsolidated sand and silty clay deposits of former Rio Puerco channels recognized in aerial photography and roughly		interfinger on a scale of a few horizontally. The zone where between fluvial and tributary
along the valley margins of the Rio Grande floodplain Varies considerably in thickness from less than 1 m loodplains and in upland settings mantling the Ceja			corresponding to the units Hcs, Hcb, and Hsb of Pearce and Kelson (2004). Scroll-bars marked by arcuate vegetation such as tamarisk. Ranges to 4 m thick.		and cementation changes due differences between the two the reduced from reddish-yellow
4 m, downslope of the lowest alluvial terrace of the Rio		Qarpm	Meander-bend deposits (Historic to upper Holocene) —		like mounds and/or elongate Where mapped, this zone ran
ivium with eolian sand (Holocene) — Lowest alluvial eolian deposits found immediately above the Rio Grande			Unconsolidated (color?) sand, silt, and clay deposits preserved along recently abandoned and active meander bends. Meanders outlined by arcuate vegetation such as tamarisk. Ranges to 4 m	Tc	Ceja Formation (upper Santa brown (7.5YR 6/4-7/3), unco
monly exhibits a lag deposit of alluvial sand and small d out of adjacent Qay fans. Thickness ranges from less		_	thick		moderately to well sorted san interbedded brown, yellowish
wium with eolian sand (Holocene to uppermost		Qarps	Swale-fill deposits (Historic? to Holocene) — Unconsolidated deposits of pale brown to reddish brown (7.5 YR 5/6?) pebbly sand, silt, and clay that partially fill a swale eroded parallel to the northern edge of the Rio		the Llano de Albuquerque we Puerco. Paleocurrent observa indicate a southeasterly to so
Upper alluvial valley-slope and eolian deposits. Textures vary considerably on opposite sides of the Rio Grande			Puerco valley floor near Bernardo. Estimated thickness less than 4 m.		pebbles less than 5 cm in dian quartzite, basaltic and interm
est, these deposits thinly mantle Tc and are predominantly dy facies with considerable eolian input. Deposits found the east, however, are much thicker, more poorly sorted,			Tributary stream-valley alluvium		sandstone, and limestone. Wi cobbles and small boulders o below to the Llano de Albuqu
gravel concentrations derived from the terrace above.	Qay	Stream	alluvium, undivided young deposits (Holocene to uppermost		obsidian (from East Grants R 1980) and Blancan fossils, in of this basin fill (Morgan and
th eolian sand (upper to middle Pleistocene) — ately consolidated, moderately sorted, light reddish-brown h deposits consisting of fine- to coarse-grained sand with		to mode	ene) — Pale brown to light reddish-brown (10 YR 8/3 to 5YR 6/4), poorly erately sorted, unconsolidated pebbly sand with gravel bars of cobbles lders. Deposit surfaces are less than 5 m above local base level near mouths of		the formation consist of arroy within the deposits are eolian
20 cm commonly exhibits a loose eolian mantle covering I to II+) soil developed into these deposits. Located of the highest alluvial terraces of both the Rio Grande		tributar weakly	y drainages, but sit less than 0.5 m above local base level upstream. Soils are developed. Corresponds to units Qt6 and Qt5 of Treadwell (1996) who		reddened horizons and stage laterally over thousands of m about 100 m. Subsurface data
the fightest and via terraces of both the Kto Grande to (Qrpt1). Commonly thins downslope from 3 m to 1 m in			that a similar deposit at an archaeological site yielded a radiocarbon date of 50 yrs. BP on the La Joya Quadrangle. Deposit is about 3 m thick.	Tcs	may be more than 560 m thic
livided (Historic to uppermost Pleistocene) — Light , poorly to moderately sorted, unconsolidated to	Qam	Pleistoc	alluvium, undivided intermediate deposits (upper to middle ene) — Unconsolidated to weakly consolidated sand and gravel associated st inset drainages east of Rio Grande. Inset against older stream alluvium	105	Ceja Formation with interfing (upper Santa Fe Group, Plioc north of the Rio Puerco Valle
fine- to coarse-grained sand commonly containing . Forms large lobate fans upon debouching from the			ta Fe Group. Locally divided into four subunits. Thickness ranges to 25 m.		Quadrangle and consists of u grayish-pink to light-brown (consolidated ledge-forming, n
uerco out onto either valley margin alluvium (Qae) or the arp). Deposits on one fan are subdivided based upon aerial lobe has clearly built out onto older fan surfaces. Fan		Qam4	Stream alluvium, younger subunit (upper Pleistocene) — Pale brown to light reddish-brown (10 YR 8/3 to 5YR 6/4), poorly to moderately sorted, unconsolidated pebbly sand with thin gravelly channels of cobbles		and conglomerate, and interb light yellowish brown (2.5 Y
I m near apexes to less than 1 m (often less than 0.3 m as floodplain levels) at their distal margins.			and/or boulders, associated with inset drainages east of Rio Grande. Deposit surfaces are more than 5 m above local base level near mouths of		suite of Ceja pebbles and Gra boulders of Proterozoic grani basaltic volcanic rocks, and s
osits (Historic to upper Holocene) — Modern fan lobe entered at UTM 13S 328000 3809500. Deposit is clearly			tributary drainages, continue to be more than 4 m above local base level upstream. Soils are weakly developed. Estimated to be 5 to 7 m thick.		up-section and to the south, a
derlying older fan deposits of the same fan and could have sult of recent debris flood events.		Qam3	Stream alluvium, younger subunit (upper Pleistocene) — Pale brown to light reddish-brown (10 YR 8/3 to 5YR 6/4), poorly exposed, poorly to moderately sorted, unconsolidated pably to cohely sand associated with		
osits (Holocene to uppermost Pleistocene) — extending beyond the alluvial-fan deposits of the same fan			moderately sorted, unconsolidated pebbly to cobbly sand associated with inset drainages east of Rio Grande. Deposit surfaces are more than 7 m above local base level near mouths of tributary drainages, continue to be		
			more than 7 m above local base level upstream. Soils are weakly developed and exhibit Stage I+ pedogenic carbonate morphology. Estimated to be 7 to 10 m thick.		
Alluvium of the Rio Grande		Qam2	Stream alluvium, intermediate subunit (middle to upper Pleistocene)		
n, undivided (Historic to upper Holocene) — porly consolidated coarse-grained sand and gravel with f fine-grained sand, silt, and clay. Forms the lowest inset			— Pale brown to light reddish-brown (10 YR 8/3 to 5YR 6/4), poorly exposed, poorly to moderately sorted, unconsolidated pebbly to cobbly sand associated with intermediate levels of inset drainages east of Rio		
inner valley and floodplain of the Rio Grande and basal antly coarser-grained. The Rio Grande floodplain alluvium is punits based upon and modified from aerial photographic work			Grande. Gravels consist of limestone, granitic and metamorphic, and red sandstone rock types as well as well-rounded pebbles reworked from older Rio Grande deposits (QTsa, Qrgt1, Qrgt2). Lowest part of unit that overlies		
n (2004) using 1935-vintage aerial photography, when nee was significantly less than present. Base not exposed but			Rio Grande terrace Qrgt3 interfingers with Rio Grande sand, silt, and clay. Soils are moderately developed and exhibit Stage II pedogenic carbonate		
n thick in this vicinity. channel facies (Historic) — Unconsolidated sand and gravel			morphology. Corresponds to unit Qt4 of Treadwell (1996) on the La Joya Quadrangle. Deposits range from 3-23 m thick.		
te active channel of the Rio Grande. Generally modified from the 5 of Pearce and Kelson (2004) (i.e., the channel in 1935) using the ital orthophotoquad, and also includes units Rib35 and Rsb35 of		Qam1	Stream alluvium, older subunit (middle Pleistocene) — Light reddish- brown (5YR 6/4), unconsolidated to moderately consolidated sand and gravel inset below top of Santa Fe Group. Gravels consist of limestone,		
nd Kelson (2004).			granitic and metamorphic, and red sandstone rock types. Deposit surface exhibits well developed soils with Stage III+ pedogenic carbonate		
channel facies and scroll-bar deposits (Historic to upper e) — Unconsolidated sand and gravel deposits of former Rio channels and scroll bars recognized in aerial photography.			morphology. Corresponds to unit Qt3 of Treadwell (1996). Deposits are approximately 2 m thick and sit about 29 m above local base level.		
onds to the units Hch, Hsb, and Hib of Pearce and Kelson (2004).	Qao		and slope alluvium, undivided older deposits (middle Pleistocene) —		
-bend deposits (Historic) — Deposits preserved along recently ed and active meander bends. Corresponds to units Rch35, Rcs35, 85 of Pearce and Kelson (2004).		6/4), sar	tely consolidated, pale brown to light reddish-brown (10 YR 8/3 to 5YR and and gravel associated with valley border fans and adjacent slopes that leo-bluffs formed on upper Santa Fe Group (QTsa and QTsp) by initial		
-bend deposits (Historic to upper Holocene) — Deposits		incision subangu	and early development of the ancestral Rio Grande Valley. Gravels are lar to subrounded pebbles and cobbles of limestone, sandstone, granitic,		1
along older abandoned meander-bend courses. Corresponds Icb and Hcs of Pearce and Kelson (2004).			rphic and sparse volcanic rock types indicating derivation from drainages lands to the east. Estimated to be 5 m thick.		

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