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Quaternary Fault and Fold Database of the United States

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Lang Canyon fault (Class A) No. 2025

Last Review Date: 2016-01-20

Compiled in cooperation with the New Mexico Bureau of Geology & Mineral Resources

citation for this record: **Vincent, K.R., and Jochems, A.P., compilers, 2016, Fault number 2025, Lang Canyon fault, in Quaternary fault and fold database of the United States: U.S. Geological Survey website, https://earthquakes.usgs.gov/hazards/qfaults, accessed 12/14/2020 02:23 PM.**

Synopsis	The middle to late Pleistocene scarp at Lang Canyon is the only reliable surface expression of Quaternary faulting on the western side of the Animas Mountains, south of the Gillespie Mountain fault, which ends 30 km north of Lang Canyon (Vincent and Krider, 1997 #1193). The fault bounds the west margin of the Animas Valley, a major (>100-km-long), north-south oriented Basin-and-Range structural feature (graben) in southwestern New Mexico that also extends about 7 km into Mexico. No trenching has been done across the fault, and no detailed mapping has been conducted to define a possible southern extension of the fault in Mexico. However, aerial imagery suggests that strands of the fault may extend 2–3 km southward into Mexico.

Name comments	This fault, mapped by Vincent and Krider (1997 #1193), forms the western margin of both the southern Animas Mountains and the northern San Luis Mountains, which are the southern extension of the Animas Mountains in Mexico. The fault was named by Vincent and Krider (1997 #1193) for Quaternary scarps at the mouth of Lang Canyon, 1.3 km north of the international border with Chihuahua, Mexico.
County(s) and State(s)	HIDALGO COUNTY, NEW MEXICO
Physiographic province(s)	BASIN AND RANGE
Reliability of location	Good Compiled at 1:24,000 scale. *Comments:* Northernmost fault trace from 1:24,000-scale map of Vincent and Krider (1997 #1193). Southern traces mapped using photogrammetric methods.
Geologic setting	The Lang Canyon fault is the southernmost fault that bounds the Animas Valley, a major (>100-km-long), north-south oriented Basin-and-Range structural feature (graben) in southwestern New Mexico that also extends about 7 km into Mexico. The valley is flanked on the west by the Peloncillo (and Guadalupe) Mountains and on the east by the Animas (and San Luis) Mountains. Over much of its length, the valley consists of a full-graben, but in the southern part of the valley the structures (i.e., the west-dipping Gillespie Mountain fault [2096] and the east-dipping Gray Ranch fault zone [2095] of Machette and others (1986 #1033) form a half-graben with a single west-dipping fault. This fault, the Lang Canyon fault, has accommodated eastward tilt of both the Animas and Peloncillo blocks (Vincent and Krider, 1997 #1193).
Length (km)	1 km.
Average strike	N19°E
Sense of movement	Normal
Dip Direction	W
Paleoseismology	

studies	
Geomorphic expression	At the mouth of Lang Canyon there is a 600-m-long fault scarp about 5 m high that trends N. 19° E. on a fan remnant thought to be of middle Pleistocene age (i.e., 500–750 ka). However, nearby late Pleistocene (130 ka) deposits cover the fault and are not disturbed (Vincent and Krider, 1997 #1193). The surficial trace of the Lang Canyon fault is preserved only at Lang Canyon, although aerial imagery suggests that two short (<1 km) strands may be present extending southward into Mexico. Detailed geomorphic surface (landform) mapping by Vincent and Krider (1997 #1193) indicates the surficial trace is not preserved on the landscape north of Lang Canyon, and the southern strands in Mexico have not been field-checked to define a possible southern extension of the structure.
Age of faulted surficial deposits	Vincent and Krider (1997 #1193) suggested that the scarp is formed on alluvial deposits of probable middle Pleistocene age (i.e., 500–750 ka), whereas nearby late Pleistocene (130 ka) deposits cover the fault and are undisturbed. The age of these deposits was inferred from soil development.
Historic earthquake	
Most recent prehistoric deformation	middle and late Quaternary (<750 ka) *Comments:* Given the uncertainty in estimates of the age of deposits, the most recent paleoevent certainly occurred in the Quaternary, probably in the middle Pleistocene but prior to the late Pleistocene. Vincent and Krider (1997 #1193) reason that the timing is probably middle Pleistocene (or older) because the scarp is well preserved only at the most erosion-resistant site (Lang Canyon). The Lang Canyon fan remnant is extremely bouldery in texture, unlike deposits of similar age along the range front; this attribute probably contributes to the scarp's local preservation.
Recurrence interval	
Slip-rate category	Less than 0.2 mm/yr *Comments:* Although no detailed offset or age data is available, the long-term slip rate must be low on the basis of no late Pleistocene offset.

Date and Compiler(s)	2016 Kirk R. Vincent, U.S. Geological Survey Andrew P. Jochems, New Mexico Bureau of Geology & Mineral Resources
References	#1033 Machette, M.N., Personius, S.F., Menges, C.M., and Pearthree, P.A., 1986, Map showing Quaternary and Pliocene faults in the Silver City 1° x 2° quadrangle and the Douglas 1° x 2° quadrangle, southeastern Arizona and southwestern New Mexico: U.S. Geological Survey Miscellaneous Field Studies Map MF-1465-C, 12 p. pamphlet, 1 sheet, scale 1:250,000. #1193 Vincent, K.R., and Krider, P.R., 1997, Geomorphic surface maps of the southern Animas Valley, Hidalgo County, New Mexico: New Mexico Bureau of Mines and Mineral Resources Open-File Report OF-429, 12 sheets, scale 1:24,000.