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Quaternary Fault and Fold Database of the United States

As of January 12, 2017, the USGS maintains a limited number of metadata fields that characterize the Quaternary faults and folds of the United States. For the most up-to-date information, please refer to the interactive fault map.

Hachita Valley fault (Class A) No. 2141

Last Review Date: 2016-02-12

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

citation for this record: **Machette, M.N., Jochems, A.P., Lawton, T.F., and Seager, W.R., compilers, 2016, Fault number 2141, Hachita Valley 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 02:21 PM.**

Synopsis	This Quaternary fault offsets piedmont-slope deposits that flank the eastern margin of the Little Hatchet Mountains. The scarps are less than 6 m high but may reflect two episodes of movement. No studies of scarp morphology have been made along the fault, nor has trenching or detailed mapping have been done.
Name comments	The Hachita Valley fault was named by Lawton and Harrigan (1998 #1745) for its location along the western margin of Hachita Valley, southwest of Hachita, New Mexico. The fault extends along the entire length of the Little Hatchet Mountains (Hachita Peak 7.5-minute quadrangle) from at least as far north as New Mexico State Highway 9 south to about 1.5 km north of Hatchet

	Gap on New Mexico State Highway 81.
County(s) and State(s)	GRANT COUNTY, NEW MEXICO HIDALGO COUNTY, NEW MEXICO
Physiographic province(s)	BASIN AND RANGE
Reliability of location	Good Compiled at 1:24,000 and 1:100,000 scale. *Comments:* Generalized trace of the central part of the fault is from geologic sketch map (fig. 1; approximately 1:24,000-scale) of Lawton and Harrigan (1998 #1745), with additional mapping of northern and southern ends from unpublished aerial photoreconnaissance compiled at 1:100,000 scale by Lawton (written commun., 1998). Photogrammetric methods were used to accurately map most traces of the central and southern parts of the fault at 1:24,000.
Geologic setting	This slightly undulating, north-south-trending, down-to-the-east fault offsets proximal piedmont-slope deposits that flank the eastern margin of the Little Hatchet Mountain and forms part of the western margin of the Hachita Valley (Lawton and Harrington, 1998 #1745). The Little Hatchet Mountains (which includes Hachita Peak) are a west-tilted block of mainly Jurassic rock that contains a NE-dipping Laramide thrust. The northern part of the mountains contain Cretaceous and early Tertiary rocks that are downdropped to the N and NE along the Copper Dick fault (Lawton and Harrington, 1998 #1745). The Hachita Valley fault cuts across these uplifted rocks to form a typical basin-and-range structure.
Length (km)	22 km.
Average strike	N5°E
Sense of movement	Normal
Dip Direction	E *Comments:* High angle in shallow subsurface inferred from other Quaternary normal faults in this part of the southern Basin and Range province. However, east of Granite Pass (NW 1/4 Sec. 2, T. 30 S., R. 16 W.) the fault is crossed by a seismic-reflection profile that shows the fault to flatten with depth and have a listric

	geometry (unpublished data of Kate Miller, UTEP). Thus, at seismogenic depths the fault might dip at moderate rather than high angle.
Paleoseismology studies	
Geomorphic expression	The fault forms conspicuous, semi-continuous scarps as much as 6 m high on proximal piedmont slope-deposits (Lawton and Harrington, 1998 #1745). The scarps are degraded according to Lawton (W.R. Seager, written commun., 1998), which suggests that they are older than 30 ka and possibly early–late Pleistocene (approaching 130 ka) in age. However, no scarp profiles have been measured to help document the age of the most recent or penultimate (?) faulting events.
Age of faulted surficial deposits	The fault offsets piedmont-slope deposits that have well developed calcic soils with stage IV calcareous B (Bk) horizons. Similarly developed soils in southern New Mexico are commonly of middle or early Pleistocene age (Machette, 1985 #1267). The piedmont-slope deposits probably correlate with the upper part of the Camp Rice and Palomas Formations, and thus would be early (?) Pleistocene in age. Holocene sediment (in channels and young fans) does not appear to be displaced by the fault.
Historic earthquake	
Most recent prehistoric deformation	middle and late Quaternary (<750 ka) *Comments:* Timing based on offset of soil on piedmont-slope deposits, which are early to possibly middle Pleistocene in age (based on correlation).
Recurrence interval	
Slip-rate category	Less than 0.2 mm/yr *Comments:* The slip rate must be very low as evidenced by less than 6-m-high scarps on middle (?) to early Pleistocene deposits. The degraded nature of the scarps suggests that they are pre-latest Pleistocene, and possibly pre-late Pleistocene in age.
Date and Compiler(s)	2016 Michael N. Machette, U.S. Geological Survey, Retired

	Andrew P. Jochems, New Mexico Bureau of Geology & Mineral Resources Timothy F. Lawton, New Mexico State University William R. Seager, New Mexico State University
References	#1745 Lawton, T.F., and Harrington, P.J., 1998, Jurassic Broken Jug Formation—Redefinition of lower part of Bisbee Group, Little Hatchet Mountains, Hidalgo County, New Mexico: New Mexico Geology, v. 20, no. 3, p. 69–77. #1267 Machette, M.N., 1985, Calcic soils of the southwestern United States, *in* Weide, D.L., ed., Soils and Quaternary geology of the southwestern United States: Geological Society of America Special Paper 203, p. 1–21.