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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.

Sawyer Canyon fault (Class A) No. 2028

Last Review Date: 1995-08-15

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

citation for this record: **Kelson, K.I., compiler, 1995, Fault number 2028, Sawyer 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 02:24 PM.**

Synopsis	The Sawyer Canyon fault is located adjacent to the western margin of the northern Rio Grande rift. The down-to-the-east fault is subparallel to the Pajarito [2008], Guaje Mountain [2027], Rendija Canyon [2026], and Puye [2009] faults, and may be an element of the Pajarito fault system. The Sawyer Canyon fault accommodates some of the roughly east-west extension within the Española basin of the rift. The fault was identified in middle Quaternary airfall volcanic deposits of the Valles caldera by field mapping, analysis of aerial photography, and detailed mapping; otherwise the fault remains virtually unstudied.
Name comments	The Sawyer Canyon fault was originally mapped as an unnamed fault by Smith and others (1970 #1125) and Kelley (1978 #1107).

	The fault was named by Wong and others (1995 #1155) after the canyon that crosses central part of the fault north of Los Alamos, New Mexico. The Sawyer Canyon fault extends from an intersection with the Pajarito fault [2008] near Santa Clara Canyon on the north to the southern side of Rendija Canyon near the town of Los Alamos.
County(s) and State(s)	SANDOVAL COUNTY, NEW MEXICO LOS ALAMOS COUNTY, NEW MEXICO
Physiographic province(s)	SOUTHERN ROCKY MOUNTAINS
Reliability of location	Good Compiled at 1:125,000 scale. *Comments:* The location of the Sawyer Canyon fault is based on field mapping compiled at scale of 1:125,000 (Smith and others, 1970 #1125), modified by analysis of 1:24,000- and 1:58,000-scale aerial photography compiled at a scale of 1:100,000 (Wong and others, 1995 #1155), and detailed field mapping at a scale of 1:24,000 (Carter and Gardner, 1993 #1179; Carter and Gardner, 1995 #1154).
Geologic setting	The Sawyer Canyon fault is located adjacent to the western margin of the northern Rio Grande rift. The east-down fault is subparallel to the Pajarito [2008], Guaje Mountain [2027], Rendija Canyon [2026], and Puye [2009] faults and may be part of the Pajarito fault system.
Length (km)	8 km.
Average strike	N10°W
Sense of movement	Normal *Comments:* Structural data suggest predominantly dip-slip, down-to-the-east movement (Carter and Gardner, 1995 #1154; Carter and Winter, 1995 #1730).
Dip Direction	E
Paleoseismology studies	
Geomorphic expression	Topographic scarps across mesas underlain (formed) by 1.2 Ma upper Bandelier Tuff are present along the central part of fault.

	Carter and Gardner (1995 #1154) noted that terraces inset within Sawyer Canyon (proper) are apparently displaced by the Sawyer Canyon fault.
Age of faulted surficial deposits	The Sawyer Canyon fault displaces 1.2 Ma upper Bandelier Tuff (Smith and others, 1970 #1125; Spell and others, 1990 #1189) about 35 m, but also has probable geomorphic expression across probable late Quaternary alluvium (Carter and Gardner, 1995 #1154).
Historic earthquake	
Most recent prehistoric deformation	late Quaternary (<130 ka) *Comments:* The timing of the most-recent event is only known to be Quaternary, but probable displacement of terraces within Sawyer Canyon may suggests late Quaternary movement.
Recurrence interval	
Slip-rate category	Less than 0.2 mm/yr *Comments:* Assigned slip-rate category based on measured vertical displacement of 21–37 m (K. Carter, pers. commun. 1993) of 1.2-Ma Bandelier Tuff.
Date and Compiler(s)	1995 Keith I. Kelson, William Lettis & Associates, Inc.
References	#1179 Carter, K.E., and Gardner, J.N., 1993, Quaternary fault kinematics in the northern Española basin, Rio Grande rift, New Mexico—Implications for early rift development: Eos, Transactions of the American Geophysical Union, v. 74, p. 611. #1154 Carter, K.E., and Gardner, J.N., 1995, Quaternary fault kinematics in the northwestern Española basin, Rio Grande rift, New Mexico, *in* Bauer, P.W., Kues, B.S., Dunbar, N.W., Karlstrom, K.E., and Harrison, B., eds., Geology of the Santa Fe region, New Mexico: New Mexico Geological Society, 46th Field Conference, September 27-30, 1995, Guidebook, p. 97-103. #1730 Carter, K.E., and Winter, C.L., 1995, Fractal nature and scaling of normal faults in the Española basin, Rio Grande rift, New Mexico—Implications for fault growth and brittle strain:

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