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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.

McCormick Ranch faults (Class A) No. 2135

Last Review Date: 2016-04-11

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

citation for this record: **Personius, S.F., and Jochems, A.P., compilers, 2016, Fault number 2135, McCormick Ranch faults, 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	Several north- to northeast-trending faults offset upper Santa Fe Group sediment and the Llano de Manzano, an early Pleistocene geomorphic surface, southwest of McCormick Ranch. These faults are marked by linear scarps and accompanying depressions that extend as far south as Hells Canyon Wash and as far west as the western margin of the Llano de Manzano. The faults form a series of horst and graben blocks that are partly buried by eolian sand.
Name comments	The McCormick Ranch faults consist of several north- to northeast-trending normal faults that lie directly west of Sandia National Laboratories. The two prominent structures that form

	this graben are the down-to-the-east West McCormick Ranch fault and the down-to-the-west East McCormick Ranch fault. The East McCormick Ranch fault was first mapped by Kelley (1977 #1106), and the West McCormick Ranch fault was first mapped by Machette and McGimsey (1983 #1024). GRAM, Incorporated and William Lettis and Associates, Incorporated (1995 #1430) named these structures after the nearby McCormick Ranch, and mapped several other faults that form smaller horst and graben blocks in the area. Numerous fault-related ridges and swales mapped by Love and others (1996 #1762) and Love (1997 #1761) and the down-to-the-west Palace-Pipeline fault of Maldonado and others (2007 #7218) are included in this compilation.
County(s) and State(s)	VALENCIA COUNTY, NEW MEXICO BERNALILLO COUNTY, NEW MEXICO
Physiographic province(s)	BASIN AND RANGE
Reliability of location	Good Compiled at 1:24,000 scale. *Comments:* Fault traces are from 1:24,000-scale geologic mapping of Love and others (1996 #1762) and Love (1997 #1761) combined with accurate placement using photogrammetric methods.
Geologic setting	The McCormick Ranch faults are intrabasin normal faults located in the east-central portion of the Albuquerque basin of the Rio Grande rift.
Length (km)	13 km.
Average strike	N7°E
Sense of movement	Normal
Dip Direction	E; W
Paleoseismology studies	
Geomorphic expression	Faults are marked by topographic scarps and accompanying linear depressions on the Llano de Manzano, an early Pleistocene geomorphic surface. They form a series of horst and graben blocks that are partly buried by eolian sand. Machette and McGimsey (1983 #1024) estimated offsets of 5–20 m across the

	West McCormick Ranch fault, and GRAM, Incorporated and William Lettis and Associates, Incorporated (1995 #1430) measured scarp heights of 10 m across several of the McCormick Ranch faults.
Age of faulted surficial deposits	The McCormick Ranch faults offset upper Santa Fe Group sediment that contains clasts of the approximately 1.2 Ma upper Bandelier Tuff from the Jemez Mountains (Love and others, 1996 #1762; Love, 1997 #1761); the faulted deposits therefore post-date this age. The stable geomorphic surface formed on these deposits, locally known as the Llano de Manzano, has a stage IV carbonate horizon developed in it (Love and others, 1996 #1762; Love, 1997 #1761), suggesting that this surface is also early Pleistocene in age.
Historic earthquake	
Most recent prehistoric deformation	middle and late Quaternary (<750 ka) *Comments:* Machette and McGimsey (1983 #1024) estimated that the latest event on the West McCormick Ranch fault is no older than the middle Pleistocene. Offsets of 10–20 m measured on some of these faults (Machette and McGimsey, 1983 #1024; GRAM Incorporated and William Lettis & Associates Incorporated, 1995 #1430) suggest recurrent movements that probably extended into at least the middle Pleistocene.
Recurrence interval	
Slip-rate category	Less than 0.2 mm/yr *Comments:* Low slip-rate category assigned based on upper Santa Fe Group sediments (1.2 Ma) offset 5–20 m (Machette and McGimsey, 1983 #1024; GRAM Incorporated and William Lettis & Associates Incorporated, 1995 #1430).
Date and Compiler(s)	2016 Stephen F. Personius, U.S. Geological Survey Andrew P. Jochems, New Mexico Bureau of Geology & Mineral Resources
References	#1430 GRAM, Incorporated and William Lettis & Associates, Incorporated, 1995, Conceptual geologic model of the Sandia National Laboratories and Kirtland Air Force Base: Technical

	report to Sandia National Laboratories, Albuquerque, New Mexico, December 1995, 15 pls. #1106 Kelley, V.C., 1977, Geology of Albuquerque basin, New Mexico: New Mexico Bureau of Mines and Mineral Resources Memoir 33, 60 p., 2 pls. #1761 Love, D.W., 1997, Preliminary geologic map of Isleta 7.5-minute quadrangle: New Mexico Bureau of Mines and Mineral Resources Open-File Digital Map OF-DM 13, 4 p. pamphlet, 1 sheet, scale 1:24,000. #1762 Love, D.W., Hitchcock, C., Thomas, E., Kelson, K., Van Hart, D., Cather, S., Chamberlin, R., Anderson, O., Hawley, J., Gillentine, J., White, W., Noller, J., Sawyer, T., Nyman, M., and Harrison, B., 1996, Geology of the Hubbell Spring 7.5-min quadrangle, Bernalillo and Sandoval [Valencia] Counties, New Mexico: New Mexico Bureau of Mines and Mineral Resources Open-File Digital Map OF-DM 5, 7 p. pamphlet, 1 sheet, scale 1:24,000. #1024 Machette, M.N., and McGimsey, R.G., 1983, Map of Quaternary and Pliocene faults in the Socorro and western part of the Fort Sumner 1° x 2° quadrangles, central New Mexico: U.S. Geological Survey Miscellaneous Field Studies Map MF-1465-A, 12 p. pamphlet, 1 sheet, scale 1:250,000. #7218 Maldonado, F., Slate, J.L., Love, D.W., Connell, S.D., Cole, J.C., and Karlstrom, K.E., 2007, Geologic Map of the Pueblo Isleta Tribal Lands and Vicinity, Bernalillo, Torrance, and Valencia Counties, Central New Mexico: U.S. Geological Survey Scientific Investigations Map 2913, scale 1:50,000.