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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.

Mike Well fault (Class A) No. 1996

Last Review Date: 2016-07-13

citation for this record: **Cikoski, C.T., compiler, 2016, Fault number 1996, Mike Well 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 Mike Well fault underlies a north-northeast-facing topographic scarp as much as 32 m high in the southern Socorro basin of the Rio Grande rift. The scarp can be followed east-southeast from the modern Rio Grande floodplain across the depositional top of the Santa Fe Group and into the discontinuous hills that define the eastern margin of the southern portion of the Socorro basin. Limited subsurface data suggest that at 90 m depth the fault may juxtapose Plio-Pleistocene Sierra Ladrones Formation strata in the hanging wall against Permian strata in the footwall. No paleoseismic studies have been performed to date.
Name comments	Named by Cikoski (2012 #7446) for the Mike well, which lay in the footwall of the fault and may bottom in Permian limestone at 90 m depth (Weir, 1965 #982; Roybal, 1991 #7550). The Mike Well fault may correlate with the Bosque del Apache fault [2132] of Cikoski (2010 #7445), described separately.

County(s) and State(s)	SOCORRO COUNTY, NEW MEXICO
Physiographic province(s)	BASIN AND RANGE
Reliability of location	Good Compiled at 1:24,000 scale. *Comments:* Originally mapped at 1:24,000 scale (Cikoski, 2012 #7446). Extrapolated further eastward by the compiler using DEM data and aerial imagery.
Geologic setting	The Mike Well fault is a west-northwest, down-to-the-northeast structure lying in the southern portion of the topographically defined Plio-Pleistocene Socorro basin of the Rio Grande rift. Surface exposures and subsurface control is poor. However, Roybal (1991 #7550) suggests the Mike well, located on the footwall of the fault approximately 0.6 km from the mapped trace of the fault, bottomed in Permian Yeso Formation strata at about 90 m depth, which would imply the fault juxtaposes Plio-Pleistocene Sierra Ladrones Formation (upper Santa Fe Group rift basin fill) in the hanging wall against Paleozoic strata in the footwall (although note that Weir (1965 #982) was less certain that the Mike well bottomed in the Permian). A water well drilled in the vicinity of the town of Socorro revealed a minimum thickness of 340 m of Sierra Ladrones Formation strata (R.M. Chamberlin, pers. comm., cited in Cikoski, 2010 #7445). The base of the Sierra Ladrones Formation in the Socorro basin is constrained by the 6.88±0.02 Ma basaltic trachyandesite of Sedillo Hill (Chamberlin and Osburn, 2006 #7442) and the 3.7±0.1 Ma basalt of Socorro Canyon (age from R. M. Chamberlin, unpublished, cited in Chapin and others, 2004 #7444). This suggests the fault accommodated a minimum of 240 m of stratigraphic offset since the late Miocene or early Pliocene.
Length (km)	km.
Average strike	N64°W
Sense of movement	Normal
Dip Direction	NE
Paleoseismology	

studies	
Geomorphic expression	The Mike Well fault underlies a broad (up to 0.5 km wide) topographic scarp as much as 32 m tall formed in the top of the Santa Fe Group. Scarp profiles from DEM data suggest as much as 0.5° of backtilting of the footwall block. The fault scarp decreases in height to the southeast, eventually becoming unrecognizable in an eolian sand sheet. Where the fault trace projects under Holocene alluvium along the modern Rio Grande floodplain, the fault has no surface expression.
Age of faulted surficial deposits	No deformed surface deposits have been directly dated in the vicinity of the Mike Well fault. The scarp is inferred to offset the depositional top of the Santa Fe Group, the age of which is constrained to approximately 700–800 ka to the north in the Albuquerque basin (Connell and others, 2013 #7235) and to the south in the basins of the southern Rio Grande rift (cf. Mack and others, 2006 #7447).
Historic earthquake	
Most recent prehistoric deformation	middle and late Quaternary (<750 ka) *Comments:* The fault offsets the depositional top of the Santa Fe Group.
Recurrence interval	
Slip-rate category	Less than 0.2 mm/yr *Comments:* Lowest slip-rate category assigned based on 32-m-high scarp on a 800-ka surface and 240 m of stratigraphic offset since 3.7 Ma.
Date and Compiler(s)	2016 Colin T. Cikoski, New Mexico Bureau of Geology & Mineral Resources
References	#7442 Chamberlin, R.M., and Osburn, G.R., 2006, Geologic map of the Water Canyon 7.5-minute quadrangle, Socorro County, New Mexico: New Mexico Bureau of Geology and Mineral Resources Open-File Geologic Map 118, scale 1:24,000. #7444 Chapin, C.E., Wilks, M., and McIntosh, W.C., 2004, Space-time patterns of late Cretaceous to present magmatism in

	New Mexico—Comparison with Andean volcanism and potential for future volcanism, *in* Cather, S.M., McIntosh, W.C., and Kelley, S.A., eds., Tectonics, geochronology, and volcanism in the Southern Rocky Mountains and Rio Grande Rift: New Mexico Bureau of Geology and Mineral Resources Bulletin 160, p. 13–40. #7445 Cikoski, C.T., 2010, Geology of the Neogene basin fill on the Indian Well Wilderness 7.5-minute quadrangle, central Rio Grande rift, New Mexico: Socorro, New Mexico Institute of Mining and Technology, unpublished M.S. thesis, 160 p. #7446 Cikoski, C.T., 2012, Geologic map of the San Antonio SE 7.5-minute quadrangle, Socorro County, New Mexico: New Mexico Bureau of Geology and Mineral Resources Open-File Geologic Map 228, scale 1:24,000.