

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](#).

Area Three fault (Class A) No. 1043

Last Review Date: 1998-01-16

citation for this record: Anderson, R.E., compiler, 1998, Fault number 1043, Area Three 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 02:20 PM.

Synopsis	An intrabasin fault whose Quaternary characteristics are known mainly from aerial photos (1:24,000) and limited field study.
Name comments	Name taken from Fernald and others (1968 #1511) who applied it to a north-striking fault in Area 3 of the Nevada Test Site, located in the central east part of Yucca Flat. Piety (1995 #915) also referred to the fault by that name. The fault was mapped by Fernald and others (1968 #1511), but it is not shown on a 1:100,000-scale photogeologic map by Reheis (1992 #1604) and also not shown on a 1:250,000-scale photogeologic map by Dohrenwend and others (1992 #289). The fault is shown on a compilation of Quaternary faults by Piety (1995 #915). Fault ID: Referred to as AT by Piety (1995 #915).
County(s) and	NINE COUNTY NEVADA

State(s)	LINCOLN COUNTY, NEVADA
Physiographic province(s)	BASIN AND RANGE
Reliability of location	<p>Good Compiled at 1:100,000 scale.</p> <p><i>Comments:</i> Location is from Fernald and others (1968 #1511) who compiled the fault on a 1:48,000-scale topographic map from limited field studies and photogeologic study of 1:24,000-scale aerial photos. They characterized the fault as an indefinite or approximately located fault in gravely alluvium (their Qtg deposits).</p>
Geologic setting	The Area Three fault is an intrabasin structure located in central east part of Yucca Flat that is a north-trending structural basin in the Nevada Test Site. The fault strikes north and is at least 2 km west of range front. As it is traced to south for 2 km, it branches into east and west splays that define a horst (Carr, 1974 #1470).
Length (km)	6 km.
Average strike	N2°E
Sense of movement	<p>Normal</p> <p><i>Comments:</i> Two fault strands at the south end of the fault define a horst and these faults are inferred to dip away from each other (Carr, 1974 #1470), implying a normal sense of movement.</p>
Dip Direction	<p>E; W</p> <p><i>Comments:</i> Southern part of fault has two branches, the western one is inferred to dip west and the eastern one to dip east (Carr, 1974 #1470).</p>
Paleoseismology studies	
Geomorphic expression	Almost no information has been reported on the geomorphic character of the Area Three fault. Fernald and others (1968 #1511) characterized the fault as an indefinite or approximately located fault in gravely alluvium. The fault is not shown on photogeologic maps of Quaternary faults by Reheis (1992 #1604) and Dohrenwend and others (1992 #289), suggesting the fault has

	little or no geomorphic expression.
Age of faulted surficial deposits	The map by Swadley and Hoover (1990 #1663) implies that displacement along the Area Three fault occurred after deposition of both their Qap deposits (about 160 ka to 800 ka) and their Qah deposits (<10 ka) because the fault is shown within these deposits, not concealed by them. However, the fault traces were adapted from Fernald and others (1968 #1511), so the implied age relations are probably not based on field study and are open to question. Apparently the fault cuts gravels of Pleistocene age but not Holocene age (Fernald and others, 1968 #1511), because the southern end of the western branch terminates at the contact between their Qtg deposits (Pleistocene) and sandy alluvium along modern washes (their Qfs deposits; Holocene). This relationship suggests that displacement on this branch probably is older than Holocene in age. The southern 2.5 km of this western branch is shown by Carr (1974 #1470, fig. 7) as having Quaternary displacement. The Area Three fault displaces surficial deposits as a result of underground nuclear testing (J.C. Cole, written common., 1987, cited in Frizzell and Shulters, 1990 #1037), so, that at least locally, part of its surficial expression may be historical and human-induced.
Historic earthquake	
Most recent prehistoric deformation	undifferentiated Quaternary (<1.6 Ma) <i>Comments:</i> This age assignment honors the original mapping of Fernald and others (1968 #1511) rather than the recompilation of Swadley and Hoover (1990 #1663). The Holocene age assigned to this fault by Piety (1995 #915) on the basis of mapping by Swadley and Hoover (1990 #1663) is highly questionable and a more conservative estimate is made herein.
Recurrence interval	
Slip-rate category	Less than 0.2 mm/yr <i>Comments:</i> There is little to no information reported on the geomorphic expression of the fault or its displacement. Low slip-rate category is assigned on the basis of poor geomorphic preservation, lack of mapped fault scarps, and relative inactivity of similar distributed faults in the Basin and Range province.

Date and Compiler(s)	1998 R. Ernest Anderson, U.S. Geological Survey, Emeritus
References	<p>#1470 Carr, W.J., 1974, Summary of tectonic and structural evidence for stress orientation at the Nevada Test Site: U.S. Geological Survey Open-File Report 74-176, 53 p.</p> <p>#289 Dohrenwend, J.C., Schell, B.A., McKittrick, M.A., and Moring, B.C., 1992, Reconnaissance photogeologic map of young faults in the Goldfield 1° by 2° quadrangle, Nevada and California: U.S. Geological Survey Miscellaneous Field Studies Map MF-2183, 1 sheet, scale 1:250,000.</p> <p>#1511 Fernald, A.T., Corchary, G.S., and Williams, W.P., 1968, Surficial geologic map of Yucca Flat, Nye and Lincoln Counties, Nevada: U.S. Geological Survey Miscellaneous Investigations Map I-550, scale 1:48,000.</p> <p>#1037 Frizzell, V.A., Jr., and Shulters, J., 1990, Geologic map of the Nevada Test Site, southern Nevada: U.S. Geological Survey Miscellaneous Investigations Map I-2046, 1 sheet, scale 1:100,000.</p> <p>#915 Piety, L.A., 1995, Compilation of known and suspected Quaternary faults within 100 km of Yucca Mountain, Nevada and California: U.S. Geological Survey Open-File Report 94-112, 404 p., 2 pls., scale 1:250,000.</p> <p>#1604 Reheis, M.C., 1992, Aerial photographic interpretation of lineaments and faults in late Cenozoic deposits in the Cactus Flat and Pahute Mesa 1:100,000 quadrangles and the western parts of the Timpahute Range, Pahrnagat Range, Indian Springs, and Las Vegas 1:100,000 quadrangles, Nevada: U.S. Geological Survey Open-File Report 92-193, 14 p., 3 pls., scale 1:100,000.</p> <p>#1663 Swadley, W., and Hoover, D.L., 1990, Geologic map of the surficial deposits of the Yucca Flat area, Nye County, Nevada: U.S. Geological Survey Miscellaneous Investigations Map I-2047, 1 sheet, scale 1:48,000.</p>

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