Jump to Navigation

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.

Clayton Valley faults (Class A) No. 1107

Last Review Date: 1999-02-16

citation for this record: **Anderson, R.E., compiler, 1999, Fault number 1107, Clayton Valley 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 02:18 PM.**

Synopsis	The Clayton Valley faults strike mostly northeast and are mostly down to the northwest. With the exception of the convex-westward fault at the west base of Angel Island, they do not follow conspicuous topographic escarpments. They are intrabasin faults, and their tectonic significance is not known. Photogeologic mapping is the main source of data for these faults. The faults may be normal faults oriented approximately normal to the extension direction. They are relatively long and have been reported to offset surfaces of several, but undefined, ages. The last displacement is probably of Pleistocene age, but the age is not well constrained and there are no reports of recurrence intervals.
Name comments	Name adapted from Piety (1995 #915) who referred to a group of faults in western, central, and eastern Clayton Valley as the Clayton Valley fault. dePolo (1998 #2845) later referred to these faults as the Clayton Valley fault zone. The faults in western

	Clayton Valley are in Tertiary strata and are not included here. The Clayton Valley faults are mapped on 1:100,000-scale (Reheis and Noller, 1991 #1195) and 1:250,000-scale (Dohrenwend and others, 1992 #289) photogeologic maps and are also shown on a compilation of Quaternary faults by Piety (1995 #915). These northeast-striking faults extend from the north flank of the Palmetto Mountains, northeastward along the east side of Clayton Valley, to the north end of Angel Island. **Fault ID:** Faults shown as CV by Piety (1995 #915) and portrayed as G4 by dePolo (1998 #2845).
County(s) and State(s)	ESMERALDA COUNTY, NEVADA
Physiographic province(s)	BASIN AND RANGE
Reliability of location	Good Compiled at 1:100,000 scale. *Comments:* Location is from Reheis and Noller (1991 #1195) who compiled the faults on a 1:100,000-scale topographic map from photogeologic study of aerial photos at scales ranging from 1:24,000 to 1:80,000.
Geologic setting	The Clayton Valley faults are located in the Goldfield section of the Walker Lane belt of Stewart (1988 #1654), an area characterized by a general lack of major through-going northwest-striking strike-slip faults and a scarcity of major Basin and Range faults. The traces of the Clayton Valley faults do not lie along range-margin or block-boundary escarpments (Reheis and Noller, 1991 #1195; Dohrenwend and others, 1992 #289) and their structural significance is not apparent. One of the faults is shown on the geologic map of Esmeralda County as juxtaposing bedrock and Holocene deposits (Albers and Stewart, 1972 #3863), but the Holocene age assignment is considered doubtful. The faults mapped photogeologically (Reheis and Noller, 1991 #1195; Dohrenwend and others, 1992 #289) are part of a larger group of northeast-striking faults that extend 25 km westward from the Montezuma Range across Clayton Valley. Their average northeast strike may be approximately normal to the extension direction in this part of the Basin and Range (Reheis and Noller, 1991 #1195).
Length (km)	26 km.

Average strike	N26°E
Sense of movement	Normal *Comments:* If the northeast strike of these faults is approximately normal to the extension direction in this part of the Basin and Range province, they can be expected to be mainly normal faults (Reheis and Noller, 1991 #1195).
Dip Direction	NW *Comments:* On the basis of photogeologic interpretation and limited field data pertaining to the northeast-striking faults in the area, Reheis and Noller (1989 #1610) suggested these faults dip steeply (70? to 90?). With the exception of a 3.2 km fault in central Clayton Valley shown by Reheis and Noller (1991 #1195) as down-to-the east, the Clayton Valley faults are down to the northwest (Reheis and Noller, 1991 #1195; Dohrenwend and others, 1992 #289).
Paleoseismology studies	
Geomorphic expression	The Clayton Valley faults are similar to other northeast-striking Pleistocene faults in the region that are within basins, but those in the east part of the valley differ from the others because they "are relatively long and appear to offset surfaces of several ages" (Reheis and Noller, 1989 #1610). The fault traces were characterized by Reheis and Noller (1991 #1195) as northwest-facing features that were compiled mainly from previous mapping, presumably from Dohrenwend and others (1992 #289). Dohrenwend and others (1992 #289) mapped the faults traces photogeologically at 1:250,000 scale and they characterized traces that extend southwest from Angel Island as northwest-facing scarps on Quaternary surficial deposits or Quaternary erosional surfaces. They characterized the strongly convex-westward fault at Angel Island as juxtaposing Quaternary alluvium against bedrock. No data are available on the height of scarps.
Age of faulted surficial deposits	Reheis and Noller (1989 #1610) noted that scarps in Clayton Valley appear to cross surfaces of several ages, but no age refinement was indicated. The eastern faults are portrayed (Dohrenwend and others, 1992 #289) as scarps on depositional or erosional surfaces of early to middle and (or) late Pleistocene age

	(with estimated ages between 10 ka and 1.5 Ma and, at one locality, early to middle Pleistocene age (between 130 ka and 1.5 Ma).
Historic earthquake	
Most recent prehistoric deformation	undifferentiated Quaternary (<1.6 Ma) *Comments:* Based on photogeologic study, scarps and lineaments are shown on Quaternary depositional or erosion surfaces (Dohrenwend and others, 1992 #289) or on surfaces of Quaternary deposits (Reheis and Noller, 1991 #1195). Apparently, the last displacement was pre Holocene (Pleistocene).
Recurrence interval	
Slip-rate category	Less than 0.2 mm/yr *Comments:* Reheis and Noller (1989 #1610) noted that scarps in Clayton Valley appear to cross surfaces of several ages, but no age refinement was indicated. dePolo (1998 #2845) assigned a reconnaissance vertical slip rate of 0.01 mm/yr for the fault based on the presence of scarps on alluvium and the absence of basal facets. The late Quaternary characteristics of these faults (overall geomorphic expression, continuity of scarps, age of faulted deposits, etc.) also support a low slip rate. Accordingly, the less than 0.2 mm/yr slip-rate category has been assigned to this fault.
Date and Compiler(s)	1999 R. Ernest Anderson, U.S. Geological Survey, Emeritus
References	#3863 Albers, J.P., and Stewart, J.H., 1972, Geology and mineral deposits of Esmeralda County, Nevada: Nevada Bureau of Mines and Geology Bulletin 78, 88 p. #2845 dePolo, C.M., 1998, A reconnaissance technique for estimating the slip rate of normal-slip faults in the Great Basin, and application to faults in Nevada, U.S.A.: Reno, University of Nevada, unpublished Ph.D. dissertation, 199 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.

	#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. #1610 Reheis, M.C., and Noller, J.S., 1989, New perspectives on Quaternary faulting in the southern Walker Lane, Nevada and California, *in* Ellis, M.A., ed., Late Cenozoic evolution of the southern Great Basin: Nevada Bureau of Mines and Geology Open-File Report 89-1, p. 57-61. #1195 Reheis, M.C., and Noller, J.S., 1991, Aerial photographic interpretation of lineaments and faults in late Cenozoic deposits in the eastern part of the Benton Range 1:100,000 quadrangle and the Goldfield, Last Chance Range, Beatty, and Death Valley Junction 1:100,000 quadrangles, Nevada and California: U.S. Geological Survey Open-File Report 90-41, 9 p., 4 sheets, scale 1:100,000. #1654 Stewart, J.H., 1988, Tectonics of the Walker Lane belt, western Great Basin—Mesozoic and Cenozoic deformation in a zone of shear, *in* Ernst, W.G., ed., Metamorphism and crustal evolution of the western United States, Ruby Volume VII: Englewood Cliffs, New Jersey, Prentice Hall, p. 683-713.