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.

Eastern Independence Valley fault zone, southern section (Class A) No. 1553b

Last Review Date: 2016-10-05

citation for this record: **Adams, K., and Sawyer, T.L., compilers, 1999, Fault number 1553b, Eastern Independence Valley fault zone, southern section, 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 02:35 PM.**

Synopsis	**General:** This relatively long, nearly continuous zone has: (1) range-bounding faults along the west front of the Independence Mountains, from Marble Creek south to Burns Creek and south-southwest to near Indian Creek; (2) intermontane faults within the range north of Marble Creek to Bailey Creek; and (3) subparallel piedmont faults in much of eastern Independence Valley. Reconnaissance photogeologic mapping of the fault zone and geologic mapping are the sources of data. **Sections:** This fault has 2 sections. Although the fault zone has not been studied in detail, two possible sections are suggested by the geometry and general movement history of the fault zone; southern section may be related to the Tuscarora fault zone [1552] on west side of southern Independence Valley. The northern section consists of north-striking faults along and near front of the

	Independence Mountains north of Burns Creek and the intermontane faults further to the north. The southern section consists of north-northeast-striking faults near the range front and in Independence Valley south of Burns Creek and east of the South Fork of the Owyhee River. Piedmont faults are expressed as prominent west-facing scarps on early to late Pleistocene and latest Quaternary alluvium in southern Independence Valley (southern section) and as scarps on undifferentiated Pleistocene alluvium in the northern part of the valley (northern section).
Name comments	**General:** Refers to faults mapped by Slemmons (1966, unpublished McDermitt 1:250,000-scale map), Coats (1987 #2861), Dohrenwend and Moring (1991 #284), and Henry and others (1998 #3018) along east side of Independence Valley and bordering the Independence Mountains, from Bailey Creek south to mouth of Burns Creek, and south-southwest to Road Canyon. dePolo (1998 #2845) referred to it as the Eastern Independence Valley fault and Dering and Faulds (2012 #7557) refer to the fault as the Independence Valley fault zone, which is adopted here. **Section:** This informally named section bounds the southern part of the Independence Mountains. **Fault ID:** Refers to the southern part of fault zone MD17 (Eastern Independence Valley fault) of dePolo (1998 #2845).
County(s) and State(s)	ELKO COUNTY, NEVADA
Physiographic province(s)	BASIN AND RANGE
Reliability of location	Good Compiled at 1:100,000 scale. *Comments:* Fault locations primarily based on 1:250,000-scale map of Dohrenwend and Moring (1991 #284), which was produced by analysis of 1:58,000-nominal-scale color-infrared photography transferred directly to 1:100,000-scale topographic quadrangle maps enlarged to scale of the photographs. The location of additional faults is from 1:250,000-scale photogeologic map of Slemmons (1966, unpublished McDermitt 1:250,000-scale quadrangle), 1:24,000-scale geologic map of Henry and others (1998 #3018), and 1:250,000-scale geologic map of Coats (1987 #2861). Slemmons (1966, unpublished McDermitt 1:250,000-scale quadranglet) mapped from analysis of

	1:60,000-scale AMS photography transferred to mylar overlaid onto a 1:250,000-scale topographic map using proportional dividers.
Geologic setting	This relatively long, nearly continuous zone has: (1) range-bounding faults along the west front of the Independence Mountains, from Marble Creek south to Burns Creek and south-southwest to near Indian Creek; (2) intermontane faults within the range north of Marble Creek to Bailey Creek; and (3) subparallel piedmont faults in much of eastern Independence Valley; southern part may be related to fault zone [1552] on west side of southern Independence Valley. The fault accommodates several kilometers of displacement (Dering and Faulds, 2012 #7557).
Length (km)	This section is 14 km of a total fault length of 42 km.
Average strike	N34°E (for section) versus N13°E (for whole fault)
Sense of movement	Normal *Comments:* (Slemmons, 1966, unpublished McDermitt 1:250,000-scale quadrangle; Dohrenwend and Moring, 1991 #284; Henry and others, 1998 #3018)
Dip Direction	NW
Paleoseismology studies	
Geomorphic expression	The southern section is a dense zone of prominent west-facing piedmont scarps in southern Independence Valley. Scarps are on early to Pleistocene to latest Quaternary alluvium. Range-front faults are expressed by the relatively degraded front of the Independence Mountains and juxtapose Quaternary alluvium against bedrock (Slemmons, 1966, unpublished McDermitt 1:250,000-scale quadrangle; Coats, 1987 #2861; Dohrenwend and Moring, 1991 #284). The preferred maximum basal fault facet is reported as 122 m (98-146 m) by dePolo (1998 #2845); however, these measurements were probably made along the northern section.
Age of faulted surficial deposits	latest Quaternary; late Pleistocene (?); Pleistocene; Tertiary. Faults in this section were mapped by Dohrenwend and Moring (1991 #284) as displacing late Pleistocene (?) and undifferentiated Pleistocene alluvium. However, Slemmons (1966, unpublished

	McDermitt 1:250,000-scale quadranglet) reported that faults in southern Independence Valley displaced latest Pleistocene or Holocene deposits.
Historic earthquake	
Most recent prehistoric deformation	late Quaternary (<130 ka) *Comments:* The timing of most recent event is not well constrained and the two map sources differ. Slemmons (1966, unpublished McDermitt 1:250,000-scale quadrangle) indicates faulting is latest Quaternary. Dohrenwend and Moring (1991 #284) indicate late Quaternary. The assigned age category is based on the sole published source.
Recurrence interval	
Slip-rate category	Less than 0.2 mm/yr *Comments:* No detailed data exists to determine slip rates for this fault. dePolo (1998 #2845) assigned a reconnaissance vertical slip rate of 0.231 mm/yr based on an empirical relationship between his preferred maximum basal facet height and vertical slip rate. This slip rate may only apply to the northern, rather than southern, section. The size of the facets (tens to hundreds of meters, as measured from topographic maps) indicates they are the result of many seismic cycles, and thus the derived slip rate reflects a long-term average. In the absence of data specifically on this part of the fault, the less than 0.2 mm/yr slip-rate category has been assigned.
Date and Compiler(s)	1999 Kenneth Adams, Piedmont Geosciences, Inc. Thomas L. Sawyer, Piedmont Geosciences, Inc.
References	#2861 Coats, R.R., 1987, Geology of Elko County, Nevada: Nevada Bureau of Mines and Geology Bulletin 101, 112 p., scale 1:250,000. #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. #284 Dohrenwend, J.C., and Moring, B.C., 1991, Reconnaissance

	photogeologic map of young faults in the McDermitt 1° by 2° quadrangle, Nevada, Oregon, and Idaho: U.S. Geological Survey Miscellaneous Field Studies Map MF-2177, 1 sheet, scale 1:250,000. #3018 Henry, C.D., Boden, D.R., and Castor, S.B., 1998, Geologic map of the Tuscarora quadrangle, northern Nevada: Nevada Bureau of Mines and Geology, Open File Map 98-AA, scale 1:24,000.