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Quaternary Fault and Fold Database of the United States

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Pinon Range fault zone, southern section (Class A) No. 1160b

Last Review Date: 2000-06-12

citation for this record: **Anderson, R.E., compiler, 2000, Fault number 1160b, Pinon Range 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 02:17 PM.**

Synopsis	**General:** The Pinon Range fault zone is divided into northern and southern sections on the basis of contrasts in structural setting. The sections appear to have contrasting structural settings: the northern section, although irregular, strikes about north parallel to a range block and the southern section strikes northeast slightly transverse to two range blocks. Each section may form the structural boundary between the sedimentary basin beneath Pine Valley and the adjacent mountains, although in its north-most part the fault appears to cut eastward across the north end of the Pinion Range. The western flank of the Pinon Range along the northern section is irregular and, in places, poorly defined, lacking the conspicuous precipitous west- or northwest-facing bedrock escarpments or the abrupt piedmont-to-hillslope transition characteristic of many ranges in the region. The fault scarps along this trace face west or and are formed on gently to moderately

	west-facing piedmont slopes that are incised by numerous transverse drainages. Although the scarps are fairly continuous, interrupted mainly by the transverse drainages, no detailed descriptions have been made of the scarps. The southern section is marked by discontinuous northwest-facing scarps scattered in the erosionally dissected piedmont slope west and northwest of Table Mountain and by highly sinuous scarps north of the Sulphur Spring Range, between McCoy Spring and Dry Creek. The southern section includes scarps and lineaments on the west flank of the Sulphur Spring Range that mark a fault not considered to be a major range-front structure. Only the northernmost scarps, north of Bruffey Canyon, are at an abrupt piedmont/hillslope transition that resembles a major range-front setting. There are no detailed accounts of geomorphic expression and no detailed mapping of surficial deposits, so estimates of recurrence times and slip rate can not be made for either of the sections. **Sections:** This fault has 2 sections. Following dePolo (1998 #2845) the fault zone is divided into two sections based on the contrasting strikes of the southern and northern parts of the fault, as well as the fact that the northern part is parallel to a range and the southern part is transverse to two separate mountain blocks.
Name comments	**General:** Taken from dePolo (1998 #2845) who gave the name Pinon Range fault zone to the fault that extends along the western flank of the Pinon Range (his fault WI 25A) and the fault that extends along the west flank of the Sulphur Spring Range (his fault WI 25B). **Section:** The faults of this section were referred to by dePolo (1998 #2845) as part of the Pinon Range fault zone (his fault WI 25B). Wallace (1979 #203) referred to highly sinuous scarps at the north margin of the Sulphur Spring Range as well as those on the western flank of the Pinon Range as the "west flank Sulphur Springs Range scarps" for reasons that are unclear. The highly sinuous scarps form the northeast part of the southern section [1160b], which extends from Dry Creek southwest past Shannon into Garden Valley. Another series of fault traces extend south from Mineral Hill, along the western flank of the Sulphur Spring Range, but east of Table Mountain as shown by Dohrenwend and Moring (1991 #282). **Fault ID:** Fault referred to by dePolo (1998 #2845) as WI25A.
County(s) and	EUREKA COUNTY, NEVADA

State(s)	EUREKA COUNTY, NEVADA
Physiographic province(s)	BASIN AND RANGE
Reliability of location	Good Compiled at 1:100,000 scale. *Comments:* Location based on map of young fault scarps at 1:125,000-scale by Wallace (1979 #203). Most of that mapping was done on 1:60,000-scale aerial photographs based on a combination of photogeology and field study. Some traces are modified slightly from Carlisle and Nelson (1990 #4312), and some are added from that mapping. Faults along the west margin of the Sulphur Spring Range are from 1:250,000-scale mapping by Dohrenwend and Moring (1991 #282). Those faults were not recognized as Quaternary by Carlisle and Nelson (1990 #4312).
Geologic setting	The Pinon Range fault zone is a range-bounding normal fault zone. Its northern section [1160a] apparently separates the sedimentary basin beneath Pine Valley from the irregular and poorly defined western margin of the Pinon Range. Its southern section [1160b] may mark the structural boundary between the same basin and the northernmost Sulphur Spring Range, as well as the northwest margin of Table Mountain. However, most scarps of the south section are on piedmont slopes adjacent to Pine Valley, so their relationship to a major fault is uncertain. The southern section includes scarps and lineaments on the west flank of the Sulphur Spring Range that mark a fault not considered to be a major range-front structure. Although northeast-striking, main range-bounding faults are common in the region (Stewart and Carlson, 1978 #3413), the northeast -striking faults that cut bedrock in Table Mountain and in the northern Sulphur Spring Range appear to be down to the southeast (Carlisle and Nelson, 1990 #4312), opposite in direction to any major fault between Table Mountain and Pine Valley. Also, a short scarp along the west margin of the Sulphur Spring Range is shown by Dohrenwend and Moring (1991 #282) as down to the east. The structural relation between the two sections is not clear, nor is the structural relation between the scattered scarps along the northwest flank of Table Mountain and the highly sinuous fault at the northern end of the Sulphur Spring Range.
Length (km)	This section is 35 km of a total fault length of 73 km.

Average strike	N19°E (for section) versus N16°E (for whole fault)
Sense of movement	Normal *Comments:* Normal sense is inferred from location and orientation in an extensional tectonic province.
Dip Direction	W; NW
Paleoseismology studies	
Geomorphic expression	The southern section of the Pinon Range fault is marked by discontinuous northwest-facing scarps scattered in the erosionally dissected piedmont slope west and northwest of Table Mountain and by highly sinuous scarps north of the Sulphur Spring Range between McCoy Spring and Dry Creek. Also included are range front and antithetic fault scarps on the western flank of the Sulphur Spring Range, but east of Table Mountain as shown by Dohrenwend and Moring (1991 #282). Only the northernmost scarps, north of Bruffey Canyon, are at an abrupt piedmont/hillslope transition that resembles a range-front setting. On a geologic map at 1:48,000-scale (Carlisle and Nelson, 1990 #4312), the southern group of faults does not appear to displace contacts between the Tertiary/Quaternary lake beds of the Hay Ranch Formation and the overlying Quaternary alluvium, suggesting that their late Quaternary activity may be slight. There is little or no deflection of 50-ft contours on topographic maps of the area.
Age of faulted surficial deposits	On the basis of reconnaissance photogeologic study (1:58,000-scale photos), Dohrenwend and Moring (1991 #282) estimated that most of the scarps to have formed on middle to early Pleistocene (0.13-1.6 Ma) and (or) late Pleistocene (10-130 ka) deposits or surfaces. None of the scarps are their strictly late Pleistocene category, which is consistent with the 1:125,000-scale map of young fault scarps by Wallace (1979 #203) that shows the scarps to be younger than 500 ka.
Historic earthquake	
Most recent prehistoric deformation	undifferentiated Quaternary (<1.6 Ma) *Comments:* No mapping showing subdivisions of Quaternary deposits is available.

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 0.01 mm/yr for the fault based on the presence of scarps on alluvium and the absence of basal facets. The late Quaternary characteristics of this fault (overall geomorphic expression, continuity of scarps, age of faulted deposits, etc.) support a low slip rate.
Date and Compiler(s)	2000 R. Ernest Anderson, U.S. Geological Survey, Emeritus
References	#4312 Carlisle, D., and Nelson, C.A., 1990, Geologic map of the Mineral Hill quadrangle, Nevada: Nevada Bureau of Mines and Geology Map 97, 1 sheet, scale 1:48,000. #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. #282 Dohrenwend, J.C., and Moring, B.C., 1991, Reconnaissance photogeologic map of young faults in the Winnemucca 1° by 2° quadrangle, Nevada: U.S. Geological Survey Miscellaneous Field Studies Map MF-2175, 1 sheet, scale 1:250,000. #3413 Stewart, J.H., and Carlson, J.E., 1978, Geologic map of Nevada: U.S. Geological Survey, Special Geologic Map, 1, scale 1:500,000. #2648 Wallace, R.E., 1978, Geometry and rates of change of fault-generated range fronts, north-central Nevada: Journal of Research of the U.S. Geological Survey, v. 6, no. 5, p. 637-649. #203 Wallace, R.E., 1979, Map of young fault scarps related to earthquakes in north-central Nevada: U.S. Geological Survey Open-File Report 79-1554, 2 sheet, scale 1:125,000.