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.

Pilot Creek Valley fault (Class A) No. 1590

Last Review Date: 1998-10-05

citation for this record: **Oswald, J.A., Sawyer, T.L., Rowley, P.C., and Anderson, R.E., compilers, 1998, Fault number 1590, Pilot Creek Valley 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 02:36 PM.**

Synopsis	This down-to-the-east, normal fault extends discontinuously along the eastern front of the northern Toano Range from 10 km north of Silver Zone Pass south to Morris Basin. The fault forms the structural boundary between the Toano Range and the basin beneath Pilot Creek Valley. It juxtaposes Quaternary alluvium against bedrock, and/or forms scarps and/or lineaments on Quaternary alluvium adjacent to the range front. Reconnaissance photogeologic mapping and field reconnaissance of fault-related features is the main source of data. Trench investigations have not been conducted and only minimal scarp morphology data are published. Neither recurrence times nor slip rate is known.
Name comments	Refers to faults mapped by Dohrenwend and others (1991 #290) and Slemmons (1964, unpublished Wells 1? x 2? sheet). The southern part of the fault was named the Pilot Creek Valley fault

	by Barnhard (1985 #428); later named the Silver Zone Pass fault zone by dePolo (1998 #2845). We elect to use the earliest established name herein because the more recent name assigned by dePolo (1998 #2845) refers to a fault that extends from 41? N latitude south to a point nearly 20 km south of the end of the fault shown here. Fault zone as portrayed herein extends along the eastern front of the Toano Range from 10 km north of Silver Zone Pass south to near Cliffside rail siding (Union Pacific Railroad). The fault is again recognized south of a nearly 10-km-long gap in the area east of Sliver Zone Pass, and extends for another 6 km south to Morris Basin (Dohrenwend and others, 1991 #286). **Fault ID:** Refers to part of fault number EK15 by 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:* Location based on 1:250,000-scale map of Dohrenwend and others (1991 #286; 1991 #290); mapping by photogeologic 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. In the Elko 1?x2? sheet, fault traces mapped by Dohrenwend and others (1991 #286) south of Cliffside rail siding do not coincide with those mapped by Barnhard (1985 #428). Also, a 9-km-long fault to the north of Cliffside rail siding that extends to 41? N latitude was shown by Dohrenwend and others (1991 #286) but not by Barnhard (1985 #428).
Geologic setting	This down-to-the-east, normal fault apparently forms the structural boundary between the northern Toano Range on the west and the basin beneath Pilot Creek Valley on the east. The fault is probably buried beneath alluvium in the nearly 10-km-long gap in the area east of Silver Zone Pass. The footwall consists of Paleozoic sedimentary rocks, but Tertiary volcanic rocks are probably downfaulted beneath the basin-fill sediments of Pilot Creek Valley (Stewart and Carlson, 1978 #3413).

Length (km)	27 km.
Average strike	N9°W
Sense of movement	Normal *Comments:* (dePolo, 1998 #2845)
Dip Direction	W
Paleoseismology studies	
Geomorphic expression	Along most of its trace, fault juxtaposes Quaternary alluvium against bedrock along the range front (Dohrenwend and others, 1991 #286; 1991 #290) but in the Elko sheet, scarps are formed on Quaternary deposits or erosion surfaces directly east of the rang-front fault trace (Dohrenwend and others, 1991 #286). Limited scarp profiles measured in the Elko quadrangle indicate scarp heights of about 4 m and scarp-slope angles of at least 8? (Barnhard, 1985 #428). dePolo (1998 #2845) indicates that there are no basal fault facets along this rangefront.
Age of faulted surficial deposits	Quaternary. The fault juxtaposes alluvium interpreted from photogeologic mapping to be Quaternary in age (Dohrenwend and others, 1991 #290) and has scarps on deposits that may be as young as late Pleistocene (Dohrenwend and others, 1991 #286). Along the southern part of the fault, Quaternary fine-grained pebbly gravels are displaced down to the east (Barnhard, 1985 #428).
Historic earthquake	
Most recent prehistoric deformation	late Quaternary (<130 ka) *Comments:* The timing of the most recent event is not well constrained. Dohrenwend and others (1991 #286; 1991 #290) suggested a Quaternary time for most of the length of the fault. However, at the southern end, both Barnhard (1985 #428) and Dohrenwend and others (1991 #286) indicate the scarps may be late Pleistocene in age. The age category assigned reflects the youngest age assignment in the published literature.
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 Silver Zone Pass fault zone based on the presence of scarps on alluvium and the absence of basal facets. The fault he depicts does not reflect the same location or extent as the fault shown here. However, the late Quaternary characteristics of this fault (overall geomorphic expression, continuity of scarps, age of faulted deposits, etc.) 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)	1998 John A. Oswald, Piedmont Geosciences, Inc. Thomas L. Sawyer, Piedmont Geosciences, Inc. Peter C. Rowley, U.S. Geological Survey, Retired R. Ernest Anderson, U.S. Geological Survey, Emeritus
References	#428 Barnhard, T.P., 1985, Map of fault scarps formed in unconsolidated sediments, Elko 1° x 2° quadrangle, Nevada and Utah: U.S. Geological Survey Miscellaneous Field Studies Map MF-1791, 1 sheet, 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. #290 Dohrenwend, J.C., McKittrick, M.A., and Moring, B.C., 1991, Reconnaissance photogeologic map of young faults in the Wells 1° by 2° quadrangle, Nevada, Utah, and Idaho: U.S. Geological Survey Miscellaneous Field Studies Map MF-2184, 1 sheet, scale 1:250,000. #286 Dohrenwend, J.C., Schell, B.A., and Moring, B.C., 1991, Reconnaissance photogeologic map of young faults in the Elko 1° by 2° quadrangle, Nevada and Utah: U.S. Geological Survey Miscellaneous Field Studies Map MF-2179, 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.