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.

West Pintwater Range fault (Class A) No. 1057

Last Review Date: 1998-02-05

citation for this record: **Anderson, R.E., compiler, 1998, Fault number 1057, West Pintwater Range 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 02:19 PM.**

Synopsis	This is major west-dipping range-bounding normal fault at the western margin of the Pintwater Range is comprised of two relatively straight traces that join at Pintwater Cave. Geomorphic expression of Quaternary displacement in the form of moderately- to well-defined scarps and lineaments are reported for major parts of the fault from aerial photo inspection. Unpublished mapping shows extensive reaches along the western Pintwater Range fault as underlain by unfaulted Holocene and late Pleistocene alluvium.
Name comments	Adapted by Piety (1995 #915) from the name Pintwater fault (Guth, 1990 #1520), which is given to a major, range-front fault that separates the basin beneath Indian Springs Valley on the west from the Pintwater Range on the east. **Fault ID:** Equivalent to WPR fault of Piety (1995 #915) and fault LV1 of dePolo (1998 #2845).

County(s) and State(s)	CLARK COUNTY, NEVADA LINCOLN COUNTY, NEVADA
Physiographic province(s)	BASIN AND RANGE
Reliability of location	Good Compiled at 1:100,000 scale. *Comments:* Fault trace compiled from Reheis (1992 #1604) who mapped at 1:100,000 scale from aerial photos at scale of about 1:60,000 and 1:80,000 scales. Fault is not shown on county maps at 1:250,000 scale (Ekren and others, 1977 #1036; Tschanz and Pampeyan, 1970 #1682; Longwell and others, 1965 #4694).
Geologic setting	Fault is down to the west and forms the western boundary of the long Pintwater Range block. It consists of two parts, a northern part that strikes N 8? W and a shorter southern part that strikes N 25? E. Each part consists of closely spaced fault traces that form a narrow range-front fault system. The north part is typical of range-bounding faults in the Basin and Range province. The two parts join at a conspicuous jog in the main range block near Pintwater Cave, possibly suggesting division of the fault into two sections. Because the separate parts have relatively straight traces, the West Pintwater fault lacks the conspicuous bent aspect typical of the ranges that border Las Vegas Valley on the north (Albers, 1967 #2922; Ekren, 1968 #1504; Stewart and others, 1968 #1655).
Length (km)	42 km.
Average strike	N4°E
Sense of movement	Normal *Comments:* The southern part of the fault may have a slight left sense of displacement consistent with the regional pattern of change of slip sense as the Las Vegas shear zone is approached from the north (Ekren, 1968 #1504).
Dip Direction	W; NW
Paleoseismology studies	
Geomorphic	Most of the West Pintwater Range fault is characterized by

expression	Dohrenwend and others (1991 #288) as bounding a tectonically active front of a major mountain range that is characterized by "fault juxtaposition of Quaternary alluvium against bedrock, fault scarps and lineaments on surficial deposits along or immediately adjacent to range front, a general absence of pediments, abrupt piedmont-hillslope transitions, steep bedrock slopes, faceted spurs, wineglass valleys, and subparallel systems of high-gradient, narrow, steep-sided canyons orthogonal to range front." The northern half of the northern part of the fault is expressed mainly as lineaments or scarps on Tertiary deposits, although two short (<2-km-long) traces within 0.5 km of the range margin are shown as developed on Quaternary deposits (Reheis, 1992 #1604). More than 90 percent of the southern half of the northern part and all of the southern part of the fault are portrayed either as range-front lineaments or as moderately to well defined lineaments or scarps on Quaternary deposits (Reheis, 1992 #1604) clearly establishing a Quaternary history of displacement.
Age of faulted surficial deposits	Quaternary
Historic earthquake	
Most recent prehistoric deformation	undifferentiated Quaternary (<1.6 Ma) *Comments:* Recent unpublished geologic mapping of the 1:100,000-scale Indian Springs quadrangle by P.L. Guth and J.C. Yount show extensive reaches along the trace of the West Pintwater Range fault as covered by Holocene and late Pleistocene alluvium. They show no faults cutting those deposits and only three faults forming a short (<1 km) cluster cutting alluvium of estimated early Pleistocene age. This older alluvium is very sparsely exposed along the range flank, so it could be extensively faulted beneath the younger alluvium. In any case, based on this unpublished mapping, the last faulting event can be constrained no tighter than Quaternary. Further studies are needed to better define the time of most recent movement.
Recurrence interval	
Slip-rate category	Less than 0.2 mm/yr

	Comments: Although no data are available on offset amounts or height or shape of scarps to guide slip-rate estimate, Reheis (1992 #1604) characterizes significantly long portions of the traces of the southern half of the north part and the south part (totaling about 25 km) as being moderately to strongly expressed as scarps or lineaments on Quaternary deposits. Although such expression, gleaned from 1:60,000 or smaller scale aerial photos, might be consistent with a slip rate of >0.2 mm/yr, P.L. Guth and J.C. Yount (unpublished 1;100,000 scale Indian Springs sheet) have mapped extensive reaches along the west Pintwater Range fault as unfaulted Holocene and late Pleistocene alluvium. If that mapping is correct, the slip rate must be very low. 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. Without further detailed studies, or at least documentation of the size of scarps on certain ages of Quaternary deposits, we assign the lowest slip-rate category to the fault.
Date and Compiler(s)	1998 R. Ernest Anderson, U.S. Geological Survey, Emeritus
References	#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. #288 Dohrenwend, J.C., Menges, C.M., Schell, B.A., and Moring, B.C., 1991, Reconnaissance photogeologic map of young faults in the Las Vegas 1° by 2° quadrangle, Nevada, California, and Arizona: U.S. Geological Survey Miscellaneous Field Studies Map MF-2182, 1 sheet, scale 1:250,000. #1504 Ekren, E.B., 1968, Geologic setting of Nevada Test Site and Nellis Air Force Range, *in* Eckel, E.B., ed., Nevada Test Site: Geological Society of America Memoir 110, p. 11-19. #1036 Ekren, E.B., Orkild, P.P., Sargent, K.A., and Dixon, G.L., 1977, Geologic map of Tertiary rocks, Lincoln County, Nevada: U.S. Geological Survey Miscellaneous Investigations Map I-1041, 1 sheet, scale 1:250,000. #1520 Guth, P.L., 1990, Superposed Mesozoic and Cenozoic

	deformation, Indian Springs quadrangle, southern Nevada, *in* Wernicke, B.P., ed., Basin and Range extensional tectonics near the latitude of Las Vegas, Nevada: Geological Society of America Memoir 176, p. 237-249. #4694 Longwell, C.R., Pampeyan, E.H., Bowyer, B., and Roberts, R.J., 1965, Geology and mineral deposits of Clark County, Nevada: Nevada Bureau of Mines and Geology Bulletin 62, 218 p., 16 pls. #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. #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, Pahranagat 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. #1655 Stewart, J.H., Albers, J.P., and Poole, F.G., 1968, Summary of regional evidence for right-lateral displacement in the western Great Basin: Geological Society of America Bulletin, v. 79, p. 1407-1413. #1682 Tschanz, C.M., and Pampeyan, E.H., 1970, Geology and mineral deposits of Lincoln County, Nevada: Nevada Bureau of Mines and Geology Bulletin 73, 188 p.