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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.

Continental fault (Class A) No. 688

Last Review Date: 1993-04-30

Compiled in cooperation with the Montana Bureau of Mines and Geology

citation for this record: **Machette, M.N., compiler, 1993, Fault number 688, Continental 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 02:02 PM.**

Synopsis	Poorly studied, but potentially young fault along western front of Rampart Mountain and East Ridge, just east of Butte. Most of the data associated with this fault is 40 or more years old.
Name comments	Weed (1912 #562) suggested the presence of this fault on the basis of abrupt range-front topography. Pardee (1950 #46) is an early reference to this fault name. The Continental fault bounds the western side of Rampart Mountain and "East Ridge" (a locally used name for ridge that extends south of Elk Park Pass along the Continental Divide) east of Butte. No other names have been found in our literature search. Witkind (1975 #317) showed the fault as extending from about 3 km north of East Butte southward

	to a point about 5 km due east of Janney, where the fault enters a valley between the foothills and East Ridge. This trace probably came from Pardee (1950 #46). Johns and others (1982 #259) showed the Continental fault as extending much farther north, to within 3 km of the Boulder River, although no references are listed to justify extending the fault in this area to the north. **Fault ID:** Refers to fault 54 (Continental fault) of Witkind (1975 #317) and fault 23 (Continental fault) of Johns and others (1982 #259).
County(s) and State(s)	SILVER BOW COUNTY, MONTANA
Physiographic province(s)	NORTHERN ROCKY MOUNTAINS
Reliability of location	Poor Compiled at 1:250,000 scale. *Comments:* Location transferred from 1:500,000-scale map of Witkind (1975 #317).
Geologic setting	Forms a prominent 600- to 900-m-high escarpment along the western front of Rampart Mountain and East Ridge, east and southeast of Butte. Pardee (1950 #46) made a convincing argument for late Cenozoic uplift and reversal of drainage in Elk Park, which appears to be a beheaded valley that lies about 400 m above East Butte on the footwall of the Continental fault. Pardee (1950 #46) reports exposures of faults that trend more or less parallel to the mountain front, and there are subparallel faults that dip steeply to the west in mine workings.
Length (km)	18 km.
Average strike	N10°W
Sense of movement	Normal *Comments:* Slickenlines along fault planes in mine tunnels show minor components of both dextral and sinistral slip (Pardee, 1950 #46).
Dip	70-75° *Comments:* Dip measured on fault planes in mine tunnels (Pardee,

	1950 #46). These faults are subparallel to the Continental fault and may or may not be associated with it.
Paleoseismology studies	
Geomorphic expression	Forms prominent escarpment along western front of Rampart Mountain and East Ridge; the surface trace of the fault is characterized by springs and zones of altered rock. Pardee (1950 #46) suspected that the main trace of the fault is at the foot of the Rampart Range, although no one has reported fault scarps on unconsolidated material.
Age of faulted surficial deposits	
Historic earthquake	
Most recent prehistoric deformation	undifferentiated Quaternary (<1.6 Ma) *Comments:* Weed (1912 #562) suspected historic movement (not associated with an earthquake) from comparison of probably unreliable leveling of two monuments in 1896 and 1906. Meinzer (1914 #563) suspected Holocene movement. Although neither of these studies demonstrated young movement, the abrupt, steep and linear front of the range and apparent reversal of drainage associated with hundreds of meters of Cenozoic uplift (Pardee, 1950 #46) suggest Quaternary movement on the Continental fault. Pierce and Morgan (1992 #539) indicate that this fault was active during the Tertiary but do not preclude Quaternary movement. Bartholomew and Stickney examined several sites along the southern part of the fault and found no evidence suggesting late Quaternary faulting (M.J. Bartholomew, written commun. 1997). Because details are lacking, the fault is included in this compilation. Due to the lack of agreement in the timing of the most recent movement, a Quaternary age is assigned here.
Recurrence interval	
Slip-rate category	Less than 0.2 mm/yr *Comments:* Inferred low slip rate based on lack of scarps

	associated with the main (concealed?) trace of the fault.
Date and Compiler(s)	1993 Michael N. Machette, U.S. Geological Survey, Retired
References	#259 Johns, W.M., Straw, W.T., Bergantino, R.N., Dresser, H.W., Hendrix, T.E., McClernan, H.G., Palmquist, J.C., and Schmidt, C.J., 1982, Neotectonic features of southern Montana east of 112°30' west longitude: Montana Bureau of Mines and Geology Open-File Report 91, 79 p., 2 sheets. #563 Meinzer, O.E., 1914, The water resources of Butte, Montana: U.S. Geological Survey Water Supply Paper 345-G, 78-125 p., 1 sheet, scale 1:62,500. #46 Pardee, J.T., 1950, Late Cenozoic block faulting in western Montana: Geological Society of America Bulletin, v. 61, p. 359-406. #539 Pierce, K.L., and Morgan, L.A., 1992, The track of the Yellowstone hot spot—Volcanism, faulting, and uplift, *in* Link, P.K., Kuntz, M.A., and Platt, L.B., eds., Regional geology of eastern Idaho and western Wyoming: Geological Society of America Memoir 179, p. 1-53, 1 pl. #562 Weed, W.H., 1912, Geology and ore deposits of the Butte district, Montana: U.S. Geological Survey Professional Paper 74, 262 p., 25 sheets. #317 Witkind, I.J., 1975, Preliminary map showing known and suspected active faults in western Montana: U.S. Geological Survey Open-File Report 75-285, 36 p. pamphlet, 1 sheet, scale 1:500,000.