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Quaternary Fault and Fold Database of the United States

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West Lobo Valley fault zone, Fay section (Class A) No. 918a

Last Review Date: 1993-01-25

Compiled in cooperation with the Texas Bureau of Economic Geology

citation for this record: **Collins, E., compiler, 1993, Fault number 918a, West Lobo Valley fault zone, Fay 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 03:13 PM.**

Synopsis	**General:** This long fault zone consists of a distinct series of continuous and discontinuous range-front scarps. The zone has been mapped by many, including Twiss (1959 #861), Belcher and others (1977 #875), Muehlberger and others (1978 #854), Henry and others (1985 #866), Machette and Personius (unpublished field notes made available to Collins), and Collins and Raney (1993 #852). Reconnaissance studies of scarp morphology and mapping of faulted Quaternary deposits are the sources for fault data. No trench investigations have been conducted.

	Sections: This fault has 4 sections. Collins and Raney (1993 #852; 1994 #853) interpreted four fault sections on the basis of the fault's geometry, map pattern, and reconnaissance studies of offset data for the fault strands that compose the zone.
Name comments	**General:** Named by Collins and Raney (1993 #852) for fault's position along the west margin of Lobo Valley. Sections discussed herein include: Fay [918a], Neal [918b], Mayfield [918c], and Sierra Vieja [918d]. The entire fault zone has also been called the Mayfield fault by Muehlberger and others (1978 #854; 1985 #911) after its proximity to Mayfield Ranch however the West Lobo Valley name is more descriptive. Northern end of fault zone is about 10 km south of Van Horn; the zone extends south-southeastward along the eastern base of the Van Horn Mountains and Sierra Vieja to a point about 18 km southwest of Valentine. **Section:** Named the Fay fault by Collins and Raney (1993 #852) for two scarps near Fay, an abandoned railroad siding. This short part of the fault zone is about 10 km south of Van Horn and is west of and en echelon to the Neal section [918b].
County(s) and State(s)	CULBERSON COUNTY, TEXAS
Physiographic province(s)	BASIN AND RANGE
Reliability of location	Good Compiled at 1:250,000 scale. *Comments:* Location based on 1:250,000-scale map compiled from field mapping using aerial photographs and 1:24,000-scale topographic maps (Collins and Raney, 1993 #852).
Geologic setting	Down-to-the-east range bounding fault zone that separates the Van Horn Mountains and Sierra Vieja (on the west) from Lobo Valley (basin). Collins and Raney (1993 #852; 1994 #853) determined that the throw is greater than 11 m on middle Pleistocene deposits along the southernmost section (Sierra Vieja [918d]) of the fault zone.
Length (km)	This section is 4 km of a total fault length of 60 km.
Average strike	N28°W (for section) versus N19°W (for whole fault)
Sense of movement	Normal

	Comments: Not studied in detail; sense of movement inferred from scarp topography.
Dip Direction	E
Paleoseismology studies	
Geomorphic expression	The surface trace of the fault is represented by only two short en echelon scarps. The northernmost scarp is 1.4 m high and has a maximum scarp-slope angle of 13° (Collins and Raney, 1993 #852).
Age of faulted surficial deposits	Quaternary alluvium. Middle Pleistocene alluvial-fan deposits are offset vertically 1.2 m (Collins and Raney, 1993 #852). It has not been determined if upper Pleistocene and/or Holocene deposits are faulted.
Historic earthquake	
Most recent prehistoric deformation	middle and late Quaternary (<750 ka) *Comments:* Approximate age of known youngest faulted deposits estimated from development of calcic soils (Collins and Raney, 1993 #852). It has not been determined if upper Pleistocene and Holocene deposits are faulted or unfaulted.
Recurrence interval	125–250 k.y. (<500 ka) *Comments:* Collins and Raney (1993 #852) estimated that the average recurrence interval for large surface ruptures since middle Pleistocene may be as great as 125–250 k.y. These values are based on (a) their estimate of the number of large-displacement (1- to 2-m) surface ruptures since middle Pleistocene time, (b) the assumption that faulted middle Pleistocene deposits are approximately 250–500 ka, and (c) approximately 1.2 m of throw on middle Pleistocene deposits.
Slip-rate category	Less than 0.2 mm/yr *Comments:* Average slip rate since middle Pleistocene is low based on 1.2 m of throw on middle Pleistocene (130–500 ka) deposits (Collins and Raney, 1993 #852).
Date and Compiler(s)	1993 E.W. Collins, Bureau of Economic Geology, The University of

	Texas at Austin
References	#875 Belcher, R.C., Goetz, L.K., and Muehlberger, W.R., 1977, Map B—Fault scarps within Quaternary units in West Texas, *in* Goetz, L.K., ed., Quaternary faulting in Salt Basin graben, West Texas: The University of Texas at Austin, unpublished M.S. thesis, 1 pl., scale 1:500,000. #852 Collins, E.W., and Raney, J.A., 1993, Late Cenozoic faults of the region surrounding the Eagle Flat study area, northwestern trans-Pecos Texas: Technical report to Texas Low-Level Radioactive Waste Disposal Authority, under Contract IAC(92-93)-0910, 74 p. #853 Collins, E.W., and Raney, J.A., 1994, Impact of late Cenozoic extension on Laramide overthrust belt and Diablo Platform margins, northwestern trans-Pecos Texas, *in* Ahlen, J., Peterson, J., and Bowsher, A.L., eds., Geologic activities in the 90s: New Mexico Bureau of Mines and Mineral Resources Bulletin 150, p. 71-81. #866 Henry, C.D., Gluck, J.K., and Bockoven, N.T., 1985, Tectonic map of the Basin and Range province of Texas and adjacent Mexico: The University of Texas at Austin, [Texas] Bureau of Economic Geology Miscellaneous Map 36, 1 sheet, scale 1:500,000. #854 Muehlberger, W.R., Belcher, R.C., and Goetz, L.K., 1978, Quaternary faulting in trans-Pecos Texas: Geology, v. 6, p. 337-340. #911 Muehlberger, W.R., Beleher, R.C., and Goetz, L.K., 1985, Quaternary faulting in Trans-Pecos Texas, *in* Dickerson, P.W., and Muehlberger, W.R., eds., Structure and tectonics of Trans-Pecos Texas: West Texas Geological Society Publication 85-81, p. 21. #861 Twiss, P.C., 1959, Geology of Van Horn Mountains Texas: The University of Texas at Austin, [Texas] Bureau of Economic Geology Geologic quadrangle Map 23, 1 sheet, scale 1:48,000.