

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 Gate fault (Class A) No. 1692

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Synopsis

This curvilinear range-front fault is nearly continuous along western escarpment of Clan Alpine Mountains from east of about Queen Peak south beyond end of range and continues along eastern margin of Stingaree Valley, to about 4 km south of U.S. Highway 50. Stingaree Valley appears to be a half-graben related to apparent eastward tilting and downfaulting of Louderback Mountains along the West Gate fault. The rupture pattern produced by the 1954 Fairview Peak-Dixie Valley earthquakes suggests that this fault is related to other faults in the area. The southern part of the fault ruptured in 1954 from south of the highway north to north-northeast of Chalk Mountain and ruptured along west flank of Twin Peaks. Scarps produced in 1954 generally are west-facing, follow the alluvial-bedrock contact, and represent as much as 1.1 m and 0.5 m of vertical separation along the southern and northern rupture zones, respectively. Along the southern part of the 1954 rupture, scarps form a left-stepping echelon pattern and stream channels are right-laterally offset up to 1.2 m. The pre-1954 range-front fault is expressed as

	<p>a topographic lineament coinciding with abrupt alluvial-bedrock contact that may represent a fault-line scarp. Reconnaissance and detailed photogeologic mapping of the fault and detailed studies of fault offsets are the sources of data. Trench investigations and detailed studies of scarp morphology have not been completed.</p>
<p>Name comments</p>	<p>Refers to faults mapped by Slemmons (1957 #154; 1968, unpublished Reno 1:250,000-scale map), Slemmons and others (1959 #155), Bell (1984 #105), Greene and others (1991 #3487), Caskey (1996 #2437), and Caskey and others (1996 #2439) along west side of Clan Alpine Mountains. Slemmons and others (1957 #154) referred to it as the Westgate (sic) fault zone evidently named after the settlement of West Gate; Doser (1986 #125), Caskey and Wesnousky (1993 #2442), Caskey (1996 #2437), Caskey and others (1996 #2439), and Hodgkinson and others (1996 #2493) referred to it as the West Gate fault. dePolo (1998 #2845) referred to it as the Stingaree Valley fault. The West Gate name appears in several recent publications, thus, it is used herein</p> <p>Fault ID: Refers to fault number R35 (Stingaree Valley fault) of dePolo (1998 #2845).</p>
<p>County(s) and State(s)</p>	<p>CHURCHILL COUNTY, NEVADA</p>
<p>Physiographic province(s)</p>	<p>BASIN AND RANGE</p>
<p>Reliability of location</p>	<p>Good Compiled at 1:100,000 scale.</p> <p><i>Comments:</i> Fault locations are primarily based on 1:48,000-scale map of Caskey (1996 #2437) (reproduced in Caskey and others, 1996 #2439). Mapping based on detailed photogeologic analysis of 1:10,000- to 1:12,000-scale vertical, low-sun-angle aerial photography, transferred by inspection to 1:24,000-scale mylar orthophotos and directly to 1:24,000-scale topographic maps, that were then reduced to 1:48,000-scale. Additional mapping based on detailed field mapping and numerous measurements of fault offsets along the fault. Southernmost fault is from 1:250,000-scale map of Bell (1984 #105).</p>
<p>Geologic setting</p>	<p>This curvilinear range-front fault is nearly continuous along western escarpment of Clan Alpine Mountains from east of about Queen Peak south beyond end of range and continues along</p>

	<p>eastern margin of Stingaree Valley, to about 4 km south of U.S. Highway 50 (Slemmons, 1957 #154, 1968, unpublished Reno 1:250,000-scale map; Slemmons and others, 1959 #155; Bell, 1984 #105; Greene and others, 1991 #3487; Caskey, 1996 #2437; Caskey and others, 1996 #2439). Stingaree Valley appears to be a half-graben related to apparent eastward tilting and downfaulting of Louderback Mountains along the West Gate fault (Caskey, 1996 #2437). The rupture pattern produced by the 1954 Fairview Peak-Dixie Valley earthquakes suggests that this fault is related the Louderback Mountains fault [1689], Gold King fault [1691], Dixie Valley fault zone [1687], and Fairview fault zone [1690].</p>
Length (km)	23 km.
Average strike	N8°E
Sense of movement	<p>Normal</p> <p><i>Comments:</i> dePolo (1998 #2845) reports that the primary long-term sense of movement is normal. However, Caskey (1996 #2437) and Caskey and others, (1996 #2439) report numerous measurements of offsets associated with the 1954 Fairview Peak earthquake. From these measurements they determined that right-lateral movement with a normal component predominated along the southern 1954 rupture zone and that normal movement was exhibited along the northern rupture. Slemmons (1957 #154) also reported dextral and normal offsets associated with the 1954 event.</p>
Dip	<p>>15°NW</p> <p><i>Comments:</i> Caskey (1996 #2437) and Caskey and others (1996 #2439) reported that one of the 1954 ruptures may dies out near south end of Clan Alpine Mountains in a fault dipping >15° NW. presumably at the alluvial-bedrock contact.</p>
Paleoseismology studies	
Geomorphic expression	<p>Scarps produced in 1954 generally are west facing, follow the alluvial-bedrock contact at west front of Clan Alpine Mountains, and represent as much as 1.1 m and 0.5 m of vertical separation along the southern and northern rupture zones, respectively. Along the southern part of the 1954 rupture , scarps form a left-stepping echelon pattern and stream channels are right-laterally</p>

	<p>offset up to 1.2 m. (Slemmons, 1957 #154; Bell, 1981 #2875; Caskey, 1996 #2437; Caskey and others, 1996 #2439). According to Caskey (1996 #2437), the 1954 ruptures documented by Slemmons (1957 #154) near Highway 50 are no longer visible. Northernmost part of fault is expressed by topographic lineament coinciding with abrupt alluvial-bedrock contact (Bell, 1981 #2875; 1984 #105), which may be fault-line scarp (Caskey, 1996 #2437). dePolo (1998 #2845) reports a maximum preferred basal fault facet height of 110 m (85–134 m).</p>
Age of faulted surficial deposits	<p>Quaternary. Bell (1984 #105) and Greene and others (1991 #3487) mapped faults that displace undifferentiated Quaternary piedmont-slope deposits along west front of Clan Alpine Mountains and in eastern Stinger Valley.</p>
Historic earthquake	<p>Fairview Peak earthquake 1954</p>
Most recent prehistoric deformation	<p>undifferentiated Quaternary (<1.6 Ma)</p> <p><i>Comments:</i> Although timing of most recent paleoevent is not well constrained, a Quaternary time is suggested based on mapping of Bell (1984 #105), Greene and others (1991 #3487).</p>
Recurrence interval	
Slip-rate category	<p>Less than 0.2 mm/yr</p> <p><i>Comments:</i> No detailed data exists to determine slip rates for this fault. dePolo (1998 #2845) assigned a reconnaissance vertical displacement rate of 0.214 mm/yr based on an empirical relationship between his preferred maximum basal facet height and vertical rate. The size of the facets (tens to hundreds of meters, as measured from topographic maps) indicates they are the result of many seismic cycles, and thus the derived slip rate reflects a long-term maximum. However, little evidence suggests that the fault ruptured in the latest Quaternary prior to 1954. Accordingly, the less than 0.2 mm/yr slip-rate category has been assigned to this fault.</p>
Date and Compiler(s)	<p>1999 Thomas L. Sawyer, Piedmont Geosciences, Inc.</p>
References	<p>#2875 Bell, J.W., 1981, Quaternary fault map of the Reno 1° by 2° quadrangle, Nevada-California: U.S. Geological Survey Open-</p>

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