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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.**

## unnamed faults near Alkali Valley (Class A) No. 1299

**Last Review Date: 1998-07-19**

***citation for this record:*** **Adams, K., and Sawyer, T.L., compilers, 1998, Fault number 1299, unnamed faults near Alkali Valley, 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 02:14 PM.**

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| **Synopsis** | This broad zone of distributed short intermontane and range-bounding faults is at the south end of the Wassuk Range, to the west of the Anchorite Hills. They extend from Powell Mountain south to the Nevada-California border, encompass a zone about 10-14 km wide, and have various strikes ranging from northeast through north and northwest. Most of the faults in this group displace only bedrock and are distinguished by aligned drainages, saddles, and relatively small topographic escarpments. However, other faults displace upper Quaternary alluvium and juxtapose Quaternary eolian and alluvial deposits against bedrock, thereby demonstrating young movement (Stewart and others, 1981 #2893; 1981 #2894; Dohrenwend, 1982 #2871). Reconnaissance photogeologic mapping and bedrock mapping of the faults are the sources of data. Trench investigations and detailed studies of scarp morphology have not been completed. |

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| **Name comments** | Refers to a group of faults near Powell Mountain, Mount Hicks, and Alkali Valley, mapped by Dohrenwend (1982 #2481; 1982 #2870; 1982 #2871), Slemmons (1966, unpublished Walker Lake 1? X 2? sheet), and Stewart and others (1981 #2893; 1981 #2894; 1982 #2873). Includes fault that dePolo (1998 #2845) refers to as the Southwestern Wassuk Range fault.<br><br>**Fault ID:** This group of faults includes fault number WL12 of dePolo (1998 #2845). |
| **County(s) and State(s)** | MONO COUNTY, CALIFORNIA<br>MINERAL COUNTY, NEVADA |
| **Physiographic province(s)** | BASIN AND RANGE |
| **Reliability of location** | Good<br>Compiled at 1:100,000 scale.<br><br>*Comments:* Locations primarily based on 1:62,500 map of Dohrenwend (1982 #2871) and 1:250,000-scale maps (Dohrenwend, 1982 #2481; 1982 #2870) and field-based bedrock and surficial mapping of Stewart and others (1981 #2893; 1981 #2894); small-scale 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. |
| **Geologic setting** | This broad zone of distributed short intermontane and range-bounding faults is at the south end of the Wassuk Range, to the west of the Anchorite Hills. |
| **Length (km)** | 36 km. |
| **Average strike** | N19°E |
| **Sense of movement** | Left lateral, Normal<br><br>*Comments:* Sinistral sense for some of the faults is inferred from general knowledge of sense of movement on other northeast-striking faults in the region (compilers' assertion); normal sense of movement for other faults is from Stewart and others (1981 #2893; 1981 #2894) and inferred from topography. |
| **Dip Direction** | W; E |

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| **Paleoseismology studies** | |
| **Geomorphic expression** | Most of the intermontane faults displace only bedrock and are primarily expressed as aligned drainages, saddles, hillside benches, and relatively small topographic escarpments (Stewart and others, 1981 #2893; 1981 #2894; Dohrenwend, 1982 #2871). Other faults either displace Quaternary alluvium or juxtapose Quaternary sediments against bedrock escarpments (Stewart and others, 1981 #2893; 1981 #2894; Dohrenwend, 1982 #2871), providing evidence for young fault movement. dePolo (1998 #2845) reports a maximum preferred basal fault facet height of 85 m (61-110 m). |
| **Age of faulted surficial deposits** | Upper Quaternary through Tertiary. Several faults in the group displace upper Quaternary alluvium or juxtapose Quaternary alluvial and eolian sediment against bedrock (Stewart and others, 1981 #2893; Dohrenwend, 1982 #2871). Elsewhere, the faults only involve Tertiary bedrock but are included in this group because of similar trend and proximity to faults with demonstrated Quaternary offset. |
| **Historic earthquake** | |
| **Most recent prehistoric deformation** | late Quaternary (<130 ka)<br><br>*Comments:* Although timing of most recent event is not well constrained, a late Quaternary time is based on mapping by Dohrenwend (1982 #2871). |
| **Recurrence interval** | |
| **Slip-rate category** | Less than 0.2 mm/yr<br><br>*Comments:* No detailed data exists to determine slip rates for this fault. dePolo (1998 #2845) assigned a reconnaissance vertical slip rate of 0.184 mm/yr based on an empirical relationship between his preferred maximum basal facet height and vertical slip 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 average. The late Quaternary characteristics of this fault (overall geomorphic expression, continuity of scarps, age of faulted |

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| | deposits, etc.) suggest the slip rate during this period is low. Accordingly, the less than 0.2 mm/yr slip-rate category has been assigned to this fault. |
| **Date and Compiler(s)** | 1998<br>Kenneth Adams, Piedmont Geosciences, Inc.<br>Thomas L. Sawyer, Piedmont Geosciences, Inc. |
| **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.<br><br>#2481 Dohrenwend, J.C., 1982, Map showing late Cenozoic faults in the Walker Lake 1° by 2° quadrangle, Nevada-California: U.S. Geological Survey Miscellaneous Field Studies Map MF-1382-D, 1 sheet, scale 1:250,000.<br><br>#2870 Dohrenwend, J.C., 1982, Surficial geologic map of the Walker Lake 1° by 2° quadrangle, Nevada-California: U.S. Geological Survey Miscellaneous Field Studies Map MF-1382-C, 1 sheet, scale 1:250,000.<br><br>#2871 Dohrenwend, J.C., 1982, Reconnaissance surficial geologic map of the Aurora quadrangle, Nevada and California: U.S. Geological Survey Miscellaneous Field Studies Map MF-1373, scale 1:62,500.<br><br>#248 Fraser, G.D., 1964, Intensity, magnitude and ground breakage, *in* The Hebgen Lake, Montana, earthquake of August 17, 1959: U.S. Geological Survey Professional Paper 435, p. 31-35.<br><br>#24 Freeman, K.J., Fuller, S., and Schell, B.A., 1986, The use of surface faults for estimating design earthquakes—Implications of the 28 October 1983 Idaho earthquake: Bulletin of the Association of Engineering Geologists, v. 23, no. 3, p. 325-332.<br><br>#2873 Stewart, J.H., Carlson, J.E., and Johannesen, D.C., 1982, Geologic map of the Walker Lake 1° by 2° quadrangle, California and Nevada: U.S. Geological Survey Miscellaneous Field Studies Map MF-1382-A, scale 1:250,000.<br><br>#2893 Stewart, J.H., Johannesen, D.C., and Dohrenwend, J.C., 1981, Geologic map of the Powell Mountain quadrangle, Mineral |

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| | County, Nevada: U.S. Geological Survey Miscellaneous Field Studies Map MF-1268, scale 1:62,500.<br><br>#2894 Stewart, J.H., Kleinhampl, F.J., Johannesen, D.C., Speed, R.C., and Dohrenwend, J.C., 1981, Geologic map of the Huntoon Valley quadrangle, Mineral County, Nevada and Mono County California: U.S. Geological Survey Open-File Report 81-274, scale 1:62,500. |