

# Latest Quaternary Fault Movement along the Las Vegas Valley Fault System, Clark County, Nevada

CRAIG M. dePOLO; JOHN W. BELL; STEVE BORRON; D. BURTON SLEMMONS; JAMES L. WERLE

Environmental and Engineering Geoscience (2006) 12 (2): 181–193.

<https://doi.org/10.2113/12.2.181>

## Abstract

Several faults exposed in a 4- to 8-m-deep excavation in North Las Vegas exhibit evidence for two surface-faulting earthquakes that offset latest Pleistocene deposits and paleo-land surfaces about 2 to 3 m per event. These faults are secondary to a major trace of the Las Vegas Valley fault system. The rupture events, defined here as the most recent and penultimate events in the excavation, are expressed as fault displacements within, and buried by, a latest Pleistocene and Holocene stack of intercalated silt-rich and clay-rich deposits. Rapid, brittle faulting offset soft sediments that had the potential to deform plastically and formed a fault scarp 2 to 3 m high in weakly to moderately consolidated materials. A radiocarbon date from organic-rich soil at the surface offset by the most recent event indicates it occurred after about 14,500 <sup>14</sup>C years before present. The penultimate event likely was a few hundred to a few thousand years before this date, based on our estimate of the time required for intervening sedimentation and lack of soils. Local earthquakes along the Las Vegas Valley fault system likely caused the sudden fault offsets because these are typical features created by earthquakes (e.g., brittle faulting, fault scarps, tectonic colluvium), and the faults are in line with and adjacent to a distinct main fault. The faults are encountered at 2- to 3-m depths, and the events are evident below this. Therefore, exploratory trenches in young sediments within Las Vegas Valley should be deeper than 3 m if the existence of latest Quaternary faulting is to be detected.