

# REEVALUATION OF HIGH SLIP RATES ON THE EGLINGTON FAULT LAS VEGAS, NV UTILIZING NEW CHRONOSTRATIGRAPHIC AND GEOLOGIC EVIDENCE

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2 The Eglington fault is a northeast striking monoclinial landform that offsets middle-  
3 late Pleistocene groundwater discharge deposits in the Las Vegas Valley by ~14 m  
4 vertically. Most of the exposure of the fault has been lost to extensive urbanization,  
5 but the scarp is preserved along its northeastern extent. The 2014 USGS National  
6 Seismic Hazards Map characterizes the Eglington fault as a Quaternary fault and  
7 estimates the slip rate at 0.16 mm/yr. Recent investigations indicate a significantly  
8 higher slip rate (0.25 to 0.9 mm/yr, with a preferred rate of 0.6 mm/year). These  
9 estimates are based on pre-AMS radiocarbon dates that constrain the age range of a  
10 deposit identified as "Unit D" of the Las Vegas Formation (40-18 ka). The preferred  
11 offset age of the fault was obtained from deposits that formed on the upper part of  
12 "Unit D" (22 ka). Our recent work has redefined the stratigraphy and chronology of  
13 the Las Vegas Formation in and around the Eglington fault area, allowing  
14 reinterpretation of its slip rate. Specifically, the Eglington fault does not displace the  
15 entirety of "Unit D", but only the middle bed (our Bed D<sub>2</sub>) from which we obtained  
16 radiocarbon dates of 27.58-31.68 ka. Thus, a more accurate revised slip rate is  
17 ~0.44 - 0.50 mm/year. Additionally, we show that the 22 ka date that previously  
18 defined the minimum displacement age for "Unit D" across the Eglington scarp  
19 applies not to that unit but to a newly recognized unit (Member E, Bed E<sub>0</sub>) that so  
20 far, has not been shown to be offset by the fault. Additional investigation is  
21 necessary to determine offset of this unit and other younger deposits in the  
22 sequence. While calculations based on our revised stratigraphy and high-precision  
23 chronology broadly corroborate previous high contemporary slip-rate estimates for  
24 the Eglington fault, they also significantly increase the precision of earlier slip rate  
25 estimates. The revised rates also affect probable earthquake-recurrence intervals  
26 and reinforce the need for further study of this fault with respect to public safety in  
27 the Las Vegas Valley.