

MORPHOLOGIC DATING OF THE FRENCHMAN MOUNTAIN FAULT SYSTEM

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ABSTRACT

Segments of five fault scarps of the Frenchman Mountain fault system were morphologically dated between 1991 and 1994 for various projects in an attempt to determine the age of the fault system and assess the risk of surface rupture at the proposed developments. Morphologic dating techniques are semi-quantitative techniques used to obtain a relative age of the most recent seismic related movement of a fault. They are based on correlations observed between scarp height, slope angles and age and are dependent upon the rate of fault scarp degradation following ground rupture. Morphologic dating is attractive because it is economical, fast, safe and nondestructive.

Empirical and mathematical methods were used to estimate the relative age of the Frenchman Mountain fault system. Empirical methods (Wallace, 1977; Buckman and Anderson, 1979) yield a relative date ranging from 90,000 to 150,000 years old. Mathematical methods (Hanks, et al., 1984; Hanks, and Andrews, 1987) were also performed; however, scarp slope angles were often outside the constraints of the models resulting in unreliable ages. Applying the models without regard to these constraints yielded an approximate age of 67,000 years.

Morphologic dating techniques show the last fault movement on the Frenchman Mountain fault system to be greater than 50,000 years old, and thus the fault system should be regarded as only "potentially active."