



FINAL TECHNICAL REPORT

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**Paleoseismologic Assessment of the Northern Tijeras-Cañoncito Fault System,
Central New Mexico**

by:

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ABSTRACT

**Paleoseismologic Assessment of the Northern Tijeras-Cañoncito Fault System,
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The Tijeras-Cañoncito fault system is a major structural element of the Rio Grande rift, and consists of the 41-km-long Canyon fault section south of the village of Golden and the 51-km-long Galisteo fault section north of Golden. Prior to this study, there was no information on whether the Galisteo fault section has had late Quaternary movement or not. The objectives of this research are to define the late Quaternary behavior of the Galisteo fault section and, from this, to help assess the segmentation of the Tijeras-Cañoncito fault system. Based on existing geologic data, analysis of aerial photography and aerial reconnaissance, we developed a preliminary map of potentially active fault strands within a 2-km-wide swath along the fault. Subsequent field mapping at a scale of 1:24,000 delineated seven surficial map units that provide a basis for assessing the late Quaternary activity on the Galisteo section of the fault. The map units include Pleistocene and Holocene alluvial-fan and fluvial deposits, as well as piedmont deposits associated with the late Pliocene to early Pleistocene Ancha Formation and Tuerto Gravel. In the vicinity of the Ortiz Mountains, the surficial deposits present across the fault are dominated by Pleistocene alluvial fans shed from the Ortiz Mountains. There is no prominent evidence of displacement of these fans. In addition, the Tuerto Gravel is not offset by the Tijeras fault near Peach Springs, suggesting an absence of movement since at least the early Pleistocene. Northeast of the Ortiz Mountains, within an area informally termed the Galisteo Basin geomorphic province, the surficial deposits consist of fluvial terraces along major stream channels as well as alluvial-fan deposits. There is no prominent evidence of displacement of middle Pleistocene to Holocene fluvial or alluvial-fan deposits where they overlie the Tijeras fault. However, there is a broad, 2-m-high, northwest-facing scarp developed across a surface associated with the Ancha Formation, which may be related to movement on a strand of the Tijeras fault during the late Pliocene to early Pleistocene. Overall, the information developed in this research provides evidence that there has been little or no movement along the Galisteo section of the fault during the middle and late Quaternary. We interpret that this fault section has not produced a surface-rupturing earthquake within the past approximately 1 to 2 Ma. Therefore, this work suggests that the 51-km-long Galisteo fault section should be viewed as inactive, and that rupture of the entire 92-km-long Tijeras-Cañoncito fault system is unlikely.