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Subject: Utilization of the B4 LiDAR data for surface rupture mitigation fault hazard along the southern San Andreas Fault, Coachella Valley, California.

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Text:

Petra Geotechnical has utilized the B4 LiDAR data along the southern San Andreas fault and related faults in the Coachella Valley for fault surface rupture mitigation studies. During the past three years, Petra has performed fault investigations in the valley for more than 7000 acres involving over 25 miles of linear trench length and detailed geologic mapping. The LiDAR data has been useful in assisting in the identification of main fault strands, but more importantly, in identifying weaker secondary strands that are difficult to identify with typical air-photo techniques. These secondary strands are also not identified on published maps in the region.

The LiDAR data has assisted us in determining the best locations to place trenches across main and secondary strands and to provide arguments whether or not trenching is warranted outside judicial (regulatory) fault hazard zones associated with State, County and Cities requirements.

Some of the work we have conducted, has identified that the published State of California and Clark (1984) mapped location of the San Andreas fault from approximately four miles southeast of Highway 10, is located approximately 250 to 350 feet southwest of the published location. Our work has also determined that the numerous fault scarps within the Coachella Fan area mapped by Clark (1984) represent inactive mostly normal dip-slip faults active in the mid to late Pleistocene. We interpret these faults resulting from lateral spreading with southwest transport toward the San Andreas fault (the toe of the slide). Overprinting the inactive normal faults, are a few “active” minor faults. These faults are laterally discontinuous, oblique strike-slip normal faults that likely do not provide a good candidate for transfer of slip to the Eastern California Shear Zone. Either the active faults represent internal ‘block’ deformation between the San Andreas and possibly a northwest extension of the Painted Canyon fault, or deformation associated with the development of an antiformal structure in the Coachella Fan from transpressive forces at depth along the San Andreas fault.

Reference: