

## **Large-Scale, Coarsening-Upward Sequences in the Stratigraphy of the Kern Water Bank: Prograding Fan-Deltas into a More Extensive Ancestral Buena Vista Lake?**

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The Kern Water Bank (KWB) is a groundwater storage facility located on the distal portion of the modern Kern River alluvial fan. The KWB extends from the outskirts of Bakersfield westward to Elk Hills, covering a surface area of approximately 32 mi<sup>2</sup>. Groundwater is produced from the uppermost 1000 ft of sediments.

Electric logs from KWB production/monitoring wells and a few oil wells from within the margins of the KWB were interpreted using Geographix™ geological interpretation software. The e-logs commonly contain 100 to 300-ft-thick intervals within which resistivity increases steadily upsection. Presuming that resistivity varies principally in response to grain size, these intervals likely represent coarsening-upward sequences that, in turn, may represent prograding phases of the Kern River alluvial fan in the vicinity of the KWB. Alternatively, the coarsening-upward sequences may represent delta sequences prograding into terminal lakes (e.g., Buena Vista Lake) perhaps several hundreds of thousands of years ago before the alluvial fan was built out as far west as the KWB.

Preliminary mapping of the base of one particularly well developed, coarsening-upward sequence suggests that this sequence was built out into an embayment of a more extensive, ancestral Buena Vista Lake. The base of the sequence defines a N-NE-trending trough in the south-central portion of the KWB. The trough deepens southward toward the modern location of Buena Vista Lake. Preliminary crosssections projecting further southward suggest that this sequence correlates with a thick, fine-grained deposit that, in turn, may be correlative with the Corcoran Clay found north of the Bakersfield Arch.

The margins of the trough coincide with a localized region of higher arsenic concentration in groundwater sampled from the Kern Water Bank. This suggests that higher arsenic levels may be related to lacustrine environments rather than those of alluvial fans.