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Sratigraphic Architecture of Upper Miocene Stevens Sandstone Turbidite Reservoir, San Joaquin Basin, California

Three cores from Upper Miocene Stevens sandstones at Elk Hills field, Kern county, California are subdivided into a hierarchy of architectural elements from subdivisions of turbidites to major reservoir intervals. Both fining-upward successions and coarsening and then fining-upward trends are observed. The central (apical) portions of the symmetrical coarsening- and then fining-upward cycles are coarse-grained, show evidence of scour and sediment bypass, contain abundant siltstone and sandstone intraclasts, and features typical of deposition by both low-density and high-density turbidity currents. These portions are interpreted as channelized, and fining-upward and coarsening- and then fining-upward cycles are interpreted to represent channel-fill and channelized lobe deposits, respectively. Major lobe development occurs in the stratigraphically lowest portion of the core; deposits showing much poorer organization overlie these deposits. As a whole, the cores are sand-rich, with fine-grained deposits consisting primarily of debris flow and reworked debris flow deposits with outsized, extra-basinal clasts. The close vertical relationship among amalgamated, very coarse-grained to pebbly sandstone deposits, packages of primarily fine-grained turbidite sandstone, stacks of debris flows up to 10 feet thick, seismic response, e-log correlation, tectono-stratigraphic setting, and comparison with modern turbidite systems provide the database used to interpret this portion of Stevens sandstone as the deposits of channelized lobes overlain by a heterogeneous (braided?) turbidite system.