



February 2014

## LOS ANGELES BASIN GEOLOGICAL SOCIETY MEETING ANNOUNCEMENT

**February 27(Thursday)** **Michael S. Clark**, Consulting Petroleum Geologist with San Joaquin Geological Services, Inc., Bakersfield, California

**Will speak on: Tectonics and Sedimentation of the Ranger Sandstone, Wilmington Field, Los Angeles Basin, California**

### Abstract

The integrated effect of differential subsidence plus variable sedimentation rate is well documented in two Mio-Pliocene, stratigraphic sequences of the Ranger interval (Pico and Repetto Formations) that subcrop on the west margin of the Los Angeles basin, California. These sequences represent a line-sourced, shore-parallel turbidite system deposited across the offshore part of the 20-mile long Wilmington anticline---a prolific structure (>2 billion bbls of oil produced) that formed along a transform margin during compression between the Palos Verdes thrust, and the Newport-Inglewood fault zone. Sand-rich sections of these sequences on the anticlinal crest contrast with thicker flank sections containing siliceous, in some places diatomaceous, shales. This architecture results from differential subsidence during deposition.

Interestingly, structurally-controlled thickening and thinning of strata is most evident in sand-poor sections at the bases of the Ranger sequences, and least evident in sand-rich sections at the tops, even though the anticline and associated faults likely existed throughout deposition. Instead, the sandy sections show thickening trends parallel to presumed sediment transport directions. Thus, structural controls (e.g., subsidence) are most evident in sand-poor sections, and stratigraphic controls most evident in sand-rich sections.

Most likely, the presence and/or absence of a structural versus stratigraphic signature reflects

sedimentation rates. Because sand-rich sections originated as debris flows and high-density turbidity currents, sediment accumulation was rapid, whereas sand-poor sections dominated by suspension settling and dilute remnants of turbid flows, took longer to deposit equivalent sediment thicknesses. Thus, enough time existed during shale deposition for anticlinal growth and fault displacements to affect sediment accumulation. By contrast, only evidence of sediment transport directions was preserved when sand flows overwhelmed the system, despite ongoing tectonic subsidence. Thus, the sequence architecture reflects the integrated effects of both controls, which means sedimentation rates must be considered if using stratal thicknesses to infer the timing of structural events.

### Speaker's Biography

Michael S. Clark is a consulting petroleum geologist with San Joaquin Geological Services, Inc. He has an A.S. degree in Biology from Cabrillo Junior College in Aptos, California (1973), a B.S. degree in Earth Sciences from the University of California at Santa Cruz (1975), an M.S. degree in Geology from the University of California at Davis (1979), and a Ph.D. in Geology from the Colorado School of Mines (1991). Dr. Clark has worked as an exploration geologist for Amoco Production Company in Denver, a research geologist for Exxon Research in Houston, and for Elf Aquitaine in Pau, France, a senior geologist for ARCO Western Energy in Bakersfield, CA and a staff

geologist for Chevron in Bakersfield. Clients he has done work for as a consultant include ARCO, Marathon Research, DeGolyer and MacNaughton, Occidental Petroleum, and Sonnatrach. He has worked on exploration and development projects in the United States, West and North Africa, and Europe, and drilled over 400 exploration and development wells, including more than 75 horizontal wells. His research interests include sequence stratigraphy, sedimentology, and organic geochemistry, and he has published several professional articles on various aspects of the Cretaceous and Tertiary of California.

## Meeting Time, Place, Cost and Reservations

### Time:

**Thursday, Feb 27th, 2014**

### Typical Meeting Agenda

**Lunch Served: 11:30 AM to 12:00PM**  
**Announcements: 11:45 AM to 12:00 PM**  
**Guest Speaker: 12:00 PM to 12:30PM**  
**Questions/Close: 12:30 PM to 12:45 PM**

### Place:

The Grand at Willow Street Conference Center located at 4101 East Willow Street, Long Beach, CA. (562-426-0555). Take Lakewood Boulevard south from the San Diego Freeway (405), turn west onto Willow Street and turn right onto Grand Avenue at the sign for the Center. Park free in the garage structure.

### Cost:

**Lunch and Speaker: \$20.00 with reservations**  
**\$25.00 without reservations**  
**Student: \$5.00 (Lunch and Speaker)**

### Meeting Reservations:

Make your reservations using our web site at [www.labgs.org](http://www.labgs.org), or by calling Graham Wilson (562)-326-5278, or emailing [gwilson@shpi.net](mailto:gwilson@shpi.net).

*Reservations must be made by 10:00 AM Tuesday morning prior to Thursday's meeting to receive discount price noted above. As always walk-ins are welcome.*

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