San Joaquin Geological Society

Date: **Tuesday, November 12th, 2013**

Time: **6:00 PM Social Hour**
7:00 PM Dinner
8:00 PM Lecture

Place: **American Legion**
2020 H St. Bakersfield, CA 93301

PSAAPG Members & Mesozoics
$25 w/ reservation
$30 without reservation

Non PSAAPG Members
$30 w/ reservation

Full-time Students with ID:
Free, Courtesy of Chevron & Occidental

SJGS WEBSITE

http://www.SanJoaquinGeologicalSociety.org/

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By: Friday, Nov. 8th, 2013

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Compaction, Cementation, and Dissolution: 30 Years of San Joaquin Basin Sandstone Petrology

Dr. Robert Horton
Professor of Geology
California State University, Bakersfield

Sandstone reservoirs in the San Joaquin basin are generally composed of arkosic arenites that contain varying ratios of quartz, plagioclase, K-feldspars, and volcanic and granitic rock fragments reflection source rocks in the Sierra Nevada and Coast Ranges. Lesser components include biotite, muscovite, hornblende, other heavy minerals, and sedimentary and metamorphic rock fragments. Diagenesis and porosity development were dominated by compaction and reaction of fractured grains with pore fluids; however the importance of cementation may have been overlooked in the past. Primary porosity was rapidly destroyed due to a combination of burial and tectonic compaction; compaction also resulted in fracturing of brittle grains and deformation of labile components. Deformation of labile grains, especially volcanic rock fragments, resulted in formation of pseudomatrix that was squeezed into adjacent pore spaces drastically reducing porosity. In arenites containing few labiles compaction caused fracturing of brittle grains; this in turn exposed unweathered material to diagenetic fluids resulting in widespread dissolution and creation of secondary porosity. Continued compaction caused both primary and secondary pores to collapse, resulting in sands whose textures and mineralogy have been altered and in which secondary porosity has come to resemble primary porosity. With deep burial, continued compaction further reduced porosity to very low levels unless through-going fractures were forming to act as conduits for diagenetic fluids. Data indicate that feldspathic arenites may retain significant porosity to depths in excess of 20,000 ft but lithic arenites are unlikely to retain significant porosity below 10,000 ft. Thus, target rock mineralogy should be an important consideration when designing exploration programs for deeply buried hydrocarbons in the San Joaquin basin.

Dr. Robert Horton – Bio

Robert (Bob) Horton received degrees in geology from State University of New York at Binghamton (B.S.), University of Tennessee (M.S.), and Colorado School of Mines (Ph.D). Bob has extensive mining industry experience having been involved in zinc exploration with Getty Minerals in Knoxville TN, uranium resource evaluation with Bendix Field Engineering in Atlanta, GA, gold and silver exploration with Anaconda, Denver, CO, and uranium exploration with Atlas Minerals, Moab, UT. He is currently a member of the geology faculty at California State University Bakersfield, having served on the faculty since 1984, including 10 years as department chair and 2 ½ years as Interim Assistant Vice President for Grants, Research, and Sponsored Programs. Bob has served as a two-time secretary, vice president, and president of San Joaquin Geological Society, vice president of Pacific Section SEPM, SJGS Delegate to AAPG, and as a member of the AAPG Distinguished Lecturer, Rules, and Credentials Committees. Bob has been awarded the AAPG Levorsen Award (1993), Pacific Section AAPG Outstanding Educator Award (1997), and CSUB Outstanding professor (2000).