

**AAPG International Conference
Barcelona, Spain
September 21-24, 2003**

S. C. Talukdar¹, E. H. Guevara², A. Galindo-Hernandez³, T. F. Wawrzyniec⁴, L. Villanueva-Rodriguez⁵, K. Fouad², E. Vazquez-Covarrubias³, L. Sanchez-Barreda², J. Meneses-Rocha⁶, D. C. Jennette², J. E. Lugo-Rivera⁶ (1) Consultant, The Woodlands, TX (2) Bureau of Economic Geology, Jackson School of Geosciences, The University of Texas at Austin, Austin, TX (3) Pemex Exploracion y Produccion, Veracruz, Mexico (4) GWN Geologic Consulting, Minneapolis, MN (5) Pemex Exploracion y Produccion, Coatzacoalcos, Mexico (6) Pemex Exploracion y Produccion, Villahermosa, Mexico

Importance of Deep Burial of Mesozoic Oil-Prone Source Rocks for Commercial Gas Accumulations in Tertiary Reservoirs, Veracruz Basin, Southern Mexico

Current hydrocarbon exploration in Tertiary siliciclastics of the Veracruz Basin follows prolonged inactivity after the early 1970's discovery of southern Mexico's giant Mesozoic reservoirs. Key to optimization and success of the renewed exploration efforts is an understanding of the petroleum systems and their relation to the basin geology and evolution.

An interdisciplinary assessment of the Neogene gas plays in the basin indicates the importance of deep burial of Mesozoic source rocks for commercial gas accumulations in Tertiary reservoirs. The assessment, conducted by a PEMEX-Bureau of Economic Geology team, included geochemical evaluation of source rocks and gases, 1-D thermal maturity modeling, and petroleum systems analysis. The results of the geochemical studies were integrated with the basin-wide structural and stratigraphic framework defined using well-log, biostratigraphic, and 2-D and 3-D seismic data.

Source-rock and gas studies and 1-D modeling show contributions from Mesozoic and Paleogene source rocks to thermogenic gases in Tertiary reservoirs. Biogenic gas contributions from Neogene shales are also widely recognized in shallow reservoirs. However, the studies also indicate that contributions from Mesozoic source rocks are significantly more important than those of Tertiary sources. Gases from the widely distributed, rich oil-prone Mesozoic source rocks include gases generated at the main gas window as well as gases cracked from the earlier Mesozoic-sourced oil accumulations buried to the main gas window. The mapped normal, reverse, thrust, and strike-slip faults, locally connecting the deeply buried, active Mesozoic source rocks with the Tertiary reservoirs, are pathways for volumetrically significant charges from the Mesozoic sources.