

**AAPG Annual Convention
Salt Lake City, Utah
May 11-14, 2003**

Irene Romero¹, Victor Jones², Blas González¹, José Humberto Sánchez¹ (1) PDVSA Intevep, Los Teques, Miranda, Venezuela
(2) Exploration Technologies, Inc, Houston, TX

A Promising Prospective Area in the Eastern Venezuela Basin: Matching Geochemical, Geological and Structural Data

The integration of all of the structural elements that affect the expression of soil gas anomalies and control their migration pathways are essential in determining the relationship of surface gas anomalies to the possible presence of subsurface reservoirs and their respective sources.

Surface geochemical data was collected over 800 Km² of a thrust-belt area located in the Eastern Venezuelan basin, and integrated with geological and structural data. The objective was to identify the magnitude and composition of near surface light hydrocarbon seepages for interpretation of possible subsurface hydrocarbons traps. In addition, the probable terrestrial and/or marine source rocks of the area were studied through GC analysis of well-head gas samples, and GC/MS/MS of special biomarker in oil and core samples of a nearby field.

Seepage magnitudes were very large in comparison with other petroliferous basins. Large oily anomalies clearly follow the strike of major Miocene anticlinal structures, suggesting an extension of known production to adjacent areas of these structures. The onset of the gassier soil gas anomalies appear to be controlled by deeper Oligocene faults and structures that are associated with a thrust fault system, suggesting the presence of deeper marine source rocks that lie to the east and possibly even underneath the Miocene structures.

Integration of five (5) interpreted structural 2-D seismic sections with ethane gas anomalies shows excellent agreement with seismically defined structural closures associated with probable subsurface Oligocene/Miocene hydrocarbon traps. This integration allows prioritization of the different leads as potential future prospects.