Oil and Gas Exploration Emphasizing Overpressure-Enhanced HC Seals in Large Tertiary Deltaic Complexes

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Abstract

Recognizing and mapping zones of overpressure-enhanced HC trap seals using both geophysical and geological-based means can be used to focus exploration efforts for 'less obvious' oil and gas fields pooled in large Tertiary sand/shale complexes deposited on the earth's passive continental margins. Many proven large field examples that could be used as analogues will be presented.

Exploration for overpressure-enhanced HC traps is usually facilitated by a combination of log analysis, subsurface mapping, and reflection seismic methods that include: 1). inversion, fault plane polarity analyses, HC chimney studies, acoustic impedance, and VP/VS studies; 2). seismic interval velocity studies (including velocity-induced reflection sag analyses); and,3). attributes studies involving seismic 'Bright Spots, 'Flat Spots', AVO, absorption, and visualization. Some of these methods will be discussed.

Many of these geophysical methods are applied as standard procedure during the seismic data processing phase. And, some are done during the subsequent seismic interpretation phase when potential hydrocarbon prospects and lead areas begin to be singled out for further economic analysis and associated de-risking. Essentially, these combined geophysical methods can deal geoscientists effective 'wild cards' to explore for less-obvious HC traps that exist in their areas (some of which contain EUR >>200MMBOE).