

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

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**Petroleum Geology of the Oil and Gas Commercial Discoveries in Spanish Basins: Guadalquivir-Golfo de Cádiz**

In The Guadalquivir-Golfo de Cadiz marine Miocene foreland basin 25 small commercial biogenic gas fields have been developed with a total URR of 220 BCF. Productive reservoirs are Miocene turbiditic sands separated in two different sedimentary models: an onshore Guadalquivir Tortonian-Messinian (Highstand System Tracts) channel-levee-lobe system and a conventional Messinian Lowstand System Tracts in the Gulf of Cadiz offshore.

Gas discoveries were provided by Tortonian shales in a deep water environment. In this setting we interpret an early phase of trapping in the form of gas hydrates and a second phase when the Pliocene overburden melt the frozen gas and created an efficient migration to the productive reservoirs. With the exception of one, the totality of gas fields are found in stratigraphic traps with a very low vertical closure (<10 milliseconds twt) generated by the combination of turbiditic relief and sand-shale differential compaction.

A careful interpretation of the sedimentary facies and their petrophysical properties was conducted and results are shown in this paper. These results can be resumed in the following four points: (i) Channel fill of both turbiditic systems and basin floor fan facies have the highest values of the individual sand thicknesses. (ii) Turbiditic facies have a strong control over the HST porosity values: distal lobe < lobe < levee < channel fill. (iii) Porosities are very constant in the different facies of the LST. (iv) The lateral continuity of sand bodies is: prograding complex < levee < lobe < channel fill < basin floor fan.