

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

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Exhumation of Corrib Gas Field and Implications for Exploration in the Slyne-Erris Basin, Offshore Ireland

Petroleum systems in exhumed basin settings manifest some common characteristics which are the result of physical and chemical changes induced by uplift, erosion and removal of overburden. In these basins, particular emphasis must be placed on the timing of thermal 'switch-off' of source rock units, the compactional and diagenetic constraints imposed by the maximum burial depth of reservoirs (prior to uplift) and the physical and mechanical characteristics of cap-rocks during and post-exhumation. In addition, attention must be focussed on the structural evolution of traps and the hydrocarbon emplacement history.

The Slyne-Erris Basin is one of a number of basins on the NE Atlantic margin which have experienced a multiphase extensional and exhumation history during the late Paleozoic to Cenozoic period. The primary hydrocarbon play in this basin consists of a Lower Triassic sandstone reservoir in structural traps, sealed by Upper Triassic evaporites and mudstones, and charged from Namurian-Westphalian claystones and coals. Sporadic exploration in the Slyne-Erris area over the last 25 years has resulted in the drilling of 6 exploration wells, which have yielded a single gas discovery (Corrib 18/20-1). A variety of techniques including vitrinite reflectance, apatite fission track analysis and fluid inclusions have been utilized to elucidate thermal history and quantify the magnitude of exhumation at Corrib. Seismic interpretation and stratigraphic restoration are employed to help rationalise the range of exhumation estimates derived from these techniques. Implications for future exploration in the Slyne-Erris basin are discussed in the context of the empirical observations at Corrib.