



San Joaquin Geological Society

October 29, 2008

North Sea Chalk: 40 Years of Production at Ekofisk Field from a Rock Some Said Would Never Flow Oil

by

Charles Feazel - Conoco-Phillips, Houston - AAPG Distinguished Lecturer

ABSTRACT

Chalk is deposited by pelagic settling of algal and foraminiferal skeletons, and subsequently modified by re-sedimentation in slumps, debris flows and turbidites. It is an improbable reservoir rock characterized by high porosity (25-45%) but low matrix permeability (typically $< 1\text{mD}$). Effective permeability due to fractures contributes significantly to flow. Ekofisk field, in the Norwegian North Sea, is approaching 40 years of production from the chalk, and has many years of economic life remaining. Technological advances - including 3D and 4D seismic, the world's largest offshore waterflood, monitoring and mitigating reservoir compaction and sea-floor subsidence, and creative design and geosteering of long-reach and multi-lateral wells - have extended field life, increased ultimate recovery, and restored daily production to rates not seen since the 1970s. Ongoing studies by the license partners facilitate effective management of the chalk reservoir, and aid in planning new wells in a field containing >300 existing wellbores, >400 mapped faults, an expanding waterflood, a dynamically deforming overburden, and a challenging matrix which many geoscientists and engineers initially dismissed as non-productive.