



First Results of 4-D Modelling of Saglek Basin, Labrador Shelf

J. Wielens*

Geological Survey of Canada, Dartmouth, Nova Scotia, Canada
hwielens@nrcan.gc.ca

and

C. Jauer and G. Williams

Geological Survey of Canada, Dartmouth, Nova Scotia, Canada

Abstract

The gas/condensate discovery at Hekja O-71, estimated at 2.3Tcf, in 1980 in the minimally explored Saglek Basin on the northern Labrador Shelf established a viable petroleum system, so we took a fresh look at prospectivity through basin modelling. Working from depth-converted seismic surfaces, recent heat flow measurements, seismic refraction models, new palynological age/paleo-environmental information and vintage well data, we have built a four-dimensional model of the deeper crust to overlying sediments, with their complex lateral variations, to assess the potential petroleum systems over time.

This area, rifted in passive-margin setting at 65 Ma, has major clastic reservoirs and seals. Biostratigraphic analysis shows an almost complete Upper Cretaceous and Tertiary section, with some condensed sequences especially in the Paleogene. Seismic shows a fairly homogenous Cenozoic clastic section without significant carbonates, overlying regional Paleocene flood basalts. Vitrinite reflectance analyses show a complex heat flow history with several different maturation slopes in several wells. New heat flow data measured at thirty locations show a complex pattern, with present heat flow values too high for a normally rifted system. The slightly younger Iceland hot spot that affected the area farther to the north at 50 Ma may explain this. It may also explain the behaviour of the vitrinite profiles.

There are indications for source rocks. In the model we assumed dispersed resinite. The maceral is present in the deltaic sediments and would explain the presence of condensate and gas only in the basin. We will show a tantalising 4-D review of the potential of Saglek Basin.