

# Seismic Features and Possibilities for Petroleum Systems Offshore Labrador

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A compilation of four mapped depth-converted seismic surfaces ranging from Paleocene flood basalts to recent sediments are presented. These are primary inputs to a 4-D petroleum systems simulation for the Saglek Basin, offshore Labrador. With only four wells to constrain the interpretation, over an area of some 167,000 sq. km ( about  $\frac{1}{4}$  of the area of Alberta ) seismic refraction and potential field data were integrated wherever possible. The reflection data set used consisted of some recent but predominantly late 1970 to early 1980's vintage data that was lacking in quality but still adequate to recognize problems with previously suggested litho stratigraphic correlation. These data also showed some curious seismic features consistent with previous descriptions of some confirmed sandstone injectite structures from the North Sea. They are shown as possible alternative structural/stratigraphic drilling targets that may be viable additions to the conventional exploration paradigm of four way dip closures.

Given the setting of a massively clastic-dominated geological environment, with proven potential for hydrocarbon generation from Mackenzie Delta type source rocks, within a tectonically active region; the occurrence of sizable remobilized sediments, i.e., sandstone injectites, appears to be highly probable. A recent Radarsat interpretation of persistent marine oil slicks is shown as an example of contemporary technology applied to assess petroleum systems in a frontier setting.

The apparent lack of correlation of the slick features with interpreted seismic structures such as basement highs or major faults may be due to differences in sampling scale, the prevalence of hydrocarbon accumulations in more stratigraphic rather than structural traps or a combination of these factors.