

Structural and Depositional Characteristics of Mesozoic Rift Section – Jeanne d’Arc to Flemish Cap Graben, Offshore Newfoundland and Labrador, Canada

Deric E. Cameron¹, James Carter¹, David McCallum¹

¹Nalcor Energy Oil and Gas, St. John's, NF, Canada.

ABSTRACT

The Southeastern Flemish Pass Basin is an underexplored region located adjacent to the prolific Jeanne d’Arc Basin, offshore Newfoundland and Labrador, Canada. This area had local vintage 2D seismic coverage largely associated with sporadic exploration drilling over the past 4 decades. More recently, extensive modern 2D long offset broadband seismic data has been acquired on a 5km by 5km grid. These acquisition programs have targeted the slope and deep-water areas of the provinces offshore in water depths ranging from 200m to 3000m, spanning the Jeanne d’Arc to the Flemish Pass basins. The continuous grid of data has imaged the presence of thick Tertiary and Mesozoic sequences that image the depo-centres of the Anson, southern Flemish Pass and Flemish Cap grabens, providing further insight to source rock and reservoir distribution. While these basins were previously known, the newer seismic data provides insight on the extent and fill of these subbasins and the linkage to adjacent discovery regions. This includes mapping of potential leads from the Flemish Cap west towards the Jeanne d’Arc Basin, and southwards to the Carson - Salar basins. Early interpretation has noted preserved thick Jurassic section displaying evidence of uplift and erosion adjacent to preserved section, rotated fault blocks and salt diapir structures associated with observed tectonic events. Revisions to the original mapping of the regional tectonic elements based on this work, is aiding in the delineation of a Mesozoic fairway into the slope and deep-water areas of the Southern Grand Banks, and impacting upcoming license rounds in this frontier exploration region.