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Paleozoic Stratigraphy and Petroleum Reservoir Potential in the Hudson Bay Basin, Northern Canada; Re-evaluation of Offshore Well Data

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Abstract

The Paleozoic Hudson Bay Basin underlies Hudson Bay and adjacent onshore areas in northern Manitoba and Ontario and southern Nunavut (Fig. 1). The sedimentary succession in the Hudson Bay Basin includes Upper Ordovician to Devonian strata, unconformably overlain by erosional remnants of Mesozoic strata, with a total (known) maximum thickness of about 2500 m. New stratigraphic correlations for the five offshore wells drilled in the Hudson Bay Basin (Netsiq N-01, Beluga O-23, Walrus A-71, Polar Bear C-11 and South Narwhal O-58; Fig.1) provide insights into basin depositional and erosional features, including a major unconformity in Lower Devonian strata and a Lower Devonian evaporite section of highly variable thickness. Petrophysical analyses of the five wells, integrated with core data, provide information on lithology and porosity, permeability, and water saturation in Paleozoic strata. The petrophysical data indicate that many limestone, dolomite and sandstone units within the succession have sufficient porosity and permeability to form good quality reservoirs, with possible hydrocarbon-bearing zones identified in some intervals. This new stratigraphic and reservoir framework will provide a foundation for ongoing petroleum-system and resource studies in the Hudson Bay Basin and surrounding Hudson Platform.

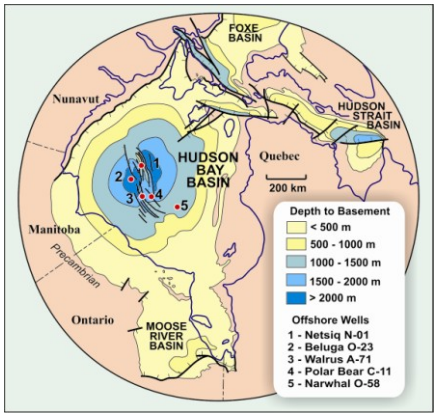

Figure 1: Regional setting of sedimentary basins in the Paleozoic Hudson Platform, with depths to Precambrian basement and locations of the five offshore wells drilled in the Hudson Bay Basin