

Hydrocarbon Exploration in Northern Canada: Upper Paleozoic and Cretaceous Investigations in the Peel Region, Yukon Territory

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Summary

The Peel Plateau is a prospective petroleum region that lies in northeast Yukon, Canada. Situated north of the Cordilleran Orogen and east of the Richardson Mountains, it consists of up to 4.5 km of Lower Cambrian to Upper Cretaceous strata up to 4.5 km thick that overlie Precambrian metasediments. The focus of this study is the Upper Paleozoic and Cretaceous strata which have estimated gas reserves of 0.5 Tcf and 2.2 Tcf, respectively. Although exploration in this region occurred in the 1960s and 1970s, there is recent interest in the Peel Plateau due to the proposed Mackenzie Gas Project.

Upper Paleozoic stratigraphy in the Peel region consists of basinal sediments overlain by a siliciclastic sedimentary wedge derived from the Late Devonian Ellesmerian Orogeny. Cretaceous sedimentary rocks deposited in the foreland basin of the Cordilleran Orogeny unconformably overlie the Paleozoic strata. Investigated as part of this study are the Upper Devonian Canol and Imperial formations, the Upper Devonian – Lower Carboniferous Tuttle Formation, an Upper Devonian – Lower Carboniferous unnamed shale (which may be equivalent to the Ford Lake Shale), and the Lower Cretaceous Martin House and Arctic Red formations. Research for this project was compiled from field investigations in 2006 and 2007 and builds on exploration data acquired prior to 1980.

This project is part of the interdisciplinary “Regional Geoscience Studies and Petroleum Potential, Peel Plateau and Plain” project (details at <http://www.nwtgeoscience.ca/petroleum/PeelPlateau.html>). Like many areas in the Yukon Territory, Peel region geology is relatively understudied. This project will substantially increase the geological knowledge of the region, including stratigraphy, sedimentology and hydrocarbon potential.