

# Ordovician Hydrogeology



Southeast Saskatchewan - T. 1-16, R. 30W1M-30W2M

Ordovician

## Introduction

Industry research indicates that vast quantities of oil have been generated from kukersite source rocks of the Upper Ordovician Yeoman Formation. To date, only a fraction of the oil has been discovered in eastern Montana, northwest North Dakota and southeast Saskatchewan. Extremely prolific oil discoveries by Shell and Berkely et al. in the Midale area has focused industry attention on the Yeoman play. These oil accumulations occur approximately 30 km updip of the Yeoman maturity edge, suggesting long distance migration has occurred. An understanding of the migration patterns and any potential barriers to migration represents one of the keys for focusing exploration efforts within the 578 township study area.

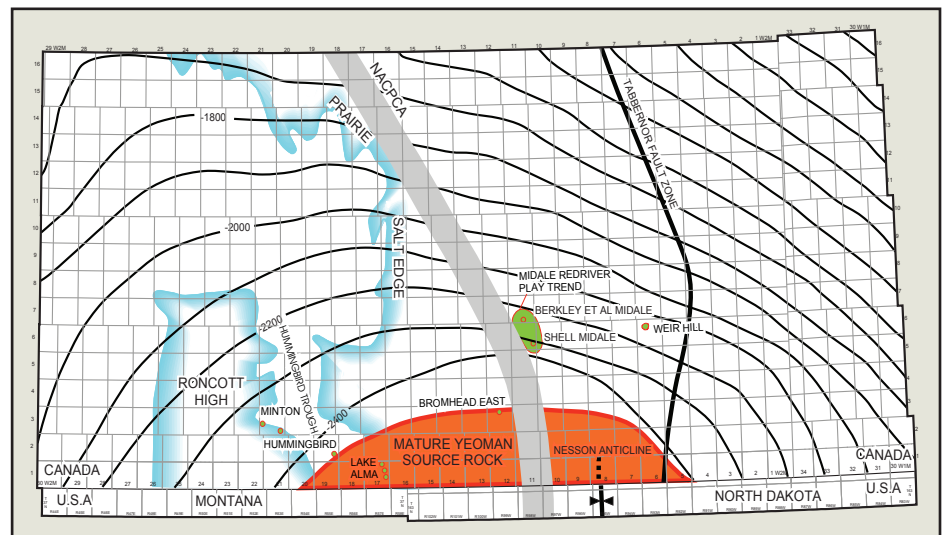
## Study

Rakhit Petroleum Consulting Ltd. (RPCL) is pleased to announce the availability of its hydrogeologic study of the Upper Ordovician Yeoman Formation. This study provides analysis of the potential oil migration envelope under the current hydrodynamic flow field, which is tied to oil geochemistry and geothermics. A detailed review of pressure, recovery and fluid chemistry data is used to define pressure systems, relationship of water chemistry to potential diagenetic patterns and vertical and lateral trapping potential. Regional hydrostratigraphic cross-sections are used to display pressure breaks related to Lake Alma and Herald anhydrites, subtle lithologic variations and postulated structural lineaments. The study defines a number of hydrodynamics based play fairways that provide a secondary exploration tool for locating and analyzing traps in this aerially extensive, homogeneous reservoir.

## Deliverables

The study includes 15 enclosures, 10 figures and a detailed technical report.

- Williston Basin petroleum systems map
- Ordovician thermal maturity map
- Ordovician oil and source rock geochemistry map
- Oil migration map (force vector analysis)
- Yeoman structure map
- Potentiometric surface map
- Water chemistry (TDS, ion ratio) maps
- Geothermal gradient map
- DST recovery and production map
- Pressure versus elevation graphs
- Hydraulic systems map
- Trap potential (oil/water contact tilt) map
- Two regional hydrostratigraphic cross-rections
- Detailed technical report
- Tops, oil geochemistry, water chemistry, and DST data



Study area map, showing structure and source rocks