

Using Outcrops of the McMurray Formation to Create a Reservoir Model

Barton Blakney* and Murray K. Gingras
Department of Geology, University of New Brunswick, Fredericton, NB, E3B 5A3
l9pz2@unb.ca

Subsurface extraction in the McMurray Formation is becoming an increasingly important means of exploiting tarsands in the McMurray Formation. Unfortunately, in situ production efforts are hampered by the complexities of the geological media present in the McMurray strata, which are mostly characterized by inclined heterolithic stratification (IHS).

IHS consists of interbedded sand and mud that define the clinofolds of point bars. Bed thicknesses in such deposits are variable and the beds can be remarkably continuous. Such bedding reduces vertical and, to a lesser degree, horizontal permeability. Their apparent effectiveness as permeability barriers suggests that these beds can provide steam-seals during in situ production; there is no general agreement on this matter.

Preliminary research is being directed towards achieving the following objectives:

- 1) Compile geological models of IHS-dominated media from outcrop. The models comprise simplified permeability fields that are strongly influenced by lithofacies.
- 2) Understanding whether there is a relationship between mud bed thickness and observed lateral continuity, and; what happens to the IHS beds at the tops and bottoms of point-bar accumulations?
- 3) Use statistical analysis on outcrop data to determine the trends or variations in permeability.
- 4) Construct flow models to address which sources of K variation are most influential on flow behavior.
- 5) Compile a database that lists the primary, secondary, and minor variables that influence the flow behavior of the model. This will provide reservoir modelers with a tool that will help them prioritize data collection from other reservoirs that are identified as candidates for numerical flow-modeling.