

An Assessment of the Ultimate Potential for Hydrocarbons in the Bakken Formation of Southeastern Saskatchewan

Peter A. Budgell¹, Chao Yang², Dan Kohlruss², Melinda Yurkowski², Mike Johnson¹, Paul Mortensen¹

Abstract

The National Energy Board and the Saskatchewan Ministry of the Economy have assessed the ultimate potential for marketable oil and natural gas in the Bakken Formation in Southeast Saskatchewan. This study focuses on the unconventional resources contained within the siltstones and fine-grained sandstones above and below the conventional sandstone reservoir found in the middle of the formation. Both the in-place and marketable volumes for oil and natural gas were estimated.

The methods used in this study are similar to those used in the 2013 study of the unconventional petroleum resources of the Montney Formation of British Columbia and Alberta. In-place volumes of oil were calculated using a standard volumetric equation where the variables were determined from map grids of geological data. This allowed the model to reflect the changing characteristics of the reservoir over its geographic extent. Statistical distributions were then applied to some of the variables in the equations and low, expected and high values were estimated using Monte Carlo simulations. The model output a set of in-place and marketable volumes for oil and natural gas on a township basis.

The assessment split the Bakken into six assessment groupings based on three geographic regions, each with two stratigraphic units (A and C). The ultimate recovery varies widely between each and to a large extent reflects their differences in geology and in the possibility of finding oil that can be produced. Areas outside the Viewfield area for example, have been less prospective so far and the estimates of their potential recoveries are lower on a per township basis. The ultimate recovery of these less prospective areas within the Bakken could increase over time as more exploration occurs, leading to more discoveries and a better understanding of the geological setting of the zones.

¹National Energy Board

²Saskatchewan Geological Survey, Saskatchewan Ministry of Economy

Peter Budgell is a hydrocarbon supply analyst with the National Energy Board. In addition to conducting resource assessments on conventional and unconventional plays in Western Canada he serves as lead supply analyst on infrastructure and energy export applications and tracks upstream developments in eastern Canada and the United States. Peter has a BSc in Geology from Acadia University.