

Identification of Residual Oil Zones in the Williston and Powder River Basins

Award Number: DE-FE0024453

Project Summary:

The goal of this project was to systematically assess the petroleum systems of the Williston and Powder River basins for prospective residual oil zones (ROZs) through a geologic modeling approach. The specific objectives were to: (1) identify the potential location, extent, and oil saturation of ROZs in the Williston and Powder River basins, (2) estimate the ROZ oil in place, (3) approximate the amount of oil that could be recovered using carbon dioxide-enhanced oil recovery, (4) estimate the storage potential in the ROZs, and (5) develop a repeatable method for the identification of ROZs in other sedimentary basins.

Prime Performer:
University of North Dakota Energy and Environmental Research Center

Principal Investigator:
Wesley Peck

Project Duration:
11/1/2014 – 3/31/2018

Performer Location:
Grand Forks, North Dakota

Program:
Carbon Storage

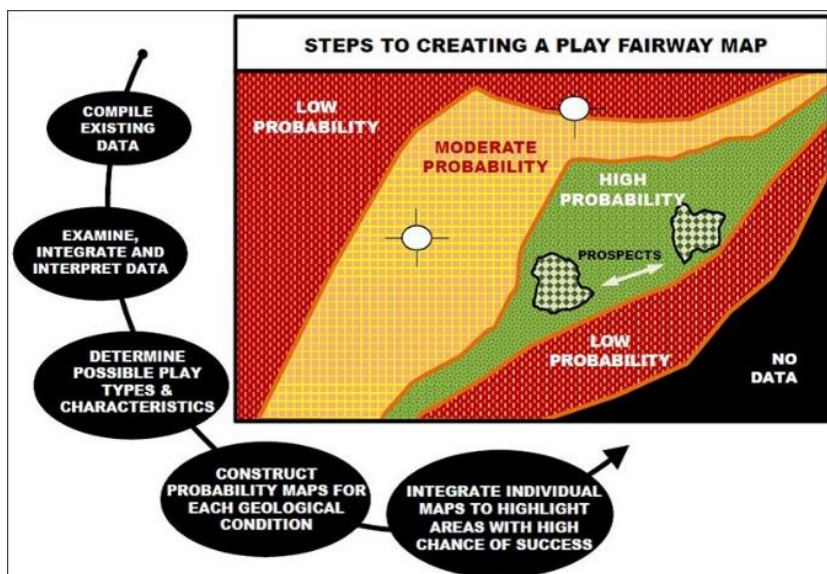


Figure 1: Methodology for creating play fairway maps showing discovered brownfield and greenfield ROZs, including probabilities.

Project Outcomes:

The research identified ROZs in both basins that could be evaluated for potential to promote further domestic oil production and carbon dioxide capture for utilization in recovering oil from these and other sedimentary basins. Schlumberger Petrel© and PetroMod© software were used to build and populate models to identify potential ROZ locations. Researchers successfully used the methods employed in this project to estimate ROZ potential for two formations in the Williston Basin. ROZ potential was low for the Powder River Basin formations examined. Researchers developed repeatable and robust methodologies for ROZ identification and utilization and developed a best practices manual for the identification, characterization, and evaluation of ROZs through a variety of sedimentary basins.

Presentations, Papers, and Publications

Final Report: [Identification of Residual Oil Zones in the Williston and Powder River Basins](#) (Mar 2018) Matthew E. Burton-Kelly, Neil W. Dotzenrod, Ian K. Feole, Wesley D. Peck, Jun He, Shane K. Butler, Marc D. Kurz, Bethany A. Kurz, Steven A. Smith, Charles D. Gorecki