

A New Migration Model for Oil in the Bakken Petroleum System of the Williston Basin

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Using hydrogeology, thermal data, hydrocarbon geochemistry, hydrochemistry, petrophysics and detailed structural mapping a new migration model for Bakken oil has been developed for the Williston Basin. This model defines three basic play types for the Bakken: A highly overpressured, high oil saturated resource play, an overpressured less oil saturated resource play and a normally pressured migrated oil play.

The distribution of these plays is controlled in large part by the occurrence of mature Bakken source rocks, partially by the stratigraphy and by the magnitude and direction of fluid movement, driven by both hydraulic head and density differences in the Basin.

This model sheds new light on some of the risks of oil charge for both in situ and migrated unconventional oil plays in Manitoba, Saskatchewan, North Dakota and Montana.