

Oil - Source Correlation within Triassic Petroleum Systems of the Western Canada Sedimentary Basin

Nina Ejezie*

University of Calgary, Calgary, Alberta, Canada
nucejezi@ucalgary.ca

Martin Fowler

Geological Survey of Canada, Calgary, Alberta, Canada

and

Cindy Riediger

University of Calgary, Calgary, Alberta, Canada

Abstract

Triassic strata are an important contributor to petroleum reserves in the Western Canada Sedimentary Basin. The Phosphate Zone (basal Doig Formation) is the main source rock for Triassic reserves with some contribution from the overlying, Jurassic Gordondale Formation. The organic-rich facies within the Montney Formation and equivalents and the Pardonet Formation are also possible source rocks but have not been correlated to any reservoir oils. Details of the Gordondale – Triassic Petroleum system are poorly known but are of potentially significant economic interest as Gordondale oils are much heavier than Doig oils and hence less economically attractive.

This study identifies Triassic oil families based on their bulk properties, molecular composition and biomarker characteristics. Oil families are correlated to their respective source rocks and an attempt at the characterization of the various Triassic petroleum systems is made. Conventional correlations proved challenging due to the high maturity of the oils. The results broadens current knowledge of the Triassic petroleum systems, opens up the possibility of new resource discoveries including potentially prospective regions for shale gas plays and increases the predictive chances in determining the occurrence of high gravity Doig oil versus low gravity Gordondale oils.