

Discovery, Petroleum Geology and the early Implementation of a High-Pressure Gas Injection EOR in the “Alberta Bakken” play; Sweetgrass area, Alberta

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ABSTRACT

The success of the Williston Basin Bakken development spawned renewed interest in the potential for contemporaneous, analogous deposits in the Alberta Basin. As a result, southern Alberta saw a rapid expansion in resources and the exploration of the evocatively named Alberta Bakken Formation; theretofore unceremoniously grouped into the widely known Big Valley-Exshaw-Banff system. Results of this exploration were largely unfruitful and proved uneconomic compared to its sister Basin. In December of 2010, however, Deethree Exploration Ltd. (now Granite Oil Corp.) discovered what has developed into the only economic early Mississippian Alberta Bakken pool in the province. Since discovery, the extent of the productive zone has been identified over a strike extending 36 miles with a primary producing pool that has been estimated to contain in excess of 470 million barrels of original oil-in-place. Upon initial oil production, details of undersaturated fluid properties, reservoir variabilities and sediment deposition and their relationship to production have become extremely important contributing factors to the ongoing development of this unique oil resource. Rapid pressure depletion and low GOR ratios sturdily pointed to an undersaturated reservoir fluid and the decision was made early in the producing life to commence a high-pressure gas injection enhanced oil recovery (EOR) scheme. Further and ongoing evaluations through complex production modelling and field observations are extremely encouraging; greatly increasing the reserves and ultimate recovery of the original oil-in-place. This early life oil play is constantly undergoing geological and production evaluation with exceptional economics, even in today's oil price reality. Granite will walk through the evolution of a large scale oil discovery, current geologic understanding (ignoring the International Border to the north), the implemented high- pressure gas injection process and its practicality. The success of the Williston Basin Bakken development spawned renewed interest in the potential for contemporaneous, analogous deposits in the Alberta Basin. As a result, southern Alberta saw a rapid expansion in resources and the exploration of the evocatively named Alberta Bakken Formation; theretofore unceremoniously grouped into the widely known Big Valley-Exshaw-Banff system. Results of this exploration were largely unfruitful and proved uneconomic compared to its sister Basin. In December of 2010, however, Deethree Exploration Ltd. (now Granite Oil Corp.) discovered what has developed into the only economic early Mississippian Alberta Bakken pool in the province. Since discovery, the extent of the productive zone has been identified over a strike extending 36 miles with a primary producing pool that has been estimated to contain in excess of 470 million barrels of original oil-in-place. Upon initial oil production, details of undersaturated fluid properties, reservoir variabilities and sediment deposition and their relationship to production have become extremely important contributing factors to the ongoing development of this unique oil resource. Rapid pressure depletion and low GOR ratios sturdily pointed to an undersaturated reservoir fluid and the decision was made early in the producing life to commence a high-pressure gas injection enhanced oil recovery (EOR) scheme. Further and ongoing evaluations through complex production modelling and field observations are extremely encouraging; greatly increasing the reserves and ultimate recovery of the original oil-in-place. This early life oil play is constantly undergoing geological and production evaluation with exceptional economics, even in today's oil price reality. Granite will

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