

A Predictive Model For Identifying High Quality SAGD Oil Sands Reservoirs – Observations From The Encana Foster Creek And Christina Lake Projects.

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ABSTRACT

A paleotopographic high on the sub-Cretaceous unconformity extends from the Foster Creek SAGD project in Township 70, Range 4W4 to the Christina Lake SAGD project in Township 76 Range 6W4 (*Fig. 1*). Informally named the Primrose Ridge, this high has a profound influence on the northerly flowing McMurray river system and associated reservoir quality of exploitable oil sands.

Foster Creek which is located along the southern most end of the Primrose Ridge consists of thick, high quality bitumen pay created by multiple stacked channel deposits. Stacking of channels is enhanced and preserved along the southern flank by channels that were forced to diverge westerly and easterly around the high. Up to 3 fluvial-dominated, stacked channels are commonly preserved within the main SAGD Foster Creek deposit. This interpretation is supported by paleocurrent data from over 300 borehole imaging logs (FMI) and examination of over 80 McMurray cores.

Christina Lake is located along the northern part of the Primrose Ridge and interpreted to be more marine influenced compared to Foster Creek. Channels associated with the McMurray system were forced to converge through this relatively narrow opening, resulting in enhanced stacking of channel deposits. SAGD exploitable oil sands deposits range from 20 to 60 m in thickness due to stacking of several channels. Paleocurrent data are derived from over 120 wells and the sedimentology of the Christina Lake area is interpreted from over 100 cored wells

Utilizing paleotopography, regional and local paleocurrent data, in combination with detailed sedimentology, provides a valuable predictive tool for predicting the quality and lateral extent of oil sands reservoirs. Identifying areas prone to sand dominated stacked channel successions helps to reduce some of the risk associated with the McMurray Formation, well known for its inherent reservoir heterogeneity. A similar approach may be appropriate for evaluating the potential of oil sands leases in other areas of the Athabasca Oil Sands Deposit.

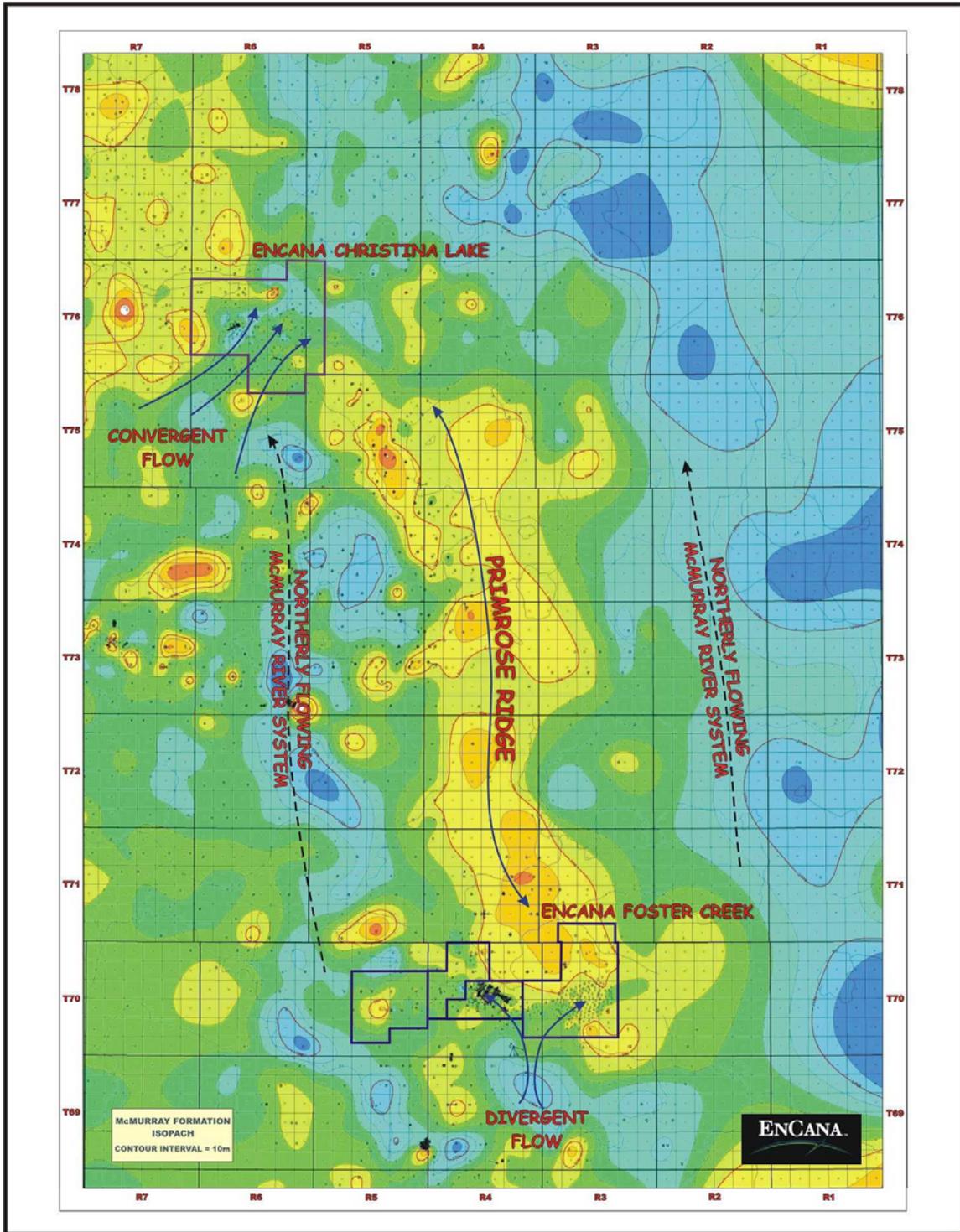


Figure 1. McMurray Formation isopach illustrating the position of the Primrose Ridge and locations of the Encana Foster Creek and Christina Lake SAGD projects.