

## **Integrated Petroleum Resource Potential and Geoscience Studies of the Bowser and Sustut Basins.**

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### **ABSTRACT**

Recent research on energy resource potential of the Bowser and Sustut basins indicates that the basin has potential for both crude oil and natural gas, and that the potential risks to the occurrence of petroleum are much lower than previously inferred from a more limited data set. New work identifying effective petroleum systems, increasing geographic coverage of thermal maturity data, initiating paleomagnetic studies, and extending geological mapping, all indicate that the petroleum potential is much higher than previously inferred. New mapping in McConnell Creek map area significantly revises distribution of upper Hazelton Group clastic rocks, assigns lithofacies assemblages to Bowser Lake Group strata, and modifies Sustut Group map distribution and structures. Thermogenic crude oil and biogenic natural gas samples characterized from diverse locations yield results that confirm a recently published revised thermal maturity model for the region and identify at least four petroleum systems with sources in the Stikine

Assemblage and younger strata. Identification of Stikinia sources and recognition of possible reservoirs in the Hazelton Group indicates that strata below the Bowser Lake Group are also prospective for petroleum accumulation. Paleomagnetic sampling of Permian to Late Jurassic strata has the capacity to recognize several periods of deformation, burial history, igneous heating and fluid migrations. The more evidence that is collected the lower the inferred risks to effective petroleum system function and the large number of total petroleum systems operating within the Basin. The Bowser Basin is well situated with respect to infrastructure and access compared to other Frontier Basins, especially as a gas pipeline already traverses the southern basin margin.