Possible Petroleum Systems in the Nechako Basin, British Columbia

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The Nechako Basin, one of several large Intermontane Basins found along the Canadian Cordillera, covers some 70,000 km2 and contains over 3000 m of Mesozoic and Cenozoic clastics. These represent overlap successions deposited after accretion of volcano-sedimentary terranes along the western edge of North America. Jurassic and Cretaceous sequences are composed of marine and fluvial-deltaic clastics whereas Cenozoic sediments represent fluvial and possibly lacustrine environments. Mesozoic stratigraphy is locally dominated by volcanics and succeeded by widespread Eocene and Miocene age flood basalts.

Thermal maturity levels within Cretaceous subsurface and surface sequences are within the oil and gas windows. Drilling in Cretaceous sediments encountered hydrocarbon shows in the form of oil stains and inclusions, and gas. Analysis of oil inclusions within sedimentary rocks has identified several oil families and suggests hydrocarbons moved through the stratigraphic sequence. Analysis of a surface tar occurrence within Tertiary volcanics of the northern Nechako Basin is equivocal with respect to its origin due to the lack of diagnostic light petroleum fractions.

No high quality source bed has yet been encountered in the subsurface. Analyses of organic matter in well cuttings indicate a gas prone system. Recent field work has recognized Early to Middle Jurassic clastics along the southern part of the Nechako Basin which have high residual organic carbon suggesting they may have expelled hydrocarbons at lower maturities.