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Fifty Shades of Grey: Utilizing "Conventional" Sedimentology and Sequence Stratigraphy to unlock rock quality to reservoir quality relationships in the liquids rich Duvernay Shale play, Kaybob Alberta Canada

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Abstract

The Duvernay Formation of Alberta is a mudrock reservoir that produces oil and gas from mature to overmature oil-prone source rocks. What makes the Duvernay Formation particularly attractive as a "shale" play like its American cousin the Eagle Ford Formation is its ability to produce significant volumes of liquids due to it's over pressured nature. The highest reservoir quality within the Duvernay is developed in high total organic carbon (TOC), siliceous mudstones. A strong positive correlation between silica content and TOC in the siliceous mudstones indicates a biogenic rather than detrital source for much of the silica and produces a higher modulus, brittle rock amenable to fracture stimulation (Dunn et al., 2012). A strong positive correlation between increased reservoir quality and TOC indicates an organo-porosity system analogous to the Barnett and Marcellus (Dunn et al., 2012).