

## **Improved Shale Gas Production Forecasting using a Simplified Analytical Method - A Montney Case Study**

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### **Introduction**

Arps' Decline Curve Analysis (DCA) has been the standard for evaluating expected ultimate recovery (EUR) in oil and gas wells since the 1950's. Although this method has served the conventional petroleum industry well, its application to fractured low permeability (tight and shale gas) reservoirs with less than 1 year of production data has proven exceptionally difficult, often yielding ambiguous results. The applicability of DCA is limited to wells exhibiting boundary dominated flow, unless special, modified decline curves are used. Shale gas wells with limited production data commonly exhibit infinite acting flow, and are therefore not suitable candidates for the standard Arps decline curves. The modified decline curves require the assumption of a limiting decline rate, which is usually not known. The misapplication of these methods to shale gas production forecasting has caused both overly optimistic and overly pessimistic reserve estimates. Yet, the Arps method persists, primarily because of its simplicity and familiarity within the oil and gas industry.

A straight-forward analytical method will be shown to dramatically improve the reliability of early-time shale gas production forecasts without compromising ease of application. The method is based on identifying flow regimes and applying appropriate (but simplified) predictive models based on the physics of fluid flow. It will be demonstrated that this method can provide reliable production forecasts with uncertainty clearly quantified. Example Montney shale gas production data sets will be presented to validate the method.