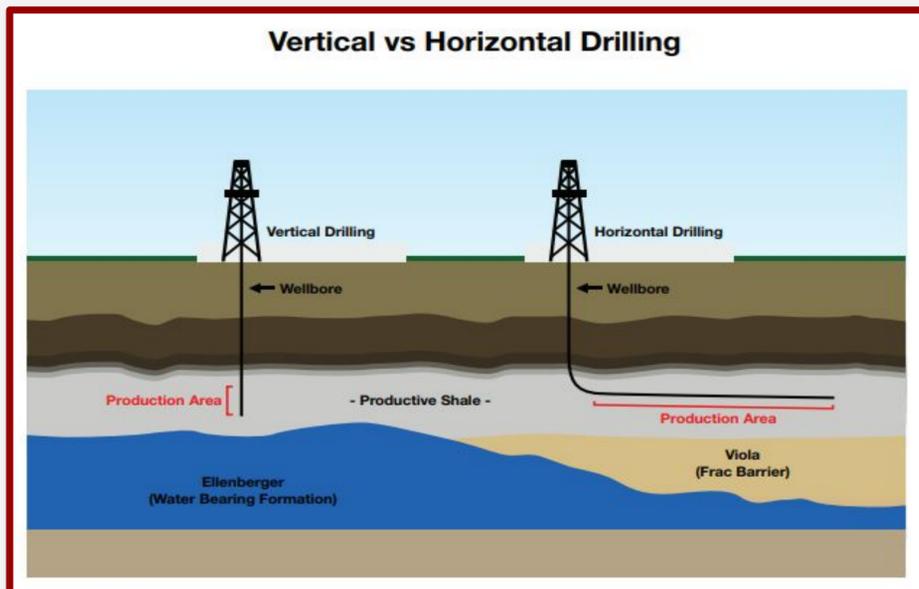


Well Testing and Production Decline Analysis for Horizontal Wells in Saskatchewan

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Horizontal drilling is drilling a well from surface to subsurface then deviating the wellbore to intersect the reservoir at near horizontal inclination. Horizontal drilling exposes more reservoir rock than vertical drilling. On the other hand, vertical drilling is used to access oil and gas that is below a site and is drilled downwards.



[Vertical-vs-horizontal-wells.png](#)

What is a Well Test?

Well testing is defined as a time period during which oil/gas well production is measured/monitored at the wellhead using movable well testing equipment. It is common practice that well tests are done by changing rate and noticing the pressure change.

Objectives:

- ❖ To understand reservoir characteristics with well test analysis.
- ❖ Look into production decline analysis curves into understanding.
- ❖ Matching the original data from Accumap with the results from KAPPA for matching.

Production decline analysis is a method of getting trends from data collected during production and the main reason for doing this is to predict future production from the well.

Basics of Type Curve Analysis:

Type curve examination comprises of finding a type curve that matches (or tries to match) the true and actual response of the well.

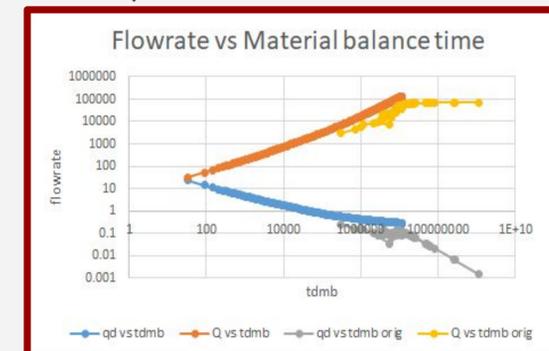
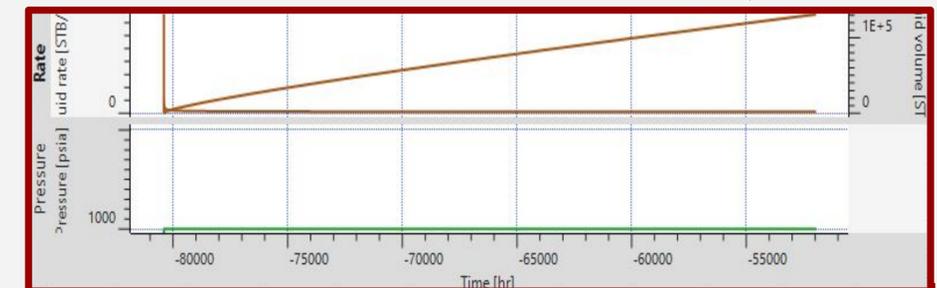
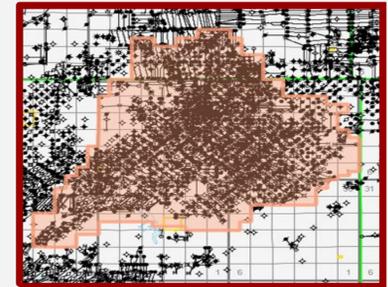
Design:

Using Kappa to generate plot and data which is converted to dimensionless time and rate. The new plot from dimensionless properties is compared to the original data from accumap for systematic matching of production decline data used to understand reservoir properties.

In this project we chose three horizontal wells in saskatchewan and we used them to generate data which were then matched.

Methodology & Result:

Using Accumap, a reservoir was found and studied. After getting data from Accumap, it was input KAPPA Topaz.



After stimulation, data is exported into excel and history marching is performed.

Conclusions:

After applying history matching method, the plots of KAPPA match the original plots of the reservoirs but a perfect match wasn't obtained due some assumptions.

References:

- <https://www.valuethemarkets.com/2019/09/11/back-to-basics-a-guide-to-the-different-types-of-wells-used-by-oil-gas-companies/>
- <https://www.investopedia.com/terms/v/verticalwell.asp#:~:text=like%20the%20name%2C%20horizontal%20wells,degrees%20to%20a%20vertical%20wellbore>