




CASE STUDY

Rapid Diagnostics and Rapid Lookbacks in the Duvernay Formation



CASE STUDY | PROJECT SUMMARY

Subsurface Dynamics was tasked with identifying the critical performance drivers on a series of offsetting Duvernay wells showing dramatically different productivity over the first 18 months of production.

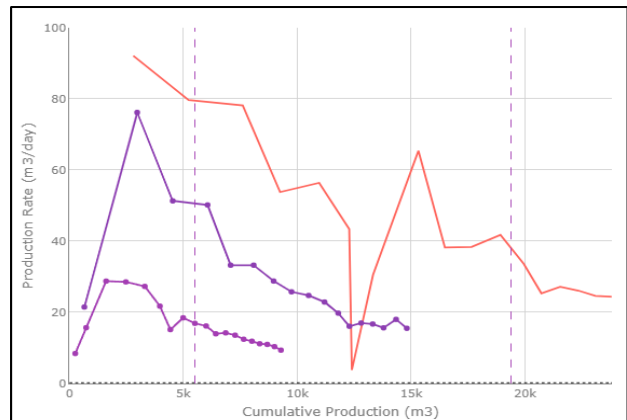
-  CLIENT : **Artis Exploration**
-  FIELD : Twining, Alberta
-  DATE : 2022-2023

CASE STUDY | PROJECT SCOPE

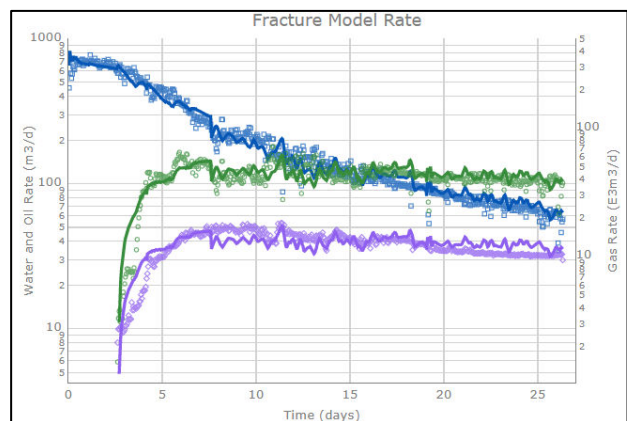
STAGE 01 : SSD utilized its proprietary flowback analysis (FBA) workflow and software platform (Athena FBA) to provide rapid, cost-effective diagnostics to differentiate between hydraulic fracture efficacy and reservoir quality. Analysis utilized typical post-frac production test data previously collected by Artis (0 added field costs).

STAGE 02 : SSD implemented simplified numerical simulation to provide confirmation that the critical fracture and matrix parameters estimated from the short-term flowback data could reproduce the productivity trends observed in the field, without sacrificing on execution time or cost.

18 Month Oil Rate-Cumulative for 3 Study Wells



FBA History-Match on Top Performing Study Well





ABOUT
SUBSURFACE
DYNAMICS


Subsurface Dynamics (SSD) is an independent Advanced Reservoir Engineering and Technology Development firm with extensive expertise in reservoir characterization, static modeling, dynamic simulation, integration, and optimization.


We provide a full spectrum of engineering services from data acquisition to a final full field development programs and optimization.

CASE STUDY | RESULTS

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The executed completions and petrophysical formation properties of the study wells were comparable. Outperforming well was completed with tighter cluster spacing – remains critical to avoid over-capitalization and detrimental cluster interference while pumping.
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Based on the rapid FBA diagnostic, the outperforming well showed moderately higher residual fracture conductivity (after damage) and matrix permeability, while showing significantly larger conductive fracture area.
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Analysis indicates that well performance is driven primarily by hydraulic fracture conductive area. No degradation in fracture conductivity or geometry associated with tighter cluster spacing.
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Study provided critical insights into well performance and optimal completion design at a fraction of the cost of fully integrated analysis.

Comparison of Fracture and Matrix Parameters Estimated Using FBA

% Difference Well 2 vs. Well 1	
Fracture Conductivity	+14%
Total Fracture Area	+55%
Conductive Frac Area/Frac	+33%
Matrix Permeability	+25%
18 Month Cum Oil	+155%

ABOUT ATHENA FBA



FBA is a state-of-the-art technique providing rapid diagnostics and rapid lookbacks to help you get ahead of capital spending. Without incurring additional field costs, it provides critical insights 6-12 months sooner than conventional methods.

Athena FBA is a streamlined, simple to use cloud-based software package that is integrated into SSD's AETHEN.IO platform. AETHEN.IO was developed with a focus on data integration, automation and producing high quality outputs from typical engineering workflows, with limited manpower and intervention.

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