Wednesday, September 23, 2020

Virtual Meeting via Zoom
12:00 –1:00 p.m.
HGS Members $10 Non-Members $30 Students $5
https://www.hgs.org/civicrm/event/info?id=2228
Registered Attendees: A confirmation email will be sent upon registration with meeting links.
Event contact: Bryan Guzman – vice.president@hgs.org

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A New Methodology to Determine Well Spacing in Unconventional Reservoirs - A Delaware Basin Study

Well spacing and its impact on performance degradation is currently an area of critical concern in unconventional reservoirs. A new methodology to estimate well spacing and optimum completion design based on local geology from readily available data is presented. The significant outcomes of this workflow are the ability to rank well performance, impact of geology/landing target, changes in pressure regimes along the lateral relative to an existing similarly landed producer.

At the core of this methodology is the innovative estimation of additional pressure induced from stimulation treatment long after closure when there is no more fluid leak-off into the matrix. This estimation is achieved through time dependent leak-off data that are usually available after stimulation. Multidisciplinary components like petrophysical properties, PVT, DFITs, geomechanical modeling and their uncertainties are stochastically engaged to realize the most probable stimulated rock volume (SRV).

A Delaware Basin Wolfcamp case study comprising of 10 wells is presented and the results obtained through the methodology are summarized below.

- The would-be relative underperformers were identified immediately after the frac job.
- The local faults/ fractured zones were identified and reaffirmed with seismic and well data.
- Identified the impact of geology on completion variables.
- The evaluated pressure regimes along the horizontal were corroborated by well performance.
- Correlated the landing zone impact to stimulation.
- The appropriate well spacing and optimum completion design to minimize well interactions were determined, specific to local geology and landing targets.

Present industry solutions to well spacing involve expensive geomechanical earth modeling or frac geometry monitoring that are time consuming, data intensive and unfortunately geography specific. The new methodology presented is quicker and requires no new data collection than those that are routinely gathered. ■

Biographical Sketch

Dicman Alfred is currently the Director of Subsurface for SOTAOG, heading the real-time production optimization and predictive analytics group. He has 18 years of unique expertise in Geoscience and Engineering domains. His areas of focus include business development, petrophysical modeling, inter-discipline integration, geo-cellular modeling, analytical reservoir performance analysis, production optimization, completion design, data analytics and machine learning. Recent experiences include involvement as a Technical Advisor from acreage acquisition to development for Scala Energy, Senior petrophysicist with the Upstream Technology Worldwide Petrophysics group at Marathon Oil, Engineering lead for Eagle Ford field development and Team lead for field studies in Woodford, Eagle Ford and Austin Chalk. Prior to joining Marathon, he worked as a wireline field engineer for Halliburton Energy Services and as a Petroleum Engineer for Schlumberger Information Solutions. He holds a Master's Degree in Petroleum Engineering from Texas A&M and a Bachelor's Degree in Mechanical Engineering from Indian Institute of Technology, Chennai.