Infill Wells – Manage spacing and timing while limiting fracture driven interactions

6X: Model pads to determine infill well spacing and bench development sequencing

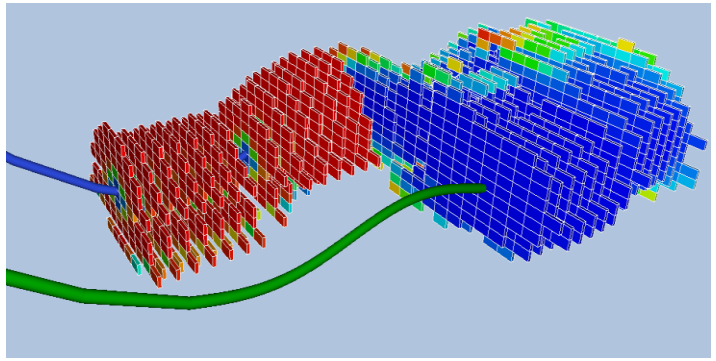
Operators are focused on multi-well infill pad development programs to develop drill spacing units (DSUs) using fiscal discipline to generate free cash flow. Infill well design, spacing and timing become critical. Infill wells are impacted by the parent well pressure depletion and the associated change in the stress magnitude in the depleted drainage area.

Infill wells drilled offset to parent wells have experienced slurry loss during treatment due to fracture-to-fracture interactions between the infill and parent well hydraulic fractures. The change in stress magnitude leads to asymmetric fracture growth from the infill well into the depleted region of rock around the parent well.

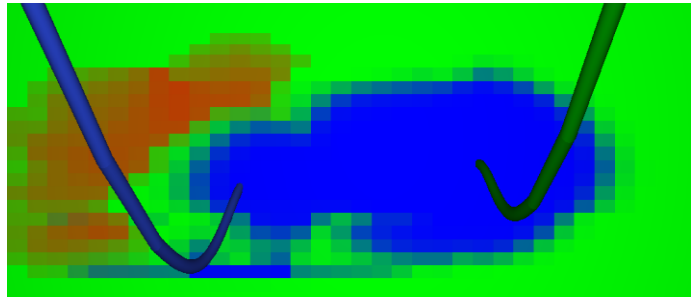
These effects typically impair the performance of the infill well. Fracture driven interactions (FDIs) that lead to proppant reaching the parent well are detrimental, eroding pad production efficiency and value.

6X: Infill well spacing and timing to optimize for economic value through pad models

6X has the unique ability to model the changes in saturations, pressure and net mean stress simultaneously in one model. This capability can be used to optimize an infill well pad development program for multiple benches for a DSU. 6X captures the fracture driven interactions as the change in net mean stress is modeled through the infill well treatments and the depletion phase. The model dynamically captures the fracture opening; the propping at the end of the treatment; the compression of the fracture pore volume during depletion; and the loss of fracture conductivity with reservoir depletion. Stochastic multiple realization sensitivities can be performed using a single 6X license to assess the impact of treatment design on FDIs; the infill well count; spacing; the infill well timing; zippering and the impact of different operating strategies to understand and optimize the economic return on investment or net present value.



Example of interference on parent well from infill well



Ternary plot showing fracture to fracture interference

6X Infill Well and Pad Model Functionality:

- Optimize infill well spacing and timing
- Design selection: cluster spacing, clusters per stage and treatment volumes
- Hydraulic fracture treatment model including limited entry
- Dynamic stress change through hydraulic fracture treatment and depletion
- Proppant transport and proppant trapping model
- Fracture conductivity dynamically changes as hydraulic fractures are formed and close
- Infill well fracture driven interactions between infill and parent wells

Use 6X to optimize infill well design, spacing and timing with multi-well pad models.

Optimize your infill well pad development across multiple benches for optimal return on investment and well performance; minimize fracture driven interactions and maximize the value of drill spacing units.

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