# Optimized Approaches to Drilling and Completing Horizontal Wells in the Niobrara Formation, Denver Basin

Deacon, Marshall[1*]; McKay, Paul[2] (1) Noble Energy, Denver, CO; (2) EnCana , Calgary, Alberta, Canada.

Horizontal drilling activity in the Niobrara Formation in the DJ basin has exploded in the last couple of years. Understanding the key technical elements is critical for a successful horizontal well program. The key elements for unlocking the horizontal well potential of the Niobrara will be discussed in this talk and include target zone and reservoir stratigraphy, azimuth, lateral length, present day maximum horizontal stress direction, and the impact of preexisting faults and fractures.

Niobrara horizontal wells completed by several operators across the basin have tested multiple concepts to determine the optimal direction and target zone for the Niobrara. Stratigraphic and lithologic changes, fault and fracture patterns, GOR, stress direction, and stimulated rock volume have a direct correlation to well production. Fracture stimulation microseismic and radioactive tracing studies reveal a stimulated fracture network that varies locally and regionally across the basin. Results from a 10 acre vertical well pilot study demonstrate the complexity of the reservoir and provide insight into potential horizontal well spacing, both vertical and lateral.