Forensic chemostratigraphy: a tool to determine lateral well bore placement

Gemma V. Hildred[1], Nahysa Martinez-Kulikowski[1] and Brian A. Zaitlin[2]

[1]*Chemostrat Inc., Houston, TX*
[2]*Native American Resource Partners, Calgary, AB*

Abstract

This study tests the efficacy of using chemostratigraphy to remain in zone during horizontal drilling, utilizing an example from the Alberta Bakken Petroleum System (ABPS) of SW Alberta. Whole rock geochemical data has been acquired from three vertical wells and one associated lateral that penetrate the Banff, Exshaw, Big Valley and Stettler formations. As is the case with many resource plays, these formations are best exploited using multilateral drilling techniques. However the lack of offset drilling causes difficulty in stratigraphically targeting key zones, which in this case is the dolomitic interval of the Big Valley Formation. This study demonstrates how whole rock inorganic geochemical data can be used to characterize and correlate the Mississippian-Devonian sequences of southern Alberta encountered in three vertical pilot holes, and how the geochemical data can then be used as a "forensic" tool to determine if key stratigraphic units have been penetrated along the length of a 1km lateral well bore.