

February 21, 2019

***“Unconventional Petroleum Potential in the Mowry Shale, Southern Powder River Basin, Wyoming”***

**Abstract**

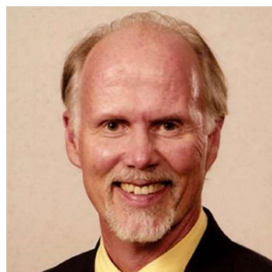
The Mowry Shale has long been recognized as an important source bed in the Rocky Mountain region. The Powder River Basin has a long history of production from mainly Cretaceous reservoirs sourced by the Mowry Shale. New technology (horizontal drilling and multistage hydraulic fracture stimulation) is now being used in the Mowry Shale. Momper and Williams (1984) calculated that the Mowry generated about 170 billion barrels of oil and expelled about 11.9 billion barrels (7% expulsion efficiency) of oil from 10,500 square miles effective source area in the Powder River Basin. The high generated and expelled numbers suggest potential for a large unconventional, continuous accumulation in the Mowry Shale.

The Mowry Shale is a highly siliceous mudrock. The siliceous nature of the Mowry is due to diagenesis (silica cement), detrital silt-sized quartz, and recrystallized radiolaria. The high silica content impacts the mechanical rock properties of the Mowry Shale.

The Mowry Shale has these attributes that are similar to other proven shale plays: good TOC content (2-5 wt. %), adequate thickness (150 - 200 ft across the basin), hydrocarbons of thermal origin, abnormal pressure, generally lacking in produced water and down dip water, low permeability and porosity matrix, favorable mechanical stratigraphy, presence of fractures, current fields with diffuse boundaries, inverted petroleum system, gas-oil-ratios greater than 1000 cubic feet per barrel, historic conventional systems present, and relatively tectonically quiet.

**Our Presenter**

***Stephen A. Sonnenberg, Colorado School of Mines***



Stephen A. Sonnenberg is a Professor of Geology and holds the Charles Boettcher Distinguished Chair in Petroleum Geology at the Colorado School of Mines. He specializes in unconventional reservoirs, sequence stratigraphy, tectonic influence on sedimentation, and petroleum geology. He is the director and principal investigator of the MUDTOC consortium at CSM. A native of Billings, Montana, Sonnenberg received BS and MS degrees in geology from Texas A&M

University and a Ph.D. degree in geology from the Colorado School of Mines. Steve began teaching at Colorado School of Mines in 2007 after working in the petroleum industry for over 25 years.

Steve has served as President of several organizations including the American Association of Petroleum Geologists, Rocky Mountain Association of Geologists, and Colorado Scientific Society.