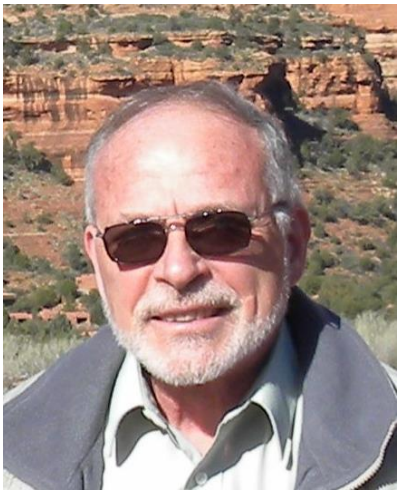
MGS Luncheon Meeting

Wednesday, May 22nd

12:00 Noon – Billings Petroleum Club



Please join us!

- **Lunch is $10 for MGS members, $14 for non-members**
- **Talk is always free**

RSVP – montanageologicalsociety@gmail.com

ERIC JOHNSON

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As Shale Plays Lose Their Luster, Will Conventional Oil Plays Again Become Relevant For Small and Mid-sized Oil Companies?

Horizontal drilling and fracing of oil shales have driven the oil industry during the past 20 years. In 2000, the Bakken Shale Play began at Elm Coulee, Montana and spread into North Dakota. Drilling and fracing technology improved very rapidly and was quickly applied to other basins throughout the U.S. All you needed was a mature oil shale. Horizontal drilling and fracing created the porosity and permeability to liberate the entombed hydrocarbons. Viewed as oil "mining" and a no-risk, sure bet by investors, these "unconventional resource plays" stripped away all the investment capital from conventional oil plays.

But growing pains are now evident for U.S. shale producers. Profitability has become driven by economies of scale and smaller companies are being bought out (or forced out) by the largest companies. New wells are underperforming, and impacting the production of older wells, resulting in projected revenues being grossly overstated. Harrold Hamm, CEO of Continental Resources, predicted that the growth in oil production during 2019 could decline by 50 percent compared to 2018 (Nick Cunningham, OILPRICE.com, Jan. 24, 2019).

Because of the huge increase in the number of shale wells drilled, and the precipitous declines associated with those wells, companies are spending more than half of their capital budgets simply replacing lost production. That amount is expected to reach 75% by 2021 and eventually reach 100 percent, causing some analysts to refer to shale oil development as a Ponzi scheme (Kurt Cobb, OILPRICE.com, Jan. 28, 2019).

As more investors turn away from the shale plays, capital could be freed up to fund promising conventional oil opportunities. Montana has several underdeveloped oil-rich areas where conventional oil prospects have been largely ignored during the last two decades while the industry has been fixated on shale plays.

One area in northwestern Montana includes Glacier County and the Kevin-Sunburst Dome. This area generated well over 3 billion barrels of oil from the Bakken Shale, but unlike northeastern Montana, the oil did not remain trapped within the Bakken strata. It migrated into adjacent formations and filled conventional structural and stratigraphic traps, where over 350 MMBO have been produced so far. The

Devonian Nisku Formation is hydrocarbon-saturated over the entire 1000 square mile structure of the Kevin-Sunburst Dome, but the dome has been sparsely drilled, averaging only 3-4 Nisku wells per township. Over 1 MMBO of Nisku oil has been produced from two oil fields, with wells averaging more than 50,000 BO each from 3,000 ft deep. Two fields in a thousand square miles indicate that more Nisku opportunities abound.

Another huge oil-rich region exists in northeastern Montana and Western North Dakota, where Mississippian Lodgepole mounds (reefs) and Devonian Nisku drape structures are found, both associated with salt-dissolution features created by the Devonian Prairie Evaporate. Those structures appear to be randomly scattered but can be readily imaged by 3D seismic data to minimize risk. The Lodgepole mounds at Dickinson, ND are legendary, producing 3 and 4 MMBO per well from about 9,800 ft deep. In Roosevelt County, Montana, 8 Nisku oil fields have resulted in 21 oil wells averaging over 1 MMBO each from about 7,200 ft deep.

Biography

Eric Johnson has been exploring for oil and gas for 45 years beginning with Union Oil Company (Unocal) in 1973, first in Los Angeles, then Indonesia, Louisiana, and Casper, Wyoming. He moved to Billings, Montana in 1982 and worked for Meridian Oil, the BLM, and the Balcron Oil Division of Equitable Resources. In 1997 he formed Johnson Geophysical Ltd. and has been an independent geological and geophysical consultant since that time.

Eric received a BS Degree in Geophysical Engineering (geology minor) from Montana Tech in Butte and a MS Degree in Geophysics from the University of Utah. He is a Wyoming Registered Professional Geologist.