

Niobrara Shale,

North American unconventional-oil plays have gained increased attention as results improve. One of the plays explorers are closely monitoring is the Cretaceous Niobrara shale in the Rocky Mountain region.

People have long known that the Niobrara is thick, rich in organics and thermally mature. Oil has flowed from the Niobrara since the dawn of the industry: Florence Field, near Canon City, Colorado, was discovered in 1876 near an oil seep. Florence produces from fractured Pierre shale, part of the Niobrara formation. Oil pioneers also found the Niobrara productive at Salt Creek, Teapot Dome, Tow Creek and Rangely fields.

Today companies are chasing the Niobrara with new fervor. Lots of buzz is surrounding EOG Resources' Jake well, a horizontal Niobrara discovery in Colorado's Weld County, in the northern Denver-Julesburg Basin. According to state records, the well, in Section 1-11n-63w, flowed an average 1,750 bbl. of oil and 360,000 cu. ft. of gas per day for its first eight days on production in October 2009. The next month, it made an average of 680 bbl. per day for 30 days.

In addition to the D-J Basin, active exploration is ongoing in the southern Powder River Basin in Wyoming, and in Colorado's North Park, Sand Wash, Piceance and Raton basins.

There are plenty of places to prospect for Niobrara, as the shale occurs across a vast, tectonically active area. It can be anywhere from 150 to 1,500 feet thick, and its TOC ranges up to around 5%. It contains Type II kerogen. Additionally, the Niobrara contains a high proportion of carbonates, including brittle, calcareous chalk benches. These appear to enhance its porosity and its ability to be fractured, by both natural and mechanical processes. And the tremendous tectonic legacy of the central Rockies region means that natural fracturing can be extensive.

Finally, the thermal maturity of the Niobrara varies, so it can yield either oil or gas or both, depending on local conditions. The shallow, biogenic Niobrara gas play in the eastern Colorado and western Kansas portion of the D-J illustrates how rapidly reservoir conditions can change within this enigmatic and fascinating formation.

We're sure to hear much more about the Niobrara in months to come, as results are posted from a number of significant tests across several play types and basins.