

Analysis of a Long Cane Creek Horizontal: New Insight into an Unconventional Tight Oil Resource Play, Paradox Basin, Utah

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A recent 5,600-ft Cane Creek horizontal well drilled by Whiting Oil & Gas provides new insight into the Cane Creek tight oil resource play in the northwestern Paradox Basin. The Threemile # 43-18H well was drilled in early 2009, approximately 20 miles southeast of the Long Canyon, Bartlett Flat, and Big Flat producing fields. Sidewall cores from the vertical pilot hole showed good reservoir storage potential in dolomitic siltstone intervals with porosities of 8 to 13 percent, permeabilities between 10 and 50 microdarcies, and 20 to 35 percent water saturation. Interbedded mature source rocks sampled from this and the nearby Gibson Dome # 1 well indicate a range of from nearly pure Type II kerogen to a mixture of Type II and Type III kerogen with up to 44 percent TOC.

Three hundred ft of salt overlying the Cane Creek and 80+ ft of salt below provide the necessary top and bottom seals for the petroleum system and were viewed as potential hydraulic fracture barriers as well. Mud weights progressively increasing from 11.5 to 15+ ppg were required during horizontal drilling, and a later DFIT analysis determined a formation pressure gradient of 0.938 psi/ft. Strong hydrocarbon shows during horizontal drilling included a steady flare up to 25 ft in length, oil over the shakers, and an overall 600 bbl pit gain. An uncemented liner with swell packers was run in the horizontal wellbore and the Cane Creek was frac stimulated over eleven 500-foot stages, each with 110,000 pounds of proppant and 2,000 bbls of gel. Although the Threemile # 43-18H well is producing oil and gas, it also produces a significant NaCl brine cut, an indication that the stimulation propagated into a nearby water-bearing zone. Several candidates for over-pressured water sources of unknown volumetrics were observed through cored salt sections in the Gibson Dome # 1 well. Observations point to technological solutions as a key to the success of the Cane Creek tight oil resource play.