The Niobrara and Mesaverde Petroleum Systems in the Piceance Basin, Colorado

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ABSTRACT

The Mesaverde gas accumulation in the Piceance Basin is one of the largest continuous tight-gas accumulations in the world. Unlike tight gas resources in some other basins (e.g., the greater Green River Basin), commercial production doesn't appear to be limited to specific fairways or sweet spots. There appears to have been a sufficient gas source within *in situ* coals and underlying marine shales to pervasively gas charge up to 3500 ft of the Mesaverde. With the advent of new production techniques gas production grew from less than 200 MMCFD in the mid-1990s to a peak of 2300 MMCFD in 2012. Increased density has greatly increased the number of potential locations, with much of the deeper part of the basin being approved for 10-acre density.

Underlying the Mesaverde are the thick marine shales of the Mancos and Niobrara formations. Beginning in 2005 numerous vertical wells tested high gas rates from zones near the base of the Niobrara to the middle of the Mancos. Since 2008, most Mancos-Niobrara tests have horizontal wells, and various horizontal targets within this 2000-5000 ft thick interval have produced up to 16 MMCFD. The most prolific horizontal wells have been in the deeper dry-gas window, with poorer results in wells that have tested the more liquids-rich basin margins. A notable exception was the Endeavour 23-3-97-1 Wiley wildcat in the northern Piceance, which IPed for 805 BOPD and 1.8 MMCFD in 2014.