

Sedimentology, Ichnology, Depositional Environment Interpretation, and Reservoir Characterization of the Cotton Valley Sandstone in the Amoco Grace Lowry #1, Harrison County, Texas

Bagley, Justin ¹; Henk, Bo ¹; Holbrook, John ² (1) Geology, Matador Resources, Dallas, TX. (2) Geoscience, UTA, Arlington, TX.

The Cotton Valley formation in east Texas and north Louisiana is a proven hydrocarbon producing tight gas sand reservoir. Understanding the depositional environment, sandstone body geometries and reservoir properties are important for exploration and development. Two hundred and thirty eight feet of conventional core, over the Cotton Valley sandstone interval, was described and interpreted from the Amoco Grace Lowry #1, located in Harrison County, Texas. The sedimentology and ichnology as well as the net sandstone isopachous maps provided the basis for the depositional environment interpretation. Core plug derived porosity and permeability, electric logs, and thin sections were utilized for reservoir characterization. Three separate sandstone intervals were identified and referred to as the Roseberry, Davis I, and Davis II sands. These are part of the massive undifferentiated Cotton Valley sands. The best quality reservoir sands were identified in the Davis I and are interpreted to be deposited within a shallow marine shoreface environment. The poorest reservoir quality sandstone is within the Roseberry interval and is interpreted as a reworked delta front system. Grain size, cementation, chlorite clay grain coating and clay distribution are the primary controls for reservoir quality.