Geophyical and Geostatistical Modeling of an Incised Valley in the Anadarko Basin

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We evaluated more than 150 well logs including density, porosity, resistivity, and gamma ray and integrated the results with seismic attributes such as coherence, volumetric curvature, and RMS amplitude from seismic data to improve our understanding of the Red Fork formation incised valley morphology and assess our ability with the data available to model each one of the incised valley stages. In addition, acoustic and elastic impedance volumes were generated from pre- and post-stack seismic data to better understand the lateral variation of impedance within the incised valley. We use the results from the impedance inversions along with the well and petrophysical analysis as input for the geostatistical analysis to derive facies, porosity, permeability and water saturation models for the Red Fork formation. The use of this variety of attributes over the Watonga survey helped improve the interpretation the channels as well as aided in identifying low and high porosity zones. Consequently, this work provided a better characterization of incised valley and served to identify low and high porosity zones ultimately validated with production data.