

A Geologic Play Book for Utica Shale Appalachian Basin Exploration

Abstract

Subsurface Mapping and Correlation through Geophysical Log Analysis

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A large, regionally extensive IHS Petra® software database was constructed using information from 10,416 wells within the Appalachian basin and surrounding crustal arch provinces. To aid in regional correlation, geophysical well logs were obtained for 1,978 of the wells (the vast majority of which were in digital LAS format) and loaded into the Petra project. This enabled project researchers to extend well-log-based stratigraphic interpretations for the Kope Formation, Utica Shale, Point Pleasant Formation, upper Lexington/Trenton Formation and Logana and Curdsville members of the Lexington/Trenton Formation from their mapped exposure areas into the subsurface. In addition, researchers studied the Upper Ordovician stratigraphy on outcrops in the Maysville, Kentucky area and interpreted Upper Ordovician stratigraphy for three continuous cores from Kentucky. The Upper Ordovician intervals of two of these (C-209 in Montgomery County and C-316 in Pulaski County) were photographed in 10-foot intervals for visual analysis. These detailed analyses facilitated the research team's understanding of depositional and facies characteristics of the Utica and Point Pleasant formations, and how those characteristics might be expressed within typical log suites. Following the log correlations for individual wells, regional structure and isopach maps were prepared for each of the six relevant stratigraphic units.

Citation

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