

# **Paleomagnetic Dating of Burial Diagenesis in the Deseret Limestone and the Timing of Migration to the Tar Sand Triangle, Utah**

By

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The main objective of this study is to test if widespread remagnetization in the Mississippian Deseret Limestone, a source rock for hydrocarbons, corresponds to the modeled early Cretaceous age of maturation. A second objective is to determine if the reservoir rock, the White Rim Sandstone of the Tar Sand Triangle, contains a remanent magnetization that is related to hydrocarbon migration. The Delle Phosphatic Member of the Deseret Limestone entered the oil window in the early Cretaceous during the Sevier orogeny based on modeling studies. Paleomagnetic results from central and western Utah indicate that the unit contains two chemical remanent magnetizations (CRMs) that reside in magnetite. Three fold tests from western Utah indicate a pre-folding CRM that is Triassic to Jurassic in age. Preliminary petrographic and geochemical studies indicate that orogenic type fluids have not altered these rocks. The age of the CRM is prior to the modeled time for organic matter maturation in central Utah to the east of the folds. This CRM is interpreted to be the result of burial diagenesis and/or an early stage of organic matter maturation. A second younger CRM in western and central Utah is post-folding based on a regional fold test. This CRM is of Cretaceous age and the timing coincides with the oil window based on thermal modeling. These results are consistent with a connection between organic matter maturation and remagnetization but also suggest that other burial diagenetic processes may be involved in acquisition of CRMs. Preliminary studies of the White Rim show only a single component that appears to be modern.