



Elemental Chemostratigraphy of Allochthonous Carbonate Gravity Flows of the Wolfcamp Formation (Lower Permian) in Crockett County, Texas

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ABSTRACT

Gravity induced deposition including debris to grain flows are important stratigraphic traps for hydrocarbons reservoirs. They can be explored using fourth-order sequence stratigraphy and are abundant across platform and basinal deposits. Studying these gravity deposits along the Central Basin Platform margins in Texas can also provide a connection between Delaware and Midland Basin deposits. Using elemental data, rock properties that impact reservoir quality such as mineralogy can be determined, especially when conventional testing of lithostratigraphy cannot be utilized. This study utilizes six cores containing the Cisco (Upper Pennsylvanian) Formation and the Wolfcamp (Lower Permian) Formation from the southernmost point of the Central Basin Platform in northeast Pecos County and northwest Crockett County, Texas. High resolution elemental analysis will be conducted using nondestructive handheld X-ray fluorescence (XRF) along with total organic carbon (TOC), X-ray diffraction (XRD), and thin section petrography at resolutions based on sequence cycles determined by XRF. Thin section petrography will identify lithostratigraphy, diagenetic properties, and mineralogy. Interpretation of sequence cycles, depositional conditions, and mineralogy will be used to evaluate small-scale fluctuations in sea level changes due to Milankovitch cycles and redox-sensitive trace metals in organic material of the Wolfcamp Formation.