

## **Sedimentologic Expression of the Upper Cretaceous Pre-Aruma Unconformity; A Subsurface Example from Northeast Saudi Arabia**

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### **ABSTRACT**

The Pre-Aruma Unconformity corresponds to an important tectonic event that occurred during the late Cretaceous as a consequence of ophiolite obduction in the northeastern part of the Arabian plate. Sedimentary facies observed at the boundary between the top of the Wasia Formation and the overlying Lower Aruma Formation show a significant range of features. The contact between the two formations is interpreted to be a merged sequence boundary 'unconformity' due to folding and uplift of adjacent areas, followed by a transgressive surface of erosion as a consequence of wave ravinement during transgression. The sequence boundary is marked by an erosional surface with various oxides, shrinkages cracks, fractures, stylolite, and vugs filled by sandstone and dolomite. The transgressive surface of erosion is characterized by a diverse assemblage of reworked components composed of various rip-up pebble clasts 'lag', shells debris, phosphate grains, coarser and poorly sorted sand grains, glauconite grains and occasional burrows. The overlying thin sedimentary succession is composed of calcareous sandstone with shells debris and glauconite grains that represents the transgressive system tract. Structural control and the followed retrogradational sedimentary processes has led to the local formation of tectono- stratigraphic traps were hydrocarbons have been trapped.