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**Paleo-Reservoir Characteristics and Diagenetic Bleaching in the Jurassic Navajo Sandstone, Southern Utah**

Landsat TM satellite imagery and detailed field mapping indicate diagenetic removal of iron oxides in the Jurassic Navajo Sandstone of Southern Utah on regional, formation scales to localized, laminae scales. Bleached redbeds have long been associated with the presence and migration of hydrocarbons. Bleaching patterns in the Navajo Sandstone suggest that this unit was a major paleo-reservoir due to its relatively thick, homogeneous, and permeable nature, yet fluid migration patterns were both constrained and independent of internal stratification.

The most extensive regional bleaching correlates with Laramide structural uplifts including the Kaibab uplift, the Escalante monocline, the Waterpocket Fold, the San Rafael Swell, and the Comb Ridge monocline. Regional bleaching patterns indicate that Laramide structures served as conduits for hydrocarbons. In areas where the Navajo Sandstone is exposed between these structural highs, changes in sandstone color appear to be stratigraphically controlled. The Navajo Sandstone is generally moderate red-orange low in the section, and becomes increasingly bleached towards the top, correlating with a shift from muddy and fine-grained sabkha facies in the lower part of the formation to more permeable fine- to medium-grained dune field facies in the upper part of the formation. Some bleaching is constrained within bedsets and bounding surfaces, and micropermeability variations in eolian foresets may show bleached grain-flow laminae inbetween unbleached finer grained wind ripple laminae. However, other field relationships show iron reduction fronts that cut across stratification and primary structures and may indicate different timings and fluid compositions.