
Glaciogenic Reservoir Intervals of North Africa and the Middle East: Regional Controls on Sediment Quality

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Reservoir rocks deposited during the Late Ordovician glaciation are productive in Algeria, Libya, and Saudi Arabia, and prospective in Iraq and Syria. Though geometrically complex, models are now available to explain processes of large-scale sediment redistribution/ erosion that provide valuable insight into their regional prospectivity. Palaeogeographic reconstruction enables the prediction of large, sandy sediment repositories at the ice sheet's margin, forming large "trough-mouth" fans. These were deposited beyond powerfully erosive, ~100 km wide belts of fast-flowing ice (ice streams). The ice streams are considered to be major agents of sediment re-distribution across North Africa and Arabia, repeatedly re-occupying pre-existing topographic lows during later phases of glaciation. Therefore, it is suggested that the character of the basin's source area/ sediment provenance plays an important role in determining the quality of sands within the trough mouth fans.

At the prospect-scale, the quality of these glaciogenic reservoirs depends upon two key factors: 1) the scale, fill, and distribution of meltwater-related valley systems, coupled with 2) glacioisostatic re-activation of deep-seated tectonic structures. Around uplifted blocks, fault re-activation not only eroded the reservoirs but also destroyed the source potential of overlying Lower Silurian shales. The valley systems contain a geometrically predictable, two-stage fill that simply reflects the water depth in which the ice sheets grounded. Post-glacial sediment re-distribution of sand produced clean target intervals immediately beneath Silurian "hot shale". A cross-border approach for glaciogenic reservoirs in North Africa and the Middle East is considered essential for understanding depositional controls on their geometric complexity.
