

Platform to Basin Transition in Terminal Neoproterozoic to Early Cambrian Intrasalt Carbonates, Ara Group, South Oman Salt Basin

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Cored intervals in intra-salt carbonates of the Ara Group in the South Oman Salt Basin comprise key lithofacies associations that imply deposition in a shallow-water platform to offshore slope/deep-water basinal setting. Many aspects of these carbonates are similar to facies relationships present in outcrop analogues such as the Nama Group of Namibia. By integrating the outcrops analogues with the subsurface data, several significant characteristics can be outlined for the depositional framework:

- 1) Peritidal platform margin or platform-top deposition was characterized by high rates of organic productivity and is reflected in small-scale thrombolitic build-ups and stromatolites. Well-developed peloidal/skeletal grainstones signify the deposition of high-energy sandsheets, either along strike from these areas of algal build-up, or along the platform margin proper,
- 2) Offshore deposition is manifested by low-energy accumulation of alternating micrites and organic matter, most of which was probably swept offshore by wave and tidal processes. The 'pinstriped' alternations potentially signify a seasonal signature to organic productivity,
- 3) Episodically, mud-charged low-density turbiditic flows, transported micrite from the shallow water platform production area and deposited it within this offshore setting,
- 4) Downdip, in a slope setting, thrombolitic breccias/conglomerates, which include possible m-scale blocks, point to deposition from debris flows, and signify episodes of buildup collapse.,
- 5) In a more distal slope setting, matrix-supported polymict conglomerates, which include offshore lithofacies, suggest that build-up collapse was also related to episodes of slope instability.

Placing the depositional evolution of the cored intervals within a sequence stratigraphic context provides a mechanism for prediction of reservoir architecture. Thrombolite reefs occur within the TST suggesting that a regime of increased accommodation was required to form well-developed reefs. Conditions of decreasing accommodation (HST) produce sheets of grainstones with interspersed thrombolites and stromatolites.