

# Sedimentological Assessment of the Norphlet Linear Eolian Dune Reservoirs of Mobile Bay, Eastern Gulf of Mexico, USA

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## Abstract

Published examples of linear eolian dune deposits have rarely been interpreted in the rock record. A growing body of evidence suggests that the recognition of transverse from linear eolian reservoir dune types is highly desirable, as the selection of an appropriate stratigraphic architecture is essential for successful reservoir characterization, static modeling and development project decision making. The Norphlet Formation in Mobile Bay (offshore eastern Gulf of Mexico, USA) is a well-known example of linear eolian dune accumulations, interpreted from 3-D seismic interpretations of north-northwest-oriented lenticular Norphlet isopach trends (Story, 1998). New sedimentological observations from updated legacy descriptions of twelve cored wells from Mobile Bay that penetrated this laterally variable Norphlet sandstone allow a closer examination of the basic composition of eolian dune lithofacies, internal facies arrangements and other stratal characteristics of these uniquely elongate sandstone accumulations. Study results support interpretations of linear dune aggradation through southerly elongation across a mobile salt substrate at Mobile Bay, interpreted as paleogeomorphic features with preservation enhanced by salt loading and rapid transgression. These new observations aid the reconstruction of the primary bedform morphology of this region of the northern Norphlet erg, as well as provide primary examples of the facies record of linear dune deposits to establish diagnostic characteristics that distinguish different bedform types in the subsurface. These efforts also highlight the value of investigating brownfield analogs for quantitative inputs to ensure static eolian reservoir models have an appropriate level

of vertical and lateral heterogeneity, which directly affects estimated ultimate recoveries and project development planning.

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