

Norphlet Geology and 3-D Geophysics of Fairway Field Mobile Bay, Alabama

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The upper Jurassic Norphlet system in the Mobile Bay area has been the subject of considerable exploration intrigue during the last 20 years. Fairway Field, which came on production in December 1991, lies in the restricted area of the main Mobile Bay shipping fairway leading to the city of Mobile, Alabama and is comprised of state blocks 113 and 132.

The exploration and exploitation of the area south of Dauphin Island has been based primarily on the geophysical evaluation of a high quality 3-D seismic survey shot by an industry consortium in 1986 to image the eolian Norphlet unit at depths between 21,000 and 22,000 ft. Seven thousand line miles of data were recorded over an area of about 250 square miles and cover all or parts of 49 state and federal offshore blocks.

The enhancement provided by 3-D imaging to the geometric

resolution of the lenticular Norphlet dune trends in this area is significantly better than with 2-D data. The concave base of the Norphlet/top of Louann event was essentially unmappable with 2-D imaging. An accurate understanding of the thick lenticular nature of the dune trends therefore did not exist pre-3-D. The 3-D imaging has led to a much better regional understanding of the unique depositional environment of the Norphlet and consequently to a much improved post-3-D interpretation of the Shell\Amoco Fairway Field. The Norphlet isopach has been mapped with confidence and has led to the interpretation of a series of northwest-southwest trending linear dune forms across the survey area. Post-3-D exploration methodology has targeted these thick, paleogeomorphic features where they have been enhanced by subjacent salt structure.