

Petroleum source rocks in East Greenland: implications for exploration of the Jan Mayen Microcontinent

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The Upper Palaeozoic – Mesozoic succession in central East Greenland is the most important outcrop analog to understand the stratigraphy and hydrocarbon potential of the offshore basins on the North-East Greenland shelf and other areas in the North Atlantic, including the Norwegian and Barents shelves, areas near the Faroe Islands, and the offshore areas of the Jan Mayen Microcontinent, in particular the Jan Mayen Basin west of the Jan Mayen Ridge.

In East and Northeast Greenland, post-Caledonian sediments are exposed from Jameson Land to the south to Store Koldewey to the north. The exposed Devonian–Cretaceous sedimentary succession has a composite thickness of more than 10 kilometres, and seismic data indicate thicknesses in excess of 15 kilometres in the Jameson Land basin

Within the sedimentary succession exposed onshore East and Northeast Greenland, organic-rich sediments with petroleum source potential have been identified in a number of different stratigraphic levels ranging in age from the Middle Devonian to the Jurassic (?Cretaceous). The potential source rocks include both lacustrine and marine deposits with highly variable characteristics and regional distribution.

It is generally accepted that the Jan Mayen Microcontinent represents a “slice” of the East Greenland shelf that due the shifting of the Atlantic rifting axis from the Aegir Ridge to the Kolbeinsey Ridge separated from East Greenland just prior to magnetic anomaly 6, i. e. approximately 20 million years ago. Geophysical data collected across the southern part of the Jan Mayen Microcontinent suggest the presence of continental crust overlain by rather thick successions of Palaeozoic, Mesozoic and Cenozoic sedimentary rocks as well as local occurrences of volcanics. Hence, some or all of the petroleum source rock units known from East Greenland can be expected to be present within the sedimentary fill of the Jan Mayen Basin.

This presentation summarises the present knowledge on stratigraphy, distribution, quality and geochemical characteristics of eight stratigraphic intervals having petroleum source potential in East and Northeast Greenland, and presents an assessment of their potential presence and quality in the Jan Mayen Basin.

Literature, petroleum geology, Northeast Greenland

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