

Unlocking Intra-Volcanic Prospectivity, West of Shetland

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ABSTRACT

The volcanic dominated North Atlantic Margin is one of the last frontiers for hydrocarbon exploration within the UK Continental Shelf. In 2004, a major oil and gas discovery (the Rosebank Field) was made within Palaeocene and Eocene age lavas in the Faroe-Shetland Basin, northwest of the United Kingdom. Consisting of terrestrial to marginal marine reservoir sequences, the Rosebank Field consists of intra-volcanic siliciclastic sediments sourced from within and outwith the lava field, separated by basaltic lava flows and volcanoclastics (Poppitt et al., 2016). Despite identification of prograding deltaic sequences and major intra-lava fluvial sequences the exact controls on the distribution of reservoir quality sandstones was unclear (Schofield et al., 2013), in part, due to poor reservoir quality. As such, understanding the controls on and the distribution of the reservoir sequence was considered key to unlocking intra-volcanic prospectivity West of Shetland. The use of newly acquired regional seismic datasets integrated with petrophysical well logs and biostratigraphic data has facilitated re-examination of the Faroe-Shetland Basin Late Palaeocene to Early Eocene volcanic sequence. Two reservoir sequences, belonging to the Colsay Sandstone Member of the Flett Formation, and associated volcanic events have been mapped in detail and interpreted in terms of their depositional and emplacement environments. High lateral and vertical variability in both the sedimentary and volcanic sequences is indicative of a dynamic palaeoenvironment that is illuminated in this presentation.