



Wellbore History

GENERAL

Well 31/4-6 was drilled on the Bjørgvin Arch in the Northern North Sea. The main objective was to appraise the 31/4-3 Discovery in the "Intra-Heather sand II" (Fensfjord Formation) and to define the oil/water contact.

OPERATIONS AND RESULTS

Appraisal well 31/4-6 was spudded with the semi-submersible installation Nortrym on 28 February 1982 and drilled to TD at 2447 m in the Early Jurassic Drake Formation. No significant problem was encountered in the operations. The well was drilled with seawater and hi-vis sweeps down to 927 m, with non-dispersed Shale Trol mud from 927 m to 1865 m, and with a fully dispersed Lignosulphonate/Unical/Ligcon mud from 1865 m to TD.

The Fensfjord Formation was encountered at 2150 m. It is a predominantly fine grained to silty, micaceous to very micaceous, subarcosic carbonaceous and occasionally glauconitic sandstone with a clay matrix and some heavily calcite cemented stringers. It is 89 m thick and oil bearing from 2156 m down to the OWC at 2172 m. Net pay in the oil bearing interval was 12.5 m with an average porosity of 26.4% and an average water saturation of 43.8%. As expected the overlying Sognefjord Formation seen in the 31/4-3 and 5 wells was not present at this location. Below the Heather Formation, the well penetrated 62.5 m of the Brent Group, which contained 31 m of net sand with an average porosity of 23.4% and was water saturated. No other reservoir intervals were encountered. Occasional poor oil shows were recorded in the Ness Formation and the Drake Formation.

Five cores were cut through the Fensfjord Formation from 2132 m to 2214.5 m. Correlation between the cores and the logs indicates that core depths are two to three meters shallower than logger's depth. RFT fluid samples were taken in the Fensfjord Formation at 2160.5 m (oil and gas) and at 2166.5 m (oil and gas).

The well was permanently abandoned on 20 April 1982 as an oil appraisal.

TESTING

One production test was performed in the Fensfjord Formation over the combined intervals 2159.5 - 2163.5 m and 2165-2168 m. The well flowed 452 Sm³ oil and 38300 Sm³ gas through a 36/24" choke. The GOR was 85 Sm³/Sm³, the oil gravity was 34.4 deg API and the gas gravity was 0.727 (air = 1). Maximum flow temperature measured at sensor depth 2153.5 m was 90.6 deg C.

LITHOSTRATIGRAPHY & HISTORY FOR WELL: 31/4-6