



Wellbore History

GENERAL

Wildcat well 1/3-4 was drilled on the northern part of the Hidra High in the North Sea. The objective was to test the hydrocarbon potential of the Danian and late Cretaceous Chalk, on a domal structure induced by halokinesis.

OPERATIONS AND RESULTS

Well 1/3-4 was spudded with the semi-submersible installation Dyvi Alpha on 15 February 1983 and drilled to TD at 3198 m in the Late Permian Zechstein Group. While drilling through Middle Miocene claystones, the average background gas increased rapidly from 5% to 80% between 1580 m and 1595 m and, at this depth, the mud weight had to be increased gradually from 1.37 to 1.50 - 1.53 to lower the gas content. Furthermore, to stop the gas leakage and to isolate the weak zone, it was decided to set the 13 3/8" casing. Logs were run (ISF/BHC and LDT/CNL) and the casing was set with shoe at 1557 m. While circulating after the logging a gain of 1 m³ with gas and more than 100 litres of oil occurred. To stabilize the well, 2 cement plugs and 4 barite plugs were set, in order to stop the gas leaking from the formation. In total, twenty days were spent on circulating, logging (ISF/BHC and LDT/CNL), setting the 13 3/8" casing, and plugging before drilling of the 12 1/4" section commenced. While drilling the 12 1/4" hole, the background gas varied between 32 and 84% down to 1695 m where the mud-weight was raised to 1.60. The background gas then decreased between 10 and 25% and drilling continued normally. Logs performed at the end of the 12 1/4" phase and covering the zone of interest are strongly affected by large cavings and by barite squeezed into the formation. Side wall core recovery was very poor from the caved zone. The well was drilled water based.

The first evidence of hydrocarbons in the well was the gas and oil kick at 1595 m in the base of the Middle Miocene, The oil in the mud was a 34 deg API gravity oil and geochemical analysis suggested that the organic matter rich Mandal Formation of Late Jurassic age was the source rock. However, according to the lithology and log information, there was no evidence of a reservoir at this level. The oil was probably trapped in a fault that acted as a drain. The Ekofisk Formation (Danian limestone) was encountered at 2754 m, and the Tor Formation (Maastrichtian) at 2797 m. Most of RFT measurements and core analysis showed that both formations were virtually tight and water bearing, but some residual hydrocarbons (60 - 80% water saturation) was seen on Cyberlook computation 2754 to 2780 in the upper Ekofisk Formation. Shows on cuttings and cores were as follows: Bright yellow direct fluorescence at 1580 - 1600 m; direct bright yellow fluorescence with pale yellow cut on sand grains at 2244 m; direct yellow fluorescence in limestones with whitish to pale yellow cut at 2678 - 2687 m; pale yellow direct fluorescence on a few particles at 2753 - 2765 m; a gain of 8m³ of salt water (85 g/l) with trace of hydrocarbons was observed at 2884 m.

Two cores were cut in the Chalk. Core 1 was cut at 2780 - 2789 m with 95% recovery, and core 2 at 2817 - 2830 m with 8% recovery. Due to tight formation no fluid samples were taken on the RFT, but oil samples were taken from the oil in the mud at 1595 m.

The well was permanently abandoned on 8 May 1983 as a dry well with strong oil shows.

TESTING

No drill stem test was performed.

LITHOSTRATIGRAPHY & HISTORY FOR WELL: 1/3-4