



## GENERAL

Well 34/10-1 was the first well to be drilled on the "Delta structure" (Gulfaks fault block) in the Northern North Sea. The primary objective of the well was to penetrate sandstones of Early to Middle Jurassic age and to evaluate their possible content of hydrocarbons.

## OPERATIONS AND RESULTS

Wildcat well 34/10-1 was spudded with the semi-submersible installation Ross Rig on 20 June 1978 and drilled to TD at 2460 m in the Late Triassic Lunde Formation. The 30" casing was set after considerable difficulty in getting through a section of boulders. A severe well kick was taken after a flow check at 1780 m, ca 3 m above top reservoir. Ca 440 barrels of mud were gained in the pit. Otherwise the operations proceeded without significant problems. No directional survey was run below 1737 m. The well was drilled with seawater and gel slugs down to 214 m, with fresh water and gel from 214 m to 504 m, with seawater/gel/lignosulphonate from 504 m to 1970 m and with Seawater/gel/spersene/XP20 from 1970 m to TD.

First oil show, pale yellow fluorescence in limestone and siltstone, was recorded at 1370 m in the Hordaland Group. Similar shows continued down to top Brent Group level interrupted only by a short interval of no shows from 1579 to 1600 m. At 1555 in the Balder Formation trace oil in the mud was observed. Top reservoir, Tarbert Formation, was encountered at 1783 m directly underlying the Late Cretaceous Shetland Group. Oil was proven in sandstones all through the Middle Jurassic Brent Group down to top Drake Formation in the Dunlin Group. The oil/water contact was not observed in the well. Below reservoir level shows decreased and died out completely below 2325 m.

A total of 12 cores were recovered in the interval from 1782.0 to 1951.1 m and one core from 2232.5 to 2250.5 m. Three runs were made with the RFT and samples were taken at 1871 m (oil) and 2244 m (water, mud and mud filtrate).

The well was permanently abandoned on 8 September as an oil discovery.

## TESTING

Three drill stem tests were conducted in the Brent Formation.

DST 1 perforated the interval 1930 to 1935 m in the Rannoch Formation and produced 191 Sm<sup>3</sup> oil and 20560 Sm<sup>3</sup> gas /day through a 32/64" choke. No water was produced. The GOR was 108 Sm<sup>3</sup>/Sm<sup>3</sup>, the oil gravity was 28.9 deg API, and the gas gravity was 0.632 (air = 1).

DST 2 perforated the interval 1839 to 1844 m in the Etive Formation and produced 1049 Sm<sup>3</sup> oil and 86930 Sm<sup>3</sup> gas /day through a 36/64" choke. No water was produced. The GOR was 83 Sm<sup>3</sup>/Sm<sup>3</sup>, the oil gravity was 28.4 deg API, and the gas gravity was 0.61 (air = 1). The maximum bottom hole temperature recorded in the test was 71.7 deg C.

DST 3 perforated the interval 1788 to 1792 m in the Tarbert Formation and produced 323 Sm<sup>3</sup> oil and 29365 Sm<sup>3</sup> gas /day through a 17/64" choke. No water was produced. The GOR was 91 Sm<sup>3</sup>/Sm<sup>3</sup>, the oil gravity was 29 deg API, and the gas gravity was 0.62 (air = 1). The maximum bottom hole temperature recorded in the test was 69 deg C.

# LITHOSTRATIGRAPHY & HISTORY FOR WELL: 34/10-1