



LITHOSTRATIGRAPHY & HISTORY FOR WELL: 30/9-3 A

Wellbore History

GENERAL

Well 30/9-3 A is a sidetrack to well 30/9-3 on the Gamma West structure on the Oseberg Fault Block in the northern North Sea. The primary objective of 30/9-3 was to find hydrocarbon accumulations in the Middle Jurassic Brent Group. Secondary objective was to find additional hydrocarbon accumulations in the Early Jurassic. Planned TD was ca 75 m below a possible intra Triassic marker to a depth of 4188 +/- 100 m. Well 30/9-3 discovered oil in the Brent Group, but reached only 3113 m in the Drake Formation due to fish in the hole. For the same reason no wire line logs were run below 1713.5 m.

Sidetrack well 30/9-3 A was drilled to complete the well programme.

OPERATIONS AND RESULTS

Well 30/9-3 A was kicked off on 26 February 1984, from a window from 1539 to 1562 m in the 13 3/8" casing. The well was drilled to TD at 4300 m (4008 m TVD) in the Late Triassic Lunde Formation using the semi-submersible installation Nortrym. No significant problem was encountered in the operations. The well was drilled with Invermul/EZmul Oil Based Mud from kick-off to TD.

The Ness Formation (2853.5 - 3059 m, 2717.3 - 2890 m TVD) was encountered at a horizontal distance of 538 m to the west of the 30/9-3 well. The top of the formation had been subjected to erosion and lacked the sandstone units which were found in the upper part of the 30/9-3 well. The lithology was alternating sandstones, siltstones and shales with beds of coal. The sandstones were generally very fine to fine grained, locally medium grained, and occurred often as normally graded beds.

The Ness Formation was found oil bearing down to 3000 m (2840m TVD). No oil/water contact could be established in this well due to shaly formation. The oil column extended to the top of the reservoir except for an isolated gas bearing sandstone bed at 2880 - 2886 m. From logs the net pay was calculated to 20.3 m of a gross thickness of 122.7 m giving a net to gross ratio of 0.17. The average porosity was calculated to 20.1% with an average water saturation of 29%. The Etive Formation (3059 - 3133 m, 2890 - 2952.5 m TVD), which consisted of sandstones with a predominantly medium to coarse grain size, was found water bearing. FMT pressure recordings indicated that the hydrocarbon bearing and the water bearing parts of the Brent Group belonged to two different pressure regimes. The Statfjord Formation (3679 - 4161 m, 3431.5-3879 m TVD) was encountered at a distance of 936.5m to the west of the 30/9-3 well and consisted of alternating sandstones, which were very fine to very coarse grained, siltstones and shales. Beds of coal occurred occasionally. The Statfjord Formation was water bearing. Oil shows were recorded in Maastrichtian limestone in the upper part of the Shetland Group.

Fourteen conventional cores were cut in the well, of which one was cut in the Hordaland Group, twelve were cut in the Ness Formation, and one in the Etive Formation. A segregated oil sample was obtained from the FMT at 2915.5 m in the Ness Formation. Segregated samples taken at 2885.7 m and 2885.5 m in the Nesss Formation contained both oil and gas, while pressure gradients indicated that this sandstone unit (2880 - 2886 m) was gas bearing. Water samples were obtained in the Etive Formation at 3086 m and in the Statfjord Formation at 3692 m.

The well was permanently abandoned on 20 May 1984 as an oil and gas appraisal well.

TESTING

One Drill Stem Test was carried out in the well in the oil zone in the Ness Formation. The perforated interval was 2910-2916 m (2764.65 - 2769.7 m TVD). The well flowed 800 Sm3/day of oil with a gravity of 34.3 API and 108000 Sm3 of gas with a gravity of 0.710 (air=l) through a 38.1 mm choke. CO2 Pressure 135.6 mB/5m3. Maximum recorded temperature in this flow was 109.6 deg C.