



Wellbore History

GENERAL

Wildcat well 7120/8-1 is located in the Snøhvit Field area. It was designed to test possible hydrocarbon accumulations in a seismic closure (Alpha prime structure) located to the east of a major N-S running fault in the western part of the block. The primary target was sandstone of Middle Jurassic age.

OPERATIONS AND RESULTS

Well 7120/8-1 was spudded with the semi-submersible installation Ross Rig on 28 June 1981 and drilled to TD in Late Triassic rocks ((Fruholmen Formation). The 17 1/2" hole was drilled to 1128 m when the lower marine riser accidentally unlatched and two days of rig time were lost curing this problem before drilling could continue. When plugging back the well, gas bubbles were observed in the riser. Four days of rig time were lost before this problem was cured. Apart from this no significant difficulties were encountered and the well was drilled according to schedule. The well was drilled with spud mud down to 358 m, with gel mud from 358 m to 750 m, and with gel/lignosulphonate mud from 750 m to TD.

Relatively dry gas was encountered at 2092 m in sandstone of the Middle to Early Jurassic Stø Formation. Log analysis, confirmed by RFT data, found a gas column down to a water contact at 2180 m. The reservoir sandstone showed good to excellent reservoir properties. Organic geochemical analyses showed TOC levels in the Early Cretaceous mudstones in the range ca 1.3 % to ca 5 %, generally increasing downwards to the base of the Cretaceous. Within the Late Jurassic Hekkingen Formation shales TOC increases from ca 3 % to at the top (1990 m) to more than 9 % at the base. In the Early Jurassic to Triassic below 2190 m occasional shales and thin coal beds have good potential for gas and oil, but are restricted in volume. The sediments are immature for petroleum generation down to ca 2000 m and marginally mature from this depth to TD. Kerogen is generally of Type II, with some addition of Type III in the lower part of Hekkingen Formation below 2012 m. Terrestrial input appears to be high in all potential source rock sequences in the well. Residual oil in the cored section showed a waxy, terrestrial signature. Seven cores were taken. Core 1 was cut in the Middle to Early Jurassic Stø Formation from 2112 m to 2121.5 m. The remaining cores were cut consecutively from 2171.5 m to 2270 m from the base of the Stø Formation and 80 m into the Early Jurassic Nordmela Formation. RFT samples were taken at 2168 m and 2094 m.

The well was permanently abandoned on 10 September 1981 as a gas/condensate discovery.

TESTING

Three drill stem tests were carried out in the hydrocarbon-bearing zone.

DST 1 perforated 2165 m to 2172 m and produced 1056000 Sm3 gas and 54 m3 condensate per day on a 64/64" choke in the second flow period. The corresponding GOR is 19540 Sm3/Sm3. The gas gravity was 0.662 (air = 1) with 4.5 % CO2, and the condensate density was 0.777 g/cm3.

DST perforated the two intervals 2133 m to 2138 m and 2140 m to 2150 m. This test produced 558000 Sm3 gas and 26.7 m3 condensate per day through a 64/64" choke in the second flow period. The corresponding GOR is 20900 Sm3/Sm3. The gas gravity was 0.666 (air = 1) with 5 % CO2, and the condensate density was 0.774 g/cm3.

DST 3 perforated 2092 m to 2110 m and produced 954300 Sm3 gas and 53.5 m3 condensate per day through a 64/64" choke in the third flow period. The corresponding GOR is 17860 Sm3/Sm3. The gas gravity was 0.666 (air = 1) with 5 % CO2, and the condensate density was 0.780 g/cm3.

No H2S was detected in any of the tests. The tests indicated a very dry gas condensate system. Dew point pressure was 209 barg (3031 psig). Density of reservoir fluid (at DP) was 0.156 g/cm3 (0.068 psi/ft).

LITHOSTRATIGRAPHY & HISTORY FOR WELL: 7120/8-1