



Wellbore History

GENERAL

Wildcat well 7120/9-2 is located in The Hammerfest Basin, west of the Albatross discovery, later included in the Snøhvit Discovery. The structure comprised a dome like feature transected by a few major N-S, and E-W oriented faults. The 7120/9-2 well was drilled in a crestal position on this structure and planned total depth was 5500 m in rocks of Permian/Carboniferous age. The objective of well 7120/9-2 was to test Permian reservoirs confined by Permian Marker III (4810 m ±150 m), Permian Marker II (4745 m ±50 m), and Permian Marker I (4620 m ±150 m) for hydrocarbons.

OPERATIONS AND RESULTS

Well 7120/9-2 was spudded with the semi-submersible rig Treasure Scout on 18 April 1984 and drilled to a total depth of 5072 m in limestones, siltstones and cherts the Permian Røye Formation. The well was drilled with Bentonite and seawater to 381 m, with KCl/Polymer mud from 381 m to 1165 m, with Lignosulfonate /Polymer mud from 3900 m to 4270 m, and with Gel/Lignosulfonate mud from 4270 m to TD. A 17 1/2" pilot hole was drilled to 1165 m, before underreaming to 26" hole. The underreamer was lost in the hole and the well was sidetracked at 1070 m. While running the 20" casing, it parted but was recovered. Before drilling the 12 1/4" hole section two cement squeeze jobs were performed due to a low leak off test. Due to lost circulation the 9 5/8" casing was set at 4270 m. Before drilling the 8 3/8" hole section a cement squeeze job was performed due to a low leak off test. Due to lost circulation the 7" liner was set at 4791 m. Two cement squeeze jobs were performed. At 5072 m lost circulation problems occurred, the well was logged and plugged back and terminated earlier than prognosed.

Some of the Jurassic sandstone intervals encountered between 1970 m and 2290 m were gas bearing, with structural closure at the point where the well bore penetrated the formation. The intervals were subdivided into three units. From 1970 m to 2048.5 m (Stø Formation) there was 62 m net sand, of which 5.75 m was net pay. Calculated average porosity in the net pay was 18 %, with an average SW of 26 %. Between 2048.5 m and 2156 m (Nordmela Formation) there was 13.38 m of net sand, 9.5 m of net pay with an average calculated porosity of 17.6 % and an Sw of 33.6 %. Between 2156 m and 2290 m (Tubåen Formation) there was 79.75 m of net sand, 1.0 m of net pay with a calculated average porosity of 20.5 % and an average Sw of 39 %. The net pay was generally associated with thin sand stringers. The Triassic sandstones were also gas bearing in the interval 2290 m - 2410 m in the upper part of the Fruholmen Formation, thus indicating the existence of a trap mechanism. Net sand amounted to 16.88 m in the interval, of which 1.75 m was net pay with an average calculated porosity of 18.14 % and an average Sw of 42 %.

The Permian reservoir potential was not realised. Fractured limestones and dolomites with cherts and minor elastics were encountered as the prognosed Permian Marker III at 5050 m, but extensive clastic development and reservoir potential was not fulfilled. Permian Marker II (4956 m) was penetrated and consisted, as prognosed, of limestones and siltstones whilst Permian Marker I (4806 m), was identified as being of Triassic age (Top Havert Formation) and although it acted as a seismic reflector and was visible on some logs there was no lithological change across the marker horizon.

Shows on sandstones, generally due to residual oil, were found from 1970 m to 2250 m and in the interval from 2343 m to 2400 m. Geochemical analyses indicate that the well enters the oil window (%Ro = 0.6) already at 1750 m and is post mature at ca 3600 m (%Ro = 1.3). Several zones of moderate to very rich source horizons (TOC up to 16% and hydrogen index up to 500 mg/g) were detected between ca 1700 m to ca 2600 m. One core was cut from 4962 m to 4964 m below the Permian Marker II horizon. Three segregated RFT samples were taken at 1995 m (mud filtrate and oil film), 2053 m (gas and mud filtrate), and at 2381 m (gas and mud filtrate). The well was permanently abandoned on 20 October 1984 as a gas appraisal for the Albatross Discovery.

LITHOSTRATIGRAPHY & HISTORY FOR WELL: 7120/9-2

TESTING

No drill stem test was performed