



Wellbore History

GENERAL

Well 7120/1-1 was drilled on the Alpha structure in the north of block 7120/1. The primary objective of the well was to test Palaeozoic carbonates and elastics in a partly fault-bounded/truncated dip closure on the western flank of the Loppa High. Potential Early Triassic sandstones in a low relief dip closure were a secondary objective.

OPERATIONS

Well 7120/1-1 was spudded on 16 August with the semi-submersible installation "Borgny Dolphin" and drilled to 2569 m where it was suspended on 15 November due to NPD drilling regulations during winter season. On 2 December permission was granted to continue operations and drilling continued to 2610 m. On 26 December the well was again suspended at the request of the Norwegian Petroleum Directorate because of safety considerations in adverse weather conditions. The well was re-entered on 13 March 1986 and drilled to a TD of 4003 m in basement rocks. The well was drilled with seawater and bentonite hi-vis pills down to 485 m. From there to TD gypsum/polymer mud was used with various "Lost Circulation Material" pills to cure mud losses.

The well encountered weak hydrocarbon shows from 800 m down to 2200 m and oil shows in Late Permian carbonates (Tempelfjorden Group, Ørret Formation). No intervals of significant reservoir potential were recognized from logs or described from cuttings in the Tertiary or Triassic sections. Below this sequence, three main Permian carbonate units were identified from logs and cuttings description. A porosity range of 5-10% for the limestone sequence between 2415 and 2461 m has been derived from log evaluation. In the basal part of this interval, a black shale was detected with a gas peak of 13% total gas. The lower limestone interval (2607-3277 m) contained weak fluorescence on cuttings from the top down to 2690 m.

No coring was attempted in the upper section of this unit due to severe mud losses to the formation. A core was recovered from the base of the interval where alternating limestone, clay stone, marl and shale were described with porosities in the order of 4%. In the lowermost interval (3310-3951 m), dolomite was described as the main lithology with porosities around 3%. No shows were registered. In general, the carbonates had low porosities, but two zones of higher porosity were detected from logs between 2810-2850 m and 2610-2660 m. Two production tests indicated that the limestone was permeable, but no pore fluids were produced.

Two cores were cut, one from 3186 m to 3194.5 m, a second from 4000 m-4003 m in basement rocks. RFT fluid samples were taken at 2798 m ("Slight smell of hydrocarbons"), 3533 m, and 3714.5 m. Bottom hole temperatures from Wire line logging gave a maximum reading of 121 deg C at TD. True bottom hole temperature at TD is thus estimated to 125 °C. The well was plugged and abandoned as a dry hole with oil and gas shows on 21 July 1986.

TESTING

Two production tests were carried out in the Upper Permian intervals 2810-2855 and 2607-2665 m. Neither interval flowed any pore fluids, not even after acid treatment. Upon nitrogen displacement treatment some fluids were produced, indicating that the formations in both intervals contained water with traces of natural gas, while the interval 2607-2665 m also produced some oil film. Attempts to analyse the oil failed due to the small amounts.

LITHOSTRATIGRAPHY & HISTORY FOR WELL: 7120/1-1