



Wellbore History

Well 6507/7 6 is an appraisal well on the crest of the Heidrun field structure on Haltenbanken off shore Mid Norway. The structure is a fault wedge. The main objectives of the well were to establish the Tilje gas/oil contact, to define Tilje and Åre oil properties, and to investigate the Åre oil/water contact. In addition, the well was expected to prove Fangst erosion and established lateral continuity of Tilje reservoir properties.

OPERATIONS AND RESULTS

Appraisal well 6507/7 6 was spudded with the semi-submersible installation Nortrym on 23 July 1986 and drilled to TD at 2525 m in Early Jurassic sediments of the Åre Formation. At 419 m the drill string torqued up and spun out five joints below the kelly, dropping the string to the seabed. The well was re-spudded after being moved approximately 8 m, and this time drilling proceeded without significant problems. The well was drilled with seawater and pre-hydrated gel sweeps down to 1030 m and with KCl/polymer mud from 1030 m to TD.

Oil shows were recorded in 3 m thick sandstone at 2096 m in the Cretaceous. A marked unconformity separates the Middle Jurassic from the overlying Late Cretaceous sequence. The total hiatus was from Aalenian-Bajocian to Campanian-Santonian. Top Middle Jurassic Fangst Group, Ile Formation was encountered at 2144.5 m and was gas bearing. From good quality RFT pressure data, cores, and electric logs a gas/oil contact was established at 2339 m in the Tilje Formation and the oil/water contact at 2440 m in the Åre Formation. Shows continued down to 2445. Below this depth no shows were reported.

A total of 191 m core was recovered from the well. Two cores were cut from the Early Cretaceous through the Fangst Group and into the top Båt Group (2129 - 2185 m), and eight cores were cut from the gas zone in the lower part of the Tilje Formation, through the OWC and into the Åre Formation (2305 - 2462 m). One RFT run was made in the 12 1/4" hole. A water sample was attempted at 2457m without any recovery. The gas gradient was 0.073 psi/ft (0.169 g/cc). Two oil gradients were found. To 2390 m the gradient was 0.327 psi/ft (0.754 g/cc). Passing through the upper Åre Formation siltstone/claystone bed a pressure increase was encountered and the oil column down to the oil/water contact exhibited a higher oil gradient of 0.362 psi/ft (0.834 g/cc). The water gradient was 0.446 psi/ft (1.028 g/cc).

The well was permanently abandoned on 6 September 1986 as a gas and oil appraisal.

TESTING

Two DST's were performed in this well.

DST 1 tested the combined intervals 2411.5 ? 2415 and 2421 ? 2424 m in the Åre Formation. Maximum flow was 782 Sm³ oil and 46100 Sm³ gas /day through a 90.5/64" choke. The GOR was 59 Sm³/Sm³, the oil gravity was 23 deg API, and the gas gravity was 0.627 with 3 % CO₂ and no detectable H₂S.

DST 2 tested the interval 2348.5 ? 2365 m in the Tilje Formation. The well flowed at maximum rates 628 Sm³ oil and 61450 Sm³ gas /day through a 132/64" choke. The GOR was 98 Sm³/Sm³, the oil gravity was 27 deg API, and the gas gravity was 0.614 with 1.7 % CO₂ and no detectable H₂S. Large amounts of sand were also produced in DST 2, leading to a pre-mature end of the flow period. The recorded down-hole temperatures were 83.3 and 78.9 deg C in DST 1 and DST 2 respectively.

LITHOSTRATIGRAPHY & HISTORY FOR WELL: 6507/7-6