



Wellbore History

GENERAL

Well 6406/9-3 was drilled on the Onyx prospect between the Linnorm, Mjøsa and Noatun discoveries in the southern part of the Halten Terrace in the Norwegian Sea. The primary objective was to prove petroleum in the Middle to Early Jurassic sequence (Ile, Tofte, and Tilje formations). The secondary objective was to evaluate potential Åre Formation reservoirs.

OPERATIONS AND RESULTS

Wildcat well 6406/9-3 was spudded with the semi-submersible installation Transocean Barents on 18 April 2013 and drilled to TD at 5138 m in the Early Jurassic Tilje Formation. No shallow gas was observed by the ROV at the wellhead or the MWD while drilling the 9-7/8" pilot hole to a planned depth of 637 m. During drilling of the 26" section at 1288 m a minor shallow water flow with some gas bubbles was observed at the wellhead and it was recognised that the Kai Formation was penetrated underbalanced. It was decided to set the 20" casing shallow. Low leak-off at the 20" shoe required running a 16" contingency liner. The 14 3/4" x 17 1/2" section was drilled to section TD at 2270 m. A bad cement job around the 13 5/8" casing caused a technical sidetrack from 1645 m. The sidetrack is named 6406/9-3 T2. While drilling the basal part of the lower Cretaceous Lange Formation the interpreted real-time pore pressure exceeded the pre-drill high-case prediction and consequently the 10" casing was set shallower than planned. The well was drilled with seawater and hi-vis sweeps down to 1288 m, with Glydril mud from 1288 m to 2294 m in both well tracks, and with EMS-400 oil based mud from 2294 m to TD.

The well penetrated the two primary reservoir targets of Jurassic age: the Ile Formation at 4635 m and the Tilje Formation at 4954 m. A non-commercial gas reservoir was evaluated in the Ile Formation. The free water level is indicated to be between 4695 and 4704 m based mainly on the mixed gas and water in the MDT sample at 4697 m. The Upper/Middle Tilje Formations was found to be tight and residual gas bearing, while the Lower Tilje Formation was confirmed water bearing. Due to the non-commercial discovery in the primary target, the Åre Formation was not drilled. Oil shows were described on the core in the Ile Formation. On cuttings, there were no shows that could be distinguished from the oil based mud.

One 27m core was taken in the Lower Ile Formation from 4704 m to 4731 m with 99.9% recovery. MDT fluid samples were taken at 4697 m (water and gas) and at 4715.4 m (water). Both samples had mud filtrate contamination.

The well was permanently abandoned on 29 September 2013 as a minor gas discovery.

TESTING

No drill stem test was performed.

LITHOSTRATIGRAPHY & HISTORY FOR WELL: 6406/9-3