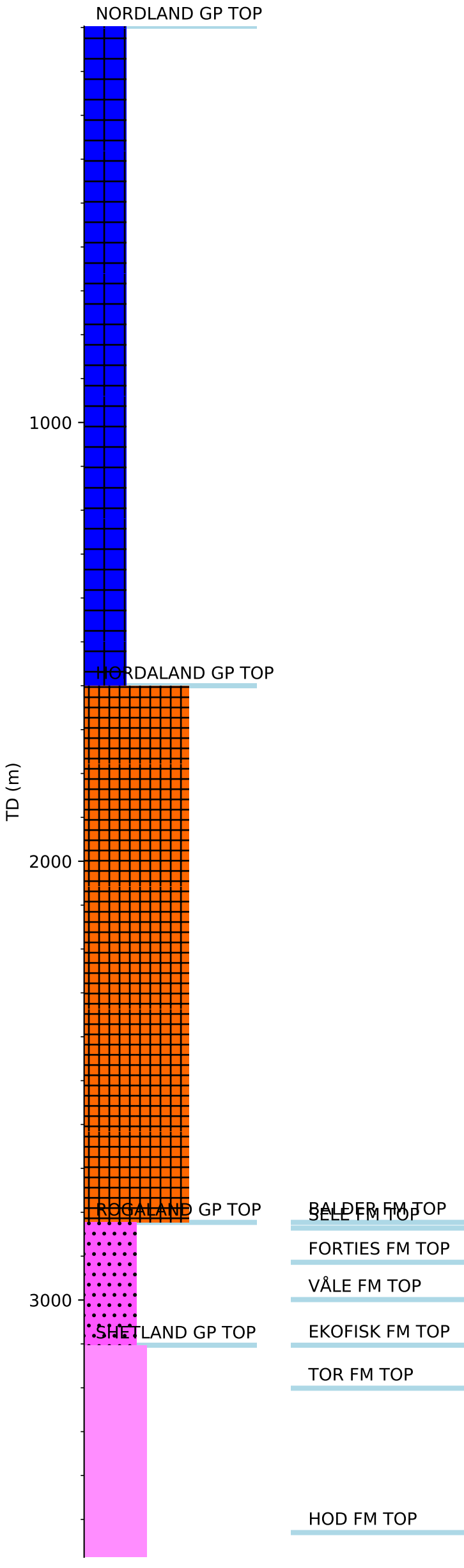
Groups

Formation Tops



Wellbore History

GENERAL

Well 1/3-6 is located between the Gyda, Ula, and Blane fields in the Central Graben of the Norwegian North Sea.

The primary objective was Late Jurassic Ula sands deposited as a rim syncline linked to salt diapirism. The Ula sands had been found hydrocarbon bearing in several wells in the surrounding blocks. Secondary objective was Late Paleocene "Cod sands" (Forties Formation), which could be present in the 1/3-6 area and could pinch out towards the diapir. The prognosed TD was 5030 m below MSL. The "Cod sands" were considered a low-probability target.

OPERATIONS AND RESULTS

Wildcat well 1/3-6 was spudded with the semi-submersible installation Dyvi Stena on 11 March 1991. Drilling performance went on without significant problems but the primary target of the well was not reached. The discovery of a significant hydrocarbon-bearing reservoir in the Paleocene activated the contingency measures of the programme (to set an extra 11 3/4" liner). For safety and technical reasons, and to allow for a proper test of the Paleocene, the well was stopped at 3586 m in the Late Cretaceous Hod Formation. No shallow gas was encountered while drilling. The well was drilled with a KCl polymer mud.

The well encountered 85 m of hydrocarbon bearing Forties sands at 2913.5 m. The pay zone was 44 m thick with a hydrocarbon saturation of 56 %. No hydrocarbon-water contact was found. Apart from the hydrocarbons in the Forties sands oil shows were also recorded from 3519 to 3530 m in the Tor Formation.

One conventional core was cut at 2921 m to 2928.5 m in the Forties sands. Segregated fluid samples were taken at three depths: 2923 m (filtrate and gas), 2937 m (filtrate and gas), and two samples at 2973.5 m (filtrate and gas in one and filtrate only in the other).

The well was permanently abandoned on 22 June 1991 as a gas-condensate discovery.

TESTING

Three DST tests were performed. DST 1A and DST 1B both tested the interval 2960.5 - 2977 m. Due to packer failure

during DST 1A this test was abnormally terminated and the re-test DST 1B was performed. DST 1B produced 78 Sm3 oil and 93300 Sm3 gas /day through a 44/64" choke in the final flow period. The GOR was 1196 Sm3/Sm3. The bottom hole temperature in this flow was 107.2 deg C.

DST 2 tested the intervals 2913 - 2924 m + 2929 - 2953 m. The final flow in DST 2 was 153 Sm3 oil and 172500 Sm3 gas /day through a 48/64" choke. The GOR was 1131 Sm3/Sm3 and the condensate gravity was measured to 50.47 deg API. The pressure drawdown in this flow was 290 bar and the bottom hole temperature was 112.2 deg C. The maximum temperature in DST 2 was 123.1 deg C and was recorded in the flow with the lowest rates and lowest drawdown. It was believed to be closer to the true formation temperature than the one recorded in DST 1B.

LITHOSTRATIGRAPHY & HISTORY FOR WELL: 1/3-6