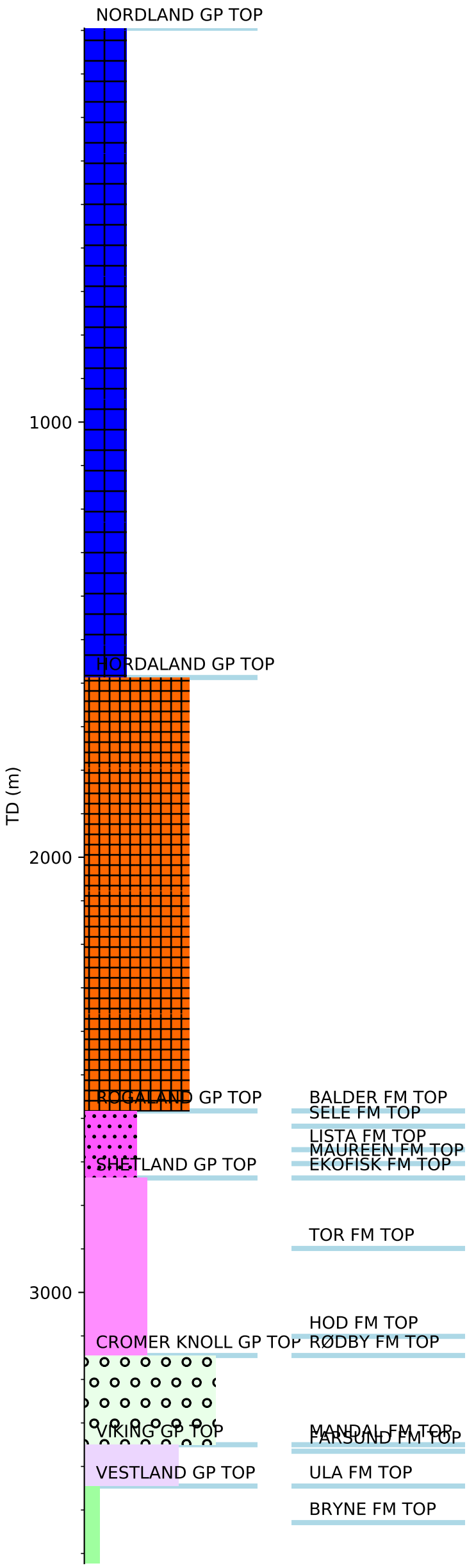
Groups

Formation Tops



Wellbore History

GENERAL

Well 7/12-4 was drilled as an appraisal well on the Ula Field in the North Sea. The main objective was to evaluate the extent and hydrocarbon potential of the Late Jurassic sands in the south eastern flank of the structure.

OPERATIONS AND RESULTS

Appraisal well 7/12-4 was spudded with the semi-submersible installation Nordskald on 11 September 1977 and drilled to TD at 3623 m in Early Jurassic sediments of the Bryne Formation. Operations proceeded without significant problem. The well was drilled with fresh water/gel down to 498 m and with lime/Drispac mud from 498 m to TD.

The target reservoir Ula Formation was encountered at 3445 m, while the underlying Bryne Formation came in at 3529 m. Net sand in the reservoir was 73 m with porosity from 10 to 23%, permeability from a few millidarcy to 1750 millidarcy, and water saturation from 5 to over 60%. The reservoir was oil-bearing with a possible OWC at 3551 m in the Bryne Formation based on disappearance of oil shows; however, drill stem tests showed that the producible contact between oil and water was between 3530 and 3536 m.

Seven cores were cut from near top Ula Formation at 3447.5 m to 3556.7 m in the Bryne Formation. The recovery was 100% in core one to six and 96% in core seven. RFT fluid samples were taken at 3458 m (oil, emulsion and water), 3467 m (emulsion) and at 3528 m (water)

The well was suspended on 12 December 1977 for possible use as a producer at a later stage. It is classified as an oil appraisal well.

TESTING

Production tests were carried out on three reservoir intervals to establish the producible oil-water contact and to obtain reservoir properties of the Middle and Late Jurassic sands.

DST 1 tested the intervals 3536 to 3540 m and 3550 to 3552 m. This test failed for mechanical reasons in the first attempt. The second attempt, DST 1B, produced 10 Sm3 water/day with no indication of hydrocarbons. This was the only test where the temperature gauge functioned correctly. The measured temperature was 141.1 deg C

DST 2 tested the interval 3527 to 3530 m. This test produced 6 Sm3 oil/day from low-permeable sands at the base of the reservoir. The oil density was 0.828 g/cm3.

DST 3 tested the main reservoir from the intervals 3453 to 3460 m and 3463.5 to 3471.5 m. This test produced in the final flow 1110 Sm3 oil, 73624 Sm3 gas /day through a 32/64" choke. The separator GOR was 66 Sm3/Sm3 while the total GOR was 96 Sm3/Sm3. The oil density was 0.830 g/cm3 and the gas gravity was 0.754 (air = 1).

LITHOSTRATIGRAPHY & HISTORY FOR WELL: 7/12-4