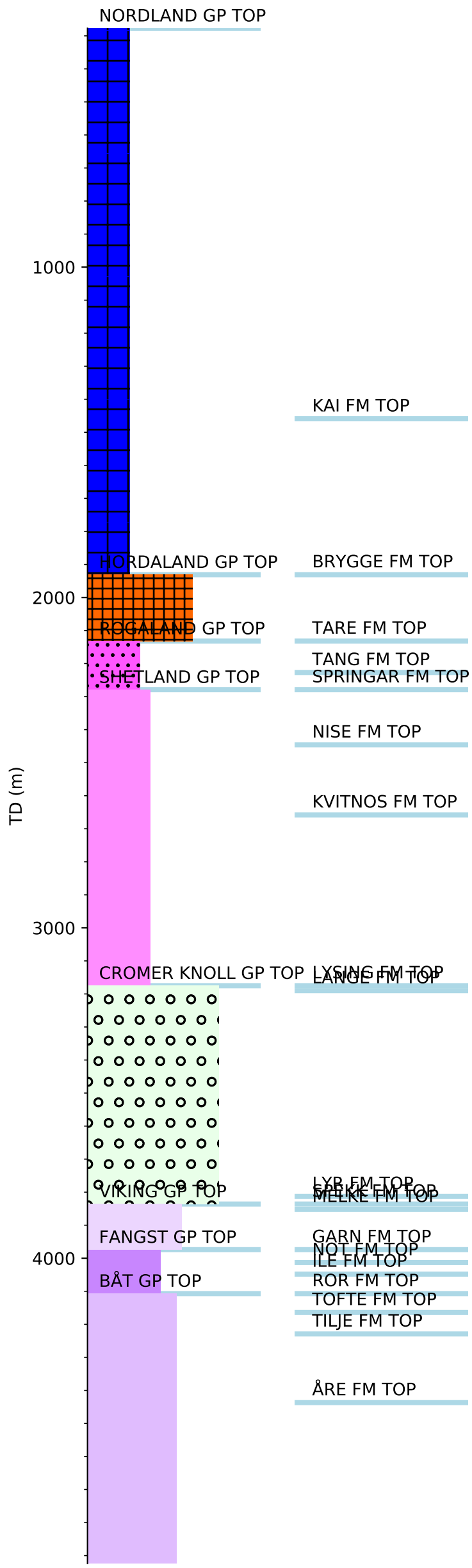

Wellbore History

GENERAL

Well 6506/12-1 was drilled on the Alpha structure in the northwest part of the block. The main objective was middle Jurassic sandstones in an anti form structure. The secondary and tertiary objectives were Early Jurassic and Triassic sandstones on the same structure. Late and Early Cretaceous were also considered possible zones of hydrocarbon accumulations. Further objectives, of a more general exploratory nature, included the sampling of potential source rocks. Total depth was to be in rocks of Triassic age, or 4000 m in order to satisfy the licence commitment.

The well is Type Well for the Tofte, Lange, and Lyr Formation. It is Reference Well for the Cromer Knoll Group and for the Springar, Nise, and Kvitnos Formations.

OPERATIONS AND RESULTS

Wildcat well 6506/12-1 was spudded with the semi-submersible installation Ross Isle on 16 August 1985 and drilled to TD at 4924 m in the Early Jurassic sediments of the Åre Formation. Drilling down to, and cementing the 20" casing, went without problems. While testing the casing a leak was discovered. No influx or loss of fluid was observed. Setting a cement plug in the interval 540-590 m solved the problem. A leak-off test equal to 1.34 g/cm3 below the 20" casing shoe was considered to low, and a cement squeeze was performed, after which a formation integrity test gave 1.64 g/cm3 without leak off. A cement squeeze also had to be performed to obtain a satisfactory leak-off test below the 13 3/8" casing shoe. Pore pressures were considerably below prognosed down to this depth. While preparing to run the 9 5/8" casing a sealing ring was dislodged and had to be milled. Down to 4317 m maximum deviation was 3.7 ° and difference between measured and true vertical depth was not more than 1 m. The last part of the well was however more problematic in this respect. At 4925 m it was decided to stop the drilling as the angle had built up too much, and an RFT-tool was stuck in the hole. The well was then logged and plugged back for testing. The well was drilled with spud mud down to 348 m, with bentonite and seawater from 348 m to 948 m, with gypsum/CMC from 948 m to 2203 m, with gypsum/lignosulphonate from 2203 m to 3918 m, with gel/lignosulphonate from 3918 m to 4554 m, and with gel/lignosulphonate/lignite from 4554 m to TD.

A 15 m thick sandstone/siltstone unit (Lysing Formation) was encountered at 3175 m. Logs indicated presence of hydrocarbons, but well site analyses of returns recorded no shows. The well penetrated 139 m Late Jurassic shales from 3835 m to 3974 m, including 22 m Spekk Formation in the upper part. Hydrocarbon bearing Middle Jurassic sandstones were encountered at 3974 m. No hydrocarbon/water contacts were recognised, neither on logs nor on cores. Moreover, the hydrocarbons seemed to be present both in Middle and Early Jurassic sandstones including sandstones within the top of the Åre Formation. The drill stem tests produced hydrocarbons down to a depth of 4373 m.

A total of 319 m of core was recovered in 15 cores from the Middle to Early Jurassic reservoir sections.

The well was permanently abandoned on 6 February 1985 as a gas and condensate discovery.

TESTING

Seven different intervals in the reservoir were tested. DST 1 (4504-4509 m), DST 3 (4291-4304), and DST 6 (4095-4110) showed tight formation with no formation fluid produced to surface. DST 2 (4351-4373 m, Lower Tilje Formation) produced 691700 Sm3 gas and 516.9 Sm3 condensate pr day on a 25.4 mm choke. DST 4 (4251-4261 m, upper Tilje Formation) produced 603100 Sm3 gas and 620.2 Sm3 condensate pr day on a 23.8 mm choke. DST 5 (4203-4218 m, Tofte Formation) produced 583900 Sm3 gas and 376.6 Sm3 condensate pr day on a 25.4 mm choke. DST 7 (3993-4011 m, Garn formation) produced 2740 Sm3 gas and 61.3 Sm3 condensate pr day on a 31.8 mm choke. The gas/oil ratio for the different tests varied from 973 to 1550 Sm3/Sm3 while the CO2 was between 4.5 to 5.6 % and the H2S content was between 6.5 to 8.0 ppm.

LITHOSTRATIGRAPHY & HISTORY FOR WELL: 6506/12-1