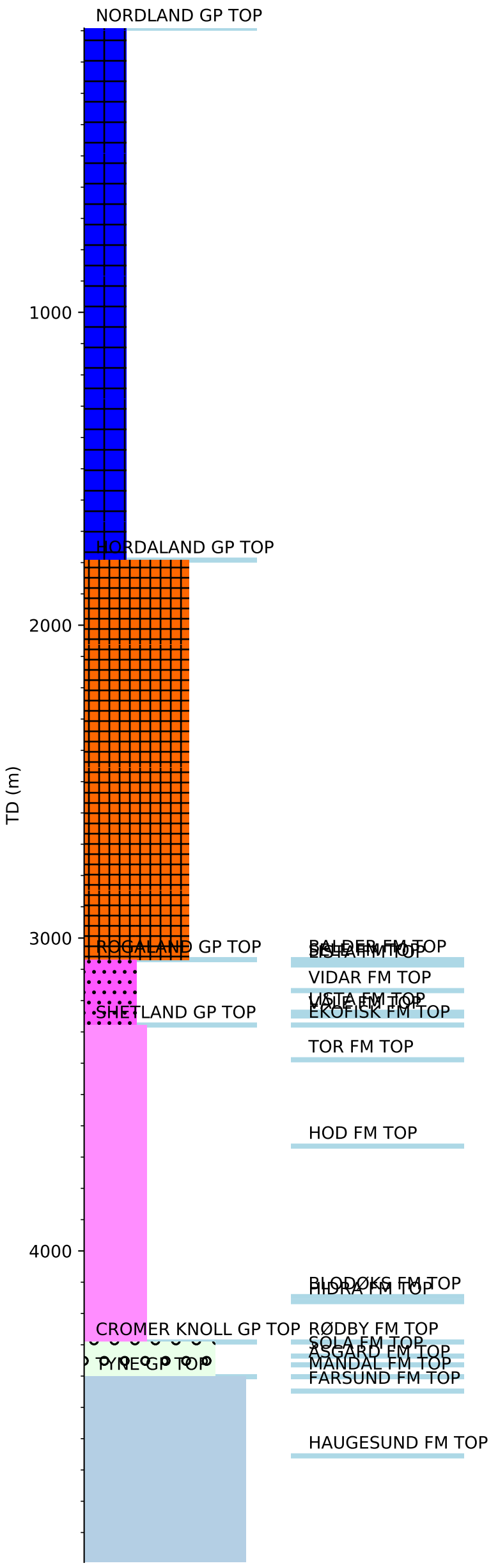

LITHOSTRATIGRAPHY & HISTORY FOR WELL: 1/6-7

Wellbore History

GENERAL

Well 1/6-7 is located in the Feda Graben of the North Sea, approximately mid-way between the Albuskjell and Tommeliten Gamma fields. It was drilled on the flank of a salt diapir. The primary objective of the well was to test the hydrocarbon potential of Late Jurassic sandstones. Two secondary objectives were identified; to test for hydrocarbons in the Cretaceous Chalk and to test for the development and the hydrocarbon potential of Paleocene sands.

OPERATIONS AND RESULTS

Wildcat well 1/6-7 was spudded with the semi-submersible installation West Vanguard on 16 March 1992 and drilled to TD at 4995 m (5001 m logger's depth / 4925 m TVD). A 9 7/8" pilot hole was drilled from 170 to 1007m prior to the 26" section to check for possible shallow gas at 311, 351, and 397 m. No shallow gas was seen. MWD check-shots inside the 20" casing (azimuth unreliable) proved that the well had sidetracked in the 26" hole. In the 12 1/4" hole a steerable assembly was run in hole to correct the course. This twisted off, leaving a fish at 3740 m. The well was plugged back to 3550 m and the well was sidetracked from 3650 m. After the sidetrack the azimuth stayed fairly constant in a northwest direction. The inclination, though, increased. In the 12 1/4" hole from 3515 m to 4329 m the angle built from 3.73deg to 13.52deg. The angle kept building in the 8 1/2" hole until a maximum MWD survey of 31.40deg at 4701m. At this depth the bit was pulled out of the hole for an intermediate logging run and to change the BHA to an angle dropping assembly. This assembly dropped the inclination to 24.7deg by TD. At 4878 m, in the top of Sandstone Unit II, a salt water kick was taken. The well was drilled with seawater with viscous pre-hydrated bentonite sweeps down to 1007 m, with inhibitive polymer mud system utilizing WBS-200 wellbore stabilizer to from 1007 m to 1400 m, with PHPA inhibitive polymer mud from 1400 m to 3273 m, and with high temperature polymer system mud from 3273 m to TD.

Weak to fair shows in the claystone and limestone were seen in several intervals from 2680 to 2950 m (Hordaland Group), and free tarry oil in the mud was observed from 2912 - 2945 m (claystone with stringers of limestone and dolomite). The tarry oil was described as dark brown to black, with a resinous lustre, orange to yellow direct fluorescence, moderate to fast streaming yellowish cut and had a dark brown residue. The Chalk objective was drilled outside of structural closure and top Ekofisk Formation was penetrated at 3278 m (3275 m TVD). Moderate shows were described here in a zone from 3288 to 3293 m with weaker shows continuing down into core #1, and on cuttings further down to 3420 m. The electrical logs indicate an average porosity of 17.5% in this zone. BCU (top Mandal Formation) was penetrated at 4402.5 m (4388.6 m TVD). Two sandstone units of Oxfordian age, Sandstone Unit II (4750 - 4788 m / 4706.4 - 4739.7 m TVD) and Unit I (4879 - 4977 m / 4820 - 4907.5 m TVD) were penetrated. Average porosities of the Units were 16.1 and 21.5 % respectively. Shows in Sandstone Unit II (4750-4788m, Core #2 and #3) were described as very weak to no direct fluorescence, slow even bluish white crush cut, and faint creamy residue fluorescence. Shows in Sandstone Unit I (4879 - 4977 m) appeared with no fluorescence, no cut, minor traces of slow even bluish white crush cut and traces of creamy residue fluorescence. The cuttings in this unit had a good gas odour.

Three cores were cut with 100, 94.7, and 98.5% recovery, respectively. The first core was cut in the upper part of the Ekofisk Formation (3295 m - 3313.9, m) and the next two in the Haugesund Formation (4754 - 4773 m and 4773 - 4800.57 m respectively) in Sandstone Unit II and into the underlying shale. In order to match the gamma ray log cores #1, #2, and #3 has to be shifted + 1.2 m, +6.5 m, and +5.5 m, respectively. A total of 10 FMT pressure tests and one fluid sample were taken in Sandstone Unit I. Calculated pressure gradient in this sandstone is 0.52 psi/ft (0.12 Bar/m). The fluid sample, at 4884 m, contained water and mud filtrate only.

The well was permanently abandoned on 12 July 1992 as a dry well with shows.

TESTING

No drill stem test was performed.