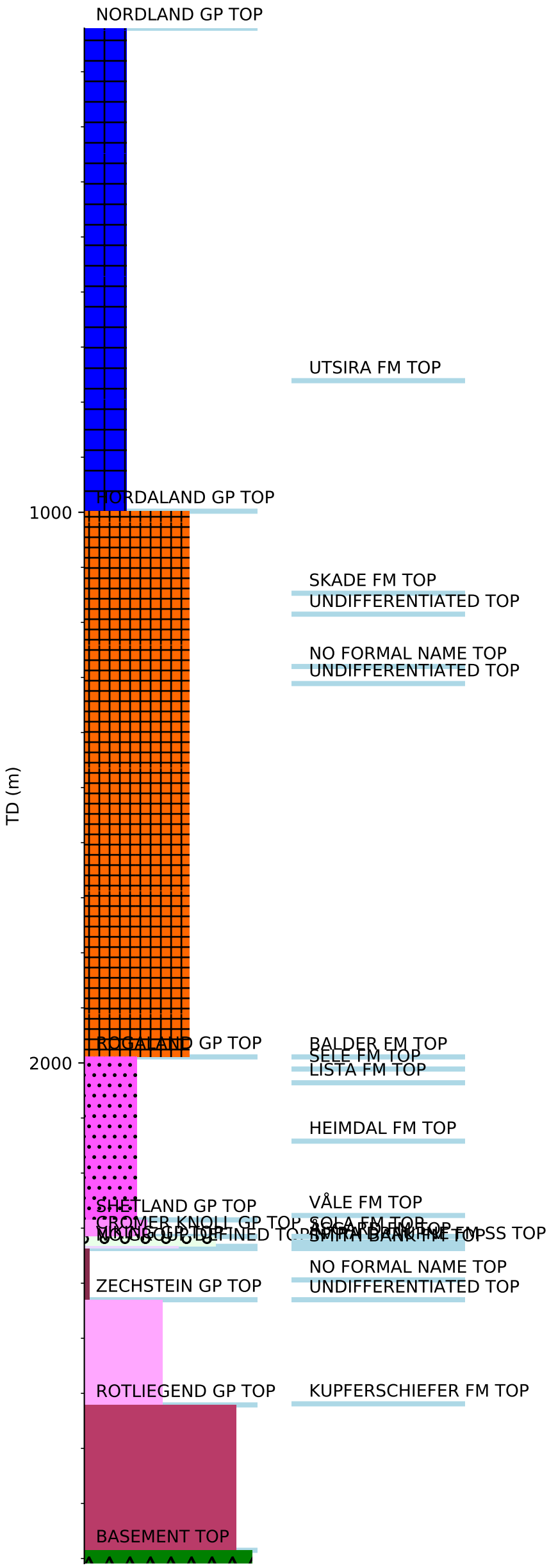

Wellbore History

GENERAL

Well 16/4-1 is located on the Utsira High. The primary objective of the well was to test the Paleocene Heimdal Formation. Secondary objectives were Jurassic and Triassic sandstones, Zechstein carbonates and Rotliegendes conglomerates. The well was planned to reach TD at 2850 m + 100 m after having identified a seismic reflector at this depth, interpreted to represent Top Metamorphic Basement.

OPERATIONS AND RESULTS

Wildcat well 16/4-1 was spudded with the semi-submersible installation Treasure Seeker on 8 September 1984 and drilled to TD at 2909 m in crystalline/metamorphic basement of Early Paleozoic age. Under the 30" casing shoe a 17 1/2" pilot hole was drilled. At 494 m in Pleistocene sand and shale, the well started to flow up the annulus from a small gas pocket. The well died out by itself but there were problems with lost circulation, so a cement plug was set from 494 - 415 m. The cement was drilled out to 480 m and the hole was underreamed to 26" before landing of the 20" casing. No other major problems occurred during drilling of this well. The well was drilled with seawater and bentonite down to 494 m, with KCl/polymer mud from 494 m to 2052 m, and with NaCl/polymer mud from 2052 m to TD.

The well 16/4-1 encountered water-bearing sandstones in the Paleocene Heimdal Formation as well as in the Triassic. The latter is a 36 m thick sand in between the Smith Bank Formation and the Zechstein Group. The Heimdal Formation Sandstones occur as interbedded sand/claystone in the upper part (2100 m to 2142 m) and as a massive sandstone, which is homogenous and very clean in the lower part (2142 m 2277 m). The Triassic sandstones (2394 m to 2430 m) were very fine-to-fine grained with a considerable amount of silt and mica. Log evaluations over these sands gave the following results: The interval 2100 m to 2142 m gave a net/gross ratio of 0.095, with an average porosity of 23,06% and a shale volume of 43,58% after cut-off. The interval 2142 m to 2277 m had a N/G of 0,89 with 26,36% average porosity and 11,19% shale volume. The Triassic interval (2394 m to 2430 m) had a net/gross of 0,37 with 22,88% average porosity and 18,54% shale volume. All these values are calculated after a cut-off of 20% (1 mD). Twenty-five pressure tests (RFT) were performed from 2083 m to 2422.4 m. These gave a water gradient of 0,445 psi/ft (1.024 g/cc) in the Heimdal Fm sandstones. No pressure data were obtained from the Triassic.

Three cores were cut in this well, the first and second in sandstones of the Heimdal and Smith Bank formations respectively. The third core was taken in metamorphic/crystalline basement. Core 1 was cut from 2161 m to 2174 m in the Heimdal formation. The recovered core of 11 m (85%) consisted of very fine to medium grained, poorly sorted sandstone with claystone in the interval 2170-71 m. Core 2 was cut from 2404 m to 2422 m and 17.5 m (97%) was recovered. The core was cut in the Triassic sand under the Smith Bank Formation. It consisted of micaceous sandstones and siltstones with subordinate clay clasts. Core 3 was cut from 2907 m to 2909 m in the Basement and 100% was recovered. The core consisted of schist and granite. No fluid samples were collected. The well was permanently abandoned on 18 November 1984 as a dry well.

TESTING

No drill stem test was performed

LITHOSTRATIGRAPHY & HISTORY FOR WELL: 16/4-1