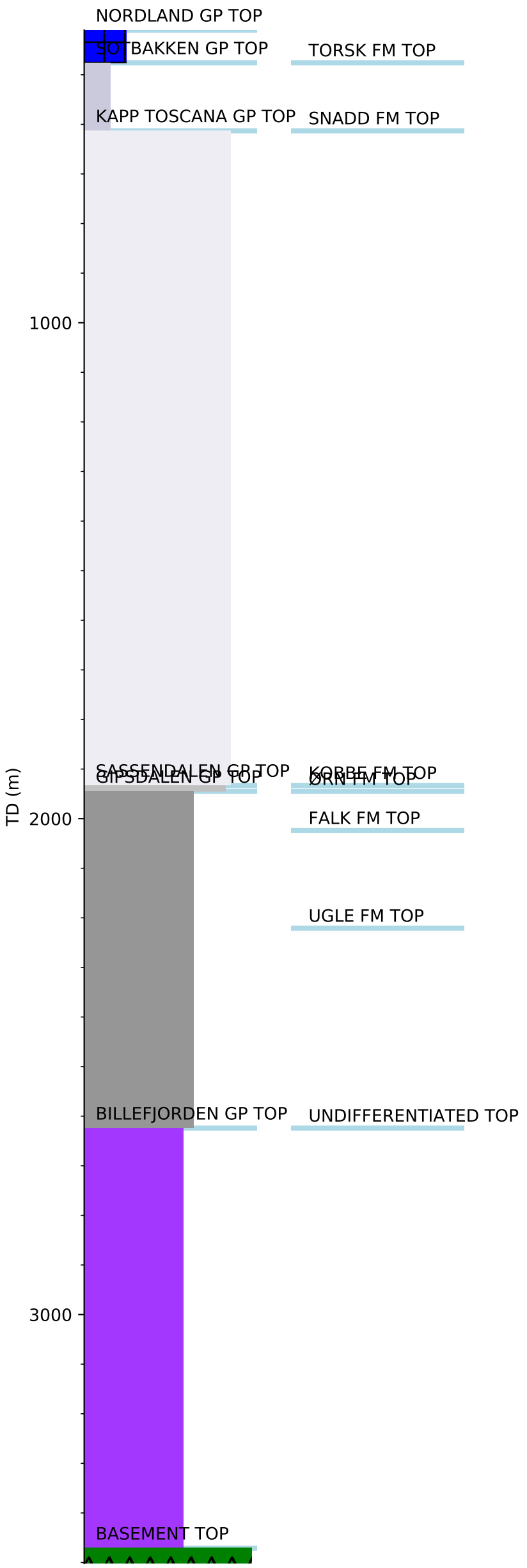

LITHOSTRATIGRAPHY & HISTORY FOR WELL: 7120/2-1

Wellbore History

GENERAL

Wildcat well 7120/2-1 was drilled on the Loppa High in the Northern part of the block, a previous unexplored province. The primary objective of well 7120/2-1 was to test the reservoir and hydrocarbon bearing potential of Early-Middle Carboniferous rocks, truncated by a major unconformity predicted at Base Ladinian

The secondary objective was to test the reservoir (and thereby the seal) potential of Intra Middle Triassic sediments deposited above the Base Ladinian unconformity, and to also penetrate a sufficiently thick interval of the Lower Permo-Carboniferous wedge, which was prognosed to pinch out above the Early Middle Carboniferous section, in order to obtain adequate stratigraphic evaluation. It was considered a possibility that such an interval would be of reservoir quality, though probably being better developed to the east. The well was also expected to fulfil the license commitment by drilling into Devonian rocks, or to 4000 m, whichever came first.

OPERATIONS AND RESULTS

The well was spudded with W.Wilhelmsen semi-submersible rig Treasure Scout on 5 May 1985 and drilled through ?Early Carboniferous sediments to TD at 3502 m in altered dolerites of indeterminate age. Due to a work conflict, while drilling a pilot hole prior to the 17 1/2" section, drilling was halted for 13 days. The drill string penetrated a pocket of shallow gas between 618 m and 622 m as predicted by shallow seismic reflectors. The well was drilled with seawater and hi-vis pills down to 1050 m and with KCl/polymer mud from 1050 m to TD.

A major unconformity (613 m) separates the Tertiary from the Triassic sediments with missing sediments in the age range Late Triassic to Early Paleocene. The Triassic sandstone prognosed to 1850 m was not found. A second stratigraphic break was observed at 1945 m, where Middle Triassic sediments were found resting unconformably on sediments of Early Permian age (the Base Ladinian Unconformity). At 1945 m a limestone with extremely high Gamma Ray was encountered. Below 2140 m the rocks was dominated by dolomitic limestone with thin sand- and slate- layers. Oil shows, staining, fluourescence and cut were observed sporadically throughout from 618 - 2218 m. There were good oil shows recorded on the cores from 1960 m - 2218 m, oil bleeding from fractures and vugs. Geochemical analyses verified trace quantities of free hydrocarbons throughout the well with significant quantities of migrated oil and gas in the section from1937 m to 2196 m. The logs also showed high hydrocarbon saturation. In spite of this the well flowed water on all four tests with a 1-2 % oil cut in test four. There was a poor correlation between porosity and permeability from the cores, this and the fact that the formation was fractured made it difficult to choose cut-off values. Porosity cut-off of 7 % and shale volume cut-off of 40 % were used. Since no hydrocarbons were produced no "net pay" was established. Geochemical studies proved promising TOC results, but no significant source rock potential was identified in the well bore, and the kerogens present were of Type III, terrestrially derived and gas prone. An increasing maturity trend from seabed to 1945 m was observed with a jump at ca 600 m (Triassic unconformity), but samples were immature with respect to hydrocarbon generation down to 1600 m where the lower limit of the oil generation window was reached. Below 1945 m the trend was much more scattered and the majority of Tmax data indicated thermal maturity. Post maturity was observed below 3270 m.

Eighteen conventional cores were taken from 1960 m through the Ørn, Falk, and Ugle Formations to a depth of 2243 m. A further two cores were taken, one in non-metamorphosed conglomerates in the Billefjorden group from 2637 m to 2648 m and the other in the altered dolerite sequence in basement from 3478 m to 3481 m. A total of 62 pretests in three RFT runs were taken, of which 42 were either tight or experienced seal failure. One 2 3/4 gallon RFT sample containing water was recovered from 620 m. No RFT samples were recovered from the reservoir intervals. Potassium-Argon dating of the altered dolerite at TD indicated an absolut age of 170 my as the date of the last overprinting. The well was accepted as an obligatory well on the License. It was permanently abandoned on 29 October 1985 as a well with strong oil shows.

TESTING

Four DST's were performed, one in the clastic sequence and three in the carbonates sequence. Acid stimulation was conducted on the first three tests, and nitrogen lift on all four tests DST 1 produced 175 Sm3