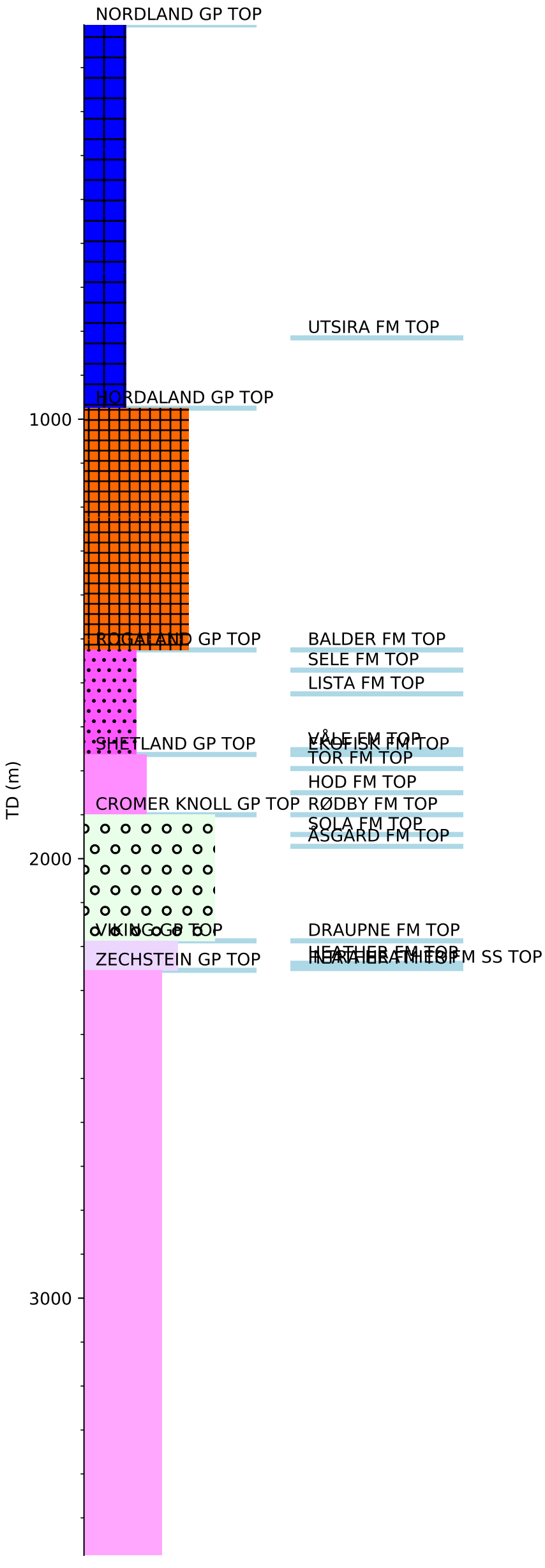
Groups

Formation Tops



Wellbore History

GENERAL

Exploration well 16/8-2 is located in the Ling Depression south of the Utsira High and North of the Danish Norwegian Basin. The primary target was Late Jurassic sandstones; secondary target was the Danian/Late Cretaceous limestones and Rotliegendes/Devonian sandstones.

OPERATIONS AND RESULTS

Well 16/8-2 was spudded from the semi-submersible installation Sedco H on 3 April 1980 and drilled to TD at 3585 m in Late Permian Zechstein evaporites. The well was drilled with bentonite and seawater down to 542 m, with a Spersene lignosulphonate/gypsum/CMC mud from 542 m to 2275 m, and with a salt saturated Drispac polymer/XC polymer/Polysal starch mud from 2275 m to TD.

Down to the setting of the 13 3/8" casing, the well progressed as programmed. However, the absence of the Triassic and the appearance of the Zechstein evaporites much shallower than expected caused the 9 5/8" casing to be set 474 metres higher than programmed. The drilling of the 8 1/2" hole commenced with a 1.45 SG salt saturated mud as programmed. Two runs with a turbine/Stratapac bit were made. However, on pulling out of the hole from 3519 m, tight hole was encountered and while attempting to work through this section, the drill string parted leaving 32.81 m of BHA at a depth of 3462 m. On running in with an overshot, the well was observed to be flowing. It was shut in but pressure continued to increase even after the appropriate mud weight increases had been effected. The mud weight was eventually raised to 2.03 SG creating a fine balance between sufficient fluid density and exceeding fracture pressure. The influx (thought to be from a Carnallite zone at approximately 3513 m) had an adverse effect on the mud properties causing the barite to settle out and reducing the pH to an acidic level. The magnesium and calcium sensitive Drispac polymer was replaced with the more tolerant 'XC Polymor1 to maintain the barite in suspension, and an inhibitor was added to prevent corrosion occurring. After many attempts at setting cement plugs and controlling well flow, the hole was plugged back into the 9 5/8" shoe, leaving 823 metres of drill pipe in the hole. Sidetracking was performed from 2325 m, drilling with a 1.82 SG mud until reaching 3481 m when again an influx was observed. The mud weight increased to 1.90 SG although full control of the influx was not gained until drilling beneath the zone.

Due to the uncertainty attached to the pore pressures in the Rotliegendes, it was decided not to drill into it with this high mud weight. The programme was therefore amended and the 7" liner was set at the base of the Zechstein with the intention of reducing the mud weight before drilling ahead. However due to further problems with cleaning out the 7" liner a decision was made to plug and abandon the well.

The well penetrated a relatively complete Tertiary and Cretaceous section including the secondary target Ekofisk, Tor, and Hod formations. No shows were observed in the chalk formations. The primary target Late Jurassic was also encountered but proved to consist of 51 m Draupne and 13.5 m Heather Formation shales intercalated by only stringers of sand. One of these, a thin Oxfordian sand was penetrated from 2247.5 to 2250 m, average porosity in this bed was approximately 30%. The Heather Formation was found unconformably on the Late Permian Zechstein salt. The further target of the Rotliegendes/Devonian sandstone was not accomplished due to the technical problems described above. Geochemical analyses showed that the only significant source rock was the Draupne Formation which had excellent potential for oil, but immature in the well location (%Ro in the range 0.45 - 0.50). No cores were cut and no fluid samples were taken. The well was permanently abandoned as dry on 13 August 1980.

TESTING

No drill stem test was performed

LITHOSTRATIGRAPHY & HISTORY FOR WELL: 16/8-2