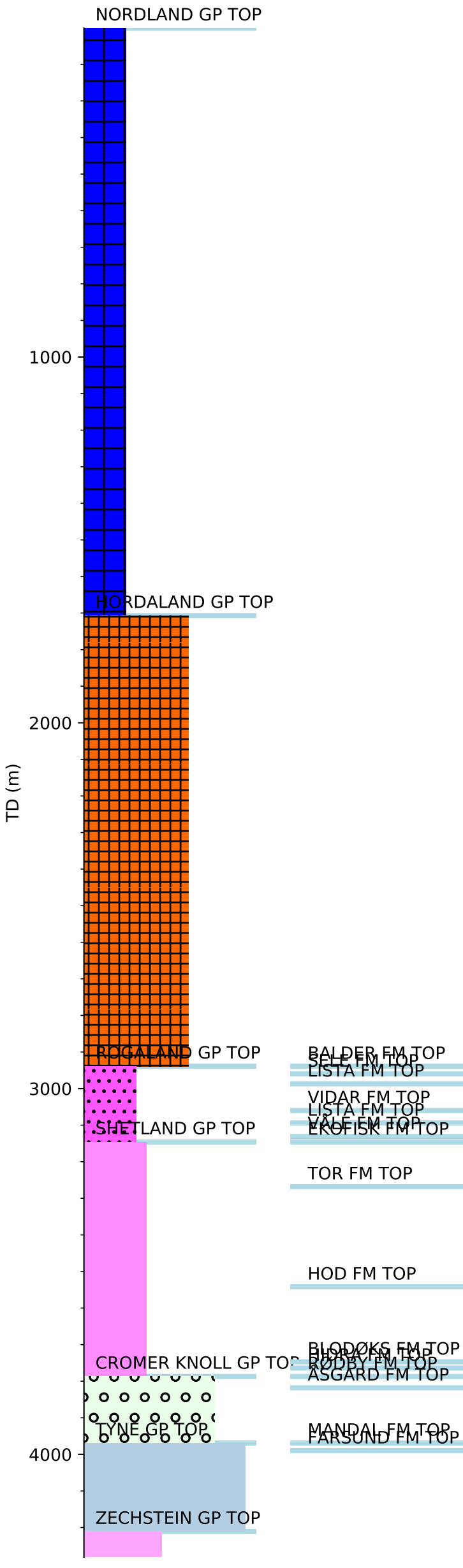
Groups

Formation Tops



Wellbore History

GENERAL

Wildcat well 2/4-11 should evaluate the southern part of a northwest-southeast trending seismic high about 3.2 km long and 2.4 km wide. The well was drilled just south of the boundary between blocks 2/1 and 2/4 about two km southeast of the 2/1-1 well. The objective formations were the Danian-Late Cretaceous limestone in addition to sandstones of the Jurassic, which had gas and condensate shows in the 2/1-1 well. Top Paleocene was anticipated at 2972 m (9750 ft), top Danian at 3078 m (10100 ft), top Late Cretaceous at 3277 m (10750 ft), and top Jurassic at 3962 m (13000 ft). Planned TD was at 4267 m (14000 ft).

OPERATIONS AND RESULTS

Well 2/4-11 was spudded with the jack-up installation Zapata Explorer on 25 December 1973 and drilled to TD at 4281 m in the Late Permian Zechstein Group. Running 7" casing at 3838 m, the casing could not get passed 3019 m. Pulling out of hole the casing stuck when 20 stands were left. Eleven days were spent working on the fish before it came loose. The hole was reamed and casing was set. Maximum hole deviation down to a depth of 2757 m was 4.75 deg, at 149 m. The well was drilled with spud mud (Seawater gel and Flosal) down to 321 m, with Shale Trol mud from 321 m to 2265 m, and with a Lignosulphonate mud (Unical and Ligcon) from 2265 m to TD. Below 792 m one to four percent diesel was added to the mud.

Top Paleocene was found at 2936 m, top Danian limestone at 3146 m, top Late Cretaceous limestone at 3268 m, top Early Cretaceous was found at 3782 m, top Late Jurassic (Kimmeridgian) at 3968 m, and top of the Permian was encountered at 4211 m. Sub-commercial amounts of oil was tested from the Danian and even smaller amounts from the Late Cretaceous. The Jurassic section penetrated consisted of shale, claystone, and siltstone and contained no reservoir rocks.

Source rock analyses of sidewall cores from the Jurassic showed TOC in the range 0.6 - 2% and vitrinite reflection from 0.78 to 0.80 %Ro. Relatively low hydrogen indices indicate that the source rock has reached past mid oil window and that a major part of the hydrocarbon potential had been realised.

No conventional cores were cut and no wire line fluid samples taken.

The well was permanently abandoned on 9 April 1974 as an oil discovery.

TESTING

Five DST's were carried out: DST 1, 2 and 3 in the Late Cretaceous limestone, DST 4 and 5 in the Danian limestone. All results given here are after acidization:

DST 1 from the interval 3758 to 3770 m flowed slowly and sluggishly. Two hours after acidization the well started to flow water, gas, mud and trace of crude oil, but due to observed mud loss in the casing the well was killed.

DST 2 from the interval 3639 to 3667 m was a misrun. DST 3 from the same interval flowed slowly and irregularly 5 - 8 Sm3 oil and some gas.

DST 4 from 3188 -3200 m flowed only water cushion to surface, at a very poor rate.

DST 5 from 3146 - 3161 m in the topmost Danian limestone flowed 50 Sm3 oil, 2 m3 water, and 1051 Sm3 gas /day on a 64/64" choke. Oil gravity was 39.9 deg API and the GOR was 21 Sm3/Sm3. The down hole temperature measured in the test was reported to be 124 deg C.

LITHOSTRATIGRAPHY & HISTORY FOR WELL: 2/4-11