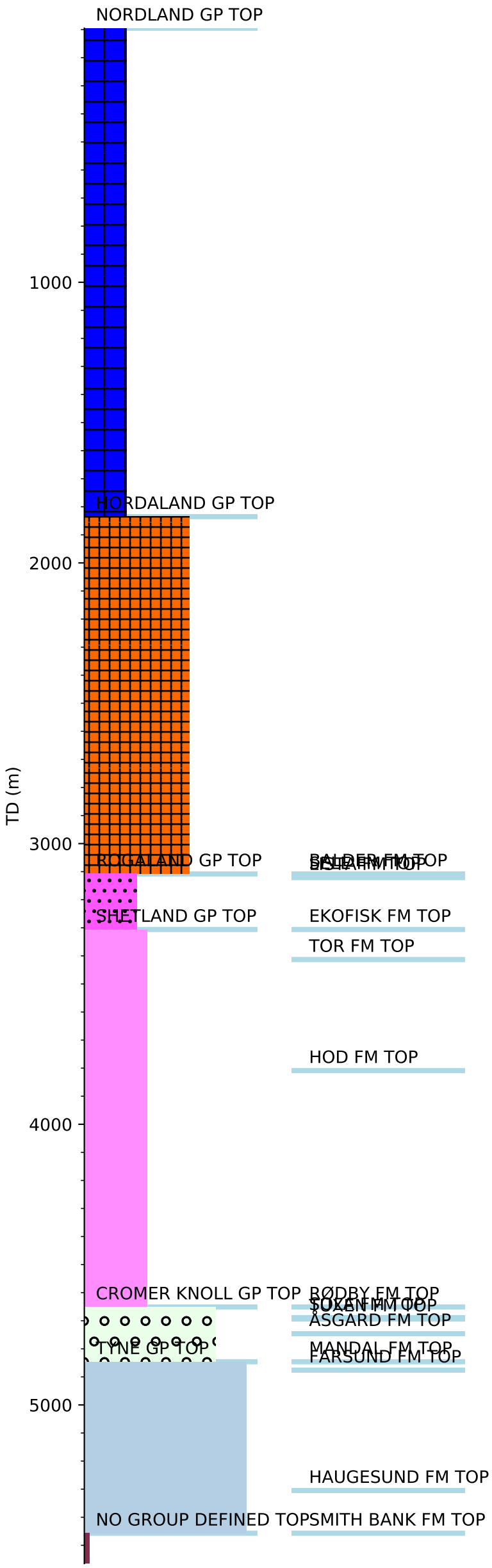
Groups

Formation Tops



Wellbore History

GENERAL

Well 1/6-6 is located ca 2 km south of the Albuskjell Field in the southern Norwegian North Sea. The principal objective was to test the hydrocarbon potential of Middle and Late Jurassic sandstones on the southern flank of a faulted dip closure, partially underlying the Albuskjell Chalk Field. It was proposed to drill to a total depth of 5355 m or 200 m below the interpreted Base Late Jurassic.

OPERATIONS AND RESULTS

Well 1/6-6 was spudded with the semi-submersible installation Dyvi Stena on 10 February 1992 and drilled to final TD at 5565 m (5562 m TVD), some 100 m into Triassic siltstone. The well achieved its objective, which entailed drilling 210 m deeper than plan, to a new Norwegian depth record of 5565 m RKB. Maximum pore pressure in the well was estimated to have been 2.24 sg, higher than the worst-case scenario defined by the well proposal. BHT was 190 deg C. Both pore pressure and BHT were the highest yet encountered in Norway. The well was production tested under these stringent conditions.

Including additional time, the planned work scope for the well was 179.5 days. It eventually took 395 days. Of these, only 204.5 days (51.8%) was considered productive time. Five incidents accounted for 75% of lost time. These were: dropped 10-3/4" casing, failed wellhead, well control incident, failure of the HPC tieback packer and waiting on weather. The problems involved two sidetracks. The dropped 10-3/4" casing with TD at 4467 m led to the first sidetrack, which was made from kick-off at 2560 m. Then, after drilling to 3284 m and tripping out, a second sidetrack was accidentally made from 2522 m.

The well was drilled with seawater and viscous sweeps to 1127 m and with gypsum / polymer mud from 1127 m to 4466 m in the first hole. The first sidetrack was drilled with gypsum/polymer mud from kick-off to TD. The second and final sidetrack was drilled with VISPLEX for sidetracking, then with HF PLUS (glycol) down to 4478 m, and with HITEMP polymer mud from 4478 m to TD.

Top Paleocene was encountered at 3108 m. Weak shows were recorded in the Lista Formation. The Shetland Chalk Group was encountered at 3306 m and was 1345 m thick. The Late Jurassic Tyne Group was penetrated at 4876 m, and a "basal sand" of Early Kimmeridgian - Late Oxfordian age at 5396 m. The gross thickness of the sandstone was 61 m. There were indications of hydrocarbons in this sand, but a DST produced only water. No Middle Jurassic rocks were penetrated. Age at TD is not confirmed by biostratigraphic evidence as samples and core was barren of fossils.

One ten-metre core was cut at TD in the well. During several FMT runs over the interval 5075 - 5450 m a total of 32 pressure settings were attempted, of which some 10 pressure points were considered useful. Two segregated samples were taken at 5432 and 5398 m. Both recovered only mud filtrate.

The well was plugged and permanently abandoned on 8 March 1993 as a dry hole with shows.

TESTING

The well was tested in the interval 5396 - 5407 m. The test flowed 900 Sm3 salt-saturated formation water and 4300 Sm3 gas /day through a 32/64" choke

LITHOSTRATIGRAPHY & HISTORY FOR WELL: 1/6-6