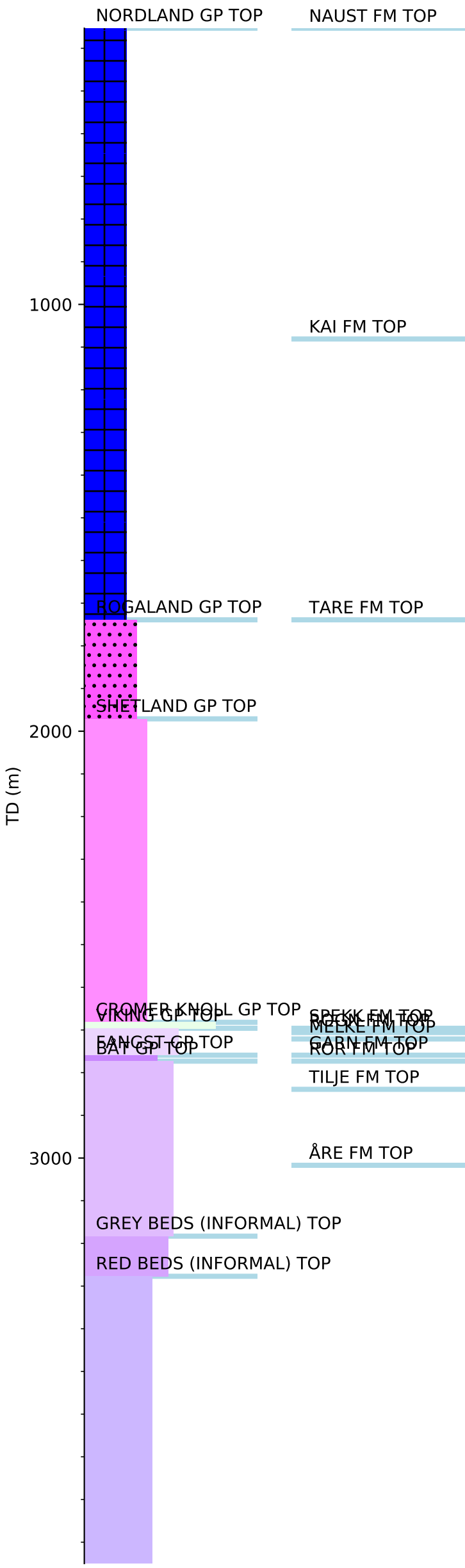

Wellbore History

GENERAL

Well 6407/7-1 S is located ca 30 km west of the Draugen field on the Njord A-structure in the southern part of the Halten Terrace. The apex of the A-structure is at about 2600 m MSL. The structure has a complex geology with dense faulting. The objective was to test for hydrocarbons in the structure, with the Middle and Early Jurassic as the primary and secondary targets. In addition, the well should obtain reservoir data from the Middle and Early Jurassic reservoir sandstones and establish a better stratigraphical, sedimentological, and structural knowledge of the area. The well should penetrate a deep reflector interpreted to be the "Top Middle Triassic Evaporite reflector". The prognosed total depth was 4025 m.

OPERATIONS AND RESULTS

Wildcat well 6407/7 1 S was spudded with the semi-submersible installation Polar Pioneer 19 October 1985 and was drilled to TD at 3950 m in Triassic rocks. Ca 30 days (17%) of the rig time was down time. Major causes for this were sub sea problems with orienting the temporary guide base, bad weather, and fishing for various objects and stuck tools. In addition the section from ca 746 to 1177 m required wiper trips and a lot of reaming to clean the hole. This added several days to the drilling time. The well was vertical down to 1177 m, it built deviation angle up to maximum 9.8 deg at 1460 m, and had a deviation between 9.8 and 3.0 deg from there to TD. The well was drilled with spud mud down to 1172 m, with KCl/polymer mud from 1172 m to 2710 m, with gel/polymer mud from 2710 m to 3601 m, and with gel/lignosulphonate mud from 3610 m to TD.

The top of the reservoir came in at 2759 m, 70.5 m higher than prognosed. Oil was discovered in three separate reservoir units. The upper reservoir (2759 - 2783.5 m) consisted of sandstones belonging to the Fangst Group and Ror Formation. Relative pressure in this unit was 1.35 g/cc. The main reservoir (2839 -2988 m) consisted of sandstones belonging to the Tilje Formation. Relative pressure was 1.40 g/cc. This reservoir tested 730 and 711 Sm3 oil /day in two tests with a maximum rate of 1400 Sm3 oil /day. The oil was found to be under saturated. The lower reservoir (3017 - 3038 m) consisted of sandstones belonging to the Åre Formation. Total net pay in the reservoirs using porosity > 13%, volume of shale <40%, and < 60% water saturation was 130 m. The OWC was estimated to be at 3045 m.

Oil shows of poor quality were observed on sand/sandstone (1-10 % of cuttings) in the Shetland Group from 2090 to 2165 m. Oil shows of poor to moderate quality were observed on siltstones recovered from CST run in the Viking Group at 2699 to 2711 m. Oil shows of poor to moderate quality restricted to porous sandstone only were observed in the Garn Formation from 2756 to 2780 m. Fair to good shows on porous coarse sandstone were observed in the Tilje/Åre Formations at 2837 to 3032 m. Shows of poor quality, again restricted to predominantly porous, coarse sandstone were observed in the Åre Formation at 3047 to 3082 m. The oil/water contact was defined from the logs to be between 3003 and 3082.5 m, while RFT data showed an oil/water contact between 3016 and 3045 m. The structural closure with estimated OWC at 3045 m was approximately 49 km2.

The deep seismic reflector interpreted as "Top middle Triassic Evaporite reflector", was caused by two lithological sequences at 3828 m in the Red Beds, which created a composite strong seismic signal.

16 cores were cut in the interval 2713 to 3118 m. Core 1 was cut in the Melke Formation, core 2 in the Garn Formation, while the remaining cores were cut in the Båt Group. An RFT segregated sample was taken at 2959.5 m (2945.2 m TVD RKB). It contained oil and gas with GOR = 241.7 Sm3/m3, BOB = 1.8358, stock tank oil density = 835.4 kg/m3, and gas gravity = 0.841 (air = 1).

The well was permanently abandoned on 7 April 1986 as an oil and gas discovery.

TESTING

Five drill stem tests were performed.

DST 1 tested the interval 3099.5 - 3113.5 m in the Åre Formation. It produced 4.4 m3 water /day through a 25.4 mm choke. Maximum bottom-hole temperature was 114.8 deg C.

LITHOSTRATIGRAPHY & HISTORY FOR WELL: 6407/7-1 S