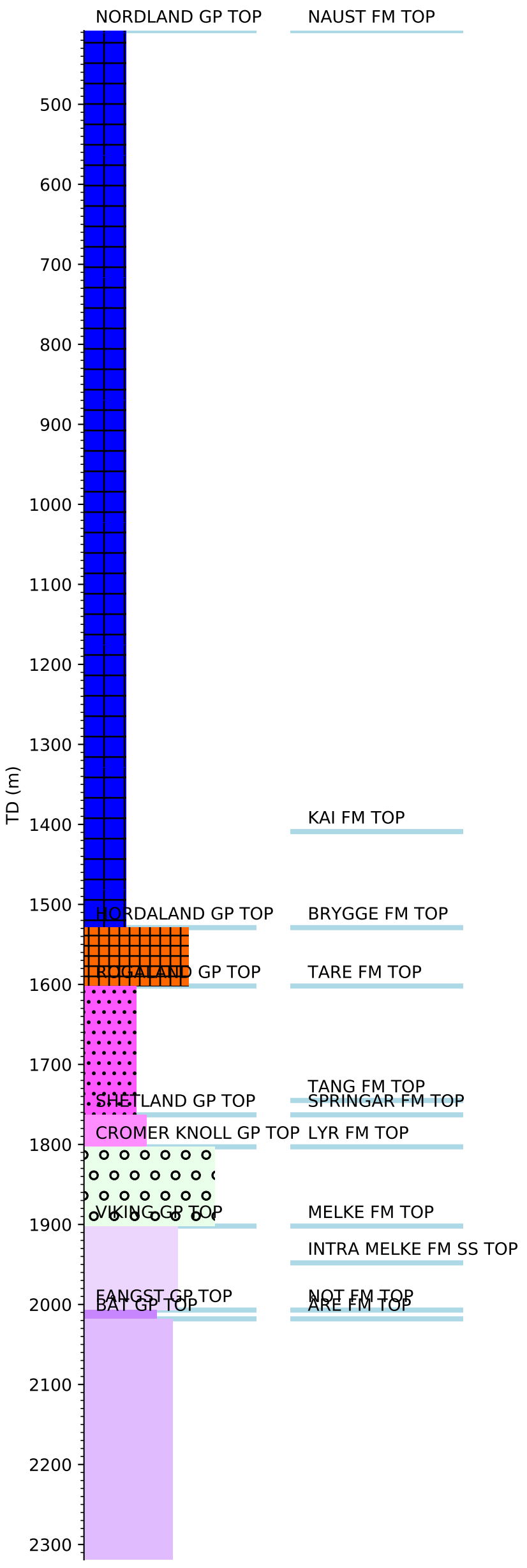

LITHOSTRATIGRAPHY & HISTORY FOR WELL 6608/10-7

Wellbore History

GENERAL

The main objective of well 6608/10-7 was to test the extent of hydrocarbons in Late to Early Jurassic sandstones in the Melke- and Åre Formation, down flanks of well 6608/10-6, and if possible prove fluid contacts. Another objective, originally designated to a possible sidetrack of well 6608/10-7, was to perform an interference test in the Åre Formation towards well 6608/10-6. A sidetrack was to be drilled if analysis of formation water samples confirmed high content of

Barium. This would demand information about communication towards 6608/10-6 from a position further down flanks than the 6608/10-7 position.

OPERATIONS AND RESULTS

Appraisal well 6608/10-7 was spudded with the semi-submersible installation Borgland Dolphin on 30 March 2001 and drilled to TD at 2319 m in Early Jurassic sediments of the Åre Formation. No shallow gas was observed by the ROV at the wellhead. The well was drilled with seawater and hi-vis sweeps down to 1315 m and with Aquadrill PAC/Glycol/KCL water base mud system from 1315 m to TD.

Oil shows appeared at ca 1800 m (top Cromer Knoll Group) and disappeared below 2018 m (top Båt Group). Two reservoir zones were penetrated, a Melke Formation Sandstone member and the Åre Formation. A silty/sandy Not Formation was also encountered, but it did not have the same reservoir quality as the two previously mentioned. The sandstone sequence of the Melke Formation proved to be oil bearing. The main part of the oil bearing reservoir zone was cored. Oil was observed down to top Not Formation at 2007 m. No oil-water contact was encountered. Weak hydrocarbon shows were seen in core chips from the Not Formation. The Åre Formation proved to be water filled up to its top at 2018 m. The water samples proved to have a Barium content lower than the limit set for requiring the sidetrack to be drilled. The observed formation tops were not in accordance with the prognosis. The difference between the prognosis and the observations for Tertiary and Cretaceous formation tops seem to vary a bit. Typically, the Tertiary and Cretaceous formation tops, as well as the base Cretaceous unconformity were encountered deeper than prognosed. The top of the Melke Formation sandstone sequences, the Not Formation and the Åre Formation were encountered shallower than prognosed, but within the given uncertainties.

A total of 8 cores were cut in the reservoirs from 1955 m to 2101.5 m. An MDT oil sample was taken at 1967.8 m in the Melke Formation sandstone unit, while MDT water samples were taken at 2155.5 m and 2052.2 m in the Åre Formation.

The well was permanently abandoned on 23 May 2001 as an oil appraisal well.

TESTING

Pressure memory gauges had been installed in well bore 6608/10-6, in November 2000. The gauges were retrieved in August 2001. A water injection test was conducted in 6608/10-7 on 7 May 2001 and the pressure response was measured in well bore 6608/10-6 R2. Pressure response was seen within 24 hours after the injection started, proving good communication over the 1520 m between the two wells. The pressure gauges also recorded temperature, and after eight and a half months the temperature, at 1854 m, had reached 64.1 deg C. Interestingly, but not important for the test, the temperature increased steadily throughout the period. The temperature increase over the last 230 days of the period was only 0.25 deg C.

After the water injection test in Åre the Melke Formation sand was perforated from 1950 m to 1980 m for a production test. The initial pressure in Melke was 1 bar above the logged MDT pressure. This had to be caused by the injection test in Åre, making the results from the production test invalid.