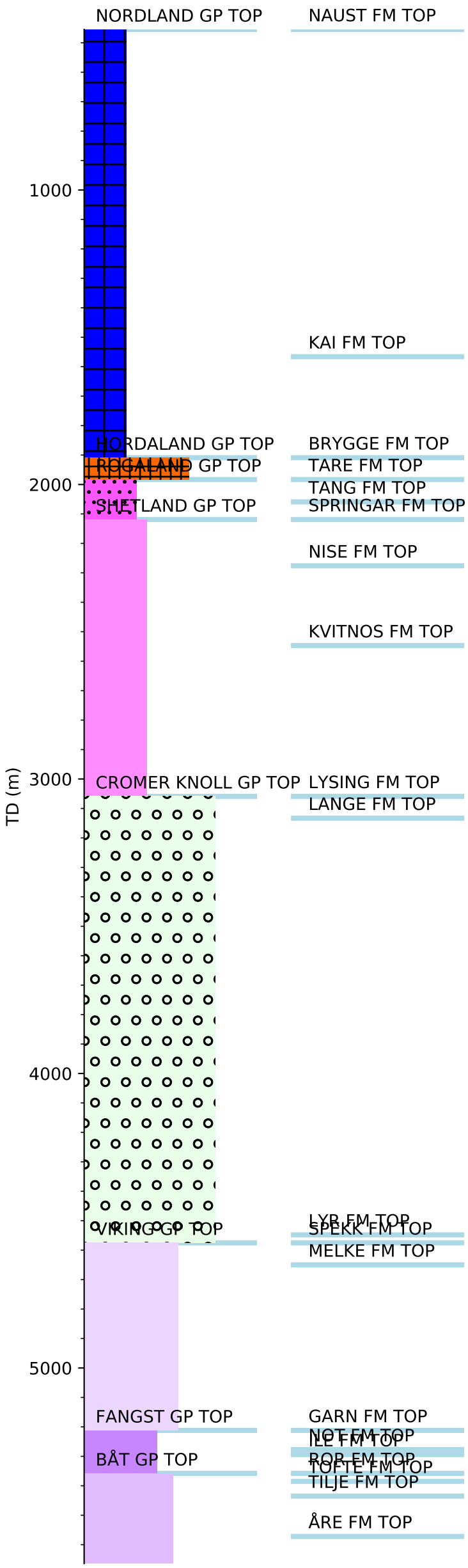

LITHOSTRATIGRAPHY & HISTORY FOR WELL: 6506/9-1

Wellbore History

General

Well 6506/9-1 was drilled to further evaluate the Victoria discovery. The discovery was proven by well 6506/6-1 in 2000 in Lower to Middle Jurassic reservoir rocks, and is located about 22 kilometres northwest of the Heidrun field in the Norwegian Sea.

The objective was to reduce uncertainties on fluid contacts, reservoir structure and reservoir quality, to prove well productivity and obtain reliable fluid samples from the Garn, Ile, Tilje and Åre reservoirs of Victoria.

OPERATIONS AND RESULTS

Appraisal well 6506/9-1 was spudded with the semi-submersible installation West Phoenix on 20 January 2009 and drilled to TD at 5664 m in the Early Jurassic Åre Formation. The well was drilled without significant problems, although wire line logging and sampling at TD was problematic due to high temperatures. The well was drilled with spud mud down to 1510 m, with NABM (non-aqueous based, or oil based mud) from 1510 to 5022 m, and with WARP (Weight Additive Research Project) NABM mud from 5022 m to TD.

All the reservoirs were drilled in the 8 1/2" section, and confirmed to be gas bearing. However, reservoirs characteristics were poor, except in a few metric layers. The Garn Formation (5212 to 5277 m) was composed of very tight sandstones with quartzite cement. Maximum gas shows were 2.2% total gas at 5232 m. In the Ile Formation the gas shows were quite constant along the whole formation with limited values due to the coring operations. Maximum values in porous layers were between 1.35 and 3.52 % total gas. In the Tilje Formation, the overall reservoir characteristics were better with a maximum of 5.84% total gas at 5488m. At the base of the Tilje, below 5534 m, formation gas decreased to less than 1% total gas, linked to reservoir characteristics decrease. The Åre Formation consisted of mainly siltstones

and silty claystones with poor reservoir characteristics in its upper part (maximum 1.68% TG). The lower half of the Åre Formation, composed of very hard poorly sorted sandstones, had very poor reservoir characteristics. Maximum gas show was 3.85% total gas at 5653m.

Petrophysical analysis showed that the Jurassic reservoirs Garn, Ile, Tofte, Tilje and Åre were all gas bearing with a total Net to Gross of 18%, corresponding to 81m of Net. The effective porosity average in the Net interval was 12.4 %. Both Ile and Tilje Formations were encountered in a Gas-Down-To/Water-Up-To configuration. The Ile Formation has GDT at 5297 m and WUT at 5325 m. The Tilje Formation had GDT at 5515 m and WUT at 5523 m. No oil shows were reported from the well.

Five cores were acquired in the Ile, Tilje and Åre Formations. The Ile Formation (5294 m to 5358 m) was nearly entirely cored. The Tilje Formation (5435 m to 5572 m) was cored from 10 m below the top of Tilje Formation when gas bearing sandstones were confirmed. The Åre Formation (5572 m to well TD) was cored in its upper section, represented mainly by siltstones and silty claystones, with poor reservoir characteristics (maximum 1.68% total gas).

Wire line logging was performed to evaluate the different reservoirs. After one run in 12 1/4" section, a total of 20 runs were performed in the 8 1/2" section for reservoir evaluation, formation pressure measurement and sampling. Due to the high temperature expected at Victoria well TD, a series of special MDT tools, capable to work at 210 deg C, were prepared in the framework of a R&D project between TOTAL and Schlumberger to obtain formation pressure measurements and fluid samples. Although repeated attempts were done, the performances were poor due to low permeability reservoir and tool failures. Fluid samples of questionable quality were obtained at four depths: 5294.8 m (dry gas contaminated by base oil), 5341.7 m (base oil, some gas, and a few ml of water), 5470.0 m (mud filtrate and some gas), and at 5538.5 m (mud filtrate and small volumes of water - no trace of gas)

The well was permanently abandoned on 15 September 2009 as a gas appraisal well.

TESTING

The well was perforated in Upper and Middle Tilje (5431 m ? 5515 m) and