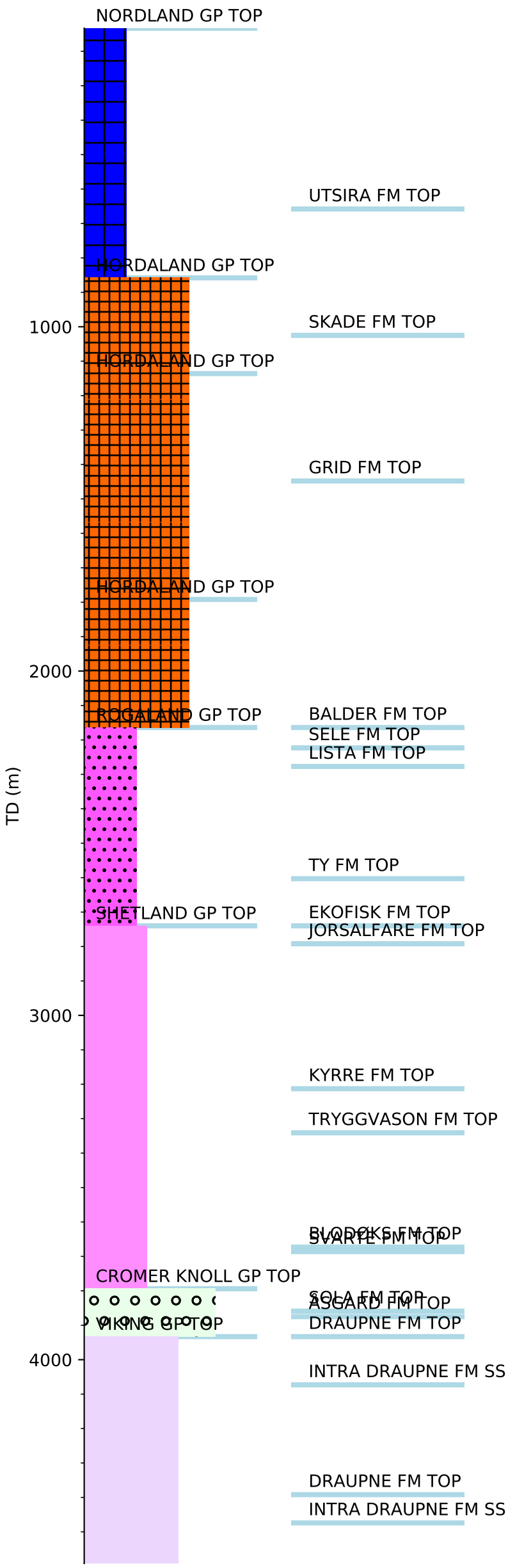

LITHOSTRATIGRAPHY & HISTORY FOR WELL: 15/3-8

Wellbore History

GENERAL

The Gudrun structure is situated on the east flank of the South Viking Graben and west of the Utsira High in the North Sea. Well 15/3-8 was drilled on the western flank of the structure, approximately 9 km east of the UK border. New seismic data and results from well 15/3-7 had revealed uncertainties regarding the Late Jurassic reservoir section in the Gudrun structure. The main purpose of well 15/3-8 was to gather the necessary information required to ascertain whether the Intra-Draupne Formation reservoir rocks of the Gudrun Discovery could be developed commercially. This included reservoir pressure data, petrophysical data including taking cores, fluid sampling for fluid characteristics, and production properties by drill stem testing.

OPERATIONS AND RESULTS

Appraisal well 15/3-8 was spudded with the semi-submersible installation Transocean Leader on 11 April 2006 and drilled to TD at 4592 m in Late Jurassic Intra-Draupne Formation sandstone. No significant technical problems were encountered in the operations and the well was completed within planned time frame. The well was drilled with seawater/bentonite/hi-vis pills down to 1010 m, with Glydril mud from 1010 m to 2765 m, and with Paratherm oil based mud (paraffin base) from 2765 m to TD.

Top Viking Group was encountered at 3932.5 m and consisted of the interbedded lithologies of sandstone, claystone and limestone, with varying thicknesses from laminas to stringers and massive layers. The first 140 m was Draupne Formation claystone. The target reservoir section, Intra Draupne Formation sands, was encountered at 4072.5 m, 38.9 m deeper than expected. Three intra Draupne Formation sandstone units were identified, SST1 from 4072.5 m to 4212.5 m, SST2 from 4212.5 m to 4346 m, and SST3 from 4474.5 m to TD. The sand quality was significantly better than observed in the neighbouring wells. When correlated with neighbouring wells well 15/3-8 showed significant lateral reservoir variations over small distances within the structure. SST1 contained a high-shrinkage volatile oil down to a contact at 4208 m, the SST2 pressure gradient proved a water bearing sandstone, although oil was sampled at 4332.9 m, while SST3 contained a near-critical gas-condensate down to a contact at 4485.4 m.

Good shows were seen in the cores from the reservoir section as they were recovered on deck. It was no possible to give a reliable evaluation of the shows on cuttings during drilling due to background fluorescence from the oil based mud. In addition, some of the most marginal shows described from the cored section were hampered by the existence of formation derived kerogens in the mud. Some of the cores were also bleeding HC from very tight zones at surface and seepages from these zones might have contaminated better sandstone sections below. From the general fluorescence picture there seem to be a presence of heavier HC in the tight zones than in the more porous zones.

A total of 158 m core was recovered in 7 cores from the interval 4167 to 4505 m in various Intra-Draupne Formation sandstone sections in the Late Jurassic. MDT fluid samples were taken at 4514.5 m (water), 4479.1 m (hydrocarbons), 4332.9 m (hydrocarbons), 4213.5 m (water), 4182.1 m (hydrocarbons), and at 4074 m (hydrocarbons).

The well was permanently abandoned on 11 April 2006 as an oil and gas appraisal well.

TESTING

Two drill stem test was performed in Intra-Draupne Formation sandstones.

DST 1 tested the interval 4141 - 4183 m. The well was opened to flow for a total of 28 hours. The main flow duration was 14 hours with an approximate oil rate of 739 m3/day a gas rate of 346600 Sm3 gas/day and a GOR of 469 m3/m3 through a 32/64" choke. This was followed by a 96 hours build up period. Maximum bottom hole temperature recorded in the test was 133 deg C.

DST 2 tested the interval 4073 - 4087 m. The well was open to flow for a total of 26 hours. The main flow duration was 10 hours with an approximate oil rate of 650m3/day, a gas rate of 342400 Sm3 gas/day and a GOR of 500 m3/m3 through a 28/64" choke. This was followed by a 96 hours build up period. Maximum bottom hole temperature recorded in the test was 130 deg C.