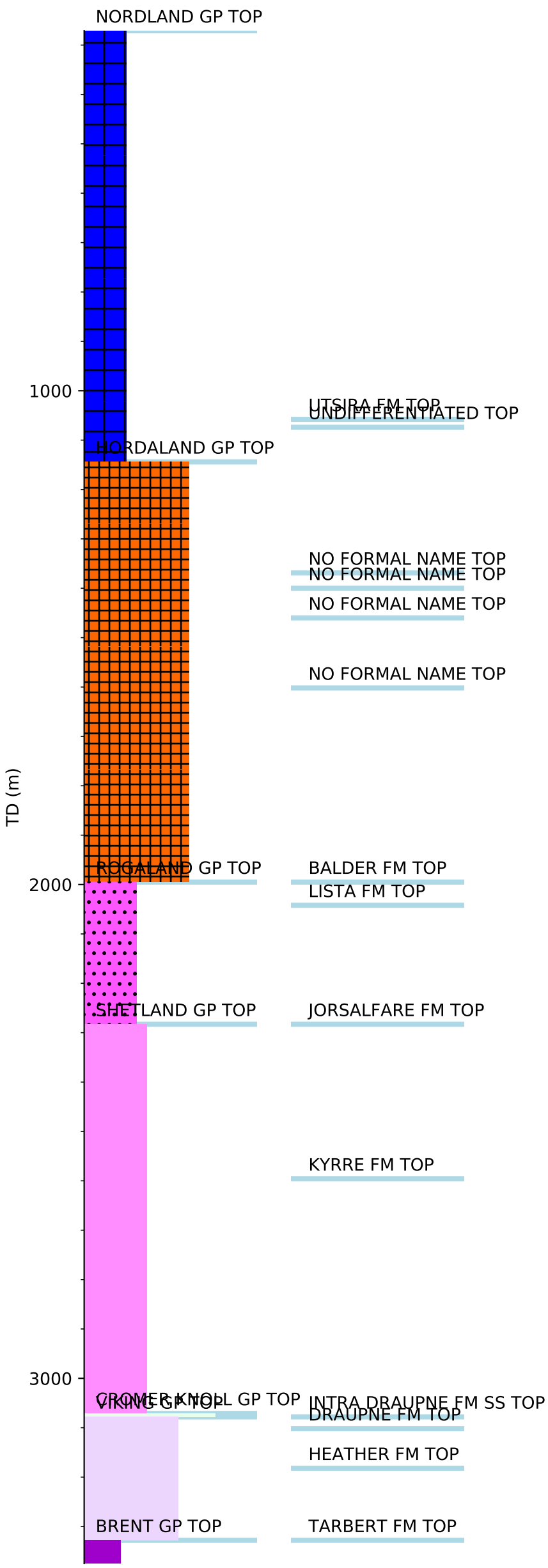

LITHOSTRATIGRAPHY & HISTORY FOR WELL: 34/7-23 S

Wellbore History

GENERAL

Well 34/7-23 S is located on the Vigdis Field on Tampen Spur in the Northern North Sea. Located 5200 meters north-northwest of the H-Sentral 34/7-21 oil discovery, the well was primarily designed to test for reservoir presence and hydrocarbons in the Top Draupne Sequence of Portlandian and Ryazanian age. In the case of a discovery, pressure communication with well 34/7-21 would be tested. Secondary objectives of the well included lowermost Early Cretaceous sandstones found oil bearing in 34/7-21, and intra Oxfordian sandstones which were found to yield oil in well 34/7-21 A. Both these sandstones are thin and below seismic resolution. An additional objective was to test the presence of sandstone in Paleocene.

OPERATIONS AND RESULTS

Well 34/7-23 S was spudded with the semi-submersible installation Vildkat Explorer on 22 February 1994 and drilled to TD at 3375 m (2889 m TVD) in the Middle Jurassic Tarbert Formation. The subsea Jurassic target location coincided with the pipeline which connects the Snorre TLP to the Statfjord C platform. To avoid any mechanical problems with the rigs anchors, the spud location was chosen to be located 1400 meters east of the Base Cretaceous target location and the borehole was designed as a westward deviated well. Special H2S equipment was mobilized when H2S was observed during coring in the upper part of the reservoir. For operational reasons it was decided to interrupt coring and take a FMT sample. An additional 10 meters were drilled from 3096 down to 3106 m to get a rathole for the FMT logging tool. This interval was thus not cored. The well was drilled with spud mud down to 1175 m, and with KCl mud with a polyalkyleneglycol additive (BP DCP 208) m from 1175 m to TD.

In the Nordland, Hordaland and Rogaland Groups, the well penetrated mainly clay/claystone with some beds of sand, except for the sandy Utsira Formation between 955 - 1144 m (934 - 1114 m TVD). In the Shetland Group clay stones with limestone beds were penetrated. The condensed Cromer Knoll Group consisted of marls, limestones and minor claystones.

The Draupne Formation was penetrated at 3078 m (2608.5 m TVD). The upper part was a 24 m thick oil-filled Intra-Draupne Formation Sand. No oil water contact was encountered in the well: the deepest oil down to was observed at 3102 m (2632 m TVD). The Intra-Draupne Formation Sandstone had a measured thickness of 25 (23.5 m TVD). It had an estimated average log porosity of 25.1% and an estimated average water saturation of 19.0%. The net gross ratio is 0.91. The underlying Draupne Formation shale was 80 m thick.

The Intra-Draupne Formation Sandstone had a pressure gradient of 1.28 g/cc (ref. MSL). The formation pressure in the impermeable rocks of the Viking Group is believed to be in the order of 1.45 - 1.43 g/cc (ref. MSL), whilst the pressure in the Brent Group was measured to be 1.43 - 1.42 g/cc (ref. MSL). The well was interpreted to be differently depleted than the H-Sentral 34/7-21 well.

Apart from the oil filled Intra-Draupne Formation sand weak shows were observed in several sections throughout the well. In the Hordaland Group sand beds with traces of shows were observed in cutting samples in the interval 1332 - 1560 m as well as in the Rogaland Formation from 2000 to 2187 m. In the Shetland Group, hydrocarbon shows occurred in thin sandstone horizons from 2735 to 2835 m and sporadically down to 3010 m. Below the reservoir in the Viking Group, traces of weak shows were observed in thin sandstone laminae, claystones, and siltstones. Also the uppermost, massive sandstones of the Brent Group had weak shows.

A total of five cores were cut in the interval 3079-3096 and 3106-3136 m in the Intra Draupne Formation sand and 34 m into the underlying Draupne shale. The total core recovery was 99.6% (46.8m). FMT samples were taken in the Intra Draupne Formation sand at 3080 m (oil and gas), 3082 m (oil and gas), and 3084.2 m (water and filtrate). All three samples contained H2S in the range 60 - 75 ppm. The well was plugged back to a depth of 2480 m and permanently abandoned on 3 April as an oil discovery. The well was later sidetracked (34/7-23 A).

TESTING

No drill stem test was performed.