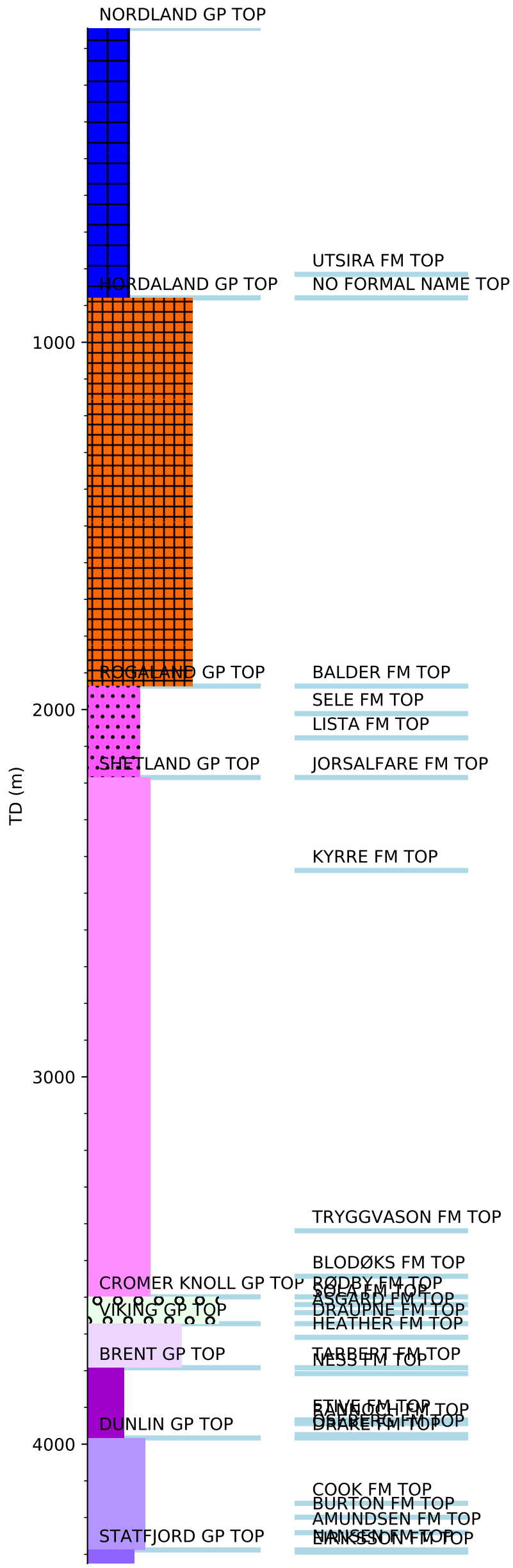

Wellbore History

GENERAL

Well 30/2-2 was drilled on the Huldra Field in the North Sea. The objective was to appraise the gas/condensate discovery in the Brent Group and reduce the gas-in-place estimates for the field.

OPERATIONS AND RESULTS

Appraisal well 30/2-2 was spudded with the semi-submersible installation Ross Isle on 11 June 1992 and drilled to TD at 4325 m in the Early Jurassic Eiriksson Formation. A pilot hole was drilled to 520 m to check for shallow gas. No gas was detected. Drilling proceeded without significant problems. Tool sticking was common in the reservoir section during logging runs. The well was drilled with seawater down to 209 m, with gel spud mud from 209 m to 1115 m, with gypsum/polymer mud from 1115 m to 2298 m, and with Ancotherm mud from 2298 m to TD.

Although a well-defined Gas-Water-contact was encountered in 30/2-3 at 3896 m, this was some 75 m shallower than the previously deepest gas-down-to for well 30/2-2. This indicates that the Huldra Field is more complex than previously thought. Good porosity and permeability were encountered in all gas bearing intervals, reducing uncertainties regarding well productivity. There were no shows above Brent reservoir level. Below the GWC weak shows on sandstone in the cores gradually diminished down to 3962 m where shows disappeared altogether.

A total of 178.4 m core was recovered in 17 cores, from 3749 m in the Heather Formation through all of the Brent Group and down to 3985 m at top Drake Formation. The core-to-log depth correction varied between -0.4 to +1.9 m. No wire line fluid samples were taken.

The well was permanently abandoned on 5 October 1992 as a gas/condensate appraisal well.

TESTING

Three drill stem tests were performed in the Brent Group.

DST 1 tested the interval 3895 - 3898 m in the Ness Formation. The average production rates towards the end of the Cleanup/ Main Flow period were approximately 43000 Sm3/d of gas, 24 Sm3/d of condensate and 129 Sm3/d of formation water. This proved a GWC in the tested interval. The condensate density was 0.810 g/cm3 and the gas gravity was 0.720 (air =1). The temperature at reference depth 3895 m was 149.0 °C.

DST 2 tested the interval 3874 - 3881 m in the Ness Formation. The average gas and condensate production rates during the Main Flow were 671000 Sm3/d and 319 Sm3/d respectively through a 12.7 mm (32/64") choke size. This gave a GOR close to 2100 Sm3/Sm3 at the prevailing separator conditions. The condensed or dissolved water production was approx. 6-8 m3/d. The condensate density was 0.0.800 g/cm3 and the gas gravity was 0.700 (air =1). DST 2 confirmed very good reservoir properties in the tested interval. The temperature at reference depth 3895 m was 147.5 °C.

DST 3 te3sted the interval 3794 -3803 m in the Tarbert Formation. The average gas and condensate production rates during the Main Flow were 466800 Sm3/d and 215 Sm3/d respectively through a 12.7 mm (32/64") choke size. This gave a GOR of approx. 2170 Sm3/Sm3 at the prevailing separator conditions. The condensed or dissolved water production was approx. 4-6 m3/d. The condensate density was 0.0.797 g/cm3 and the gas gravity was 0.0.690 (air =1). DST 3 confirmed moderate reservoir properties in the tested interval. The temperature at reference depth 3895 m was 146.0 °C.

LITHOSTRATIGRAPHY & HISTORY FOR WELL: 30/2-3