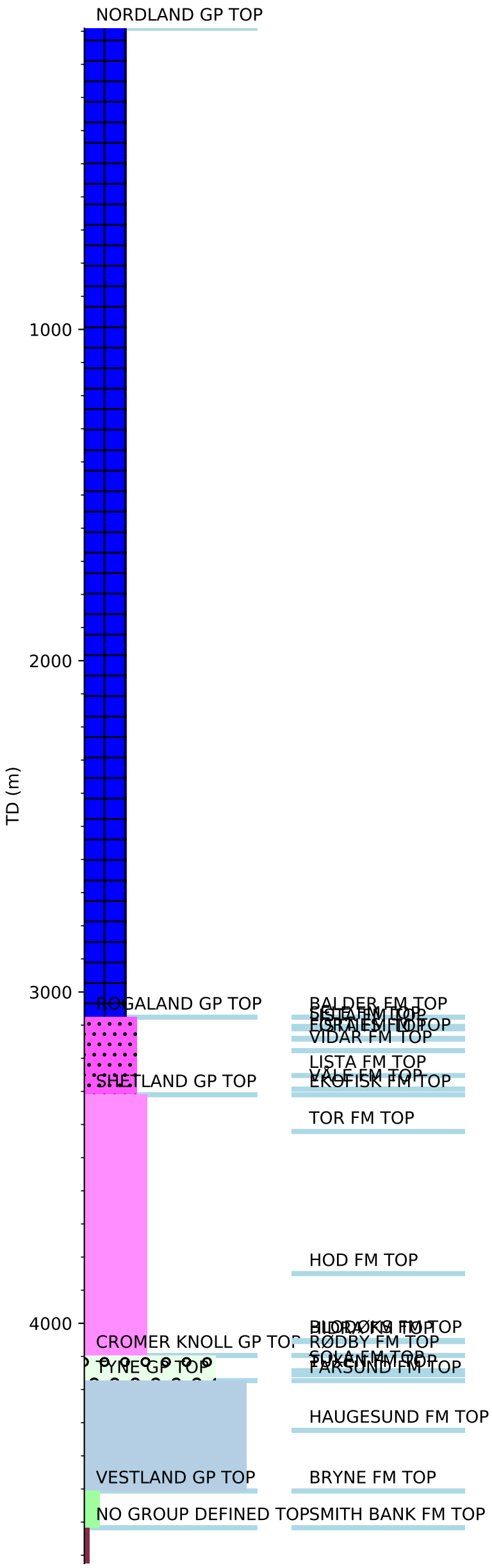
Groups

Formation Tops



Wellbore History

GENERAL

Well 2/1-11 is located on the Hidra High in the Central Graben of the North Sea. It was drilled to investigate the possibility of commercial quantities of hydrocarbons in the Jurassic J60/J70 sandstones (Ula Formation). A secondary objective was to assess the reservoir potential of the older J50 Jurassic sandstone sequence.

OPERATIONS AND RESULTS

Wildcat well 2/1-11 was spudded with the semi-submersible installation Mærsk Jutlander on 14 January 1997 and drilled to TD at 4725 m (4697 m TVD) in the Late Triassic Smith Bank Formation. At a depth of 724 m, while drilling riserless, the well was observed by the ROV to be flowing. Evidence of this flow was observed in the moon pool - a patch of light coloured water being apparent. The well was circulated with seawater while additional kill mud was built. A pilot hole was then drilled to the section TD of 1151 m with further flows being observed at 736 m, 802 m, 900 m, 939 m, 1112 m and 1121 m. Most likely the gas in all instances came from an interval between 650 and 724 m, which after drilling was correlated to a shallow biogenic gas warning at 638 identified in the site survey. The shallow gas problems led to a delay in installing a new cuttings handling system on the rig, required because of a late decision to use oil based mud in the 12 1/4" hole. No serious harm was done by the shallow gas but considerable rig time was spent. The well was planned vertical but a slight deviation is seen in the deviation survey, starting at ca 3600 m (3 deg deviation). At 4350 m the deviation had reached 10 deg, and at TD it was 30 deg. As a result MD is more than 5 m larger than TVD below 4450 m, and the difference is as much as 28 m at TD. The well was drilled with seawater and hi-vis sweeps down to 1162 m and with ENVIROMUL oil based mud from 1162 m to TD.

All principal seismic horizons were penetrated within their error bars. A poorly developed Forties Formation Equivalent sand encountered at 3139.5 m had minor associated gas shows. Top Vidar Formation was 67 m shallow to prognosis, Ekofisk Formation 19 m shallow and the Cromer Knoll Group on prognosis. There were no shows in the Vidar and Ekofisk Chalk Formations. The Base Cretaceous pick, identified as the Farsund Formation, was 10 m shallow to prognosis. The Mandal Formation (Late Jurassic, J73 - J71) was absent as prognosed. No significant J70 - J60 (Ula Formation) sandstones were encountered, but minor sandstones were present. Hydrocarbon shows were limited to gas peaks with compositions up to C5. A sidewall core at 4316m had oil staining and fluorescence. Biostratigraphic data suggested a J50 sequence boundary at 4483 m at the base of the Haugesund Formation, 69 m shallow to prognosis, but was seen only as a condensed sequence. The interval 4500 - 4535 m, within the J40 - J20 Bryne Formation, was oil bearing with fluorescence in cuttings samples and drilled gas with the compositional range of Cl - C5. The Triassic was picked at 4617 m, 92 m high to prognosis. There were no hydrocarbon shows in the Triassic.

No cores were cut and no wire line fluid samples were taken.

The well was plugged and suspended on 7 May 1997 as an oil discovery.

TESTING

No drill stem test was performed.

LITHOSTRATIGRAPHY & HISTORY FOR WELL: 2/1-11