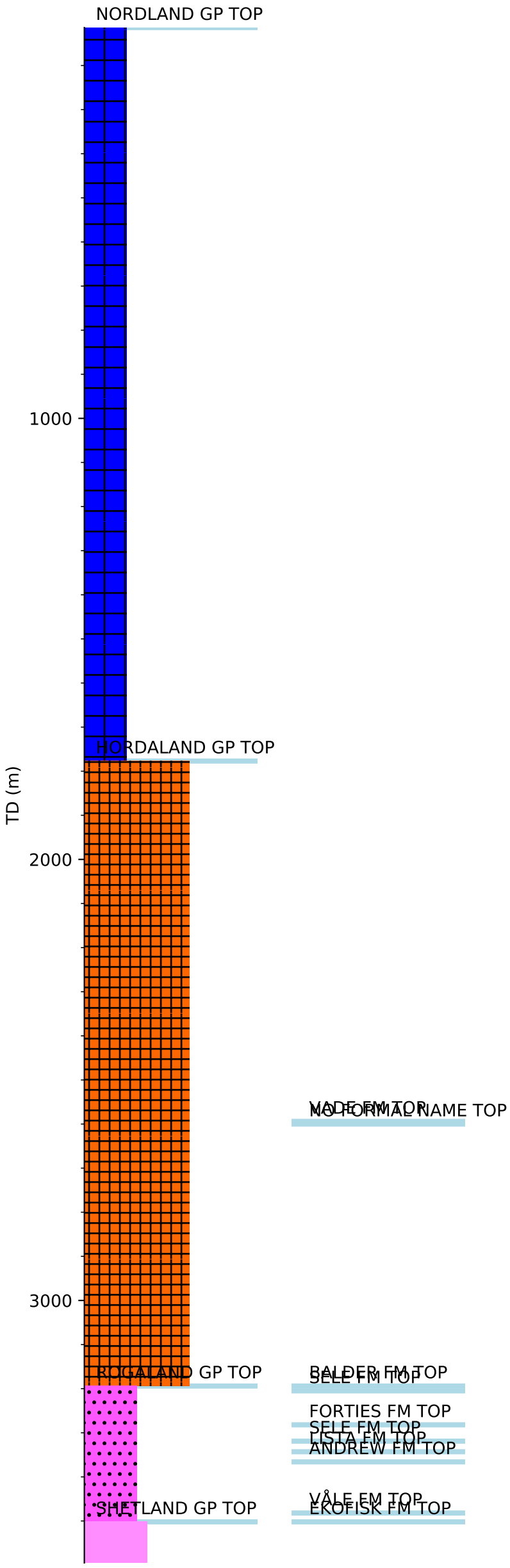
Groups

Formation Tops



Wellbore History

GENERAL

The 1/3-11 Ipswich well was drilled in the Central Graben of the North Sea about 9 km south of the 1/3-10 Oselvar well, which confirmed oil in a similar geological setting to that of the Ipswich prospect. The primary objective of the 1/3-11 well was to determine the presence and nature of recoverable hydrocarbons in the Forties Formation Sandstone reservoir expected to exist along the western flank of the Ipswich salt dome.

OPERATIONS AND RESULTS

Wildcat well 1/3-11 was spudded with the jack-up installation Mærsk Galant on 28 May 2008 and drilled to 3289 m in the Paleocene Våle Formation. The well path was drilled with a slight S shape after the originally planned surface location was moved to avoid potential shallow gas. Due to unexpected lithology the original hole penetrated most of an hydrocarbon-bearing reservoir sand in the well without cores being taken. Therefore it was decided to make a technical coring side-track, in which also fluid samples would be obtained. The sidetrack was denoted technical (1/3-11 T2) as coring was the main objective. It was kicked off at 1330 m and drilled to final TD at 3595 m in the Paleocene Ekofisk Formation. The well was drilled with seawater and pre-hydrated bentonite down to 825 m, with KCl/polymer mud from 825 m to 1306 m, and with Carbo SEA oil based mud from 1306 m to TD, including the technical sidetrack.

The well penetrated the clays and claystones (with sand interbeds) of the Nordland Group, the claystones of the Hordaland Group, and the claystones, tuffaceous claystones and sandstones of the Rogaland Group. The latter contained the Balder Formation, the Sele Formation (which was expected to contain the target Forties Formation sandstone), the Lista Formation and the Våle Formation. The well did not penetrate sands at the stratigraphic equivalent of the target Forties Formation sandstone. Instead, a de-sanded Forties equivalent was penetrated consisting of claystone interbedded with siltstone and dolomitic limestone. However, hydrocarbon bearing sands were encountered at 3176 m within the underlying Lista formation, and these were interpreted as possible lateral equivalents of the "Mey Sandstone Member" (Andrew Formation).

Based on initial analysis of the LWD logs and wire line formation pressure measurements, it was decided to drill the coring sidetrack down dip in order to investigate also the thickness of the hydrocarbon column, lateral variation in reservoir quality and thickness, the presence of the Forties Formation sandstone down dip in addition to the Andrew Formation penetrated in the main well, in addition to the coring and sampling objectives. The Ipswich 1/3-11 T2 sidetrack kicked off in the claystones of the Nordland Group and penetrated the claystone of the Hordaland Group and claystones, tuffaceous claystones and sandstones of the Rogaland Group. The sandstones of the Rogaland Group included 37 m of Forties Formation which, unlike in the main well, was present in the sidetrack as a sandstone, in addition to 116 m of the Andrew Formation. In 1/3-11 T2 the Forties Sandstone was found hydrocarbon bearing, while the Andrew Formation was poorer and water filled.

No definite hydrocarbon contact levels were seen in the wells.

In the primary well oil shows were recorded throughout the Andrew Formation, else no shows above background OBM was observed. In the sidetrack a show (very weak, if any) was recorded in the Vade Formation sandstone at 2594 to 2600 m, in a thin sandstone at 3215 m within the Sele Formation, and in the Forties Formation. In the sidetrack no shows above background OBM level was observed in the Andrew Formation.

At total of 93.63 m core was recovered in three cores from the interval 3288 m to 3355.7 m in the Forties and Sele Formations and 2 cores from the interval 3398.9 m to 3429.1 m in the Andrew Formation. All cores were cut in the sidetrack. No fluid samples were taken in the primary well. In the sidetrack fluid sampling resulted in the recovery of three water samples at 3415 m within the Andrew Formation and five oil samples at 3294.5 m in the Forties Formation Sandstone. All oil samples were heavily contaminated by oil based mud filtrate.

The well was permanently abandoned on 30 August as an oil discovery.

TESTING

No drill stem test was performed.

LITHOSTRATIGRAPHY & HISTORY FOR WELL: 1/3-11