



Wellbore History

GENERAL

Well 30/6-7 is an appraisal well on the Oseberg Field, discovered by well 30/6-1 in 1979. The primary objective was to test for hydrocarbon accumulations in the Late Jurassic sandstones of the Brent formation and the Late and Early Jurassic sandstones of the Dunlin and Statfjord formations in the Alpha north structure. Secondary objectives were to establish the type of communication between the Alpha and Alpha North structures and to define the oil/water contact on Alpha North. The well was planned to reach total depth at 3225 +/- 50 m, 75 m into the Statfjord Formation.

The well is Type well for the Oseberg Formation and Reference well for the Amundsen, Cook, Drake, Etive, Ness, and Tarbert Formations.

OPERATIONS AND RESULTS

Well 30/6-7 was spudded with the semi-submersible installation Nortrym on 20 May 1982 and drilled to TD at 3236 m in Early Jurassic rocks of the Statfjord Formation. The 26" section was initiated by a 17 1/2" pilot hole. One small pocket of shallow gas was detected at 358 m (5.6% C1). The well was drilled with seawater and hi-vis pills down to 952 m and with KCl/polymer mud from 952 m to 2285 m. At 2285 m the 13 3/8" casing got stuck and a pill of EZY spot and diesel was pumped in the hole, without effect. The drilling fluid used in the 12 1/4" section from 2285 m to 2915 m the well was drilled with a Dextrid/KCl mud. From 2915 m to TD the mud was converted to a dispersed system by adding lignosulfonate.

The Brent Group was encountered at 2631.5 m. The Brent Group was hydrocarbon bearing with a total gross thickness of 154.5 m and a net sand interval of 106.9 m. The net pay was 50.7 m. Sandstone intervals were also encountered in the Early Jurassic Cook and Statfjord formations but these were both 100% water saturated.

The Tarbert Formation (2631.5 - 2646.5 m) formed the uppermost interval in the Brent Group. It consisted of very fine to fine grained sandstone which was occasionally medium to coarse grained. Wire line log evaluation gave a net pay of 14.7 m, with an average porosity of 20.7% and an average water saturation of 18.1%. Average permeability (KH, log) was 520 mD.

The Ness Formation (2646.5 - 2727.5 m) consisted of interbedded sandstones, shales, siltstones and stringers of coal. The sandstones were very fine to medium, occasionally coarse grained and locally very micaceous and carbonaceous. The interval contained 38.7 m of net sand and 36 m of net pay which had an average porosity of 20.5%, average water saturation of 27.7% and an average permeability of 577 mD (KH, log). Measured average permeability (KH, core) was 1163 mD.

FMT pressure measurements were taken throughout the Brent interval showing that the different sandstone intervals in the Tarbert and Ness Formations have different oil gradients. From log analysis an oil/water contact has been estimated to be at 2723.5 m in the Ness Formation. On the Alpha structure an oil/water contact has been defined at 2731 m from earlier wells and it appears therefore that the southwest - northeast fault separating the Alpha from the Alpha North structure does have some sealing properties.

The Etive Formation (2727.5 - 2786 m) consists predominantly of a very fine grained to pebbly sandstone with occasional stringers of shale and siltstone. The interval contained 53.5 m of net sand with average porosity of 19.5%. A transition zone of residual hydrocarbons (2727.5 - 2747 m) had an average water saturation of 72%. This agrees with patchy oil shows seen in the cores down to 2755 m (2747 m when depth correction between logger's and driller's depths is applied). The remaining interval of the Etive Formation (2747 - 2786 m) had an average water saturation of 94%. Average permeability of the Etive Formation was 799 mD (KH, log) Measured average permeability from cores was 1670 mD (KH, core).

LITHOSTRATIGRAPHY & HISTORY FOR WELL: 30/6-7

Apart from in the hydrocarbon bearing reservoirs as described above, weak shows were described in thin limestone stringers in the Sele Formation and in limestones of the Shetland Group.

A total of twelve conventional cores were cut from 2648 to 2812.4 m in the 12 1/4" section in the well. A total of 155.1 m (94.3%) was recovered. Cores were cut consecutively from the top of the Ness