

**General information**

Wellbore name	1/9-3 R
Type	EXPLORATION
Purpose	APPRAISAL
Status	P&A
Factmaps in new window	link to map
Main area	NORTH SEA
Field	TOMMELITEN A
Discovery	1/9-1 Tommeliten Alpha
Well name	1/9-3
Seismic location	line No 404-404 & SP 476
Production licence	044
Drilling operator	Den norske stats oljeselskap a.s
Drill permit	181-L2
Drilling facility	DYVI BETA
Drilling days	127
Entered date	27.05.1978
Completed date	30.09.1978
Plugged and abandon date	30.09.1978
Release date	30.09.1980
Publication date	18.01.2007
Purpose - planned	WILDCAT
Reentry	YES
Reentry activity	DRILLING/TESTING/PLUGGING
Content	GAS/CONDENSATE
Discovery wellbore	NO
1st level with HC, age	PALEOCENE
1st level with HC, formation	EKOFISK FM
2nd level with HC, age	LATE CRETACEOUS
2nd level with HC, formation	TOR FM
Kelly bushing elevation [m]	35.8
Water depth [m]	76.5
Total depth (MD) [m RKB]	4570.0
Final vertical depth (TVD) [m RKB]	4566.0
Maximum inclination [°]	8.3
Oldest penetrated age	LATE JURASSIC
Oldest penetrated formation	HAUGESUND FM
Geodetic datum	ED50
NS degrees	56° 24' 55.68" N



EW degrees	2° 54' 15.22" E
NS UTM [m]	6252464.47
EW UTM [m]	494090.84
UTM zone	31
NPDID wellbore	246

Wellbore history

General

Well 1/9-3 is located in the Feda Graben, close to the UK border southwest in the Norwegian North Sea. The primary objective of the well was to evaluate the Jurassic sandstones. The secondary objective was to appraise and test the hydrocarbon bearing zones of Danian and Maastrichtian age (Shetland Group) encountered in 1/9-1. The well was drilled in two phases, of which Phase I is named 1/9-3 and Phase II is named 1/9-3 R. This procedure was a requirement from the Norwegian Petroleum Directorate since Dyvi Gamma came directly from the yard and had therefore not accumulated the experience needed to drill the high pressure Jurassic well to a planned TD of 5000 m. The re-entry 1/9-3 R was to be drilled with the rig Dyvi Beta.

Operations and results

Well 1/9-3 was re-entered (1/9-3 R) with the semi-submersible installation Dyvi Beta on 27 May 1978 and drilled to TD at 4570 m in the Late Jurassic Haugesund Formation. When running the 9 5/8" casing problems occurred with stuck pipe. This resulted in severe delays, but the casing was landed at planned depth. In the 8 1/2" hole the progress was delayed due to hole problems with high pressure and mud weight combined with lost returns. Tight hole and stuck pipe occurred on several occasions. Max mud weight was 2.04 g/cm. The well was drilled water based, but with several additions of diesel from 9 5/8" casing depth and downwards, resulting in 1 - 12 % diesel in the mud at all times below 3835 m.

Several problems arose during the logging operations, which in the end resulted in a poor suit of logs over the reservoir.

In summary the problems were due to uncontrolled stretch in the logging cable, generally poor log quality, especially for FDC/CNL logs, and difficult hole conditions with high pressure/temperature and excessive sticking. Logs that normally are run in combination had to be run separately. This made petrophysical evaluation difficult, and several logs had to be disregarded due to the poor quality.

The well penetrated a typical stratigraphy for the area with a 2754 m thick Tertiary sequence down to top Rogaland Group (the 1/9-3 well bore), a 215 m thick Rogaland Group, a 709 m thick Shetland Group, and a 475 m thick Early Cretaceous Cromer Knoll Group. The well was terminated 305 m into the Late Jurassic Tyne Group. The Tyne Group contained a sand/shale sequence (Eldfisk Formation), but the sand beds were water bearing without shows.

Live hydrocarbons were encountered and proved by testing in the Ekofisk and Tor Formations, but only the Ekofisk Formation had good reservoir properties. Petrophysical evaluation showed 36 m net pay in the upper part of the Ekofisk Formation and only 1.75 m net pay in the Tor Formation.

A total of 100 m core was recovered in eight conventional cores in the interval from 3053 m in the Early Paleocene Maureen Formation to 3234 m in the Late Cretaceous Tor Formation. No fluid samples were taken on wire line.



The well was permanently abandoned on 30 September 1978 as a gas/condensate appraisal.

Testing

Four drill stem tests were conducted in the Shetland Group chinks. DST 1 from 3205 m to 3214 m in the Tor Formation produced only water. Maximum temperature recorded at the end of the 12 hours main flow was 124.8 deg C. DST 2 from 3157 m to 3180 m in the Tor Formation produced 7175 m3 water together with 7.9 Sm3 oil and 4800 Sm3 gas per day through a 9.5 mm choke. Maximum temperature recorded at the end of the 10 hours main flow was 122.6 deg C. DST 3 from 3126 m to 3135 m in the Ekofisk Formation produced only 3 m3/day water with traces of oil and gas. DST 4 from 3094 m to 3112 m in the Ekofisk Formation was a good producer with a maximum flow of 397 Sm3 oil and 648400 Sm3 gas per day on a 19 mm choke. The gravity of the oil was 50 deg API. The maximum temperature recorded in this test was 120.1 deg C.

Cores at the Norwegian Offshore Directorate

Core sample number	Core sample - top depth	Core sample - bottom depth	Core sample depth - uom
1	3053.0	3065.3	[m]
2	3066.7	3082.6	[m]
3	3105.3	3123.5	[m]
4	3164.6	3170.5	[m]
5	3175.2	3178.7	[m]
6	3191.8	3207.6	[m]
7	3208.3	3214.1	[m]
8	3214.9	3233.4	[m]

Total core sample length [m]	95.9
Cores available for sampling?	YES

Palynological slides at the Norwegian Offshore Directorate

Sample depth	Depth unit	Sample type	Laboratory
1150.0	[m]	DC	HRS
1250.0	[m]	DC	HRS
1350.0	[m]	DC	HRS
1450.0	[m]	DC	HRS
1550.0	[m]	DC	HRS
1650.0	[m]	DC	HRS
1750.0	[m]	DC	HRS
1850.0	[m]	DC	HRS
1950.0	[m]	DC	HRS



2050.0	[m]	DC	HRS
2150.0	[m]	DC	HRS
2250.0	[m]	DC	HRS
2350.0	[m]	DC	HRS
2450.0	[m]	DC	HRS
2551.0	[m]	DC	HRS
2650.0	[m]	DC	HRS
2752.0	[m]	DC	HRS
2850.0	[m]	DC	HRS
2952.0	[m]	DC	HRS
3051.0	[m]	DC	HRS
3090.0	[m]	DC	HRS
3825.0	[m]	DC	HRS
3918.0	[m]	DC	HRS
4035.0	[m]	DC	HRS
4134.0	[m]	DC	HRS
4236.0	[m]	DC	HRS
4275.0	[m]	DC	HRS
4278.0	[m]	DC	OD
4290.0	[m]	DC	OD
4299.0	[m]	DC	OD
4308.0	[m]	DC	OD
4317.0	[m]	DC	OD
4326.0	[m]	DC	HRS
4332.0	[m]	DC	OD
4341.0	[m]	DC	OD
4350.0	[m]	DC	OD
4359.0	[m]	DC	OD
4371.0	[m]	DC	OD
4377.0	[m]	DC	HRS
4380.0	[m]	DC	OD
4389.0	[m]	DC	OD
4398.0	[m]	DC	OD
4410.0	[m]	DC	OD
4419.0	[m]	DC	OD
4425.0	[m]	DC	HRS
4431.0	[m]	DC	OD
4440.0	[m]	DC	OD
4449.0	[m]	DC	OD
4461.0	[m]	DC	OD



4470.0	[m]	DC	OD
4476.0	[m]	DC	HRS
4479.0	[m]	DC	OD
4488.0	[m]	DC	OD
4500.0	[m]	DC	OD
4509.0	[m]	DC	OD
4521.0	[m]	DC	OD
4527.0	[m]	DC	HRS
4530.0	[m]	DC	OD
4539.0	[m]	DC	OD
4551.0	[m]	DC	OD
4560.0	[m]	DC	OD
4569.0	[m]	DC	OD

Lithostratigraphy

Top depth [mMD RKB]	Lithostrat. unit
111	NORDLAND GP
1150	HORDALAND GP
1617	NO FORMAL NAME
1634	NO FORMAL NAME
1664	NO FORMAL NAME
1683	NO FORMAL NAME
2866	ROGALAND GP
2866	BALDER FM
2905	SELE FM
2943	LISTA FM
3021	MAUREEN FM
3081	SHETLAND GP
3081	EKOFISK FM
3157	TOR FM
3395	HOD FM
3651	BLODØKS FM
3683	HIDRA FM
3790	CROMER KNOLL GP
3790	RØDBY FM
4265	TYNE GP
4265	MANDAL FM
4319	FARSUND FM



4360	ELDFISK FM
4387	HAUGESUND FM

Composite logs

Document name	Document format	Document size [MB]
246	pdf	0.94

Geochemical information

Document name	Document format	Document size [MB]
246_1	pdf	4.18
246_2	pdf	3.70

Casing and leak-off tests

Casing type	Casing diam. [inch]	Casing depth [m]	Hole diam. [inch]	Hole depth [m]	LOT/FIT mud eqv. [g/cm3]	Formation test type
INTERM.	9 5/8	3830.0	12 1/4	3830.0	0.00	LOT
OPEN HOLE		4570.0	8 1/2	4570.0	0.00	LOT

