General information

Wellbore name	35/11-10
Type	EXPLORATION
Purpose	APPRAISAL
Status	P&A
Factmaps in new window	link to map
Main area	NORTH SEA
Field	FRAM
Discovery	35/11-4 Fram
Well name	35/11-10
Seismic location	MN 9201- INLINE 5385 & CROSSLINE 1871
Production licence	090
Drilling operator	Norsk Hydro Produksjon AS
Drill permit	891-L
Drilling facility	WEST VANGUARD
Drilling days	36
Entered date	19.05.1997
Completed date	23.06.1997
Release date	23.06.1999
Publication date	15.06.2005
Purpose - planned	APPRAISAL
Reentry	NO
Content	OIL/GAS
Discovery wellbore	NO
1st level with HC, age	LATE JURASSIC
1st level with HC, formation	SOGNEFJORD FM
2nd level with HC, age	MIDDLE JURASSIC
2nd level with HC, formation	FENSFJORD FM
3rd level with HC, age	MIDDLE JURASSIC
3rd level with HC, formation	NESS FM
Kelly bushing elevation [m]	22.0
Water depth [m]	353.5
Total depth (MD) [m RKB]	2950.0
Final vertical depth (TVD) [m RKB]	2949.0
Maximum inclination [°]	5.1
Bottom hole temperature [°C]	107
Oldest penetrated age	EARLY JURASSIC
Oldest penetrated formation	COOK FM

Geodetic datum	ED50
NS degrees	61° 1' 10.54'' N
EW degrees	3° 31' 26.29'' E
NS UTM [m]	6765243.58
EW UTM [m]	528323.08
UTM zone	31
NPDID wellbore	3042

Wellbore history

General

Well 35/11-10 is located on the western edge of the Uer Terrace, ca 9 km North of the Troll Field. It was drilled to appraise the oil and gas discovery made in the exploration well 35/11-4, which encountered hydrocarbons in the Upper Sognefjord Formation separated from an oil column in the Lower Sognefjord Formation, in the Fensfjord Formation, and in the Brent Group. In addition the Utsira Formation was to be cored in order to obtain information about the productivity for injection water.

Operations and results

Appraisal well 35/11-10 was spudded with the semi-submersible installation West Vanguard on 19 May 1997 and drilled to TD at 2950 m in the Early Jurassic Cook Formation. Some problems were encountered with coring in the Utsira Formation. In addition the Utsira Formation was not logged due to a tight spot at 439 m. Otherwise no significant problems were encountered during operations. The well was drilled with spud mud down to 1152 m and with ANCO 2000 glycol mud from 1152 m to TD.

From MWD logs and drilling parameters the Utsira Formation proved not to be developed as a sand reservoir in this location. The well confirmed hydrocarbons in all target levels except for the Etive Formation of the Brent Group. The top Sognefjord reservoir was encountered at 1971 m. The upper part of the Sognefjord Formation was thicker and had better reservoir properties than prognosed. A gas oil contact was identified at 1987 m and an oil water contact at 2011 m. Within the range of uncertainty this was the same OWC as in the well 35/11-4 and there was pressure communication in both the water and the oil zones. The GOC however, differs between the two wells. A total of 14 m of gas pay and 22.6 m oil pay with an average porosity of 27% were encountered. The Lower Sognefjord contained oil and gas with a thin gas cap at 2037 m identified by an MDT sample. The OWC was at 2054 m, which is the same depth as in well 35/11-4. Top Fensfjord Formation was encountered at 2275 m with GOC identified at 2299 m and OWC at 2312 m. The OWC is at the same depth in the two wells with the same oil gradient, while gas is encountered structurally deeper in well 35/11-10. The Brent Group was encountered at 2647.5 m, approximately 30 m deeper than prognosed. Both the GOC (2660 m) and the OWC (2702 m) were identified in the Ness Formation and occurs at different depths compared to well 35/11-4. The Etive Formation was only 10 m thick and water bearing. The Top Etive map, interpreted after drilling, shows that well 35/11-10 was drilled outside structural closure.

A total of 8 conventional cores were cut at different intervals throughout the well. Due to technical problems only one meter core was recovered from the Utsira Formation, otherwise recovery was excellent. Three cores were cut in the Sognefjord Formation, two in the Heather and Fensfjord Formations, and two in the Etive and Rannoch Formations. MDT fluid samples of oil and water were recovered in both the Upper (only oil) and Lower Sognefjord Formation, the Fensfjord Formation and the Brent Group. In the lower Sognefjord Formation also a sample of the 1 metre thin gas cap was taken.

It was decided to make a sidetrack for further appraisal of the Discovery. The well bore was plugged back with 4 cement plugs to 1888 m and a kick off plug from 1350 m a 1100 m. It was permanently abandoned on 23 June 1997 as an oil and gas appraisal well.

Testing

No drill stem test was performed.

Cuttings at the Norwegian Offshore Directorate

Cutting sample, top depth [m]	Cutting samples, bottom depth [m]
1160.00	2950.00

Cuttings available for sampling?	YES

Cores at the Norwegian Offshore Directorate

Core sample number	Core sample - top depth	Core sample - bottom depth	Core sample depth - uom
1	879.1	880.0	[m]
2	1975.0	2007.1	[m]
3	2008.0	2040.6	[m]
4	2041.0	2078.2	[m]
5	2268.0	2296.0	[m]
6	2296.0	2314.8	[m]
7	2676.0	2722.9	[m]
8	2723.0	2769.6	[m]

Total core sample length [m]	243.1
Cores available for sampling?	YES

Core photos


879-880m


1975-1980m


1980-1985m


1985-1990m


1990-1995m


1995-2000m


2000-2005m


2005-2007m


2008-2013m


2013-2018m


2018-2023m


2023-2028m


2028-2033m


2033-2038m


2038-2040m


2041-2046m


2046-2051m


2051-2056m


2056-2061m


2061-2066m


2066-2071m


2071-2076m


2076-2078m


2268-2273m


2273-2278m


2278-2283m


2283-2288m


2288-2293m


2293-2295m


2296-2301m


2301-2306m


2306-2311m


2311-2314m


2676-2677m


2681-2686m


2686-2691m


2691-2696m


2696-2701m


2701-2706m


2706-2711m


2711-2716m


2716-2721m


2721-2711m


2623-2728m


2728-2733m


2733-2738m


2738-2743m


2743-2748m


2748-2753m


2753-2758m


2758-2763m


2763-2768m


2768-2769m

Lithostratigraphy

Top depth [mMD RKB]	Lithostrat. unit
376	NORDLAND GP
756	HORDALAND GP
1414	ROGALAND GP
1414	BALDER FM
1462	SELE FM
1578	LISTA FM
1713	HEIMDAL FM
1777	LISTA FM
1791	VÅLE FM
1858	SHETLAND GP
1858	JORSALFARE FM
1965	VIKING GP
1965	DRAUPNE FM
1971	SOGNEFJORD FM
2117	HEATHER FM

2275	FENSFJORD FM
2385	HEATHER FM
2648	BRENT GP
2648	NESS FM
2718	ETIVE FM
2728	RANNOCH FM
2746	OSEBERG FM
2801	DUNLIN GP
2801	DRAKE FM
2818	COOK FM

Composite logs

Document name	Document format	Document size [MB]
3042_35_11_10	pdf	0.53

Geochemical information

Document name	Document format	Document size [MB]
3042_1	pdf	6.43
3042_2	pdf	7.42

Documents - reported by the production licence (period for duty of secrecy expired)

Document name	Document format	Document size [MB]
3042_35_11_10_COMPLETION_LOG	pdf	0.94
3042_35_11_10_COMPLETION_REPORT	pdf	17.17

Logs

Log type	Log top depth [m]	Log bottom depth [m]
DIL LDL CNL GR	0	0
DLL MSFL DSI LDL CNL NGT SP AMS	2325	2940
DLL MSFL LDL CNL NGT SP AMS	1046	2900

FMS DSI GR AMS	1139	2932
MDT GR AMS	0	0
MDT GR AMS	1972	2026
MDT GR AMS	1996	2036
MDT GR AMS	2028	2113
MDT GR AMS	2036	2870
MDT GR AMS	2305	2346
MWD - GR RES DIR	375	2950
VSP GR	450	2920

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
CONDUCTOR	30	435.0	36	438.0	0.00	LOT
INTERM.	13 3/8	1152.0	17 1/2	1158.0	0.00	LOT
OPEN HOLE		1906.0	12 1/4	1906.0	0.00	LOT
OPEN HOLE		2950.0	8 1/2	2950.0	0.00	LOT

Drilling mud

Depth MD [m]	Mud weight [g/cm3]	Visc. [mPa.s]	Yield point [Pa]	Mud type	Date measured
1152	1.25	23.0		WATER BASED	
1906	1.25	18.0		WATER BASED	
2078	1.26	18.0		WATER BASED	
2362	1.25	19.0		WATER BASED	
2950	1.25	16.0		WATER BASED	

Pressure plots

The pore pressure data is sourced from well logs if no other source is specified. In some wells where pore pressure logs do not exist, information from Drill stem tests and kicks have been used. The data has been reported to the NPD, and further processed and quality controlled by IHS Markit.

Document name	Document format	Document size [MB]
3042_Formation_pressure_(Formasjonstrykk)	pdf	0.24