

**General information**

Wellbore name	35/11-9
Type	EXPLORATION
Purpose	APPRAISAL
Status	P&A
Factmaps in new window	link to map
Main area	NORTH SEA
Field	FRAM
Discovery	35/11-8 S
Well name	35/11-9
Seismic location	MN 9201- INLINE 5320 & CROSSLINE 1455
Production licence	090
Drilling operator	Norsk Hydro Produksjon AS
Drill permit	875-L
Drilling facility	WEST DELTA
Drilling days	61
Entered date	02.03.1997
Completed date	01.05.1997
Release date	01.05.1999
Publication date	15.06.2005
Purpose - planned	APPRAISAL
Reentry	NO
Content	OIL
Discovery wellbore	NO
1st level with HC, age	LATE JURASSIC
1st level with HC, formation	INTRA HEATHER FM SS
Kelly bushing elevation [m]	29.0
Water depth [m]	357.0
Total depth (MD) [m RKB]	2830.0
Final vertical depth (TVD) [m RKB]	2828.0
Maximum inclination [°]	6.7
Bottom hole temperature [°C]	95
Oldest penetrated age	MIDDLE JURASSIC
Oldest penetrated formation	HEATHER FM
Geodetic datum	ED50
NS degrees	61° 3' 54.23" N
EW degrees	3° 30' 6.95" E
NS UTM [m]	6770298.99



EW UTM [m]	527092.97
UTM zone	31
NPDID wellbore	3009

Wellbore history

General

Well 35/11-9 is located ca 14 km north of the Troll Field and ca 3.5 km south-east well 35/11-8 S, which discovered oil and gas in a 79 m thick Intra Heather Sandstone unit, termed the "Early Oxfordian Turbidite" sequence. Well 35/11-9 was designed to appraise the oil and gas resources of this discovery. It should delineate the hydrocarbon contacts and test the lateral continuity and cementation of the turbidite sequence. The Sognefjord Formation was seen as secondary objective.

Operations and results

Appraisal well 35/11-9 was spudded with the semi-submersible installation West Delta on 2 March 1997 and drilled to TD at 2830 m in the Late Jurassic Heather Formation. The well was drilled with seawater to 1250 m and with ANCO 2000 water based glycol mud from 1250 m to TD.

The Intra Heather Sandstone unit was encountered at 2653 m. From 2653 m to 2688 m, 30 m net pay oil reservoir showed oil saturation of 76% and the average porosity was calculated to 22.1%. MDT pressure measurements gave an oil-water contact at 2687 m (2658 m TVD MSL), which is 4 m deeper than the oil-water contact in well 35/11-8 S. The top reservoir was, as prognosed, penetrated below the expected gas-oil contact for the structure. However, the main conclusion is that within the range of uncertainties there are pressure communication both in the oil and the gas zones.

No reservoir sand was encountered in the Sognefjord Formation. No shows were reported above top Jurassic, and all shows apart from those in the Intra Heather Sandstone reservoir, were found associated with in-situ source rock shales. Organic geochemical analyses showed that the oils from 35/11-8 S and 35/11-9 are very similar although a slightly lower maturity was noted for 35/11-8 S. Three conventional cores were cut from 16 m above the Intra Heather Sandstone to 8 m below the Heather Sandstone. MDT fluid samples were taken at 2706 m (water), 2677.4 m (oil), 2679.9 m (oil), and at 2677.5 m (oil).

The well was permanently abandoned on 1 May 1997 as an oil 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]
1360.00	2827.00

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	2638.0	2666.0	[m]
2	2666.0	2714.2	[m]
3	2714.2	2740.5	[m]

Total core sample length [m]	102.5
Cores available for sampling?	YES

Core photos



2638-2643m



2643-2648m



2648-2653m



2653-2658m



2658-2663m



2664-2668m



2666-2671m



2671-2676m



2676-2681m



2681-2686m



2686-2691m



2691-2696m



2696-2701m



2701-2706m



2711-2714m



2714-2719m



2719-2724m



2724-2729m



2729-2734m



2734-2739m



2739-2740m

Lithostratigraphy

Top depth [mMD RKB]	Lithostrat. unit
386	NORDLAND GP
724	UTSIRA FM
783	HORDALAND GP
1534	ROGALAND GP
1534	BALDER FM
1584	SELE FM
1646	LISTA FM
1715	HEIMDAL FM
1784	LISTA FM
1856	VÅLE FM
1910	TY FM
1973	SHETLAND GP
1973	JORSALFARE FM
2093	KYRRE FM
2303	SVARTE FM
2381	CROMER KNOLL GP
2381	RØDBY FM
2389	VIKING GP
2389	DRAUPNE FM
2539	HEATHER FM
2556	SOGNEFJORD FM
2580	HEATHER FM
2653	INTRA HEATHER FM SS
2733	HEATHER FM

Composite logs





Document name	Document format	Document size [MB]
3009_35_11_9	pdf	0.43

Geochemical information

Document name	Document format	Document size [MB]
3009_1	pdf	3.29

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

Document name	Document format	Document size [MB]
3009_35_11_9_COMPLETION_LOG	pdf	1.06
3009_35_11_9_COMPLETION_REPORT	pdf	13.81

Logs

Log type	Log top depth [m]	Log bottom depth [m]
DLL MSFL LDL CNL NGT SP AMS	1180	2820
FMI DSI GR ACTS	1225	2795
MDT GR	2565	2731
MWD - GR RES DIR	1250	2830
VSP GR	620	2140
VSP GR	1820	2320
VSP GR	2260	2810

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	447.0	36	447.0	0.00	LOT
SURF.COND.	13 3/8	1243.0	17 1/2	1250.0	0.00	LOT
OPEN HOLE		2325.0	12 1/4	2325.0	0.00	LOT
OPEN HOLE		2830.0	8 1/2	2830.0	0.00	LOT



**Drilling mud**

Depth MD [m]	Mud weight [g/cm3]	Visc. [mPa.s]	Yield point [Pa]	Mud type	Date measured
420	1.06			WATER BASED	
447	1.06			WATER BASED	
1250	1.03			WATER BASED	
1250	1.03			WATER BASED	
1890	1.25	21.0		WATER BASED	
2400	1.28	25.0		WATER BASED	
2830	1.21	17.0		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]
3009 Formation pressure (Formasjonstrykk)	pdf	0.23

