General information

Wellbore name	35/12-2
Type	EXPLORATION
Purpose	WILDCAT
Status	P&A
Press release	link to press release
Factmaps in new window	link to map
Main area	NORTH SEA
Discovery	35/12-2 (Grosbeak)
Well name	35/12-2
Seismic location	SG9603MN9201REV06 IL 3504 XL 2089
Production licence	378
Drilling operator	Wintershall Norge ASA
Drill permit	1241-L
Drilling facility	SONGA DELTA
Drilling days	47
Entered date	30.05.2009
Completed date	15.07.2009
Release date	15.07.2011
Publication date	15.07.2011
Purpose - planned	WILDCAT
Reentry	NO
Content	OIL/GAS
Discovery wellbore	YES
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	NESS FM
Kelly bushing elevation [m]	29.0
Water depth [m]	359.0
Total depth (MD) [m RKB]	2541.0
Final vertical depth (TVD) [m RKB]	2541.0
Maximum inclination [°]	1.6
Bottom hole temperature [°C]	91
Oldest penetrated age	MIDDLE JURASSIC
Oldest penetrated formation	ETIVE FM
Geodetic datum	ED50
NS degrees	61° 9' 59.72'' N
EW degrees	3° 40' 13.35'' E

NS UTM [m]	6781688.99
EW UTM [m]	536069.13
UTM zone	31
NPDID wellbore	6095

Wellbore history

General

Well 35/12-2 is an exploration well on the Grosbeak prospect. The Grosbeak prospect is located on the Ryggsteinen Ridge on the East flank of the Sogn Graben, with a number of fields and discoveries in the neighbouring blocks (Fram East, Fram West, Gjøa, Troll). The objective was to explore the hydrocarbon potential in sandstones of the Late Jurassic Sognefjord and Fensfjord formations and in the Middle Jurassic Brent Group.

Operations and results

Wildcat well 35/12-2 was spudded with the semi-submersible installation Songa Delta on 30 May 2009 and drilled to TD at 2541 m in the Middle Jurassic Brent Group. The well was drilled without significant operational problems and within pre-drill time schedule. The well was drilled with bentonite mud down to 517 m and with AQUACOL KCl/polymer mud from 517 m to TD.

The Late Jurassic Sognefjord Formation sandstones came in at 1968 m. Clear hydrocarbon shows and increased gas values were seen on penetrating this formation. The sandstones had an average porosity of 11.7 % when using a 10 % cut-off and contained gas to their base. The Heather Formation came in at 2030 m and consisted of very fine sandstones and siltstones with hydrocarbon shows throughout. Approximately 6 m of logs are missing in the top section of the Heather Formation. The Fensfjord Formation came in at 2100 m with oil encountered in a two-metre sandstone at the top of the formation. The Fensfjord Formation then passed into 13 m of shale, then into water-bearing sandstones. The sandstones had an average porosity of 19.4 % when using a 12.5 % cut off. Below the Fensfjord Formation was 291 m of non-hydrocarbon-bearing Heather Formation including 5 m of water-bearing Krossfjord Formation sandstone.

The Middle Jurassic Brent Group, Ness Formation was penetrated at 2450 m. A 35 m gross oil column was encountered in the Ness Formation. Based on pressure measurements and fluid densities two different pressure regimes with two hydrocarbon contacts were identified. The upper contact was placed at 2476.5 m, but it is not known what kind of fluid contact it is. The lower was recognised as an OWC at 2485 m. The reservoir properties in both zones are good. Also the underlying water bearing Etive Formation sands (2509.6 to 2529.1 m) have good reservoir properties.

Three successive cores were cut in the interval 1974.0 to 2106.0 m. Four (4) wire line runs comprised SBT, VSP and two RCI runs. A successful RCI gas sample using straddle packer was collected at 2027 m in the Sognefjord Formation. Further RCI single probe samples were collected in the Fensfjord Formation at 2101.5 m in (oil, gas, water, mud) and 2119 m (water); in the Ness Formation at 2454.4 m, 2459 m, 2459.5 m, 2460 m, 2477 m, 2481 m (all oil, gas, water, and mud) and at 2489 m (water and mud); and in the Etive Formation at 2524 m (water and mud). Low permeabilities in the Sognefjord Formation made the acquisition of accurate formation pressures (RCI) and fluid samples problematic, but otherwise the data collection was without incidents. Pressure measurements were also obtained in the Lista water bearing sands in the 12-1/4" hole section using a LWD formation pressure tool (TesTrak).

The well was permanently abandoned on 15 July 2009 as an oil and gas discovery.

Testing

No drill stem test was performed.

Cuttings at the Norwegian Offshore Directorate

Cutting sample, top depth [m]	Cutting samples, bottom depth [m]
1320.00	2541.00

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	1974.0	2025.7	[m]
2	2028.0	2055.0	[m]
3	2055.0	2101.0	[m]

Total core sample length [m]	124.7
Cores available for sampling?	YES

Lithostratigraphy

Top depth [mMD RKB]	Lithostrat. unit
389	NORDLAND GP
546	UTSIRA FM
675	HORDALAND GP
1285	ROGALAND GP
1285	BALDER FM
1340	SELE FM
1425	LISTA FM
1742	VÅLE FM
1770	SHETLAND GP
1770	JORSALFARE FM
1829	KYRRE FM
1968	VIKING GP
1968	SOGNEFJORD FM
2030	HEATHER FM
2100	FENSFJORD FM
2159	HEATHER FM
2232	KROSSFJORD FM
2237	HEATHER FM
2450	BRENT GP
2450	NESS FM

2510	ETIVE FM

Logs

Log type	Log top depth [m]	Log bottom depth [m]
LWD - DIR GR RES DEN NUT SON PWD	1310	1975
LWD - DIR GR RES DEN NUT SON PWD	1975	2541
LWD - DIR GR RES PWD	388	517
LWD - DIR GR RES PWD SON	517	1310
RCI GR	1971	2531
RCI GR	1996	2101
SBT GR	800	1972
VSP	840	2451

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	453.0	36	457.0	0.00	LOT
SURF.COND.	20	513.0	26	517.0	0.00	LOT
PILOT HOLE		517.0	9 7/8	517.0	0.00	LOT
INTERM.	13 3/8	1304.0	17 1/2	1310.0	1.39	LOT
LINER	9 5/8	1968.0	12 1/4	1975.0	1.52	LOT
OPEN HOLE		2541.0	8 1/2	2541.0	1.52	LOT

Drilling mud

Depth MD [m]	Mud weight [g/cm3]	Visc. [mPa.s]	Yield point [Pa]	Mud type	Date measured
423	1.05			BENTONITE MUD	
430	1.10	7.0		BENTONITE MUD	
453	1.50	20.0		BENTONITE MUD	
517	1.50			BENTONITE MUD	
1137	1.26	16.0		AQUACOL KCL/POLYMER/GLYCOL	

1310	1.30	21.0		AQUACOL KCL/POLYMER/GLYCOL	
1975	1.32	21.0		AQUACOL KCL/POLYMER/GLYCOL	
2105	1.31	18.0		AQUACOL KCL/POLYMER/GLYCOL	
2386	1.32	24.0		AQUACOL KCL/POLYMER/GLYCOL	
2541	1.32	18.0		BENTONITE MUD	