General information

Wellbore name	16/2-7
Type	EXPLORATION
Purpose	APPRAISAL
Status	P&A
Press release	link to press release
Factmaps in new window	link to map
Main area	NORTH SEA
Field	JOHAN SVERDRUP
Discovery	16/2-6 Johan Sverdrup
Well name	16/2-7
Seismic location	LN0902 inline2414 -crossline 6992
Production licence	501
Drilling operator	Lundin Norway AS
Drill permit	1343-L
Drilling facility	BREDFORD DOLPHIN
Drilling days	45
Entered date	19.07.2011
Completed date	01.09.2011
Release date	01.09.2013
Publication date	01.09.2013
Purpose - planned	APPRAISAL
Reentry	NO
Content	OIL
Discovery wellbore	NO
1st level with HC, age	LATE JURASSIC
1st level with HC, formation	INTRA DRAUPNE FM SS
Kelly bushing elevation [m]	25.0
Water depth [m]	113.0
Total depth (MD) [m RKB]	2500.0
Final vertical depth (TVD) [m RKB]	2500.0
Maximum inclination [°]	2.1
Bottom hole temperature [°C]	103
Oldest penetrated age	EARLY PERMIAN
Oldest penetrated formation	ROTLIEGEND GP
Geodetic datum	ED50
NS degrees	58° 46' 47.77'' N
EW degrees	2° 39' 16.28'' E
NS UTM [m]	6515749.45

EW UTM [m]	480024.06
UTM zone	31
NPDID wellbore	6561

Wellbore history

General

Well 16/2-7 was drilled about 5.5 kilometres southeast of the discovery well for the oil discovery 16/2-6 (Avaldsnes) on the Utsira High in the North Sea. The 16/2-6 Avaldsnes discovery was proven in September 2010 in Middle-Late Jurassic reservoir rocks. The primary exploration target for 16/2-7 was to delineate the presence of hydrocarbons in Middle-Late Jurassic sandstones above the 1922 m MSL oil-water contact established in well 16/2-6. The well?s secondary objective was to determine the reservoir properties of the Rotliegendes Formation.

Operations and results

Appraisal well 16/2-7 was spudded with the semi-submersible installation Bredford Dolphin on 19 July 2011and drilled to TD at 2500 m in Early Permian Rotliegendes Group rock. A 9 7/8" pilot hole was drilled from the seabed to 710 m to check for shallow gas. Some sand was found at the pre-warned level, but without shallow gas. No significant technical problem was encountered in the operations. The well was drilled with seawater and hi-vis pills down to 710 m and with Performadril WBM from 710 m to TD.

BCU/top Draupne Formation was encountered at 1936 m approximately 15 m deeper than prognosis. This was due to a small fault that was originally not accounted for in the seismic interpretation. The well proved oil in Intra Draupne Formation sandstone from top at 1939 m and down to the OWC at 1947.5 m (1922.5 m TVD MSL), confirming the OWC found in 16/2-6. Reservoir quality was good to very good and the reservoir continued through base of the Intra Draupne Formation sandstone at 1964 m and into the underlying Sleipner with base at 1984 m. Total net reservoir was 35 m. The Permian Zechstein and Rotliegendes Groups were encountered within the depth prognosis uncertainty. Reservoir properties were not found in these sequences. The first oil show was observed in the Draupne Formation at 1937 m. Good oil shows were recorded down through the reservoir to 1948 m. Below 1948 m the oil shows became progressively weaker with no further shows observed below 1957 m.

Five conventional cores were cut in the well. The three first were cut from 1924 m to 1973.5 m across BCU, Draupne Formation shales and sandstone and into the underlying Sleipner Formation. Core no 4 was cut from 2198 m to 2217 m in the Zechstein Group, and core no 5 was cut from 2283 m to 2310 m in the Rotliegendes Group. MDT wire line fluid samples were taken in the Intra Draupne Formation sandstone at 1941.62 m (oil), 1945.54 m (oil), 1963.51 m (water, and 1963.52 m (water).

The well was permanently abandoned on 1 September 2011 as an oil appraisal.

Testing

No drill stem test was performed.

Cuttings at the Norwegian Offshore Directorate

Cutting sample, top depth [m]	Cutting samples, bottom depth [m]
710.00	2500.00

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	1924.0	1950.8	[m]
2	1951.0	1967.9	[m]
3	1968.0	1973.4	[m]
4	2198.3	2216.9	[m]
5	2283.0	2309.7	[m]

Total core sample length [m]	94.4
Cores available for sampling?	YES

Oil samples at the Norwegian Offshore Directorate

Test type	Bottle number	Top depth MD [m]	Bottom depth MD [m]	Fluid type	Test time	Samples available
MDT		1950.84	0.00	OIL	13.08.2011 - 00:00	YES

Lithostratigraphy

Top depth [mMD RKB]	Lithostrat. unit
138	NORDLAND GP
792	UTSIRA FM
892	UNDIFFERENTIATED
974	HORDALAND GP
974	SKADE FM
1025	NO FORMAL NAME
1375	NO FORMAL NAME

1397	ROGALAND GP
1397	BALDER FM
1420	SELE FM
1431	LISTA FM
1498	VÅLE FM
1500	SHETLAND GP
1500	EKOFISK FM
1502	TOR FM
1621	HOD FM
1737	BLODØKS FM
1762	SVARTE FM
1801	CROMER KNOLL GP
1801	RØDBY FM
1894	SOLA FM
1900	ÅSGARD FM
1936	VIKING GP
1936	DRAUPNE FM
1940	INTRA DRAUPNE FM SS
1965	VESTLAND GP
1965	SLEIPNER FM
1985	STATFJORD GP
1986	HEGRE GP
1986	SKAGERRAK FM
2134	ZECHSTEIN GP
2134	UNDIFFERENTIATED
2239	KUPFERSCHIEFER FM
2244	ROTLIEGEND GP
2244	NO FORMAL NAME

Logs

Log type	Log top depth [m]	Log bottom depth [m]
CMR XPT GR	1782	2036
ECS HNGS XPT	2098	2487
FMI MSIP GR	1722	2040
FMI MSIP GR	1915	2046
FMI MSIP GR	2012	2494
MDT GR	1941	2021
MSCT GR	1802	2038

MSCT GR	2106	2483
MWD - GR REMP	133	2098
MWD - GR REMP DEN NEU AC	689	2497
PEX HRLA ECS HNGS	1771	2037
VSI GR	137	2489

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	216.0	36	216.0	0.00	LOT
SURF.COND.	20	700.0	26	705.0	2.34	LOT
PILOT HOLE		710.0	9 7/8	710.0	0.00	LOT
INTERM.	13 3/8	1772.0	17 1/2	1779.0	1.60	LOT
INTERM.	9 5/8	2098.0	12 1/4	2100.0	1.50	LOT
OPEN HOLE		2500.0	8 1/2	2500.0	0.00	LOT

Drilling mud

Depth MD [m]	Mud weight [g/cm3]	Visc. [mPa.s]	Yield point [Pa]	Mud type	Date measured
353	1.03			Kill/Displacement mud	
540	1.39	23.0		Performadril	
705	1.35	21.0		PERFORMADRIL	
705	1.39	11.0		Kill/displacement mud	
754	1.35	22.0		PERFORMADRIL	
1363	1.35	40.0		PERFORMADRIL	
1690	1.39	24.0		Performadril	
1868	1.20	32.0		PERFORMADRIL	
2050	1.20	33.0		PERFORMADRIL	
2134	1.14	20.0		PERFORMADRIL	
2217	1.14	24.0		PERFORMADRIL	
2464	1.15	37.0		PERFORMADRIL	
2500	1.14	32.0		PERFORMADRIL	

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]
6561_Formation_pressure_(Formasjonstrykk)	pdf	0.23