General information

Wellbore name	16/2-10
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	16/2-10
Seismic location	LN0902R10 inline 3994 & xline 3578
Production licence	265
Drilling operator	Statoil Petroleum AS
Drill permit	1375-L
Drilling facility	TRANSOCEAN LEADER
Drilling days	32
Entered date	27.09.2011
Completed date	28.10.2011
Release date	28.10.2013
Publication date	28.10.2013
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
2nd level with HC, age	MIDDLE JURASSIC
2nd level with HC, formation	HUGIN FM
Kelly bushing elevation [m]	23.5
Water depth [m]	115.0
Total depth (MD) [m RKB]	2090.0
Final vertical depth (TVD) [m RKB]	2090.0
Maximum inclination [°]	0.7
Bottom hole temperature [°C]	94
Oldest penetrated age	LATE TRIASSIC
Oldest penetrated formation	SKAGERRAK FM
Geodetic datum	ED50
NS degrees	58° 51' 16.08'' N

EW degrees	2° 32' 37.5'' E
NS UTM [m]	6524086.78
EW UTM [m]	473675.68
UTM zone	31
NPDID wellbore	6715

Wellbore history

General

Well 16/2-10 was drilled on the Utsira High in the North Sea to appraise the northern part of the Aldous Major Discovery in a segment called Espevær. The main objective was to investigate the hydrocarbon potential and the

reservoir quality and lateral sand distribution in Late Jurassic sandstones in the Draupne Formation of the Viking Group, and the Hugin and Sleipner Formations of the Vestland Group. The secondary well objective was to explore the reservoir properties in the Triassic age Skagerrak Formation. The third objective was to investigate the hydrocarbon potential in the Cretaceous chalk of the Shetland Group.

Operations and results

A 9 7/8" pilot hole 16/2-U-6 was drilled to check for shallow gas down to setting depth for the 20" casing. No sign of shallow gas or shallow water flow was seen on the logs nor observed by the ROV.

Appraisal well 16/2-10 was spudded with the semi-submersible installation Transocean Leader on 27 September 2011 and drilled to TD at 2090 m in the Late Triassic Skagerrak Formation. No significant problem was encountered in the operations. The well was drilled with sea water down to 463 m and with water based Performadril mud with 3-4% glycol from 463 m to TD.

Well 16/2-10 penetrated sediments of Cenozoic, Cretaceous, Jurassic and Triassic age. Top of the Intra Draupne Formation sandstones, came in at 1892 m. An oil column of 66 meters was found in these sandstones and the underlying sandstones of the Middle Jurassic Hugin Formation. The free water level was established at 1957.7 m (1934.2 m TVD MSL) as confirmed by logs, cores, pressure data and fluid samples. This is deeper than in the 16/2-8 discovery well, where the free water level was found at 1920.7 m. The Triassic Skagerrak Formation was water wet. There were no sign of hydrocarbons in the Shetland Group. Oil shows were recorded from 1890 m to 1953 m.

Four cores were cut from 1889.5 m in the Åsgard Formation to base Hugin Formation at 1962 m. Reservoir fluid samples were obtained in 3 MDT runs at 7 depths: 1893.5 m (oil), 1927.0 m (oil), 1935.5 m (oil), 1935.7 m (oil), 1955 m (oil and some water), 1961 m (water), and 1966 m (water).

The well was permanently abandoned on 28 October 2011 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]
460.00	2089.00

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	1889.5	1894.7	[m]
2	1897.4	1912.5	[m]
3	1912.5	1939.6	[m]
4	1939.6	1962.0	[m]

Total core sample length [m]	69.9
Cores available for sampling?	YES

Palynological slides at the Norwegian Offshore Directorate

Sample depth	Depth unit	Sample type	Laboratory
460.0	[m]	DC	FUGRO
480.0	[m]	DC	FUGRO
500.0	[m]	DC	FUGRO
520.0	[m]	DC	FUGRO
540.0	[m]	DC	FUGRO
560.0	[m]	DC	FUGRO
580.0	[m]	DC	FUGRO
600.0	[m]	DC	FUGRO
620.0	[m]	DC	FUGRO
640.0	[m]	DC	FUGRO
660.0	[m]	DC	FUGRO
680.0	[m]	DC	FUGRO
700.0	[m]	DC	FUGRO
720.0	[m]	DC	FUGRO
740.0	[m]	DC	FUGRO
760.0	[m]	DC	FUGRO
780.0	[m]	DC	FUGRO
800.0	[m]	DC	FUGRO
820.0	[m]	DC	FUGRO
840.0	[m]	DC	FUGRO

860.0	[m]	DC	FUGRO
880.0	[m]	DC	FUGRO
900.0	[m]	DC	FUGRO
920.0	[m]	DC	FUGRO
940.0	[m]	DC	FUGRO
960.0	[m]	DC	FUGRO
980.0	[m]	DC	FUGRO
1000.0	[m]	DC	FUGRO
1020.0	[m]	DC	FUGRO
1040.0	[m]	DC	FUGRO
1060.0	[m]	DC	FUGRO
1080.0	[m]	DC	FUGRO
1100.0	[m]	DC	FUGRO
1120.0	[m]	DC	FUGRO
1140.0	[m]	DC	FUGRO
1160.0	[m]	DC	FUGRO
1180.0	[m]	DC	FUGRO
1200.0	[m]	DC	FUGRO
1220.0	[m]	DC	FUGRO
1240.0	[m]	DC	FUGRO
1260.0	[m]	DC	FUGRO
1280.0	[m]	DC	FUGRO
1300.0	[m]	DC	FUGRO
1320.0	[m]	DC	FUGRO
1340.0	[m]	DC	FUGRO
1360.0	[m]	DC	FUGRO
1390.0	[m]	DC	FUGRO
1400.0	[m]	DC	FUGRO
1420.0	[m]	DC	FUGRO
1440.0	[m]	DC	FUGRO
1460.0	[m]	DC	FUGRO
1480.0	[m]	DC	FUGRO
1500.0	[m]	DC	FUGRO
1520.0	[m]	DC	FUGRO
1540.0	[m]	DC	FUGRO
1560.0	[m]	DC	FUGRO
1580.0	[m]	DC	FUGRO
1600.0	[m]	DC	FUGRO
1620.0	[m]	DC	FUGRO
1633.0	[m]	DC	FUGRO

1639.0	[m]	DC	FUGRO
1657.0	[m]	DC	FUGRO
1729.0	[m]	DC	FUGRO
1747.0	[m]	DC	FUGRO
1759.0	[m]	DC	FUGRO
1765.0	[m]	DC	FUGRO
1771.0	[m]	DC	FUGRO
1777.0	[m]	DC	FUGRO
1783.0	[m]	DC	FUGRO
1789.0	[m]	DC	FUGRO
1795.0	[m]	DC	FUGRO
1801.0	[m]	DC	FUGRO
1807.0	[m]	DC	FUGRO
1813.0	[m]	DC	FUGRO
1819.0	[m]	DC	FUGRO
1825.0	[m]	DC	FUGRO
1831.0	[m]	DC	FUGRO
1837.0	[m]	DC	FUGRO
1882.0	[m]	DC	FUGRO
1885.0	[m]	DC	FUGRO
1888.0	[m]	DC	FUGRO
1898.6	[m]	CC	FUGRO
1904.2	[m]	CC	FUGRO
1906.6	[m]	CC	FUGRO
1911.2	[m]	CC	FUGRO
1922.0	[m]	CC	FUGRO
1928.9	[m]	CC	FUGRO
1929.9	[m]	CC	FUGRO
1930.1	[m]	CC	FUGRO
1931.0	[m]	CC	FUGRO
1940.0	[m]	CC	FUGRO
1944.9	[m]	CC	FUGRO
1948.1	[m]	CC	FUGRO
1952.6	[m]	CC	FUGRO
1959.0	[m]	CC	FUGRO

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		1927.00	0.00	OIL	21.10.2011 - 00:00	YES
MDT		1935.50	0.00	OIL	19.10.2011 - 00:00	YES
MDT		1893.50	0.00	OIL	19.10.2011 - 00:00	YES

Lithostratigraphy

Top depth [mMD RKB]	Lithostrat. unit
139	NORDLAND GP
818	UTSIRA FM
1057	HORDALAND GP
1084	SKADE FM
1137	NO FORMAL NAME
1500	ROGALAND GP
1500	BALDER FM
1531	SELE FM
1540	LISTA FM
1605	VÅLE FM
1622	SHETLAND GP
1622	EKOFISK FM
1632	TOR FM
1710	HOD FM
1766	BLODØKS FM
1780	SVARTE FM
1809	CROMER KNOLL GP
1809	RØDBY FM
1851	SOLA FM
1885	ÅSGARD FM
1892	VIKING GP
1892	INTRA DRAUPNE FM SS
1924	VESTLAND GP
1924	HUGIN FM
1962	SLEIPNER FM
1968	HEGRE GP
1968	SKAGERRAK FM

Logs

Log type	Log top depth [m]	Log bottom depth [m]
CMR ECS GR	1631	2092
FMI HNGS HRLA	1631	2092
LWD MWD - ARCRES6 ADN	1889	2090
LWD MWD - ARCRES8 PP	138	455
LWD MWD - ARCRES9 TELE	455	948
LWD MWD - GVR ARCRES8 TELE	948	1631
LWD MWD - RAB6 ECO TELE	1631	1889
MDT HC	1893	1966
MDT PS	1893	1966
MDT QWS	1955	1961
MSIP GPIT PEX CBL	1025	2078
USIT GR	1250	1630
VSI4 GR	1243	2082

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	212.2	36	213.0	0.00	LOT
SURF.COND.	20	449.0	26	463.0	1.53	LOT
INTERM.	13 3/8	942.0	17 1/2	948.0	0.00	LOT
INTERM.	9 5/8	1630.0	12 1/4	1631.0	1.57	LOT
OPEN HOLE		2090.0	8 1/2	2090.0	0.00	LOT

Drilling mud

Depth MD [m]	Mud weight [g/cm3]	Visc. [mPa.s]	Yield point [Pa]	Mud type	Date measured
139	1.60	24.0		Kill Fluid-SW/Bentonite	
216	1.60	24.0		Kill Fluid-SW/Bentonite	
300	1.35	22.0		Spud Mud	
513	1.25	16.0		Performadril	
872	1.25	26.0		Performadril	

1045	1.35	28.0		Performadril	
1631	1.37	51.0		Performadril	
2090	1.22	23.0		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]
6715_Formation_pressure_(Formasjonstrykk)	pdf	0.21