



Generell informasjon

Brønnbane navn	16/4-9 S
Type	EXPLORATION
Formål	APPRAISAL
Status	P&A
Pressemelding	lenke til pressemelding
Faktakart i nytt vindu	lenke til kart
Hovedområde	NORTH SEA
Felt	SOLVEIG
Funn	16/4-6 S Solveig
Brønn navn	16/4-9
Seismisk lokalisering	LN0902R10 3D :inline 3746 crossline 140
Utvinningstillatelse	359
Boreoperatør	Lundin Norway AS
Boretillatelse	1558-L
Boreinnretning	BREDFORD DOLPHIN
Boredager	64
Borestart	14.06.2015
Boreslutt	16.08.2015
Frigitt dato	16.08.2017
Publiseringsdato	16.08.2017
Opprinnelig formål	WILDCAT
Gjenåpnet	NO
Innhold	OIL
Funnbrønnbane	NO
1. nivå med hydrokarboner, alder	TRIASSIC
1. nivå med hydrokarboner, formasjon.	SKAGERRAK FM
Avstand, boredekk - midlere havflate [m]	25.0
Vanndybde ved midlere havflate [m]	100.0
Totalt målt dybde (MD) [m RKB]	2358.0
Totalt vertikalt dybde (TVD) [m RKB]	2330.0
Maks inklinasjon [°]	13
Temperatur ved bunn av brønnbanen [°C]	89
Eldste penetrerte alder	TRIASSIC
Eldste penetrerte formasjon	SKAGERRAK FM
Geodetisk datum	ED50



NS grader	58° 42' 22.76" N
ØV grader	2° 9' 55.07" E
NS UTM [m]	6507802.03
ØV UTM [m]	451635.06
UTM sone	31
NPDID for brønnbanen	7631

Brønnhistorie

General

Well 16/4-9 S was drilled to appraise the 16/4-6 S Luno II discovery on the Utsira High southwest of the Johan Sverdrup Field in the North Sea. The well should prove extension of Triassic/Jurassic reservoir sandstone and verify pressure communication towards the Luno II C segment northwest of the 16/4-6 S discovery well.

Operations and results

Appraisal well 16/4-9 S was spudded with the semi-submersible installation Bredford Dolphin on 14 June 2015 and drilled to TD at 2358 m (2330 m TVD) in the Triassic Skagerrak Formation. The well was drilled S-shaped, building angle from 602 m to a sail angle of ca 12.9° in the interval 1000 m to 1750 m and back to vertical again from ca 1970 m. No significant problem was encountered in the operations. The well was drilled with seawater and high viscosity pills down to 6011 m and with Aquadril mud from 6011 m to TD.

Top reservoir Skagerrak Formation sandstones was penetrated at 1983 m. The reservoir consisted of relatively homogenous sandstone overlain by a more conglomeratic sequence. It held an oil column of ca 25 m down to a clean OWC at 2008.8 m (1981 m TVD). The oil is a mix of biodegraded residual oil and a fresh light oil. The reservoir is 4 bar depleted compared to well 16/4-6 S. No shows were observed above the reservoir. Below the reservoir, good oil shows were recorded on cores down to 2042 m, and weaker shows were seen down to 2053 m. No shows were seen below 2053 m.

Three cores were cut from 1985 m to 2066.2 m with close to 100% recovery. The core depth was 0.775 m deeper than log depth for all three cores. MDT fluid samples were taken at 1984.5 m (oil), 2000.1 m (oil), 2006.66 m (oil and water), and 2030.1 m (water).

The well was permanently abandoned on 16 August 2015 as an oil appraisal well.

Testing

One production test (DST) was performed from the interval 1981 to 2001.9 m. The DST produced on average 136 Sm³ oil and 23400 Sm³ gas/day through a 28/64" choke (main flow). The GOR was 172 Sm³/Sm³. The maximum downhole temperature in the DST was 78.5 °C.

Borekaks i Sokkeldirektoratet

Borekaksprøve, topp dybde [m]	Borekaksprøve, bunn dybde [m]
620.00	2358.00



Borekaks tilgjengelig for prøvetaking?	YES
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Borekjerne i Sokkeldirektoratet

Kjerneprøve nummer	Kjerneprøve - topp dybde	Kjerneprøve - bunn dybde	Kjerneprøve dybde - enhet
1	1985.0	2011.4	[m]
2	2012.0	2040.2	[m]
3	2040.2	2065.6	[m]

Total kjerneprøve lengde [m]	80.0
Kjerner tilgjengelig for prøvetaking?	YES

Oljeprøver i Sokkeldirektoratet

Test type	Flaske nummer	Topp dyp MD [m]	Bunn dyp MD [m]	Væske type	Test tidspunkt	Prøver tilgjengelig
DST		2002.00	1981.00	OIL	03.08.2015 - 01:25	YES
DST		2002.00	1981.00	OIL	03.08.2015 - 02:45	YES

Litostratigrafi

Topp Dyb [mMD RKB]	Litostrat. enhet
125	NORDLAND GP
735	UTSIRA FM
984	HORDALAND GP
995	SKADE FM
1245	HORDALAND GP
1663	GRID FM
1670	HORDALAND GP
1705	GRID FM
1708	HORDALAND GP
1871	ROGALAND GP
1871	BALDER FM
1882	SELE FM
1911	LISTA FM



1969	VÅLE FM
1975	SHETLAND GP
1975	EKOFISK FM
1977	TOR FM
1982	HOD FM
1984	HEGRE GP
1984	SKAGERRAK FM

Borestrengtester (DST)

Test nummer	Fra dybde MD [m]	Til dybde MD [m]	Reduksjonsven til størrelse [mm]
1.0	1981	2002	11.1

Test nummer	Endelig avstengningstrykk [MPa]	Endelig strømningstrykk [MPa]	Bunnhullstrykk [MPa]	Borehullstemperatur [°C]
1.0				78

Test nummer	Olje produksjon [Sm3/dag]	Gass produksjon [Sm3/dag]	Oljetetthet [g/cm3]	Gasstyngde rel. luft	GOR [m3/m3]
1.0	136	23400			172

Logger

Type logg	Topp dyp for logg [m]	Bunn dyp for logg [m]
ADT CMR ON TLC	0	0
FMI HRLA PEX HNGS GR ON TLC	0	0
FMI ON TLC	0	0
GR RES DIR	1941	1984
GR RES DIR CAL DEN NEU SON	1937	2357
MDT ON TLC	0	0
MWD - DIR PWD	192	596
MWD - ECD	1937	2357
MWD - GR DIR PWD	92	129
MWD - GR RES DIR CAL DEN NEU SON	608	1941
MWD - GR RES SIR PWD SON	192	608



XLROCK ON TLC	0	0
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Foringsrør og formasjonsstyrketester

Type utforing	Utforing diam. [tommer]	Utforing dybde [m]	Brønnbane diam. [tommer]	Brønnbane dyp [m]	LOT/FIT slam eqv. [g/cm3]	Type formasjonstest
CONDUCTOR	30	203.2	36	207.5	0.00	
SURF.COND.	20	602.5	26	609.0	1.55	FIT
PILOT HOLE		611.0	9 7/8	611.0	0.00	
INTERM.	9 5/8	1937.2	12 1/4	1945.0	1.81	LOT
LINER	7	2096.2	8 1/2	2096.2	0.00	
OPEN HOLE		2358.0	8 1/2	2358.0	0.00	

Boreslam

Dybde MD [m]	Egenvekt, slam [g/cm3]	Viskositet, slam [mPa.s]	Fløtegrense [Pa]	Type slam	Dato, måling
208	1.50	1.0		Glydril	
208	1.40	1.0		Glydril	
611	1.25	1.0		Spud Mud	
971	1.35	13.0		Water Based	
1409	1.40	19.0		Water Based	
1945	1.20	14.0		Water Based	
1945	1.40	20.0		Water Based	
2100	1.20	20.0		Water Based	
2358	1.20	20.0		Water Based	
2358	1.20	13.0		Water Based	