Generell informasjon

Brønnbane navn	16/4-11
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	16/4-11
Seismisk lokalisering	LN12M02R14 Inline 2810 Crossline 2122
Utvinningstillatelse	359
Boreoperatør	Lundin Norway AS
Boretillatelse	1685-L
Boreinnretning	COSLInnovator
Boredager	54
Borestart	07.02.2018
Boreslutt	01.04.2018
Frigitt dato	01.04.2020
Publiseringsdato	01.04.2020
Opprinnelig formål	APPRAISAL
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]	2475.0
Totalt vertikalt dybde (TVD) [m RKB]	2475.0
Maks inklinasjon [°]	4.8
Temperatur ved bunn av brønnbanen [°C]	94
Eldste penetrerte alder	PERMIAN
Eldste penetrerte formasjon	ROTLIEGEND GP
Geodetisk datum	ED50

NS grader	58° 40' 16.11'' N
ØV grader	2° 14' 25.3'' E
NS UTM [m]	6503833.13
ØV UTM [m]	455939.97
UTM sone	31
NPDID for brønnbanen	8353

Brønnhistorie

General

Well 16/4-11 was drilled on the Luno Discovery on the Utsira High in the North Sea. The primary objective of the well was to delineate the southwest flank of the 16/4-6 S (Luno II) discovery, to investigate the reservoir properties, and to investigate the type of oil and total oil column in this part of the discovery.

Operations and results

Appraisal well 16/4-11 was spudded with the semi-submersible installation COSL Innovator on 7 February 2018. A 9 7/8” pilot hole was drilled from below the 30x36” casing shoe at 195 m to 475 m. Shallow gas was observed in the interval 469 m to 471 m. The 20” casing was therefore set shallow at 409.5 m, above the shallow gas zone. From there the well was drilled to TD at 2475 m in the Permian Rotliegendes Group. Operations proceeded without significant problems. The well was drilled with seawater and hi-vis pills down to 409.5 m, with KCl/polymer mud from 409.5 m to 1922 m, and with Aquadrill mud from 1922 m to TD.

Top of the target reservoir, Hegre Group, was encountered at 1950 m. It was oil-bearing down to a clear oil-water contact at 1971.5 m. Good shows were described in the oil-bearing reservoir section. Below the OWC shows continued down to the base of the cored interval at 2004 m. These shows are described as having no odour, 100% even weak yellowish direct fluorescence, slightly blooming weak bluish white cut fluorescence, and 10% moderate bluish white fluorescent residue. The conventional core and sidewall cores from the Permian sandstone had shows that weakened with depth in the interval 2090 to 2329 m. These are typically described as having no odour, yellowish brown direct fluorescence, no to diffuse blue-white fluorescent cut, and no to 80% blue white cream fluorescent residue.

Three cores were cut in the well. Cores 1 and 2 were cut in the top of the Hegre Group reservoir from 1952 to 2004.1 m with 100% recovery. Core 3 was cut in the Permian sandstones from 2090 to 2099 m with 94.2% recovery. MDT fluid samples were taken at 1952.1 m (oil), 1963 m (oil), 1970.1 m (oil), 1971.61 m (water), 1978.3 m (water), 2001.72 m (water), and 2075 m (water). Single flash of the uppermost oil sample gave a GOR of 233.4 Sm3/Sm3 and an oil density of 0.8482 g/cm3.

The well was permanently abandoned on 1 April 2018 as an oil appraisal.

Testing

No drill stem test was performed.

Borekaks i Sokkeldirektoratet

Borekaksprøve, topp dybde [m]	Borekaksprøve, bunn dybde [m]
420.00	2476.00

Borekaks tilgjengelig for prøvetaking?	YES

Borekjerner i Sokkeldirektoratet

Kjerneprøve nummer	Kjerneprøve - topp dybde	Kjerneprøve - bunn dybde	Kjerneprøve dybde - enhet
1	1952.0	1976.7	[m]
2	1976.7	2004.1	[m]
3	2090.0	2098.5	[m]

Total kjerneprøve lengde [m]	60.6
Kjerner tilgjengelig for prøvetaking?	YES

Litostratigrafi

Topp Dyb [mMD RKB]	Litostrat. enhet
125	NORDLAND GP
125	UNDIFFERENTIATED
760	UTSIRA FM
922	UNDIFFERENTIATED
1010	HORDALAND GP
1010	UNDIFFERENTIATED
1022	SKADE FM
1188	NO FORMAL NAME
1329	NO FORMAL NAME
1613	NO FORMAL NAME
1772	ROGALAND GP
1772	BALDER FM
1782	SELE FM
1819	LISTA FM
1914	VÅLE FM
1925	SHETLAND GP
1925	EKOFISK FM
1950	HEGRE GP
1950	SKAGERRAK FM
2069	ROTLIEGEND GP

Logger

Type logg	Topp dyp for logg [m]	Bunn dyp for logg [m]
FMI PPC MSIP PPC GR	1500	2474
LWD - GR RES DEN NEU CAL AC	1890	2474
LWD - MPR GR CAL DEN NEU AC	1213	1922
LWD - PWD DIR	195	415
LWD - PWD DIR GR	130	183
LWD - PWD DIR GR RES AC	164	473
LWD - PWD DIR GR RES AC	344	1311
LWD - PWD DIR NBRES NBGR	1890	2474
LWD - PWD DIR NBRES NBGR NBINC	1213	1922
LWD - PWD DIR NBRES NBGR RES	1866	1952
MDT CMR GR	1940	2474
MFRAC GR	1935	1935
MSCT GR	1951	2329
PEX HRLA HNGS ECS XPT GR	1921	2475

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	36	193.5	30	195.3	0.00	
SURF.COND.	20	409.5	26	415.0	1.35	FIT
PILOT HOLE		475.0	9 7/8	475.0	0.00	
INTERM.	13 3/8	1297.0	17 1/2	1315.0	1.96	LOT
LINER	9 5/8	1921.1	12 1/4	1922.0	1.67	LOT
OPEN HOLE		2474.5	8 1/2	2474.5	0.00	

Boreslam

Dybde MD [m]	Egenvekt, slam [g/cm3]	Viskositet, slam [mPa.s]	Flytegrense [Pa]	Type slam	Dato, måling
125	1.03	5.0		Bentonite Spud Mud	
194	1.05	25.0		Bentonite Spud Mud	

194	1.39	23.0		Gel/Polymer	
195	1.50	23.0		Gel/Polymer	
195	1.03	15.0		Bentonite Spud Mud	
300	1.26	20.0		Aquadrill	
398	1.39	24.0		Gel/Polymer	
415	1.39	24.0		Gel/Polymer	
415	1.20	15.0		Aquadrill	
475	1.25	22.0		Gel/Polymer	
475	1.50	19.0		Gel/Polymer	
723	1.20	16.0		Aquadrill	
1315	1.22	15.0		Aquadrill	
1315	1.23	14.0		AQUA-DRILL WBM	
1555	1.35	16.0		AQUA-DRILL WBM	
1947	1.12	21.0		AQUA-DRILL WBM	
2475	1.12	25.0		AQUA-DRILL WBM	
2475	1.17	19.0		AQUA-DRILL WBM	