



Generell informasjon

Brønnbane navn	35/11-18 A
Type	EXPLORATION
Formål	APPRAISAL
Status	P&A
Pressemelding	lenke til pressemelding
Faktakart i nytt vindu	lenke til kart
Hovedområde	NORTH SEA
Funn	35/11-18 (Syrah)
Brønn navn	35/11-18
Seismisk lokalisering	3D survey ST9303 inline 10000 .xline 1452
Utvinningstillatelse	248
Boreoperatør	Wintershall Norge AS
Boretillatelse	1604-L
Boreinnretning	BORGLAND DOLPHIN
Boredager	80
Borestart	27.09.2015
Boreslutt	16.12.2015
Frigitt dato	16.12.2017
Publiseringsdato	16.12.2017
Opprinnelig formål	APPRAISAL
Gjenåpnet	NO
Innhold	OIL/GAS
Funnbrønnbane	NO
1. nivå med hydrokarboner, alder	LATE JURASSIC
1. nivå med hydrokarboner, formasjon.	INTRA HEATHER FM SS
2. nivå med hydrokarboner, alder	MIDDLE JURASSIC
2. nivå med hydrokarboner, formasjon	BRENT GP
3. nivå med hydrokarboner, alder	EARLY JURASSIC
3. nivå med hydrokarboner, formasjon	COOK FM
Avstand, boredekk - midlere havflate [m]	31.0
Vanndybde ved midlere havflate [m]	366.0
Totalt målt dybde (MD) [m RKB]	4020.0
Totalt vertikalt dybde (TVD) [m RKB]	3905.0
Maks inklinasjon [°]	24.5



Temperatur ved bunn av brønnbanen [°C]	151
Eldste penetrerte alder	EARLY JURASSIC
Eldste penetrerte formasjon	STATFJORD GP
Geodetisk datum	ED50
NS grader	61° 9' 24.41" N
ØV grader	3° 20' 38.09" E
NS UTM [m]	6780460.23
ØV UTM [m]	518509.99
UTM sone	31
NPDID for brønnbanen	7813

Brønnhistorie

**General**

Well 35/11-18 A is a geological sidetrack to well 35/11-18 on the Marflo Spur/Lomre Terrace, west of the Vega Field in the North Sea. Well 35/11-18 made hydrocarbon discoveries in Intra-Heather Formation sandstone, in the Tarbert Formation and in the Oseberg Formation. The overall objective was to appraise the 35/11-18 Syrah discovery. The primary target was to prove commercial volumes of hydrocarbons in the Tarbert-Upper Ness, Lower Ness-Etive, Oseberg and Cook formations. The secondary target was to penetrate and prove hydrocarbons in the Late Jurassic Intra-Heather Formation sandstone.

Operations and results

Appraisal well 30/11-18 A kicked off from 1775 m in well 30/11-18 on 27 September 2015. It was drilled with the semi-submersible installation Borgland Dolphin to 4020 m (3905 m TVD) in the Early Jurassic Statfjord Group. Technical problems during DST led to a week downtime. Otherwise no significant problem was encountered in the operations. The well was drilled with Innovert oil based mud from kick-off to TD.

Top Draupne Formation was penetrated at 3088 m (3005 m TVD). As in the main bore, clear hydrocarbon shows and increased gas values were seen on penetrating the Late Jurassic Heather Formation. A 35 m thick Intra-Heather Formation sandstone of Kimmeridgian age proved to be gas filled with a GDT. Further, thin Oxfordian aged Intra-Heather Formation sandstones in this formation proved oil-filled. Both Kimmeridgian and Oxfordian sandstones had an average porosity of 13.6 % when using a 10 % cut off. No oil-water contact was established (ODT). Top Brent Group, Tarbert Formation was penetrated at 3540 m (3437 m TVD). All Brent Group reservoirs were oil-filled, as well as the Early Jurassic Cook Formation. Pressure measurements show that all formations have a common aquifer, but with seven different oil gradients in the oil-filled formations, suggesting at least seven pressure compartments. Oil shows on cuttings were described but noted to be uncertain due to the oil based mud. Good continuous oil shows are recorded on the core down to ca 3740 m.

One 53.5 m core was cut with 100% recovery from 3705.5 to 3759.0 m in the Oseberg Formation. The core-log depth shift is +1.54 m. MDT fluid samples were taken at 3590.8 m (oil), 3659.1 m (oil), 3707.9 m (oil), 3737.8 m (water) and 3830.1 m (oil).

The well was permanently abandoned on 16 December 2015 as an oil and gas appraisal well.

Testing

Two Drill Stem Tests were conducted in this well. DST 1 tested the interval 3804 to 3834 m (3692 to 3722 m TVD) in the Cook Formation. This test produced 520 Sm³/d of oil and 97074 Sm³/d of gas through a 32/64" choke. The DST temperature was 144.4 °C. PVT analyses gave a total solution GOR at bubble point of 341.7 Sm³/Sm³. Oil density at standard conditions is 0.818 g/cm³.

DST 2 tested the interval 3704 to 3724 m (3594 to 3614 m TVD) in the Oseberg Formation. The test was aborted in the first attempt due to malfunction in the downhole isolation and circulating valve (SLB's IRDV). The test was re-run as DST 2B. This test produced 856 Sm³/d of oil and 219060 Sm³/d of gas through a 40/64" choke. The DST temperature was 141.2 °C. PVT analyses gave a total solution GOR at bubble point of 370.2 Sm³/Sm³. Oil density at standard conditions is 0.809 g/cm³.



Borekaksprøve, topp dybde [m]	Borekaksprøve, bunn dybde [m]
1750.00	4020.38

Borekaks tilgjengelig for prøvetaking?	YES
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Borekjerne i Sokkeldirektoratet

Kjerneprøve nummer	Kjerneprøve - topp dybde	Kjerneprøve - bunn dybde	Kjerneprøve dybde - enhet
1	3705.8	3759.3	[m]

Total kjerneprøve lengde [m]	53.5
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		0.00	0.00	OIL	07.11.2015 - 20:25	YES
DST	DST 1	0.00	0.00	OIL	07.11.2015 - 20:20	YES
DST	DST 2B	0.00	0.00	OIL	22.11.2015 - 12:10	YES
DST	DST 2B	0.00	0.00	OIL	26.11.2015 - 12:00	YES

Litostratigrafi

Topp Dyb [mMD RKB]	Litostrat. enhet
397	NORDLAND GP
397	UNDIFFERENTIATED
806	UTSIRA FM
948	HORDALAND GP
948	UNDIFFERENTIATED
1711	ROGALAND GP
1711	BALDER FM
1798	SELE FM



1828	LISTA FM
1995	VÅLE FM
2020	SHETLAND GP
2020	JORSALFARE FM
2180	KYRRE FM
2934	TRYGGVASON FM
2983	CROMER KNOLL GP
2983	RØDBY FM
3005	SOLA FM
3012	ÅSGARD FM
3088	VIKING GP
3088	DRAUPNE FM
3160	HEATHER FM
3228	INTRA HEATHER FM SS
3257	HEATHER FM
3303	INTRA HEATHER FM SS
3316	HEATHER FM
3540	BRENT GP
3540	TARBERT FM
3657	ETIVE FM
3665	RANNOCH FM
3705	OSEBERG FM
3750	DUNLIN GP
3750	DRAKE FM
3808	COOK FM
3928	AMUNDSEN FM
3943	JOHANSEN FM
3953	AMUNDSEN FM
3968	STATFJORD GP
3968	UNDIFFERENTIATED

Borestrengtester (DST)

Test nummer	Fra dybde MD [m]	Til dybde MD [m]	Reduksjonsven til størrelse [mm]
1.0	3804	3834	12.7
2.0	3704	3724	15.8



Test nummer	Endelig avstengningstrykk [MPa]	Endelig strømningstrykk [MPa]	Bunnhullstrykk [MPa]	Borehullstemperatur [°C]
1.0				144
2.0				141

Test nummer	Olje produksjon [Sm3/dag]	Gass produksjon [Sm3/dag]	Oljetetthet [g/cm3]	Gasstyngde rel. luft	GOR [m3/m3]
1.0	520	97074	0.818		341
2.0	856	219060	0.809		370

Logger

Type logg	Topp dyp for logg [m]	Bunn dyp for logg [m]
GR RES NEU DEN	3417	3857
IMAGE SON	1682	3857
MWD - DIR	397	494
MWD - GR RES PWD DIR	494	1742
MWD - GR RES PWD DIR NEU DEN	3424	3857
MWD - GR RES PWD DIR NEU DEN PRE	3857	4020
MWD - GR RES PWD DIR NEU DEN SON	1775	3424
PRESS SAMPLE	3219	3311
PRESSURE NMR	3416	3849
SAMPLE	3590	3830
SWC	3219	3320
SWC	3583	3848
VSP	1667	3847

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	486.5	36	494.0	0.00	
SURF.COND.	20	1104.0	26	1111.0	0.00	
		1114.0		1114.0	1.54	LOT
INTERM.	13 3/8	1736.0	17 1/2	1742.0	0.00	



		1745.0		1745.0	1.53	LOT
INTERM.	9 5/8	3417.0	12 1/4	3424.0	0.00	
		3427.0		3427.0	1.87	LOT
LINER	7	4018.0	8 1/2	4020.0	0.00	

Boreslam

Dybde MD [m]	Egenvekt, slam [g/cm ³]	Viskositet, slam [mPa.s]	Flytegrense [Pa]	Type slam	Dato, måling
1058	1.29	33.0		PERFORMADRIL	
1400	1.29	33.0		PERFORMADRIL	
1600	1.41	27.0		INNOVERT	
1750	1.29	16.0		INNOVERT NS	
1900	1.41	26.0		INNOVERT	
2100	1.29	15.0		INNOVERT NS	
2718	1.29	14.0		INNOVERT NS	
3115	1.41	19.0		INNOVERT NS	
3424	1.41	22.0		INNOVERT NS	
3428	1.59	30.0		INNOVERT NS	
3675	1.59	28.0		INNOVERT NS	
3854	1.59	26.0		INNOVERT NS	
4020	1.59			Calcium Chloride/ Bromide Brine	