Generell informasjon

Brønnbane navn	15/3-8
Type	EXPLORATION
Formål	APPRAISAL
Status	P&A
Pressemelding	lenke til pressemelding
Faktakart i nytt vindu	lenke til kart
Hovedområde	NORTH SEA
Felt	GUDRUN
Funn	15/3-1 S Gudrun
Brønn navn	15/3-8
Seismisk lokalisering	ST0208-inline 2620 & crossline 2328
Utvinningstillatelse	025
Boreoperatør	Statoil ASA (old)
Boretillatelse	1096-L
Boreinnretning	TRANSOCEAN LEADER
Boredager	160
Borestart	03.11.2005
Boreslutt	11.04.2006
Frigitt dato	11.04.2008
Publiseringsdato	15.08.2008
Opprinnelig formål	APPRAISAL
Gjenåpnet	NO
Innhold	OIL/GAS
Funnbrønnbane	NO
1. nivå med hydrokarboner, alder	LATE JURASSIC
1. nivå med hydrokarboner, formasjon.	INTRA DRAUPNE FM SS
Avstand, boredekk - midlere havflate [m]	23.5
Vanndybde ved midlere havflate [m]	109.0
Totalt målt dybde (MD) [m RKB]	4592.0
Totalt vertikalt dybde (TVD) [m RKB]	4591.0
Maks inklinasjon [°]	2.2
Temperatur ved bunn av brønnbanen [°C]	145
Eldste penetrerte alder	LATE JURASSIC
Eldste penetrerte formasjon	DRAUPNE FM
Geodetisk datum	ED50

NS grader	58° 51' 27.89'' N
ØV grader	1° 43' 16.67'' E
NS UTM [m]	6525066.95
ØV UTM [m]	426231.96
UTM sone	31
NPDID for brønnbanen	5175

Brønnhistorie

General

The Gudrun structure is situated on the east flank of the South Viking Graben and west of the Utsira High in the North Sea. Well 15/3-8 was drilled on the western flank of the structure, approximately 9 km east of the UK border. New seismic data and results from well 15/3-7 had revealed uncertainties regarding the Late Jurassic reservoir section in the Gudrun structure. The main purpose of well 15/3-8 was to gather the necessary information required to ascertain whether the Intra-Draupne Formation reservoir rocks of the Gudrun Discovery could be developed commercially. This included reservoir pressure data, petrophysical data including taking cores, fluid sampling for fluid characteristics, and production properties by drill stem testing.

Operations and results

Appraisal well 15/3-8 was spudded with the semi-submersible installation Transocean Leader on 11 April 2006 and drilled to TD at 4592 m in Late Jurassic Intra-Draupne Formation sandstone. No significant technical problems were encountered in the operations and the well was completed within planned time frame. The well was drilled with seawater/bentonite/hi-vis pills down to 1010 m, with Glydril mud from 1010 m to 2765 m, and with Paratherm oil based mud (paraffin base) from 2765 m to TD.

Top Viking Group was encountered at 3932.5 m and consisted of the interbedded lithologies of sandstone, claystone and limestone, with varying thicknesses from laminas to stringers and massive layers. The first 140 m was Draupne Formation claystone. The target reservoir section, Intra Draupne Formation sands, was encountered at 4072.5 m, 38.9 m deeper than expected. Three intra Draupne Formation sandstone units were identified, SST1 from 4072.5 m to 4212.5 m, SST2 from 4212.5 m to 4346 m, and SST3 from 4474.5 m to TD. The sand quality was significantly better than observed in the neighbouring wells. When correlated with neighbouring wells well 15/3-8 showed significant lateral reservoir variations over small distances within the structure. SST1 contained a high-shrinkage volatile oil down to a contact at 4208 m, the SST2 pressure gradient proved a water bearing sandstone, although oil was sampled at 4332.9 m, while SST3 contained a near-critical gas-condensate down to a contact at 4485.4 m.

Good shows were seen in the cores from the reservoir section as they were recovered on deck. It was no possible to give a reliable evaluation of the shows on cuttings during drilling due to background fluorescence from the oil based mud. In addition, some of the most marginal shows described from the cored section were hampered by the existence of formation derived kerogens in the mud. Some of the cores were also bleeding HC from very tight zones at surface and seepages from these zones might have contaminated better sandstone sections below. From the general fluorescence picture there seem to be a presence of heavier HC in the tight zones than in the more porous zones.

A total of 158 m core was recovered in 7 cores from the interval 4167 to 4505 m in various Intra-Draupne Formation sandstone sections in the Late Jurassic. MDT fluid samples were taken at 4514.5 m (water), 4479.1 m (hydrocarbons), 4332.9 m

(hydrocarbons), 4213.5 m (water), 4182.1 m (hydrocarbons), and at 4074 m (hydrocarbons).

The well was permanently abandoned on 11 April 2006 as an oil and gas appraisal well.

Testing

Two drill stem test was performed in Intra-Draupne Formation sandstones.

DST 1 tested the interval 4141 - 4183 m. The well was opened to flow for a total of 28 hours. The main flow duration was 14 hours with an approximate oil rate of 739 m3/day a gas rate of 346600 Sm3 gas/day and a GOR of 469 m3/m3 through a 32/64" choke. This was followed by a 96 hours build up period. Maximum bottom hole temperature recorded in the test was 133 deg C.

DST 2 tested the interval 4073 - 4087 m. The well was open to flow for a total of 26 hours. The main flow duration was 10 hours with an approximate oil rate of 650m3/day, a gas rate of 342400 Sm3 gas/day and a GOR of 500 m3/m3 through a 28/64" choke. This was followed by a 96 hours build up period. Maximum bottom hole temperature recorded in the test was 130 deg C.

Borekaks i Sokkeldirektoratet

Borekaksprøve, topp dybde [m]	Borekaksprøve, bunn dybde [m]
1020.00	4590.00

Borekaks tilgjengelig for prøvetaking?	YES

Borekjerner i Sokkeldirektoratet

Kjerneprøve nummer	Kjerneprøve - topp dybde	Kjerneprøve - bunn dybde	Kjerneprøve dybde - enhet
1	4167.0	4179.6	[m]
2	4179.6	4200.5	[m]
3	4202.0	4238.5	[m]
4	4238.5	4275.2	[m]
5	4275.2	4302.5	[m]
6	4478.5	4492.5	[m]
7	4494.0	4505.1	[m]

Total kjerneprøve lengde [m]	158.9
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		4141.00	4183.00	OIL	04.03.2006 - 08:17	YES

Litostratigrafi

Topp Dyb [mMD RKB]	Litostrat. enhet
133	NORDLAND GP
658	UTSIRA FM
858	HORDALAND GP
1025	SKADE FM
1136	HORDALAND GP
1448	GRID FM
1792	HORDALAND GP
2164	ROGALAND GP
2164	BALDER FM
2223	SELE FM
2277	LISTA FM
2603	TY FM
2740	SHETLAND GP
2740	EKOFISK FM
2792	JORSALFARE FM
3213	KYRRE FM
3341	TRYGGVASON FM
3673	BLODØKS FM
3686	SVARTE FM
3794	CROMER KNOLL GP
3859	SOLA FM
3875	ÅSGARD FM
3933	VIKING GP
3933	DRAUPNE FM
4073	INTRA DRAUPNE FM SS
4392	DRAUPNE FM
4474	INTRA DRAUPNE FM SS

Borestrengtester (DST)

Test nummer	Fra dybde MD [m]	Til dybde MD [m]	Reduksjonsventil størrelse [mm]
1.0	4141	4183	12.7
2.0	4073	4087	11.0

Test nummer	Endelig avstengningstrykk [MPa]	Endelig strømningstrykk [MPa]	Bunnhullstrykk [MPa]	Borehullstemperatur [°C]
1.0	3.500		7.000	133
2.0	4.000		7.500	130

Test nummer	Olje produksjon [Sm3/dag]	Gass produksjon [Sm3/dag]	Oljetetthet [g/cm3]	Gasstyngde rel. luft	GOR [m3/m3]
1.0	733				473
2.0	670				500

Logger

Type logg	Topp dyp for logg [m]	Bunn dyp for logg [m]
AIT DSI EMS GR	2750	4590
MDT	4074	4514
MDT MINI DST SAMPLE	3946	4514
MDT PT	3946	4519
MDT SAMPLE	4332	4479
MFC 80	129	2007
MSCT	3945	4581
MWD - GR RES DIR PWD ECD	182	2765
MWD - GR RES DIR PWD ECD	3910	4590
MWD - GR RES DIR PWD ECD BCPM AP	2765	3908
OBMI-2 GR	3900	4590
VSP	129	4474
VSP WAZO	130	3300
VSP ZO	1000	3901

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	179.0	36	179.0	0.00	LOT
SURF.COND.	20	1001.0	26	1010.0	1.50	LOT
INTERM.	14	2754.0	17 1/2	2765.0	1.71	LOT
INTERM.	9 7/8	3910.0	12 1/4	3910.0	2.12	LOT
LINER	7	4298.0	8 1/2	4590.0	0.00	LOT

Boreslam

Dybde MD [m]	Egenvekt, slam [g/cm3]	Viskositet, slam [mPa.s]	Flytegrense [Pa]	Type slam	Dato, måling
151	1.05			SW / BENTONITE 1	
182	1.05			SW / BENTONITE 1	
955	1.03			SW / BENTONITE 1	
1010	1.30			SW / BENTONITE 1	
1617	1.35	18.0		GLYDRIL 12	
1995	1.36	22.0		GLYDRIL 12	
2800	1.39	29.0		PARATHERM	
3217	1.45	27.0		PARATHERM	
3510	1.62	40.0		PARATHERM	
3908	1.62	37.0		PARATHERM	
3910	1.61	40.0		PARATHERM	
3931	1.03			PARATHERM	

Tynnslip i Sokkeldirektoratet

Dybde	Enhet
4170.25	[m]
4176.50	[m]
4180.30	[m]
4205.44	[m]
4209.20	[m]
4211.75	[m]
4218.50	[m]
4223.00	[m]
4228.75	[m]
4236.50	[m]
4244.00	[m]

4247.50	[m]
4254.50	[m]
4268.50	[m]
4270.60	[m]
4285.75	[m]
4292.00	[m]
4298.75	[m]
4483.54	[m]
4488.00	[m]
4501.25	[m]

Trykkplott

Porertrykksdataene kommer fra logging i brønnen hvis ingen annen kilde er oppgitt. I noen brønner der trykk ikke er logget, er det brukt informasjon fra formasjonstester eller brønnspark. Trykkdataene er rapportert inn til Oljedirektoratet og videre prosessert og kvalitetssikret av IHS Markit.

Dokument navn	Dokument format	Dokument størrelse [KB]
5175_Formation_pressure_(Formasjonstrykk)	pdf	0.21