



Generell informasjon

Brønnbane navn	6407/1-4
Type	EXPLORATION
Formål	APPRAISAL
Status	P&A
Faktakart i nytt vindu	lenke til kart
Hovedområde	NORWEGIAN SEA
Felt	TYRIHANS
Funn	6407/1-3 Tyrihans Nord
Brønn navn	6407/1-4
Seismisk lokalisering	ST 9503-INLINE 554 & CROSSLINE 1562
Utvinningsstillatelse	073
Boreoperatør	Den norske stats oljeselskap a.s
Boretillatelse	846-L
Boreinnretning	BYFORD DOLPHIN
Boredager	77
Borestart	08.06.1996
Boreslutt	23.08.1996
Frigitt dato	23.08.1998
Publiseringsdato	13.12.2005
Opprinnelig formål	APPRAISAL
Gjenåpnet	NO
Innhold	OIL/GAS
Funnbrønnbane	NO
1. nivå med hydrokarboner, alder	MIDDLE JURASSIC
1. nivå med hydrokarboner, formasjon.	GARN FM
Avstand, boredekk - midlere havflate [m]	25.0
Vanndybde ved midlere havflate [m]	286.0
Totalt målt dybde (MD) [m RKB]	3805.0
Temperatur ved bunn av brønnbanen [°C]	141
Eldste penetrerte alder	MIDDLE JURASSIC
Eldste penetrerte formasjon	NOT FM
Geodetisk datum	ED50
NS grader	64° 51' 46.05" N
ØV grader	7° 1' 21.25" E
NS UTM [m]	7194806.98
ØV UTM [m]	406280.05



UTM sone	32
NPDID for brønnbanen	2796

Brønnhistorie

General

Well 6407/1-4 was drilled primarily to appraise the 6407/1-3 Tyrihans Nord Discovery. The specific target was to encounter a free oil-water-contact in the Garn Formation. Secondary objective was to gather information from the possibly oil bearing Campanian sandstone interval (Nise Formation).

Operations and results

Appraisal well 6407/1-4 was spudded with the semi-submersible installation Byford Dolphin on 6 June 1996 and drilled to TD at 3805 m in the Middle Jurassic Not Formation. Due to a labour conflict the MWD services was not run in the top hole down to 810 m. In addition 183 hrs rig time was lost during the strike. The well was drilled with seawater and prehydrated bentonite sweeps down to 816 m, from 816 m to 1810 m with ANCO 2000 mud, and with oil based Ancovet mud from 1810 m to TD.

The upper part of the Nise Formation was dominated by siltstone with abundant thin laminae of very fine sandstone and rare limestone stringers. From 2560 m the siltstone progressively grades to claystone, becoming 100 % claystone at 2620 m. Top Garn reservoir came in 101 m thick at 3675 m, 18 m deep to prognosis, so rock-volume above proven OWC was reduced. The reservoir was more cemented than expected. Trace fluorescence and crush cut was recorded in a single siltstone cutting sample from the Springar Formation at 2470 m, otherwise no shows were seen above the shales and claystones of the Late Jurassic Spekk and Melke Formations. Gas on oil on water was encountered in the Garn Formation reservoir. The gas/oil contact was at 3681 m, while the oil/water contact was at 3705 m. No shows were recorded below the OWC. One conventional core was cut from 2498 m to 2526 m in the Nise Formation. Two conventional cores were cut across both fluid contacts from 3679.0 m to 3740.0 m in the Garn Formation, A FMT water sample was taken below the OWC at 3709 m. Two segregated FMT samples were taken to collect gas (3679.2 m) and oil (3691.2 m).

The well was permanently abandoned on 23 August 1996 as an oil and gas appraisal well.

Testing

One drill stem test was performed from 3687 m to 3693 m in the oil zone in the Garn Formation. The test produced at the end of the multirate period 29505 Sm³ gas and 243.9 Sm³ oil /day. The GOR was 120 Sm³/Sm³ and the oil density was 0.86 g/cm³.

Borekaks i Sokkeldirektoratet

Borekaksprøve, topp dybde [m]	Borekaksprøve, bunn dybde [m]
830.00	3805.00

Borekaks tilgjengelig for prøvetaking?	YES
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Borekjerne i Søkeldirektoratet

Kjerneprøve nummer	Kjerneprøve - topp dybde	Kjerneprøve - bunn dybde	Kjerneprøve dybde - enhet
1	2498.0	2526.0	[m]
2	3679.0	3706.6	[m]
3	3706.6	3739.0	[m]

Total kjerneprøve lengde [m]	88.0
Kjerner tilgjengelig for prøvetaking?	YES

Kjernebilder



2498-2502m



2502-2506m



2506-2510m



2510-2514m



2514-2518m



2518-2522m



2522-2526m



3679-3684m



3684-3689m



3689-3694m



3694-3699m



3699-3704m



3704-3706m



3706-3711m



3711-3716m



3716-3721m



3721-3726m



3726-3731m



3731-3736m



3736-3739m



Palynologiske preparater i Sokkeldirektoratet

Prøve dybde	Dybde enhet	Prøve type	Laboratorie
1860.0	[m]	DC	RRI
1870.0	[m]	DC	RRI
1890.0	[m]	DC	RRI
1900.0	[m]	DC	RRI
1920.0	[m]	DC	RRI
1930.0	[m]	DC	RRI
1950.0	[m]	DC	RRI
1960.0	[m]	DC	RRI
1980.0	[m]	DC	RRI
1990.0	[m]	DC	RRI
2010.0	[m]	DC	RRI
2020.0	[m]	DC	RRI
2040.0	[m]	DC	RRI
2050.0	[m]	DC	RRI
2070.0	[m]	DC	RRI
2080.0	[m]	DC	RRI
2100.0	[m]	DC	RRI
2110.0	[m]	DC	RRI
2130.0	[m]	DC	RRI
2140.0	[m]	DC	RRI
2160.0	[m]	DC	RRI
2170.0	[m]	DC	RRI
2190.0	[m]	DC	RRI
2200.0	[m]	DC	RRI
2220.0	[m]	DC	RRI
2230.0	[m]	DC	RRI
2250.0	[m]	DC	RRI
2260.0	[m]	DC	RRI
2280.0	[m]	DC	RRI
2290.0	[m]	DC	RRI
2310.0	[m]	DC	RRI
2320.0	[m]	DC	RRI
2340.0	[m]	DC	RRI
2350.0	[m]	DC	RRI
2370.0	[m]	DC	RRI



2380.0 [m]	DC	RRI
2400.0 [m]	DC	RRI
2410.0 [m]	DC	RRI
2430.0 [m]	DC	RRI
2440.0 [m]	DC	RRI
2460.0 [m]	DC	RRI
2461.0 [m]	SWC	WESTL
2470.0 [m]	DC	RRI
2470.5 [m]	SWC	WESTL
2490.0 [m]	DC	RRI
2498.2 [m]	DC	WESTL
2503.7 [m]	C	WESTL
2508.8 [m]	C	WESTL
2513.8 [m]	C	WESTL
2519.7 [m]	C	WESTL
2525.8 [m]	C	WESTL
2539.0 [m]	SWC	WESTL
2540.0 [m]	DC	RRI
2550.0 [m]	DC	RRI
2570.0 [m]	DC	RRI
2580.0 [m]	DC	RRI
2600.0 [m]	DC	RRI
2610.0 [m]	DC	RRI
2630.0 [m]	DC	RRI
2640.0 [m]	DC	RRI
2660.0 [m]	DC	RRI
2670.0 [m]	DC	RRI
2690.0 [m]	DC	RRI
2700.0 [m]	DC	RRI
2720.0 [m]	SWC	WESTL
2720.0 [m]	DC	RRI
2730.0 [m]	DC	RRI
2750.0 [m]	DC	RRI
2760.0 [m]	DC	RRI
2780.0 [m]	DC	RRI
2800.0 [m]	DC	RRI
2820.0 [m]	DC	RRI
2830.0 [m]	DC	RRI
2850.0 [m]	DC	RRI
2860.0 [m]	DC	RRI



2880.0	[m]	DC	RRI
2890.0	[m]	DC	RRI
2910.0	[m]	DC	RRI
2920.0	[m]	DC	RRI
2940.0	[m]	DC	RRI
2948.0	[m]	SWC	WESTL
2950.0	[m]	DC	RRI
2970.0	[m]	DC	RRI
3120.0	[m]	DC	RRI
3122.5	[m]	SWC	WESTL
3135.0	[m]	SWC	WESTL
3140.0	[m]	DC	RRI
3150.0	[m]	DC	RRI
3160.0	[m]	SWC	WESTL
3170.0	[m]	DC	RRI
3180.0	[m]	DC	RRI
3186.0	[m]	SWC	WESTL
3200.0	[m]	DC	RRI
3210.0	[m]	DC	RRI
3230.0	[m]	DC	RRI
3240.0	[m]	DC	RRI
3260.0	[m]	DC	RRI
3270.0	[m]	DC	RRI
3290.0	[m]	DC	RRI
3300.0	[m]	DC	RRI
3317.0	[m]	SWC	WESTL
3320.0	[m]	DC	RRI
3330.0	[m]	DC	RRI
3350.0	[m]	DC	RRI
3356.0	[m]	SWC	WESTL
3356.0	[m]	SWC	RRI
3360.0	[m]	DC	RRI
3380.0	[m]	DC	RRI
3390.0	[m]	DC	RRI
3406.5	[m]	SWC	WESTL
3410.0	[m]	SWC	WESTL
3410.0	[m]	DC	RRI
3420.0	[m]	DC	RRI
3440.0	[m]	DC	RRI
3450.0	[m]	DC	RRI



3452.0 [m]	SWC	WESTL
3470.0 [m]	DC	RRI
3480.0 [m]	DC	RRI
3482.5 [m]	SWC	WESTL
3492.5 [m]	SWC	WESTL
3500.0 [m]	DC	RRI
3531.0 [m]	DC	RRI
3540.0 [m]	DC	RRI
3546.0 [m]	DC	RRI
3549.5 [m]	SWC	WESTL
3552.0 [m]	DC	RRI
3558.0 [m]	DC	RRI
3564.0 [m]	DC	RRI
3576.0 [m]	DC	RRI
3582.0 [m]	SWC	WESTL
3582.0 [m]	DC	RRI
3587.0 [m]	SWC	WESTL
3588.0 [m]	DC	RRI
3594.0 [m]	DC	RRI
3600.0 [m]	DC	RRI
3604.0 [m]	SWC	WESTL
3606.0 [m]	DC	RRI
3608.0 [m]	SWC	WESTL
3612.0 [m]	DC	RRI
3618.0 [m]	DC	RRI
3622.5 [m]	SWC	WESTL
3624.0 [m]	DC	RRI
3630.0 [m]	DC	RRI
3636.0 [m]	DC	RRI
3642.0 [m]	DC	RRI
3648.0 [m]	DC	RRI
3654.0 [m]	DC	RRI
3660.0 [m]	DC	RRI
3666.0 [m]	DC	RRI
3672.0 [m]	DC	RRI
3676.0 [m]	DC	RRI
3680.4 [m]	C	RRI
3685.4 [m]	C	RRI
3688.9 [m]	C	RRI
3696.8 [m]	C	RRI



3701.2	[m]	C	RRI
3704.1	[m]	C	RRI
3704.6	[m]	C	RRI
3707.6	[m]	C	RRI
3713.8	[m]	C	RRI
3717.9	[m]	C	RRI
3725.6	[m]	C	RRI
3730.6	[m]	C	RRI
3734.4	[m]	C	RRI

Oljeprøver i Sokkeldirektoratet

Test type	Flaske nummer	Topp dyp MD [m]	Bunn dyp MD [m]	Væske type	Test tidspunkt	Prøver tilgjengelig
DST	DST1	0.00	0.00	OIL	03.08.1996 - 00:00	YES

Litostratigrafi

Topp Dyb [mMD RKB]	Litostrat. enhet
311	NORDLAND GP
311	NAUST FM
1444	KAI FM
1878	HORDALAND GP
1878	BRYGGE FM
2220	ROGALAND GP
2220	TARE FM
2284	TANG FM
2347	SHETLAND GP
2347	SPRINGAR FM
2479	NISE FM
2780	KVITNOS FM
3116	CROMER KNOLL GP
3116	LYSING FM
3154	LANGE FM
3547	LYR FM
3571	VIKING GP
3571	SPEKK FM



3595	MELKE FM
3675	FANGST GP
3675	GARN FM
3776	NOT FM

Spleisede logger

Dokument navn	Dokument format	Dokument størrelse [KB]
2796	pdf	0.38

Dokumenter - rapportert av utvinningstillatelsen (frigitt ihht til regelverk)

Dokument navn	Dokument format	Dokument størrelse [KB]
2796_6407_1_4_COMPLETION_REPORT_AND_COMPLETION_LOG	pdf	20.47

Borestrengtester (DST)

Test nummer	Fra dybde MD [m]	Til dybde MD [m]	Reduksjonsven til størrelse [mm]
1.0	3693	3687	12.7

Test nummer	Endelig avstengningstrykk [MPa]	Endelig strømningstrykk [MPa]	Bunnhullstrykk [MPa]	Borehullstemperatur [°C]
1.0		3.000	15.100	136

Test nummer	Olje produksjon [Sm3/dag]	Gass produksjon [Sm3/dag]	Oljetetthet [g/cm3]	Gasstyngde rel. luft	GOR [m3/m3]
1.0	244	29505	0.860	0.690	121

Logger

Type logg	Topp dyp for logg [m]	Bunn dyp for logg [m]
DEL2 HDIL MAC CAL DSL CHT	1400	3677





DSL2 ZDL CN GR	3670	3805
HDIL MAC DSL GR CHT	3670	3805
HEXDIP GR CHT	1800	3677
HEXDIP GR CHT	3670	3807
MAC GR CHT	1800	3677
MWD - DPR2	810	1806
MWD - DPR2A	1806	2485
MWD - DPR2A	2845	3668
RCI GR CHT	3667	3765
RCORE GR CHT	2461	3623
VSP GR	950	3655
VSP GR	3565	3800
ZDL CN DSL CHT	1800	3677

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	371.0	36	373.0	0.00	LOT
SURF.COND.	20	810.0	26	813.0	1.35	LOT
INTERM.	13 3/8	1802.0	17 1/2	1804.0	1.78	LOT
INTERM.	9 5/8	3670.0	12 1/4	3674.0	1.50	LOT
LINER	7	3805.0	8 1/2	3805.0	0.00	LOT

Boreslam

Dybde MD [m]	Egenvekt, slam [g/cm3]	Viskositet, slam [mPa.s]	Flytegrense [Pa]	Type slam	Dato, måling
860	1.07	16.0		ANCO 2000	
1810	1.30	18.0		ANCO 2000	
2040	1.63	57.0		ANCO VERT	
2190	1.63	57.0		ANCO VERT	
2498	1.72	52.0		ANCO VERT	
2526	1.72	50.0		ANCO VERT	
3675	1.72	54.0		ANCO VERT	
3706	1.20	21.0		ANCO VERT	
3805	1.20	25.0		ANCO VERT	



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]
2796 Formation pressure (Formasjonstrykk)	PDF	0.27

