



Generell informasjon

Brønnbane navn	2/4-7
Type	EXPLORATION
Formål	APPRAISAL
Status	P&A
Faktakart i nytt vindu	lenke til kart
Hovedområde	NORTH SEA
Felt	TOR
Funn	2/5-1 Tor
Brønn navn	2/4-7
Seismisk lokalisering	
Utvinningstillatelse	018
Boreoperatør	Phillips Petroleum Company Norway
Boretillatelse	59-L
Boreinnretning	MÆRSK EXPLORER
Boredager	77
Borestart	24.07.1971
Boreslutt	08.10.1971
Frigitt dato	08.10.1973
Publiseringsdato	02.04.2007
Opprinnelig formål	APPRAISAL
Gjenåpnet	NO
Innhold	OIL
Funnbrønnbane	NO
1. nivå med hydrokarboner, alder	LATE CRETACEOUS
1. nivå med hydrokarboner, formasjon.	TOR FM
Avstand, boredekk - midlere havflate [m]	34.0
Vanndybde ved midlere havflate [m]	68.0
Totalt målt dybde (MD) [m RKB]	3494.0
Maks inklinasjon [°]	0.75
Temperatur ved bunn av brønnbanen [°C]	142
Eldste penetrerte alder	LATE CRETACEOUS
Eldste penetrerte formasjon	HOD FM
Geodetisk datum	ED50
NS grader	56° 38' 5.4" N
ØV grader	3° 16' 45.3" E
NS UTM [m]	6276913.21



ØV UTM [m]	517130.46
UTM sone	31
NPDID for brønnbanen	196

Brønnhistorie

General

Well 2/4-7 was drilled on a structure ca six km west off the Ekofisk discovery. The objective of the well was to test the Danian limestone with estimated 200 m gross / 120 m net pay, and the Late Cretaceous limestone with estimated 60 m gross / 15 m net pay. These Formations had proved oil productive in the other wells on the Tor structure. Secondary objective was possible Paleocene sand in the interval 3020 - 3140 m. Planned depth was 3414 m (11200 ft).

Operations and results

Appraisal well 2/4-7 was spudded with the jack-up installation M ærsk Explorer on and drilled to TD at 3493 m in the Late Cretaceous Tor Formation. The drill pipe stuck at 3405 m, but was freed after seven hours working. The well was drilled with seawater and gel down to 555 m and with seawater/drill aid and 2 - 5% diesel from 555 m to TD.

Top Paleocene (Balder Formation) was encountered at 3048 m. The Paleocene contained only minor, thin sand beds. The chalk group came in with the Ekofisk Formation at 3175 m and the Tor Formation at 3304 m. Fair shows were recorded on cores in the top 2 m of the Ekofisk Formation, otherwise Ekofisk only had scattered shows. Fair to good shows were again recorded in the Tor Formation, from the top and down to 3332 m. Below this depth shows were reported as spotty, on fracture plains. Oil was confirmed by testing in the top 24 m of the Tor Formation. The test in top Ekofisk gave only water with a trace of gas. Thirteen cores were cut in the well, recovering a total of 164 m core. Core 1 to 9 were cut throughout the Ekofisk Formation, the rest were cut in the upper part of the Tor Formation. Core depths were reported to be 4 - 5 m shallower than log depth for all cores except core 5, which need to be shifted only + 1 m. No wire line fluid samples were taken.

The well was permanently abandoned on 18 October as an oil appraisal.

Testing

Seven drill stem tests were carried out through perforations in the 7" liner. DST 1, 2, and 3 were conducted in the Tor Formation, the rest in the Ekofisk Formation. The following results are after acidization of the formation. DST 1 from 3367 - 3370 m flowed 229 m³ water /day. DST 2 from 3345 - 3348 m flowed only water cushion to surface and died after 50 min. DST 3 from 3304 - 3313 and 3319 - 3328 m flowed 551 Sm³ oil, 73620 Sm³ gas, and 164 Sm³ water /day. The GOR was 137 Sm³/Sm³ and the oil gravity was 38.2 deg API. The tests in the Ekofisk Formation gave water with only a trace of gas in the interval 3176 - 3203 m in DST 5. The reported DST temperatures are somewhat erratic but were all higher than BHT's from well logging from similar depths. The reported temperatures from the best flows, DST 1 and DST 3, were 138 and 129 deg C, respectively.

Borekaks i Sokkeldirektoratet



Borekaksprøve, topp dybde [m]	Borekaksprøve, bunn dybde [m]
566.93	3486.91

Borekaks tilgjengelig for prøvetaking?	YES
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Borekjerne i Sokkeldirektoratet

Kjerneprøve nummer	Kjerneprøve - topp dybde	Kjerneprøve - bunn dybde	Kjerneprøve dybde - enhet
1	10405.0	10445.0	[ft]
2	10445.0	10483.0	[ft]
3	10483.0	10532.0	[ft]
4	10532.0	10579.0	[ft]
5	10579.0	10615.0	[ft]
6	10630.0	10660.0	[ft]
7	10670.0	10708.0	[ft]
8	10707.0	10766.5	[ft]
9	10767.0	10814.0	[ft]
10	10814.0	10830.0	[ft]
11	10874.0	10880.0	[ft]
12	10904.0	10924.5	[ft]
13	10934.0	10955.0	[ft]

Total kjerneprøve lengde [m]	136.6
Kjerner tilgjengelig for prøvetaking?	YES

Litostratigrafi

Topp Dyb [mMD RKB]	Litostrat. enhet
102	NORDLAND GP
1736	HORDALAND GP
3048	ROGALAND GP
3048	BALDER FM
3060	SELE FM
3070	LISTA FM
3162	VÅLE FM
3175	SHETLAND GP
3175	EKOFISK FM
3304	TOR FM



Dokumenter - eldre Sokkeldirektoratets WDSS rapporter og andre relaterte dokumenter

Dokument navn	Dokument format	Dokument størrelse [KB]
196_01_WDSS_General_Information	pdf	0.17

Dokumenter - rapportert av utvinningstillatelsen (frigitt ihht til regelverk)

Dokument navn	Dokument format	Dokument størrelse [KB]
196_01_2_4_7 (7X) Completion Report and Completion log	pdf	24.23
196_01_2_4_7(7X) Well Completion Report	pdf	24.23
196_02_2_4_7 (7X) Individual Well Completion Record	pdf	0.08
196_03_2_4_7 (7X) Computer Processed Interpretation	pdf	9.74
196_03_2_4_7 (7X) Computer Processed Interpretations	pdf	34.66
196_03_2_4_7 (7X) Lithostratigraphy Sedimentology Reservoir	pdf	252.67
196_03_2_4_7 (7X) Stratigraphical Palaeontological Final Report	pdf	1.38
196_03_2_4_7 (7X) The Micropalaeontology and Stratigraphy	pdf	1.92
196_03_2_4_7(7X) Well Log Interpretation	pdf	15.31
196_03_2_4_7 (7X) XRD Analysis from the 2_4_7X	pdf	0.25
196_04_2_4_7 (7X) A Study of the Natural Fracture System	pdf	6.72
196_04_2_4_7 (7X) Biostratigraphic Summary Charts	pdf	20.46
196_04_2_4_7 (7X) Biostratigraphy and paleoenvironmental interpretation	pdf	4.64
196_04_2_4_7(7X) Core Analysis (Pore-Perm) and Core Lithology	pdf	0.72
196_04_2_4_7(7X) Core Analysis Results	pdf	0.93
196_05_2_4_7 (7X) Companion Separator Sample Analysis	pdf	2.70





196 05 2 4 7(7X) DSTs	pdf	101.99
196 05 2 4 7 (7X) Fluid and sample Analysis from DSTs	pdf	8.96
196 05 2 4 7 (7X) Formation Testing Service Report No.1	pdf	4.51
196 05 2 4 7 (7X) Formation Testing Service Report No.2	pdf	4.04
196 05 2 4 7 (7X) Formation Testing Service Report No.3	pdf	11.62
196 05 2 4 7 (7X) Formation Testing Service Report No.4	pdf	3.75
196 05 2 4 7 (7X) Formation Testing Service Report No.5	pdf	4.43
196 05 2 4 7 (7X) Formation Testing Service Report No.6	pdf	3.68
196 05 2 4 7 (7X) Formation Testing Service Report No.7	pdf	10.17

Borestrengtester (DST)

Test nummer	Fra dybde MD [m]	Til dybde MD [m]	Reduksjonsven til størrelse [mm]
1.0	3367	3370	0.0
2.0	3346	3349	0.0
3.0	3304	3329	0.0
4.0	3250	3261	0.0
5.0	3176	3204	0.0
6.0	3176	3182	0.0
7.0	3189	3204	0.0

Test nummer	Endelig avstengningstrykk [MPa]	Endelig strømningstrykk [MPa]	Bunnhullstrykk [MPa]	Borehullstemperatur [°C]
1.0				138
2.0				139
3.0				129
4.0				
5.0				
6.0				
7.0				





Test nummer	Olje produksjon [Sm3/dag]	Gass produksjon [Sm3/dag]	Oljetetthet [g/cm3]	Gasstyngde rel. luft	GOR [m3/m3]
1.0					
2.0					
3.0	551	736231			
4.0					
5.0					
6.0					
7.0					

Logger

Type logg	Topp dyp for logg [m]	Bunn dyp for logg [m]
BHC GR	559	3491
CBL	427	3146
CBL GR	3049	3480
FDC	3145	3494
GR	107	559
GR N	3049	3480
HDT	3145	3493
IES	556	3494
LL-7	3146	3494
PROX ML	3146	3493
SNP	3176	3494
WSC	1164	3489

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	136.0	36	136.0	0.00	LOT
SURF.COND.	20	557.0	26	564.0	0.00	LOT
INTERM.	13 3/8	1587.0	17 1/2	1591.0	0.00	LOT
INTERM.	9 5/8	3147.0	12 1/4	3155.0	0.00	LOT
LINER	7	3488.0	8 1/2	3488.0	0.00	LOT

Boreslam



Dybde MD [m]	Egenvekt, slam [g/cm ³]	Viskositet, slam [mPa.s]	Fløtegrense [Pa]	Type slam	Dato, måling
186	1.12			seaw/ligno	
564	1.36			seaw/ligno	
1362	1.72			seaw/ligno	
2835	1.71			seaw/ligno	
3155	1.71			seaw/ligno	
3333	1.72			seaw/ligno	