



Generell informasjon

Brønnbane navn	2/5-7
Type	EXPLORATION
Formål	WILDCAT
Status	P&A
Faktakart i nytt vindu	lenke til kart
Hovedområde	NORTH SEA
Funn	2/5-7
Brønn navn	2/5-7
Seismisk lokalisering	82-408 SP 253 AND NS-19 SP 301
Utvinningstillatelse	067
Boreoperatør	A/S Norske Shell
Boretillatelse	384-L
Boreinnretning	NEDDRILL TRIGON
Boredager	198
Borestart	11.08.1983
Boreslutt	24.02.1984
Frigitt dato	24.02.1986
Publiseringsdato	02.04.2007
Opprinnelig formål	WILDCAT
Gjenåpnet	NO
Innhold	OIL
Funnbrønnbane	YES
1. nivå med hydrokarboner, alder	LATE CRETACEOUS
1. nivå med hydrokarboner, formasjon.	TOR FM
Avstand, boredekk - midlere havflate [m]	35.0
Vanndybde ved midlere havflate [m]	65.0
Totalt målt dybde (MD) [m RKB]	4531.0
Totalt vertikalt dybde (TVD) [m RKB]	4529.0
Maks inklinasjon [°]	5.3
Temperatur ved bunn av brønnbanen [°C]	157
Eldste penetrerte alder	TRIASSIC
Eldste penetrerte formasjon	SKAGERRAK FM
Geodetisk datum	ED50
NS grader	56° 43' 16.69" N
ØV grader	3° 22' 1.07" E



NS UTM [m]	6286563.74
ØV UTM [m]	522459.70
UTM sone	31
NPDID for brønnbanen	25

Brønnhistorie

General

Wildcat well 2/5-7 is located ca 9 km North of the Tor Field in the southern Norwegian North Sea. The primary objective was to test Late Jurassic and Middle Jurassic/Triassic sandstones on top of a gentle salt-induced dome structure. Secondary objectives were Late Cretaceous chalk and Paleocene sandstones.

Operations and results

Well was spudded with the jack-up installation Neddrill Trigon on 11 August 1983 and drilled to TD at 4531 m in the Triassic Skagerrak Formation. During drilling of the 17 1/2" hole several tight spots and problems with cavings were experienced. While tripping out of the hole at 3956 m, the drill string parted and 193 m of the bottom hole assembly was left in the hole. The fish was recovered after some problems due to tight hole conditions. When pressure testing the 9 5/8" casing the float collar sheared out causing the casing to jump. After re-landing, the casing was found to have dropped a couple of inches. Repair of the casing took 35 days extra rig time. A drilling break occurred at 4161 m where a 1.5 m thick marl was encountered. Maximum gas reading at bottoms-up was 30 %, and slight oil shows were observed in the mud. A kick was taken at 4519 m with an influx of 2.5 m³ water. The well was drilled with seawater and gel down to 862 m, with KCl/polymer mud from 862 m to 2254 m, with lignosulphonate mud from 2254 m to 3529 m, and with gel/lignosulphonate mud from 3529 m to TD.

Only traces of sandstone were encountered in the Late Paleocene, and there were no indications of hydrocarbons. Porous chalk was encountered in the Ekofisk Formation at 3204 m and in the Tor Formation at 3289 m. Both formations tested oil, but the oil flow in the Ekofisk test was interpreted to originate from the Tor Formation (see below). The matrix permeability in these zones is low, but the results from the production tests indicated that fracture permeability is significant. No hydrocarbons were found in the Late Jurassic Ula Formation. The silty/sandy interval in the Ula Formation is thin and of poor reservoir quality. A total of 144 m of Triassic sediments with two sandy intervals of reasonable porosity was penetrated. However, the sands were water bearing. Five cores were cut in the Late Cretaceous sequence. Core no 4 recovered only 7 cm due to junk in the 12 1/4" hole. A segregated RFT sample was taken at 3321 m. It recovered only mud and mud filtrate.

The well was permanently abandoned on 24 February 1984 as an oil discovery.

Testing

After the well was plugged back to 3501 m three production tests were carried out: PT-1 at 3300 - 3335 m in the Tor Formation, PT-2 at 3263 - 3287 m in the Ekofisk Formation, and PT-3 at 3210 - 3225 m in the Ekofisk Formation.

The Maastrichtian interval had extremely low oil saturation as evidenced by petrophysical data. Oil shows had been detected while drilling this section and the core samples showed oil in the fracture/fissure system. RFT pressure data indicated an oil gradient over the producing zone. The PT-1 produced after acidization 120 Sm³ oil and 189 m³ water /day (water cut = 61%) on a 20/64" bean at a FTHP = 780 psig. The GOR was 27 Sm³/Sm³, the oil gravity was 42 deg API, and the separator gas gravity was



0.83 (air = 1). The gas contained no H₂S and 3.5% CO₂. The test results suggested an average permeability of some 3 mD, which was an order of magnitude higher than the core measured values and thus indicated a significant flow contribution from a fracture/fissure system.

PT-2 produced after acidization 121 Sm³ oil and 146 m³ water (water cut = 56%) on a 36/64" choke at FTHP = 295 psig. The GOR was 48 Sm³/Sm³, the oil gravity was 41 deg API, and the gas gravity varied between 0.96 and 1.02 (air =1). The gas contained no H₂S and 5% CO₂. PT-2 was interpreted to have flown from the underlying Maastrichtian after acid fracturing had established communication.

PT-3 showed an essentially tight and only water-bearing formation. Accurate temperature measurements in this test gave a mid-perforation temperature of 124.5 deg C.

Borekaks i Sokkeldirektoratet

Borekaksprøve, topp dybde [m]	Borekaksprøve, bunn dybde [m]
150.00	4531.00

Borekaks tilgjengelig for prøvetaking?	YES
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Borekjerne i Sokkeldirektoratet

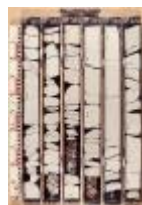
Kjerneprøve nummer	Kjerneprøve - topp dybde	Kjerneprøve - bunn dybde	Kjerneprøve dybde - enhet
1	3303.0	3308.4	[m]
2	3312.0	3321.1	[m]
3	3326.5	3335.6	[m]
5	3339.0	3348.3	[m]

Total kjerneprøve lengde [m]	32.8
Kjerner tilgjengelig for prøvetaking?	YES

Kjernebilder



3303-3308m



3312-3318m



3318-3321m



3326-3332m



3332-3335m



3339-3345m



3345-3348m

Palynologiske preparater i Sokkeldirektoratet

Prøve dybde	Dybde enhet	Prøve type	Laboratorie
4093.0	[m]	DC	HRS
4099.0	[m]	DC	SAGA
4105.0	[m]	DC	HRS
4111.0	[m]	DC	HRS
4132.0	[m]	DC	OD
4141.0	[m]	DC	HRS
4156.0	[m]	DC	OD
4159.0	[m]	DC	SAGA
4174.0	[m]	DC	HRS
4177.0	[m]	DC	OD
4183.0	[m]	DC	SAGA
4195.0	[m]	DC	SAGA
4195.0	[m]	DC	OD
4219.0	[m]	DC	OD
4222.0	[m]	DC	HRS
4231.0	[m]	DC	SAGA
4237.0	[m]	DC	SAGA
4243.0	[m]	DC	OD
4261.0	[m]	DC	HRS
4261.0	[m]	DC	OD
4285.0	[m]	DC	SAGA
4285.0	[m]	DC	OD
4300.0	[m]	DC	HRS
4309.0	[m]	DC	SAGA
4309.0	[m]	DC	OD
4330.0	[m]	DC	OD
4345.0	[m]	DC	HRS
4357.0	[m]	DC	OD
4357.0	[m]	DC	HYDRO



4363.0 [m]	DC	HYDRO
4366.0 [m]	DC	HYDRO
4372.0 [m]	DC	HYDRO
4378.0 [m]	DC	HYDRO
4381.0 [m]	DC	HYDRO
4381.0 [m]	DC	SAGA
4384.0 [m]	DC	SAGA
4390.0 [m]	DC	TNO
4399.0 [m]	DC	SAGA
4408.0 [m]	DC	SAGA
4408.0 [m]	DC	HYDRO
4414.0 [m]	DC	HYDRO
4417.0 [m]	DC	SAGA
4435.0 [m]	DC	SAGA
4441.0 [m]	DC	HYDRO
4450.0 [m]	DC	HYDRO
4456.0 [m]	DC	HYDRO
4459.0 [m]	DC	HYDRO
4462.0 [m]	DC	SAGA
4468.0 [m]	DC	TNO
4472.0 [m]	DC	TNO
4474.0 [m]	DC	HYDRO
4477.0 [m]	DC	HYDRO
4477.0 [m]	DC	TNO
4480.0 [m]	DC	SAGA
4480.0 [m]	DC	HYDRO
4483.0 [m]	DC	HYDRO
4486.0 [m]	DC	HYDRO
4486.0 [m]	DC	SAGA
4486.0 [m]	DC	TNO
4492.0 [m]	DC	HYDRO
4507.0 [m]	DC	SAGA
4528.0 [m]	DC	SAGA

Oljeprøver i Sjøkeldirektoratet



Test type	Flaske nummer	Topp dyp MD [m]	Bunn dyp MD [m]	Væske type	Test tidspunkt	Prøver tilgjengelig
DST	PT-2	3263.00	3287.00			YES

Litostratigrafi

Topp Dyb [mMD RKB]	Litostrat. enhet
100	NORDLAND GP
1548	HORDALAND GP
3028	ROGALAND GP
3028	BALDER FM
3038	SELE FM
3047	LISTA FM
3143	VÅLE FM
3204	SHETLAND GP
3204	EKOFISK FM
3289	TOR FM
3726	HOD FM
4087	CROMER KNOLL GP
4108	TYNE GP
4108	MANDAL FM
4120	FARSUND FM
4347	VESTLAND GP
4387	NO GROUP DEFINED
4387	SKAGERRAK FM

Geokjemisk informasjon

Dokument navn	Dokument format	Dokument størrelse [KB]
25_1	pdf	0.19
25_2	pdf	0.35
25_3	pdf	1.00
25_4	pdf	0.65

Dokumenter - eldre Sokkeldirektoratets WDSS rapporter og andre relaterte dokumenter





Dokument navn	Dokument format	Dokument størrelse [KB]
25_01_WDSS_General_Information	pdf	0.22
25_02_WDSS_completion_log	pdf	0.37

Dokumenter - rapportert av utvinningstillatelsen (frigitt ihht til regelverk)

Dokument navn	Dokument format	Dokument størrelse [KB]
25_01_2_5_7_Completion_Report_and_Completion_log	pdf	13.56
25_03_2_5_7_Biostratigraphy_of_the_Cretaceous-Tertiary_Interval	pdf	6.47
25_03_2_5_7_Geochemical_Analysis_Crude_Oil_Well	pdf	0.38
25_03_2_5_7_Geochemical_Analysis_of_two_Kimmeridge_Klay_rock_Samples	pdf	1.12
25_04_2_5_7_Preliminary_Petrophysical_Evaluation	pdf	3.30
25_04_2_5_7_Results_of_Rock_Eval_Analysis_of_Sidewall_Core_Samples	pdf	0.35
25_04_2_5_7_Routine_Core_Analysis	pdf	0.43
25_05_2_5_7_High_Accuracy_Pressure_Temperature_Measurements	pdf	4.15
25_05_2_5_7_Well_Testing_Report_Production_Test_1	pdf	10.41
25_05_2_5_7_Well_Testing_Report_Production_Test_2	pdf	10.75
25_05_2_5_7_Well_Testing_Report_Production_Test_3	pdf	4.88

Borestrengtester (DST)

Test nummer	Fra dybde MD [m]	Til dybde MD [m]	Reduksjonsventil størrelse [mm]
1.0	3300	3335	7.9
2.0	3263	3287	14.3
3.0	3210	3225	0.0

Test nummer	Endelig avstengningstrykk [MPa]	Endelig strømningstrykk [MPa]	Bunnhullstrykk [MPa]	Borehullstemperatur [°C]
1.0	5.000		35.000	





2.0	14.000		29.000	
3.0			32.000	

Test nummer	Olje produksjon [Sm3/dag]	Gass produksjon [Sm3/dag]	Oljetetthet [g/cm3]	Gasstygde rel. luft	GOR [m3/m3]
1.0	120	46350	0.820	0.830	27
2.0	121	32670	0.820	0.960	48
3.0	8				

Logger

Type logg	Topp dyp for logg [m]	Bunn dyp for logg [m]
4ARM CAL	95	3978
CBL VDL CCL	101	2243
CBL VDL CCL	850	3984
CDM	2243	3994
CDM	3995	4532
CDM AP	2231	3990
CDM AP	3996	4533
DLL MSFL	3150	3675
DWLD	899	4000
ISF SLS GR	156	4531
LDL CNL	156	4531
RFT	3216	3512
RFT	3236	3765
RFT HP	3236	3765
TEMP	101	2700
VELOCITY	156	4531

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	156.0	36	156.3	0.00	LOT
SURF.COND.	20	851.5	26	864.0	1.90	LOT
INTERM.	13 3/8	2244.0	17 1/2	2272.0	1.89	LOT
INTERM.	9 5/8	3988.0	12 1/4	4007.0	0.00	LOT
LINER	7	3993.0	8 1/2	4007.0	2.15	LOT



OPEN HOLE		4531.0	5 3/4	4531.0	0.00	LOT
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Boreslam

Dybde MD [m]	Egenvekt, slam [g/cm ³]	Viskositet, slam [mPa.s]	flytegrense [Pa]	Type slam	Dato, måling
150	1.03	8.0	12.0	WATER BASED	
400	1.08	8.0	12.0	WATER BASED	
1175	1.10	20.0	22.0	WATER BASED	
1400	1.18	18.0	18.0	WATER BASED	
1510	1.20	27.0	19.0	WATER BASED	
1630	1.22	18.0	20.0	WATER BASED	
1780	1.24	24.0	14.0	WATER BASED	
1990	1.40	27.0	15.0	WATER BASED	
2270	1.65	28.0	18.0	WATER BASED	
2475	1.66	41.0	15.0	WATER BASED	
3630	1.67	30.0	14.0	WATER BASED	
4140	1.90	31.0	8.0	WATER BASED	
4235	1.93	37.0	10.0	WATER BASED	
4330	1.95	26.0		WATER BASED	
4520	2.08	30.0	12.0	WATER BASED	

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]
25 Formation pressure (Formasjonstrykk)	pdf	0.22

