



General information





Wellbore name	1/6-1
Type	EXPLORATION
Purpose	WILDCAT
Status	P&A
Factmaps in new window	link to map
Main area	NORTH SEA
Field	ALBUSKJELL
Discovery	1/6-1 Albuskjell
Well name	1/6-1
Seismic location	
Production licence	011
Drilling operator	A/S Norske Shell
Drill permit	75-L
Drilling facility	ZAPATA NORDIC
Drilling days	140
Entered date	10.07.1972
Completed date	26.11.1972
Release date	26.11.1974
Publication date	02.04.2007
Purpose - planned	WILDCAT
Reentry	NO
Content	GAS/CONDENSATE
Discovery wellbore	YES
1st level with HC, age	PALEOCENE
1st level with HC, formation	EKOFISK FM
2nd level with HC, age	LATE CRETACEOUS
2nd level with HC, formation	TOR FM
Kelly bushing elevation [m]	34.0
Water depth [m]	69.0
Total depth (MD) [m RKB]	4822.0
Bottom hole temperature [°C]	166
Oldest penetrated age	LATE PERMIAN
Oldest penetrated formation	ZECHSTEIN GP
Geodetic datum	ED50
NS degrees	56° 38' 2.4" N
EW degrees	2° 59' 50.3" E
NS UTM [m]	6276785.58
EW UTM [m]	499834.71
UTM zone	31
NPDID wellbore	239



Wellbore history

General

Wildcat well 1/6-1 is located ca 15 km northwest of the Ekofisk Field in the southern Norwegian North Sea. It was drilled in a crestal position on a large chalk structure shared between Norske Shell's block 1/6 and Phillips' block 2/4, the Ekofisk block. Phillips participated in drilling this well on a 50/50 basis. The primary objective was to investigate Danian and Maastrichtian chalk prospects. Secondary objective was to evaluate possible sand developments in the Paleocene and the Lower Cretaceous or older units. Planned total depth was 4572 m (1500 ft).

Operations and results

Well 1/6-1 was spudded with the jack-up installation Zapata Nordic on 10 July 1972 and drilled to TD at 4822 m in the Late Permian Zechstein Group. No major technical problems were encountered in the operations and the drilling of this deep well was within the prognosed time schedule. The drill string stuck at 228 m. After working the string and spotting pipe-free/diesel the string came loose. Some highly porous limestone intervals (1 - 8 m thick) resulted in lost circulation problems. The pipe stuck at 3456 m, but was freed after spotting with pipe-free/diesel. The well was drilled with seawater down to 448 m, with seawater/lignosulphonate and a shale inhibitor (shalock) from 448 m to 1586 m, and with seawater/lignosulphonate/ligcon (causticized lignite) from 1586 m to TD.

Reservoir development was encountered only in the Chalk Formations, with hydrocarbon-bearing intervals being developed in both the Danian and Late Cretaceous. Four hydrocarbon-bearing intervals were encountered and tested within the Chalk, but only one zone in the Maastrichtian (Tor Formation), yielded commercial flows of gas and condensate. Reservoir developments in the Danian (Ekofisk Formation) and earlier Maastrichtian (Hod Formation) were found to be considerably less favourable in 1/6-1 than in the adjacent Ekofisk and West Ekofisk field. The Early Cretaceous (Valanginian) was found resting directly on Late Permian Zechstein evaporite at 4800 m.

Two cores were cut in the intervals 3177.5 to 3189.7 m and 4604.6 to 4610.7 m. No fluid samples were taken on wire line.

The well was permanently abandoned on 26 November as a gas/condensate discovery.

Testing

Based on results from logging four zones were perforated and tested.

Zone 1 was perforated from 3821 to 3833 m in the (DST 1, Hod Formation). The test produced only a small quantity of gas and traces of light crude/acid emulsion.

Zone 2 was perforated in the intervals 3653.6 - 3650.6 m, 3646.0 - 3647.5 m, and 3621 - 3632.2 m (DST 2, Hod Formation). The test produced ca 65 Sm³ fluid (50% oil) /day.

Zone 3 was perforated from 3270.5 m to 3279.6 m (DST 3, Tor Formation). The test produced at maximum 451 Sm³ oil and 480400 Sm³ gas /day. The rates decreased during the test and the GOR changed accordingly from 1070 to 1330 Sm³/Sm³. Oil gravity was 46.8 deg API. Maximum down hole temperature was 135 deg C.

Zone 4 was perforated from 3152.9 m to 3158.9 m (DST 4, Ekofisk Formation). After acidization the test produced 24 Sm³ oil, 52000 Sm³ gas, and 29 Sm³ water / day. Oil gravity was 46.3 deg API, gas gravity was 0.745 (air = 1), and GOR was 2180 Sm³/Sm³.

**Cuttings at the Norwegian Offshore Directorate**

Cutting sample, top depth [m]	Cutting samples, bottom depth [m]
169.16	4818.89

Cuttings available for sampling?	YES
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Cores at the Norwegian Offshore Directorate

Core sample number	Core sample - top depth	Core sample - bottom depth	Core sample depth - uom
1	10425.0	10463.0	[ft]
2	15106.0	15123.0	[ft]

Total core sample length [m]	16.8
Cores available for sampling?	YES

Palynological slides at the Norwegian Offshore Directorate

Sample depth	Depth unit	Sample type	Laboratory
15107.0	[ft]	DC	HRS

Oil samples at the Norwegian Offshore Directorate

Test type	Bottle number	Top depth MD [m]	Bottom depth MD [m]	Fluid type	Test time	Samples available
DST	DST4	3153.00	3159.00		20.11.1972 - 00:00	YES

Lithostratigraphy

Top depth [mMD RKB]	Lithostrat. unit
102	NORDLAND GP
1795	HORDALAND GP
2942	ROGALAND GP
2942	BALDER FM



2953	SELE FM
2995	LISTA FM
3106	VÅLE FM
3144	SHETLAND GP
3144	EKOFISK FM
3247	TOR FM
3566	HOD FM
4144	CROMER KNOLL GP
4800	ZECHSTEIN GP

Geochemical information

Document name	Document format	Document size [MB]
239 1	pdf	1.39
239 2	pdf	0.57
239 3	pdf	0.97

Documents - older Norwegian Offshore Directorate WDSS reports and other related documents

Document name	Document format	Document size [MB]
239 01 WDSS General Information	pdf	0.42

Documents - reported by the production licence (period for duty of secrecy expired)

Document name	Document format	Document size [MB]
239 01 1 6 1 Completion Report and Completion log	pdf	19.61

Drill stem tests (DST)

Test number	From depth MD [m]	To depth MD [m]	Choke size [mm]
1.0	3820	3833	0.0
2.0	3621	3633	12.0
3.0	3271	3280	25.4
4.0	3153	3159	25.4





Test number	Final shut-in pressure [MPa]	Final flow pressure [MPa]	Bottom hole pressure [MPa]	Downhole temperature [°C]
1.0				
2.0				
3.0				
4.0				

Test number	Oil [Sm3/day]	Gas [Sm3/day]	Oil density [g/cm3]	Gas grav. rel.air	GOR [m3/m3]
1.0					
2.0	32	16980	0.832		
3.0	352	466893	0.794	0.690	
4.0	24	51959	0.796	0.745	

Logs

Log type	Log top depth [m]	Log bottom depth [m]
BHC	450	4591
BHC-C	4511	4816
CAL	449	1591
CBL	1402	3146
CBL	2804	4214
CDM AP	1583	4603
CDM FP	1583	4598
CDM PP	3146	4602
CNL	2560	4222
DL	3148	4220
FDC GR	2560	4222
GR	61	488
IES	450	4819
ML MLL	3146	4220
PML	3146	4220
TS	113	1539
VELOCITY	0	0

Casing and leak-off tests



Casing type	Casing diam. [inch]	Casing depth [m]	Hole diam. [inch]	Hole depth [m]	LOT/FIT mud eqv. [g/cm3]	Formation test type
CONDUCTOR	30	169.0	36	169.0	0.00	LOT
SURF.COND.	20	448.0	26	455.0	0.00	LOT
INTERM.	13 3/8	1586.0	17 1/2	1591.0	0.00	LOT
INTERM.	9 5/8	3149.0	12 1/4	3175.0	0.00	LOT
LINER	7	4220.0	8 1/2	4226.0	0.00	LOT

Drilling mud

Depth MD [m]	Mud weight [g/cm3]	Visc. [mPa.s]	Yield point [Pa]	Mud type	Date measured
165	0.99			seawater	
178	1.21			waterbased	
455	1.20			seawat/lign	
823	1.22			seawat/lign	
1591	1.62			seawat/lign	
2761	1.73			seawat/lign	
3175	1.73			seawat/lign	
3365	1.73			seawat/lign	
3564	1.73			seawat/lign	
4225	1.75			seawat/lign	
4602	1.90			seawat/lign	
4821	1.73			seawat/lign	

Thin sections at the Norwegian Offshore Directorate

Depth	Unit
15117.00	[ft]