General information

Wellbore name	1/3-1
Type	EXPLORATION
Purpose	WILDCAT
Status	P&A
Factmaps in new window	link to map
Main area	NORTH SEA
Discovery	1/3-1
Well name	1/3-1
Seismic location	LINE 5651 SP. E165
Production licence	011
Drilling operator	A/S Norske Shell
Drill permit	15-L
Drilling facility	ORION
Drilling days	129
Entered date	06.07.1968
Completed date	11.11.1968
Release date	11.11.1970
Publication date	30.04.2010
Purpose - planned	WILDCAT
Reentry	NO
Content	GAS
Discovery wellbore	YES
1st level with HC, age	LATE CRETACEOUS
1st level with HC, formation	TOR FM
2nd level with HC, age	EARLY CRETACEOUS
2nd level with HC, formation	CROMER KNOLL GP
Kelly bushing elevation [m]	26.0
Water depth [m]	71.0
Total depth (MD) [m RKB]	4877.0
Maximum inclination [°]	18
Bottom hole temperature [°C]	182
Oldest penetrated age	LATE PERMIAN
Oldest penetrated formation	ZECHSTEIN GP
Geodetic datum	ED50
NS degrees	56° 51' 21'' N
EW degrees	2° 51' 5'' E
NS UTM [m]	6301488.86
EW UTM [m]	490936.87
UTM zone	31
NPDID wellbore	154

Wellbore history

General

Well 1/3-1 was drilled on the crest of a salt-induced anticline on the Hidra High in the North Sea. The purpose of the well was to investigate Tertiary and Mesozoic sequences down to top salt.

The well is Type Well for the Våle, Hidra, Hod, and Tor Formations, and Reference Well for the Vidar, Ekofisk and Blodøks Formations.

Operations and results

Well 1/3-1 was spudded with the four leg jack-up installation Orion on 6 July 1968 and drilled to TD at 4877 m in the Permian Zechstein Group. From the deviation survey it is seen that the well starts to deviate significantly at 4037 m (8 deg deviation), and at TD the deviation is 18 deg. This will correspond to a TVD RKB that is ca 25 m less than MD RKB.Several drilling problems occurred during the drilling operations of well 1/3-1. While drilling the 17 1/2" hole for the 20" casing, circulation losses started at 220 m (720') and became total at 238 m (781'). While drilling on with sea water, without returns, the pipe stuck. The lost circulation zone eventually had to be sealed off with a cement plug. In the Tertiary plastic clays the problems included tight hole conditions, bit balling, and difficulties in lowering the logging tools. The mud weight had to be raised from 10.8 ppg to 13.6 ppg to stabilize the hole. At 4131 m (13554') the bit twisted off, but was retrieved on the second fishing run. A hydrocarbon bearing zone was encountered at 4567 m (14984'). The mud became gas cut. At 4592 m (15064') the degasser was overloaded and the circulation lost, probably higher in the hole. A cement plug was needed to combat the lost circulation problems. It was then decided to set a 7" casing. Circulation was lost while running the casing, which had to be cemented in two stages. Drilling continued with a 5 7/8" bit. Around 4677 m (15346'), when drilling into salt, the penetration rate increased from 10 to 50 ft/hr. Further deepening to TD went without problems. The well was drilled water based.

Well 1/3-1 found no sand of any significance in the Tertiary section. An unexpectedly thick Danian/Late Cretaceous chalk section (Shetland Group) was penetrated from 3258 m to 4441 m. The underlying Cromer Knoll Group was found resting directly on Permian salt at 4671 m. Minor gas was confirmed by testing in the Tor Formation. No source rock section was identified in the well. Shows were reported in the interval from 2999 m to 3423 m as follows: direct and cut "faint" fluorescence were reported on sidewall cores from the interval 2999 to 3002 m; weak cut fluorescence was recorded on cuttings from 3039 m; strong cuttings fluorescence and moderate cut was recorded at 3357 m; "fair" - "soaked w/oil, giving yellowish-grn flu, but no cut" on the conventional core at 3405 to 3423 m

One core was cut from 11165 to 11232 ft (3403.1 to 3423.5 m). No wire line fluid samples were taken. A sea bed core (0 - 46 m from seabed) was taken for geotechnical purposes at the 1/3-1 location. Samples from this core are available at the NPD.

The well was permanently abandoned on 11 November 1968 as a minor gas discovery.

Testing

Three Drill Stem Tests were conducted. They produced some fluids at very low rates:

DST 1 tested the interval 4583.6 - 4601.0 m in the Cromer Knoll Group and recovered a total of 0.74 bbl gas cut mud in 45 minutes, corresponding to a standard rate of 40 bbl (1133 Sm3) gas/day.

DST 2 tested the interval 4563.5 - 4581.8 m in the Cromer knoll Group and recovered a total of 18 bbl of gas cut mud with traces of condensate and slugs of gas in 140 minutes. This corresponds to a standard rate of 234 bbl (6626 Sm3) gas/day.

DST 3 tested the interval 3355.2 - 3359.8 m in the Tor Formation and recovered a total of 30 bbl of gas cut mud and slugs of gas in 45 minutes. This corresponds to a standard rate of 1000 bbl (28317 Sm3) gas/day.

Cores at the Norwegian Offshore Directorate

Core sample number	Core sample - top depth	Core sample - bottom depth	Core sample depth - uom
1	3403.4	3422.6	[m]

Total core sample length [m]	19.2
Cores available for sampling?	YES

Palynological slides at the Norwegian Offshore Directorate

Sample depth	Depth unit	Sample type	Laboratory
4510.0	[ft]	DC	
4780.0	[ft]	DC	
5170.0	[ft]	DC	
5440.0	[ft]	DC	
5740.0	[ft]	DC	
6070.0	[ft]	DC	
6280.0	[ft]	DC	
6600.0	[ft]	DC	
6860.0	[ft]	DC	
7140.0	[ft]	DC	
7400.0	[ft]	DC	
7690.0	[ft]	DC	
7960.0	[ft]	DC	
8240.0	[ft]	DC	
8550.0	[ft]	DC	
8800.0	[ft]	DC	
9060.0	[ft]	DC	
9350.0	[ft]	DC	
9570.0	[ft]	DC	
9780.0	[ft]	DC	
10080.0	[ft]	DC	UNIVSHEF

10140.0	[ft]	DC	UNIVSH
10270.0	[ft]	DC	UNIVSH
10330.0	[ft]	DC	UNIVSH
10390.0	[ft]	DC	UNIVSH
10600.0	[ft]	DC	
10810.0	[ft]	DC	
11370.0	[ft]	DC	
11680.0	[ft]	DC	
11980.0	[ft]	DC	
12210.0	[ft]	DC	
12490.0	[ft]	DC	
12780.0	[ft]	DC	
13060.0	[ft]	DC	
13350.0	[ft]	DC	
13560.0	[ft]	DC	
13840.0	[ft]	DC	
14050.0	[ft]	DC	
14310.0	[ft]	DC	
14590.0	[ft]	DC	
14850.0	[ft]	DC	
15100.0	[ft]	DC	
15310.0	[ft]	DC	
15560.0	[ft]	DC	

Lithostratigraphy

Top depth [mMD RKB]	Lithostrat. unit
97	NORDLAND GP
2995	ROGALAND GP
2995	BALDER FM
3006	SELE FM
3013	LISTA FM
3095	VIDAR FM
3147	LISTA FM
3209	VÅLE FM
3258	SHETLAND GP
3258	EKOFISK FM
3354	TOR FM
3828	HOD FM

4343	BLODØKS FM
4371	HIDRA FM
4441	CROMER KNOLL GP
4441	RØDBY FM
4482	SOLA FM
4671	ZECHSTEIN GP

Geochemical information

Document name	Document format	Document size [MB]
154_1	pdf	0.88
154_2	pdf	1.24

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

Document name	Document format	Document size [MB]
154_01_WDSS_General_Information	pdf	0.21

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

Document name	Document format	Document size [MB]
154_01_1_3_1_Completion_log	pdf	3.01
154_01_1_3_1_Core_report	pdf	4.16
154_01_1_3_1_Well_Resume	pdf	24.93
154_1_3_1_COMPLETION_LOG	pdf	2.31
154_1_3_1_COMPLETION_REPORT	pdf	23.69

Documents - Norwegian Offshore Directorate papers

Document name	Document format	Document size [MB]
154_01_NPD_Paper_No.15_Lithology_Well_1_3_1	pdf	14.98
154_02_NPD_Paper_No.15_Interpreted_Lithology_log_Well_1_3_1	pdf	78.91

Drill stem tests (DST)

Test number	From depth MD [m]	To depth MD [m]	Choke size [mm]
1.0	4585	4602	12.5
2.0	4565	4602	12.5
3.0	3356	3361	12.5

Test number	Final shut-in pressure [MPa]	Final flow pressure [MPa]	Bottom hole pressure [MPa]	Downhole temperature [°C]
1.0	80.000	61.000		
2.0	52.000	40.000		
3.0	70.000	50.000		

Test number	Oil [Sm3/day]	Gas [Sm3/day]	Oil density [g/cm3]	Gas grav. rel.air	GOR [m3/m3]
1.0		1132			
2.0		6626			
3.0		28317			

Logs

Log type	Log top depth [m]	Log bottom depth [m]
BRIDGEPLUG-1	3480	3480
BRIDGEPLUG-2	3337	3337
BS GRC	137	4745
CALI	365	1435
CBL	71	1310
CBL	2895	4583
CDM	1529	4757
FDC	405	4645
IE.7	1530	4758
IES	408	3736
MLLC	1529	4867
PERF	3355	3359
PERF	4563	4565
PERF	4573	4578
PERF	4580	4581

SNP	2819	4767
SWS	1533	3116
SWS	4588	4733
TS	30	3313
VELOCITY	609	4458

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	36	140.0	36	137.0	0.00	LOT
SURF.COND.	20	408.0	26	415.0	0.00	LOT
INTERM.	13 3/8	1529.0	17 1/2	1535.0	0.00	LOT
INTERM.	9 5/8	3118.0	12 1/4	3128.0	0.00	LOT
LINER	7	4585.0	8 1/2	4593.0	0.00	LOT

Drilling mud

Depth MD [m]	Mud weight [g/cm3]	Visc. [mPa.s]	Yield point [Pa]	Mud type	Date measured
415	1.07	42.0		waterbased	
861	1.12	48.0		waterbased	
1218	1.13	43.0		waterbased	
1534	1.18	45.0		waterbased	
2034	1.31	49.0		waterbased	
2455	1.34	46.0		waterbased	
3127	1.53	48.0		waterbased	
3409	1.56	47.0		waterbased	
4220	1.60	48.0		waterbased	

Thin sections at the Norwegian Offshore Directorate

Depth	Unit
11221.00	[ft]
11221.00	[ft]