

**General information**

Wellbore name	2/4-4
Type	EXPLORATION
Purpose	APPRAISAL
Status	P&A
Factmaps in new window	link to map
Main area	NORTH SEA
Field	EKOFISK
Discovery	2/4-2 Ekofisk
Well name	2/4-4
Seismic location	LINE PG-0312 SP: 685
Production licence	018
Drilling operator	Phillips Petroleum Company Norway
Drill permit	37-L
Drilling facility	OCEAN VIKING
Drilling days	61
Entered date	02.06.1970
Completed date	01.08.1970
Release date	01.08.1972
Publication date	02.04.2007
Purpose - planned	APPRAISAL
Reentry	NO
Content	OIL
Discovery wellbore	NO
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]	27.0
Water depth [m]	71.0
Total depth (MD) [m RKB]	3424.0
Final vertical depth (TVD) [m RKB]	3424.0
Maximum inclination [°]	1.5
Bottom hole temperature [°C]	121
Oldest penetrated age	LATE CRETACEOUS
Oldest penetrated formation	TOR FM
Geodetic datum	ED50
NS degrees	56° 30' 47.9" N
EW degrees	3° 12' 39.48" E



NS UTM [m]	6263370.75
EW UTM [m]	512983.23
UTM zone	31
NPDID wellbore	174

Wellbore history

General

Well 2/4-4 (named 2/4-3X by operator Phillips) was drilled to appraise the southern segment of the 2/4-2 Ekofisk discovery. The Ekofisk discovery is located in the Central Trough in the southern Norwegian North Sea and its structure is an anticline, uplifted by halokinetic movements of Permian salt. The objective of well 2/4-4 was to test the Tertiary and the top of the Late Cretaceous. Planned total depth was 11000 ft (3352 m).

Operations and results

Well 2/4-4 was spudded with the semi-submersible installation Ocean Viking on 2 June 1970 and drilled to TD at 3424 m in the Late Cretaceous Tor Formation. The well was drilled with seawater and hi-vis mud down to 622 m, and with seawater/drill-aid mud from 622 m to TD. Two - six percent oil was added to the mud below 622 m.

The Shetland Group was encountered with top Ekofisk Formation at 3116 m and top Tor Formation at 3259 m. Oil was tested in the Ekofisk Formation in various zones in the interval 3127 - 3225 m. The Tor Formation produced only water.

Two short cores were cut in the Ekofisk Formation and one 8-m core was cut in the Tor Formation. No fluid samples were taken on wire line.

The well was permanently abandoned on 1 August 1970 as an oil appraisal.

Testing

Eight drill stem tests through perforations in the 7" liner were carried out, one in the Tor Formation, the rest in the Ekofisk Formation. The Tor test produced only water, the lowermost test in Ekofisk did not produce liquid to the surface, but 100 ft (30.5 m) gas cut mud was reversed out of the test string. The next lowermost Ekofisk test, DST 3 from 3233 - 3236 m, also produced water and no hydrocarbons. The remaining tests, all in the Ekofisk Formation gave oil. Maximum flow was obtained from the interval 3162 - 3200 m in DST 8 with 601 Sm³ oil /day on two 3/4" chokes. The oil gravity was in the range 34.2 - 35.6 deg API and the GOR was in the range 165 - 251 Sm³/Sm³.

Cuttings at the Norwegian Offshore Directorate

Cutting sample, top depth [m]	Cutting samples, bottom depth [m]
627.90	3422.90

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	10520.0	10522.0	[ft]
2	10647.0	10648.0	[ft]
3	10790.0	10817.0	[ft]

Total core sample length [m]	9.1
Cores available for sampling?	YES

Lithostratigraphy

Top depth [mMD RKB]	Lithostrat. unit
98	NORDLAND GP
1736	HORDALAND GP
2978	ROGALAND GP
2978	BALDER FM
2989	SELE FM
2994	LISTA FM
3116	SHETLAND GP
3116	EKOFISK FM
3259	TOR FM

Composite logs

Document name	Document format	Document size [MB]
174	pdf	0.47

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

Document name	Document format	Document size [MB]
174 01 WDSS General Information	pdf	0.19

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





Document name	Document format	Document size [MB]
174 01 2 4 4(3X) Completion Report and Completion log	pdf	17.90
174 02 2 4 4(3X) Drilling Fluid Summary	pdf	6.83
174 02 2 4 4(3X) Individual Well Record	pdf	4.22
174 02 2 4 4(3X) Mud Reports	pdf	10.55
174 02 2 4 4 (3X) Well Recompletion Report	pdf	17.90
174 03 2 4 4 (3X) Complex Lithology Analysis	pdf	47.43
174 03 2 4 4 (3X) Computer Processed Interpretation	pdf	3.23
174 03 2 4 4 (3X) Computer Processed Interpretations	pdf	4.47
174 03 2 4 4 (3X) Quantitative Log Interpretation	pdf	14.31
174 03 2 4 4(3X) Reservoir Fluid Study	pdf	6.81
174 05 2 4 4 (3X) Companion Separator Sample Analysis	pdf	13.17
174 05 2 4 4 (3X) Drill Stem Test Data Test 1	pdf	5.31
174 05 2 4 4 (3X) Drill Stem Test Data test 2	pdf	2.00
174 05 2 4 4 (3X) Drill Stem Test Data Test 3	pdf	3.78
174 05 2 4 4 (3X) Drill Stem Test data Test 4	pdf	3.93
174 05 2 4 4 (3X) Drill Stem Test Data Test 5	pdf	0.25
174 05 2 4 4 (3X) Drill Stem Test Data Test 5A	pdf	5.55
174 05 2 4 4 (3X) Drill Stem Test Data Test 6	pdf	3.27
174 05 2 4 4 (3X) Drill Stem Test data Test 7	pdf	3.15
174 05 2 4 4 (3X) Drill Stem Test Data Test 8	pdf	4.21
174 05 2 4 4(3X) Summary of DSTs	pdf	0.81

Documents - Norwegian Offshore Directorate papers

Document name	Document format	Document size [MB]
174 01 NPD Paper No.25 Lithology Well 2 4 4	pdf	18.62





174 02 NPD Paper No.25 Interpreted Lithology log Well 2 4 4	pdf	57.03
174 03 NPD Paper No.25 Lithologic Correlation chart Well 2 4 4	pdf	1.95
174 04 NPD Paper No.25 Paleocene Maastrichtian Correlation chart Well 2 4 4	pdf	1.18

Drill stem tests (DST)

Test number	From depth MD [m]	To depth MD [m]	Choke size [mm]
1.0	3274	3284	25.4
2.0	3247	3256	25.4
3.0	3234	3237	25.4
4.0	3220	3226	19.0
5.0	3177	3201	19.0
6.0	3163	3168	19.0
7.0	3128	3152	19.0

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	27.000	4.000	15.000	
5.0	28.000	6.000	23.000	
6.0	26.000	2.000	9.000	
7.0	28.000	8.000	30.000	

Test number	Oil [Sm3/day]	Gas [Sm3/day]	Oil density [g/cm3]	Gas grav. rel.air	GOR [m3/m3]
1.0					
2.0					
3.0					
4.0	168	32488	0.854		
5.0	432	77655	0.848		
6.0	107	26998	0.850		
7.0	600	613800	0.847		1023





Logs

Log type	Log top depth [m]	Log bottom depth [m]
CAL	599	1648
CBL	3003	3410
CDM	3094	3427
DIR	599	3427
FDC	2744	3428
GR	91	598
IES	599	3426
LL-7	3094	3428
MLL-C	3094	3428
SGR	598	1640
SGR-C	1640	3425
SNP	3094	3428
AA	3094	3425

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	135.0	36	135.0	0.00	LOT
SURF.COND.	20	598.0	26	622.0	0.00	LOT
INTERM.	13 3/8	1639.0	17 1/2	1646.0	0.00	LOT
INTERM.	9 5/8	3094.0	12 1/4	3111.0	0.00	LOT
LINER	7	3424.0	8 1/2	3426.0	0.00	LOT

Drilling mud

Depth MD [m]	Mud weight [g/cm3]	Visc. [mPa.s]	Yield point [Pa]	Mud type	Date measured
135	1.49			seawat/slug	
653	1.50			seawat/slug	
1113	1.71			seawat/aid	
1646	1.71			seawat/aid	
2060	1.71			seawat/aid	
3021	1.71			seawat/aid	
3255	1.71			seawat/aid	
3425	1.71			seawat/aid	

**Thin sections at the Norwegian Offshore Directorate**

Depth	Unit
10455.00	[ft]
10474.00	[ft]
10497.00	[ft]
16101.00	[ft]
21901.00	[ft]