



General information





Wellbore name	18/10-1
Type	EXPLORATION
Purpose	WILDCAT
Status	P&A
Factmaps in new window	link to map
Main area	NORTH SEA
Discovery	18/10-1 (Mackerel)
Well name	18/10-1
Seismic location	685402 SP.160
Production licence	008
Drilling operator	Elf Petroleum Norge AS
Drill permit	227-L
Drilling facility	DYVI ALPHA
Drilling days	75
Entered date	19.10.1979
Completed date	01.01.1980
Release date	01.01.1982
Publication date	25.04.2005
Purpose - planned	WILDCAT
Reentry	NO
Content	OIL
Discovery wellbore	YES
1st level with HC, age	MIDDLE JURASSIC
1st level with HC, formation	SANDNES FM
2nd level with HC, age	MIDDLE JURASSIC
2nd level with HC, formation	BRYNE FM
Kelly bushing elevation [m]	25.0
Water depth [m]	96.0
Total depth (MD) [m RKB]	2800.0
Bottom hole temperature [°C]	88
Oldest penetrated age	LATE TRIASSIC
Oldest penetrated formation	SKAGERRAK FM
Geodetic datum	ED50
NS degrees	58° 4' 38.25" N
EW degrees	4° 7' 0.83" E
NS UTM [m]	6438006.82
EW UTM [m]	565878.03
UTM zone	31
NPDID wellbore	342



Wellbore history

General

Well 18/10-1 is located in the Egersund Basin in the North Sea, ca 16 km southeast of the 17/12-1R Bream Discovery. It was designed to test a seismic structure on the same trend as the Bream discovery. The primary target was to test possible hydrocarbon accumulation in Jurassic sandstones on. Planned TD is about 150 to 200 m below Jurassic sandstone in a shaly-sandy sequence of Early Jurassic or top of Triassic.

Operations and results

Well 18/10-1 was spudded with the semi-submersible installation Dyvi Alpha on 19 October 1979 and drilled to TD at 2800 m in the Triassic Skagerrak Formation.

A thick Late Jurassic shale sequence with limestone stringers was penetrated before reaching the target Middle Jurassic sands. The sands (Sandnes and Bryne Formations) were encountered at 2405 m, close to prognosis. The reservoir consisted of two zones separated by a thin shale barrier between 2427 and 2433 m. Based on FMT and DST pressure measurements the upper zone appeared slightly overpressured relative to the lower, suggesting a compartmentalized reservoir. The reservoirs were found hydrocarbon bearing and an OWC was found at 2437 m in the lower zone. The lithology below the target reservoir section, from 2483 m to TD, was predominantly sandstone, fine in the upper part, becoming medium to coarse downwards. Frequent thin interbeds of shale and marl, occasionally also thin stringers of limestone were encountered. The sequence was entirely water bearing. Weak direct fluorescence and cut appears at 2420 m, becoming very good in the intervals 2423 m to 2430 m and 2433 m to 2440 m, then the shows get weaker and disappear below 2444 m.

Organic geochemical analyses showed an immature well all through (%Ro = 0.5 at TD). TOC in the Late Jurassic shale increased gradually from ca 0.8% at top Jurassic to ca 1 % at 2200 m. A peak TOC is reached in the Tau Formation with 4.5 % TOC in cuttings and 6.9 % in a sidewall core. The hydrogen index in the Tau Formation was up to 273 mg HC/g TOC in cuttings and up to 415 mg HC/g TOC in the sidewall core. TOC in the underlying Egersund Formation is also high, from 2 - 4%, but the hydrogen index is lower, in the range 120 to 270 mg HC/g TOC. Next potential source rock is represented by the Bryne coals with HI up to 300 mg HC/g TOC.

Three conventional cores were cut in the Bryne Formation reservoir section from 2421 m to 2469 m. A total of 39 sidewall cores were recovered between 1080 m to 2791 m. Three FMT runs over the reservoir section gave 10 valid pressure readings and one fluid sample. The fluid sample, at 2434 m, contained only mud filtrate.

The well was permanently abandoned on 1 January 1980 as an oil discovery.

Testing

One Drill Stem Test was performed in the interval 2414.5 m to 2427.0 m. It flowed 295 m³/day of oil and 2850 Sm³/day of gas on a 2" choke. The gas-to-oil ratio was 9.7 m³/m³, oil gravity was 36.4 °API (0.843 g/cm³), and gas gravity was 0.724 (air = 1) with 1.4% CO₂ and no detectable H₂S. Reservoir temperature (at shut-in) was 80 °C.

Cuttings at the Norwegian Offshore Directorate

Cutting sample, top depth [m]	Cutting samples, bottom depth [m]
183.00	2800.00



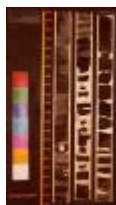
Cuttings available for sampling?	YES
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Cores at the Norwegian Offshore Directorate

Core sample number	Core sample - top depth	Core sample - bottom depth	Core sample depth - uom
1	2421.0	2432.5	[m]
2	2432.5	2450.5	[m]
3	2450.5	2469.0	[m]

Total core sample length [m]	48.0
Cores available for sampling?	YES

Core photos



2421-2424m



2424-2427m



2427-2430m



2430-2432m



2432-2435m



2435-2439m



2439-2442m



2442-2445m



2445-2449m



2449-2450m



2450-2453m



2453-2457m



2457-2460m



2460-2463m



2463-2467m





2467-2469m

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		2389.50	2402.00			YES

Lithostratigraphy

Top depth [mMD RKB]	Lithostrat. unit
121	NORDLAND GP
369	HORDALAND GP
709	ROGALAND GP
709	BALDER FM
729	SELE FM
737	LISTA FM
742	VÅLE FM
744	SHETLAND GP
744	EKOFISK FM
808	TOR FM
1161	HOD FM
1326	CROMER KNOLL GP
1326	RØDBY FM
1468	SOLA FM
1573	ÅSGARD FM
1991	BOKNFJORD GP
1991	FLEKKEFJORD FM
2046	SAUDA FM
2277	TAU FM
2319	EGERSUND FM
2405	VESTLAND GP
2405	SANDNES FM
2421	BRYNE FM
2506	NO GROUP DEFINED
2506	SKAGERRAK FM



Composite logs

Document name	Document format	Document size [MB]
342	pdf	0.43

Geochemical information

Document name	Document format	Document size [MB]
342_1	pdf	1.38
342_2	pdf	0.23

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

Document name	Document format	Document size [MB]
342_01_WDSS_General_Information	pdf	0.13
342_02_WDSS_completion_log	pdf	0.60

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

Document name	Document format	Document size [MB]
342_01_Geological_well_prognosis_and_drilling_programme	pdf	15.28
342_02_Composite_log	pdf	1.52

Drill stem tests (DST)

Test number	From depth MD [m]	To depth MD [m]	Choke size [mm]
1.0	2414	2427	50.8

Test number	Final shut-in pressure [MPa]	Final flow pressure [MPa]	Bottom hole pressure [MPa]	Downhole temperature [°C]
1.0	23.000	19.000		67





Test number	Oil [Sm3/day]	Gas [Sm3/day]	Oil density [g/cm3]	Gas grav. rel.air	GOR [m3/m3]
1.0	295	2850	0.834	0.724	9

Logs

Log type	Log top depth [m]	Log bottom depth [m]
CNL CDL GR	168	2795
DIPLOG	945	2314
DLL MLL	2303	2497
IEL BHC	160	2793
MFT	2416	2479
MFT	2425	2753
MFT	2430	2465
VELOCITY	405	2791

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	146.0	36	146.0	0.00	LOT
SURF.COND.	20	323.0	26	332.0	0.00	LOT
INTERM.	13 3/8	916.0	17 1/2	927.0	0.00	LOT
INTERM.	9 5/8	2308.0	12 1/4	2310.0	0.00	LOT
LINER	7	2478.0	8 1/2	2800.0	0.00	LOT

Drilling mud

Depth MD [m]	Mud weight [g/cm3]	Visc. [mPa.s]	Yield point [Pa]	Mud type	Date measured
193	1.06	55.0		seawater	
325	1.12	55.0		waterbased	
920	1.17	55.0		waterbased	
1810	1.16	44.0		waterbased	
2256	1.18	30.0		waterbased	
2775	1.21	60.0		waterbased	

**Pressure plots**

The pore pressure data is sourced from well logs if no other source is specified. In some wells where pore pressure logs do not exist, information from Drill stem tests and kicks have been used. The data has been reported to the NPD, and further processed and quality controlled by IHS Markit.

Document name	Document format	Document size [MB]
342 Formation pressure (Formasjonstrykk)	pdf	0.22

