

**General information**

Wellbore name	34/11-2 S
Type	EXPLORATION
Purpose	WILDCAT
Status	P&A
Factmaps in new window	link to map
Main area	NORTH SEA
Discovery	34/11-2 S (Nøkken)
Well name	34/11-2
Seismic location	TFE 91- ROW 1111& COLUMN 653
Production licence	193
Drilling operator	Den norske stats oljeselskap a.s
Drill permit	838-L
Drilling facility	VILDKAT EXPLORER
Drilling days	123
Entered date	16.01.1996
Completed date	17.05.1996
Plugged date	17.05.1996
Plugged and abandon date	23.04.2015
Release date	17.05.1998
Publication date	15.11.2012
Purpose - planned	WILDCAT
Reentry	NO
Content	GAS/CONDENSATE
Discovery wellbore	YES
1st level with HC, age	MIDDLE JURASSIC
1st level with HC, formation	BRENT GP
Kelly bushing elevation [m]	25.0
Water depth [m]	261.0
Total depth (MD) [m RKB]	4743.0
Final vertical depth (TVD) [m RKB]	4579.0
Maximum inclination [°]	48
Bottom hole temperature [°C]	172
Oldest penetrated age	EARLY JURASSIC
Oldest penetrated formation	STATFJORD GP
Geodetic datum	ED50
NS degrees	61° 13' 33.24" N
EW degrees	2° 22' 56.81" E
NS UTM [m]	6788267.62



EW UTM [m]	466835.28
UTM zone	31
NPDID wellbore	2733

Wellbore history

General

Well 34/11-2 S was drilled on the Tjalve Terrace east of the Gullfaks Field in the northern North Sea. The main objective was to explore the hydrocarbon potential of the Middle Jurassic Brent Group reservoirs within the Beta structure. The secondary objective was to test for hydrocarbons in the Lower Jurassic/Triassic Statfjord Formation.

Operations and results

Wildcat well 34/11-2 S was spudded with the semi-submersible installation Vildcat Explorer on 16 January 1996 and drilled to TD at 4743 m in the Early Jurassic Statfjord Formation. The well was drilled practically vertical down to ca 3139 m, ca 140 m below the 13 3/8" casing shoe, and deviated from this point. The drilling of the well was not performed within the plan due to lost time as a consequence of bad weather, steering and building angle in 12 1/4" hole section, extended logging, extended well and equipment failure. The well was drilled with pre-hydrated bentonite, seawater and bentonite sweeps down to 1170 m, with ANCO 2000 mud with 3.4 to 5.2% glycol from 1170 m to 3766 m, and with a KCl/polymer mud system from 3766 m to TD.

Oil was proven by MDT fluid sampling in a thin sand bed at 3797.5 m (3756.2 m TVD) above the main Brent Group reservoir. The Bathonian age of these sand beds imply that they belong to the upper part of the Brent Group. Sliding or faulting of huge blocks along the foot wall of the main fault could explain the presence of this Allochthonous "Brent Group" above the Heather Formation. Top of the main objective the Brent Group was penetrated at 4068.0 m

(3422.1 m TVD), 252 m deeper than the prognosis. Pressure measurements indicated hydrocarbon fluids present in the entire reservoir section, with one pressure regime in Tarbert and Upper Ness Formations and another some 20 bar higher in Lower Ness and Etive Formations. The DST tests confirm that the fluid systems are different with the lower Brent having the richest condensate. A shale layer at 4145 to 4175 m in the Ness Formation appears to be the pressure barrier. Due to poor quality pressure data (low permeability in reservoir) no conclusive hydrocarbon gradients were established. No fluid contacts could be derived from the MDT data. The log evaluation showed 100 % water saturation in the Rannoch Formation below 4288 m.

Acetone was used for oil shows extraction and poor shows were described from the whole well below 1170 m.

A total of 173.5 m core was recovered in 9 cores. All core depths are corrected to logger's depth. Core 1 was cut in the allochthonous Brent Group from 3846 m to 4478 m. Cores 2 to 5 were cut from 4083 to 4154 m in the upper reservoir compartment of the main Brent Group. Cores 6 to 8 were cut from 4209 m to 4294 m in the lower reservoir compartment of the main Brent Group. Core 9 was cut from 4460 m to 4478 m in the Early Jurassic Cook Formation. Fluid samples were taken with Schlumberger's MDT with Dual Packer tool. An oil sample was taken in Allochthonous Brent Group/Heather Formation at 3797.5 m and gas/condensate samples were taken in the in Ness Formation at 4178.0 m and in the Etive Formation at 4248.5 m.

The well was suspended on 16 January as a gas/condensate discovery.

**Testing**

Three tests were performed in the Brent Group.

Test 1A tested 4240 - 4260 m in the Etive formation. It produced only some mud to the surface and was aborted due to a failure during the clean up flow.

Test 1B tested the intervals 4240 - 4260 m interval in Etive plus 4185-4229 m in the Ness Formation. It produced 125 Sm3 condensate and 126100 Sm3 gas /day through a 36/64" choke. The GOR was 1000 Sm3/Sm3, the oil density was 0.795 g/cm3 at 15 deg C, and the gas gravity was 0.750 (air = 1). The bottom hole flowing temperature was 133 deg C.

Test 2 tested the interval 4068 - 4142.5 m in the Tarbert and Ness formations. It produced 75 Sm3 condensate and 172200 Sm3 gas /day through a 32/64" choke. The GOR was 2300 Sm3/Sm3, the oil density was 0.800 g/cm3 at 15 deg C, and the gas gravity was 0.690 (air = 1). The bottom hole flowing temperature was 125 deg C.

Cuttings at the Norwegian Offshore Directorate

Cutting sample, top depth [m]	Cutting samples, bottom depth [m]
1180.00	4368.00

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	3846.0	3849.7	[m]
2	4083.0	4110.8	[m]
3	4111.0	4115.0	[m]
4	4116.0	4125.4	[m]
5	4126.0	4154.4	[m]
6	4209.0	4237.0	[m]
7	4237.0	4265.0	[m]
8	4266.0	4293.9	[m]
9	4460.0	4476.3	[m]

Total core sample length [m]	173.5
Cores available for sampling?	YES



Core photos



3846-3849m



4083-4088m



4088-4093m



4093-4098m



4098-4103m



4103-4108m



4108-4110m



4110-4115m



4116-4121m



4121-4125m



4126-4131m



4131-4136m



4136-4141m



4141-4146m



4146-4151m



4151-4154m



4209-4214m



4214-4219m



4219-4224m



4224-4229m



4229-4234m



4234-4237m



4237-4242m



4242-4247m



4247-4252m



4252-4257m



4257-4262m



4262-4265m



4266-4271m



4271-4276m



4276-4281m



4281-4286m



4286-4291m



4291-4293m



4460-4465m



4465-4470m



4475-4476m-



4475-4476m

Palynological slides at the Norwegian Offshore Directorate

Sample depth	Depth unit	Sample type	Laboratory
1180.0	[m]	DC	GEOSTR
1200.0	[m]	DC	GEOSTR
1220.0	[m]	DC	GEOSTR
1240.0	[m]	DC	GEOSTR
1260.0	[m]	DC	GEOSTR
1280.0	[m]	DC	GEOSTR
1300.0	[m]	DC	GEOSTR
1320.0	[m]	DC	GEOSTR
1340.0	[m]	DC	GEOSTR
1360.0	[m]	DC	GEOSTR
1380.0	[m]	DC	GEOSTR
1400.0	[m]	DC	GEOSTR
1420.0	[m]	DC	GEOSTR
1440.0	[m]	DC	GEOSTR
1460.0	[m]	DC	GEOSTR
1480.0	[m]	DC	GEOSTR



1500.0	[m]	DC	GEOSTR
1520.0	[m]	DC	GEOSTR
1540.0	[m]	DC	GEOSTR
1560.0	[m]	DC	GEOSTR
1580.0	[m]	DC	GEOSTR
1600.0	[m]	DC	GEOSTR
1620.0	[m]	DC	GEOSTR
1640.0	[m]	DC	GEOSTR
1660.0	[m]	DC	GEOSTR
1680.0	[m]	DC	GEOSTR
1700.0	[m]	DC	GEOSTR
1710.0	[m]	DC	GEOSTR
1730.0	[m]	DC	GEOSTR
1740.0	[m]	DC	GEOSTR
1760.0	[m]	DC	GEOSTR
1770.0	[m]	DC	GEOSTR
1790.0	[m]	DC	GEOSTR
1800.0	[m]	DC	GEOSTR
1820.0	[m]	DC	GEOSTR
1830.0	[m]	DC	GEOSTR
1850.0	[m]	DC	GEOSTR
1860.0	[m]	DC	GEOSTR
1880.0	[m]	DC	GEOSTR
1890.0	[m]	DC	GEOSTR
1910.0	[m]	DC	GEOSTR
1920.0	[m]	DC	GEOSTR
1940.0	[m]	DC	GEOSTR
1950.0	[m]	DC	GEOSTR
1970.0	[m]	DC	GEOSTR
1980.0	[m]	DC	GEOSTR
2000.0	[m]	DC	GEOSTR
2020.0	[m]	DC	GEOSTR
2040.0	[m]	DC	GEOSTR
2060.0	[m]	DC	GEOSTR
2080.0	[m]	DC	GEOSTR
2100.0	[m]	DC	GEOSTR
2120.0	[m]	DC	GEOSTR
2140.0	[m]	DC	GEOSTR
2160.0	[m]	DC	GEOSTR
2180.0	[m]	DC	GEOSTR



2200.0	[m]	DC	GEOSTR
2220.0	[m]	DC	GEOSTR
2240.0	[m]	DC	GEOSTR
2260.0	[m]	DC	GEOSTR
2280.0	[m]	DC	GEOSTR
2300.0	[m]	DC	GEOSTR
2320.0	[m]	DC	GEOSTR
2340.0	[m]	DC	GEOSTR
2360.0	[m]	DC	GEOSTR
2380.0	[m]	DC	GEOSTR
2400.0	[m]	DC	GEOSTR
2420.0	[m]	DC	GEOSTR
2440.0	[m]	DC	GEOSTR
2460.0	[m]	DC	GEOSTR
2480.0	[m]	DC	GEOSTR
2500.0	[m]	DC	GEOSTR
2520.0	[m]	DC	GEOSTR
2540.0	[m]	DC	GEOSTR
2560.0	[m]	DC	GEOSTR
2580.0	[m]	DC	GEOSTR
2600.0	[m]	DC	GEOSTR
2620.0	[m]	DC	GEOSTR
2640.0	[m]	DC	GEOSTR
2660.0	[m]	DC	GEOSTR
2680.0	[m]	DC	GEOSTR
2700.0	[m]	DC	GEOSTR
2720.0	[m]	DC	GEOSTR
2740.0	[m]	DC	GEOSTR
2760.0	[m]	DC	GEOSTR
2780.0	[m]	DC	GEOSTR
2800.0	[m]	DC	GEOSTR
2820.0	[m]	DC	GEOSTR
2840.0	[m]	DC	GEOSTR
2860.0	[m]	DC	GEOSTR
2880.0	[m]	DC	GEOSTR
2900.0	[m]	DC	GEOSTR
2920.0	[m]	DC	GEOSTR
2940.0	[m]	DC	GEOSTR
2960.0	[m]	DC	GEOSTR
2980.0	[m]	DC	GEOSTR



3000.0	[m]	DC	GEOSTR
3020.0	[m]	DC	GEOSTR
3040.0	[m]	DC	GEOSTR
3060.0	[m]	DC	GEOSTR
3080.0	[m]	DC	GEOSTR
3100.0	[m]	DC	GEOSTR
3120.0	[m]	DC	GEOSTR
3140.0	[m]	DC	GEOSTR
3160.0	[m]	DC	GEOSTR
3180.0	[m]	DC	GEOSTR
3200.0	[m]	DC	GEOSTR
3220.0	[m]	DC	GEOSTR
3240.0	[m]	DC	GEOSTR
3260.0	[m]	DC	GEOSTR
3280.0	[m]	DC	GEOSTR
3300.0	[m]	DC	GEOSTR
3318.0	[m]	DC	GEOSTR
3337.1	[m]	SWC	WESTLB
3346.0	[m]	SWC	WESTLB
3360.0	[m]	DC	GEOSTR
3381.0	[m]	DC	GEOSTR
3399.0	[m]	DC	GEOSTR
3420.0	[m]	DC	GEOSTR
3441.0	[m]	DC	GEOSTR
3454.0	[m]	DC	GEOSTR
3480.0	[m]	DC	GEOSTR
3501.0	[m]	DC	GEOSTR
3519.0	[m]	DC	GEOSTR
3540.0	[m]	DC	GEOSTR
3548.0	[m]	SWC	WESTLB
3562.0	[m]	SWC	WESTLB
3567.0	[m]	DC	GEOSTR
3576.0	[m]	DC	GEOSTR
3615.0	[m]	DC	GEOSTR
3621.0	[m]	DC	GEOSTR
3630.0	[m]	DC	GEOSTR
3635.1	[m]	SWC	WESTLB
3648.0	[m]	DC	GEOSTR
3655.0	[m]	SWC	WESTLB
3664.0	[m]	SWC	WESTLB



3675.0	[m]	DC	GEOSTR
3683.0	[m]	SWC	WESTLB
3693.0	[m]	DC	GEOSTR
3698.0	[m]	SWC	WESTLB
3705.1	[m]	SWC	WESTLB
3712.1	[m]	SWC	WESTLB
3726.1	[m]	SWC	WESTLB
3729.0	[m]	SWC	WESTLB
3747.0	[m]	DC	GEOSTR
3756.0	[m]	SWC	WESTLB
3788.0	[m]	SWC	WESTLB
3797.5	[m]	SWC	WESTLB
3801.0	[m]	DC	GEOSTR
3819.0	[m]	DC	GEOSTR
3828.0	[m]	DC	GEOSTR
3837.0	[m]	DC	GEOSTR
3846.1	[m]	C	WESTLB
3849.2	[m]	C	WESTLB
3852.5	[m]	SWC	WESTLB
3860.5	[m]	SWC	WESTLB
3873.0	[m]	DC	GEOSTR
3887.5	[m]	SWC	WESTLB
3893.0	[m]	SWC	WESTLB
3900.0	[m]	SWC	WESTLB
3909.0	[m]	DC	GEOSTR
3918.0	[m]	DC	GEOSTR
3927.0	[m]	DC	GEOSTR
3936.0	[m]	DC	GEOSTR
3946.0	[m]	SWC	WESTLB
3954.0	[m]	DC	GEOSTR
3963.0	[m]	DC	GEOSTR
3972.0	[m]	DC	GEOSTR
3985.0	[m]	SWC	WESTLB
3990.0	[m]	DC	GEOSTR
3999.0	[m]	DC	GEOSTR
4008.0	[m]	DC	GEOSTR
4017.0	[m]	DC	GEOSTR
4025.0	[m]	SWC	WESTLB
4032.0	[m]	DC	GEOSTR
4041.0	[m]	DC	GEOSTR



4050.0 [m]	DC	GEOSTR
4063.0 [m]	SWC	WESTLB
4070.0 [m]	SWC	WESTLB
4075.0 [m]	SWC	WESTLB
4080.5 [m]	SWC	WESTLB
4085.2 [m]	C	WESTLB
4088.7 [m]	C	WESTLB
4091.3 [m]	C	WESTLB
4098.4 [m]	C	WESTLB
4104.1 [m]	C	WESTLB
4109.5 [m]	C	WESTLB
4113.3 [m]	C	WESTLB
4121.9 [m]	C	WESTLB
4129.4 [m]	C	WESTLB
4134.9 [m]	C	WESTLB
4140.2 [m]	C	WESTLB
4145.5 [m]	C	WESTLB
4151.7 [m]	C	WESTLB
4161.0 [m]	DC	GEOSTR
4170.0 [m]	DC	GEOSTR
4178.0 [m]	SWC	WESTLB
4188.0 [m]	DC	GEOSTR
4200.0 [m]	SWC	WESTLB
4209.0 [m]	C	WESTLB
4214.8 [m]	C	WESTLB
4220.2 [m]	C	WESTLB
4225.7 [m]	C	WESTLB
4244.3 [m]	C	WESTLB
4251.4 [m]	C	WESTLB
4286.7 [m]	C	WESTLB
4291.8 [m]	C	WESTLB
4299.0 [m]	DC	GEOSTR
4318.0 [m]	SWC	WESTLB
4325.0 [m]	SWC	WESTLB
4329.0 [m]	SWC	WESTLB
4338.0 [m]	DC	GEOSTR
4350.0 [m]	SWC	WESTLB
4356.0 [m]	DC	GEOSTR
4365.0 [m]	DC	GEOSTR
4370.0 [m]	SWC	WESTLB



4383.0 [m]	DC	GEOSTR
4392.0 [m]	DC	GEOSTR
4401.0 [m]	DC	GEOSTR
4410.0 [m]	DC	GEOSTR
4419.0 [m]	DC	GEOSTR
4431.0 [m]	SWC	WESTLB
4437.5 [m]	SWC	WESTLB
4441.0 [m]	SWC	WESTLB
4450.0 [m]	SWC	WESTLB
4458.0 [m]	SWC	WESTLB
4460.3 [m]	C	WESTLB
4465.7 [m]	C	WESTLB
4470.4 [m]	C	WESTLB
4476.3 [m]	C	WESTLB
4483.0 [m]	SWC	WESTLB
4491.0 [m]	DC	GEOSTR
4500.0 [m]	DC	GEOSTR
4509.0 [m]	SWC	WESTLB
4518.0 [m]	DC	GEOSTR
4527.0 [m]	DC	GEOSTR
4536.0 [m]	DC	GEOSTR
4543.0 [m]	SWC	WESTLB
4575.0 [m]	SWC	WESTLB
4588.0 [m]	SWC	WESTLB
4600.0 [m]	SWC	WESTLB
4614.0 [m]	DC	GEOSTR
4622.0 [m]	SWC	WESTLB
4645.0 [m]	SWC	WESTLB
4677.0 [m]	SWC	WESTLB
4692.0 [m]	DC	GEOSTR
4707.0 [m]	DC	GEOSTR
4722.0 [m]	DC	GEOSTR
4737.0 [m]	DC	GEOSTR
4742.0 [m]	DC	GEOSTR

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	TEST1B	4260.00	4185.00	CONDE NSATE	01.05.1996 - 00:00	YES

Lithostratigraphy

Top depth [mMD RKB]	Lithostrat. unit
286	NORLAND GP
1034	UTSIRA FM
1054	NO FORMAL NAME
1123	HORDALAND GP
1418	NO FORMAL NAME
1507	NO FORMAL NAME
1631	NO FORMAL NAME
1666	NO FORMAL NAME
1820	ROGALAND GP
1820	BALDER FM
1880	SELE FM
1885	LISTA FM
2033	SHETLAND GP
2033	JORSALFARE FM
2310	KYRRE FM
2762	TRYGGVASON FM
3342	SVARTE FM
3559	CROMER KNOLL GP
3697	VIKING GP
3697	DRAUPNE FM
3699	NO FORMAL NAME
3755	NO FORMAL NAME
3801	NO FORMAL NAME
3865	HEATHER FM
4068	BRENT GP
4068	TARBERT FM
4085	NESS FM
4241	ETIVE FM
4261	RANNOCH FM
4320	BROOM FM
4328	DUNLIN GP



4328	DRAKE FM
4433	COOK FM
4478	BURTON FM
4512	AMUNDSEN FM
4696	STATFJORD GP

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

Document name	Document format	Document size [MB]
2733_34_11_2_S_COMPLETION_REPORT_AND_COMPLETION_LOG	pdf	45.37

Drill stem tests (DST)

Test number	From depth MD [m]	To depth MD [m]	Choke size [mm]
1.0	4260	4240	15.8
2.0	4185	4260	12.7
3.0	4143	4068	12.7

Test number	Final shut-in pressure [MPa]	Final flow pressure [MPa]	Bottom hole pressure [MPa]	Downhole temperature [°C]
1.0				
2.0	6.000	8.000	13.000	133
3.0		8.000	14.000	125

Test number	Oil [Sm ³ /day]	Gas [Sm ³ /day]	Oil density [g/cm ³]	Gas grav. rel.air	GOR [m ³ /m ³]
1.0					
2.0	125	126100	0.791	0.720	1009
3.0	75	172288	0.801	0.680	2305

Logs

Log type	Log top depth [m]	Log bottom depth [m]
ARI IPL GR ACTS	3749	4741
CST	3337	3764





CST GR	3777	4695
DLL DSI LDL GR	1157	2984
DLL DSI MSFL LDL CNL GR	2998	3763
DSI MSFL GR ACTS	3550	4737
FMS GR ACTS	3747	4742
MDT DP	3797	3797
MDT DP	4123	4248
MDT GR ACTS	3776	4739
MWD	364	4742

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	356.0	36	356.0	0.00	LOT
SURF.COND.	20	1158.0	26	1158.0	1.56	LOT
INTERM.	13 3/8	2999.0	17 1/2	3010.0	1.83	LOT
INTERM.	9 5/8	3747.0	12 1/4	3747.0	1.87	LOT
LINER	7	4340.0	8 1/2	4743.0	0.00	LOT

Drilling mud

Depth MD [m]	Mud weight [g/cm3]	Visc. [mPa.s]	Yield point [Pa]	Mud type	Date measured
741	1.03			DUMMY	
1173	1.03			DUMMY	
1675	1.39	26.0		ANCO 2000	
2057	1.45	24.0		ANCO 2000	
2388	1.45	23.0		ANCO 2000	
2999	1.50			DUMMY	
3010	1.45	21.0		ANCO 2000	
3079	1.50	26.0		ANCO 2000	
3364	1.39	19.0		ANCO 2000	
3755	1.55	28.0		ANCO 2000	
3797	1.59	24.0		KCL/PAC/XANVIS	
3851	1.55	23.0		ANCO 2000	
3871	1.55	21.0		ANCO 2000	
4154	1.55	22.0		ANCO 2000	
4273	1.55	23.0		ANCO 2000	



4742	1.55	31.0		KCL/PAC/XANVIS	
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Thin sections at the Norwegian Offshore Directorate

Depth	Unit
4222.95	[m]
4237.14	[m]
4242.73	[m]
4248.56	[m]
4251.75	[m]
4255.47	[m]
4257.70	[m]
4263.10	[m]
4281.95	[m]
4083.05	[m]
4086.80	[m]
4094.72	[m]
4099.00	[m]
4099.68	[m]
4104.70	[m]
4109.55	[m]
4119.90	[m]
4127.88	[m]
4139.40	[m]
4134.23	[m]

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]
2733 Formation pressure (Formasjonstrykk)	pdf	0.23

