General information

Wellbore name	34/10-36
Type	EXPLORATION
Purpose	APPRAISAL
Status	P&A
Factmaps in new window	link to map
Main area	NORTH SEA
Field	GULLFAKS SØR
Discovery	34/10-2 Gullfaks Sør
Well name	34/10-36
Seismic location	ST 8720-695 & KOLONNE 555
Production licence	050
Drilling operator	Den norske stats oljeselskap a.s
Drill permit	723-L
Drilling facility	DEEPSEA BERGEN
Drilling days	77
Entered date	28.04.1992
Completed date	13.07.1992
Release date	13.07.1994
Publication date	03.12.2014
Purpose - planned	APPRAISAL
Reentry	NO
Content	OIL
Discovery wellbore	NO
1st level with HC, age	MIDDLE JURASSIC
1st level with HC, formation	TARBERT FM
Kelly bushing elevation [m]	23.0
Water depth [m]	136.0
Total depth (MD) [m RKB]	3640.0
Final vertical depth (TVD) [m RKB]	3634.0
Maximum inclination [°]	10.5
Bottom hole temperature [°C]	134
Oldest penetrated age	EARLY JURASSIC
Oldest penetrated formation	COOK FM
Geodetic datum	ED50
NS degrees	61° 6' 48.49'' N
EW degrees	2° 10' 35.15'' E
NS UTM [m]	6775866.39
EW UTM [m]	455614.12

UTM zone	31
NPDID wellbore	1940

Wellbore history

General

Well 34/10-36 was the sixth well drilled on the Gullfaks Sør structure. The objectives were to test the potential of Intra-Draupne Formation turbiditic sandstone, and to confirm the gas-oil contact, the oil-water contact, and the pressure regime in the Brent Group.

Operations and results

Appraisal well 34/10-36 was spudded with the semi-submersible installation Deepsea Bergen on 28 April 1992 and drilled to TD at 3640 m in the Early Jurassic Cook Formation. A 9 7/8" pilot hole was drilled from surface to 859 m to check for shallow gas. The MWD indicated several sands but all were water-filled. The well was drilled with seawater and CMC down to 1071 m, with gypsum/polymer mud from 1071 m to 3010 m, and with Ancotemp/bentonite from 3010 m to TD.

The Draupne Formation consisted of shale with only traces of sandstone stringers towards the base. The Brent Group, Tarbert Formation was encountered at 3361 m (3355.3 m TVD), 55 m deeper than prognosed. It was oil-bearing down to the OWC at 3377.5 m (3371.9 m TVD). Shows were seen down to 3397 m. The GOC was not penetrated in the well location.

Three cores were cut in the well. Core 1 was cut from 3029 to 3054 m in the Draupne Formation. Cores 2 and 3 were cut in the Tarbert Formation from 3363 m to 3417 m. The core shifts for cores 1, 2 and 3 were 3.0 m, 2.3 m and 2.3 m, respectively. One segregated sample was taken at 3363.8 m. The 2 3/4 gallon chamber contained 3.5 litres of oil, 3.5 litres of mud filtrate and 0.22 m3 gas. No CO2 or H2S was detected from this sample chamber.

The well was permanently abandoned on 13 July 1992 as an oil appraisal well.

Testing

One drill stem test was performed in the Tarbert Formation, from the interval 3371.2 - 3376.2 m. The well flowed 836 Sm3 oil and 161490 Sm3 gas /day through a 36/64" choke. The GOR was 193 Sm3/Sm3, the oil density was 0.869 g/cm3 and the gas density was 0.695 with 2 % CO2 and 3.5 ppm H2S. The recorded temperature was 126.1 °C.

Cuttings at the Norwegian Offshore Directorate

Cutting sample, top depth [m]	Cutting samples, bottom depth [m]
1080.00	3640.00

Cuttings available for sampling?	YES

Cores at the Norwegian Offshore Directorate

Core sample number	Core sample - top depth	Core sample - bottom depth	Core sample depth - uom
1	3029.0	3053.0	[m]
2	3363.0	3390.0	[m]
3	3390.0	3417.0	[m]

Total core sample length [m]	78.0
Cores available for sampling?	YES

Core photos


3029-3034m


3034-3039m


3039-3044m


3044-3049m


3049-3053m


3363-3368m


3368-3373m


3373-3378m


3378-3383m


3383-3388m


3388-3390m


3390-3395m


3395-3400m


3400-3405m


3405-3410m


3410-3415m


3415-3416m

Palynological slides at the Norwegian Offshore Directorate

Sample depth	Depth unit	Sample type	Laboratory
1080.0	[m]	DC	GEOST
1100.0	[m]	DC	GEOST
1120.0	[m]	DC	GEOST
1130.0	[m]	DC	GEOST
1150.0	[m]	DC	GEOST
1160.0	[m]	DC	GEOST
1180.0	[m]	DC	GEOST
1190.0	[m]	DC	GEOST
1210.0	[m]	DC	GEOST
1220.0	[m]	DC	GEOST
1240.0	[m]	DC	GEOST
1250.0	[m]	DC	GEOST
1270.0	[m]	DC	GEOST
1280.0	[m]	DC	GEOST
1300.0	[m]	DC	GEOST
1310.0	[m]	DC	GEOST
1330.0	[m]	DC	GEOST
1340.0	[m]	DC	GEOST
1360.0	[m]	DC	GEOST
1370.0	[m]	DC	GEOST
1390.0	[m]	DC	GEOST
1400.0	[m]	DC	GEOST
1420.0	[m]	DC	GEOST
1430.0	[m]	DC	GEOST
1450.0	[m]	DC	GEOST
1460.0	[m]	DC	GEOST
1480.0	[m]	DC	GEOST
1490.0	[m]	DC	GEOST
1510.0	[m]	DC	GEOST
1520.0	[m]	DC	GEOST
1540.0	[m]	DC	GEOST
1550.0	[m]	DC	GEOST
1570.0	[m]	DC	GEOST
1580.0	[m]	DC	GEOST
1600.0	[m]	DC	GEOST
1610.0	[m]	DC	GEOST
1630.0	[m]	DC	GEOST

1640.0	[m]	DC	GEOST
1660.0	[m]	DC	GEOST
1670.0	[m]	DC	GEOST
1690.0	[m]	DC	GEOST
1700.0	[m]	DC	GEOST
1720.0	[m]	DC	GEOST
1730.0	[m]	DC	GEOST
1750.0	[m]	DC	GEOST
1760.0	[m]	DC	GEOST
1780.0	[m]	DC	GEOST
1790.0	[m]	DC	GEOST
1809.0	[m]	DC	GEOST
1827.0	[m]	DC	GEOST
1839.0	[m]	DC	GEOST
1854.0	[m]	DC	GEOST
1869.0	[m]	DC	GEOST
1884.0	[m]	DC	GEOST
1899.0	[m]	DC	GEOST
1914.0	[m]	DC	GEOST
1926.0	[m]	DC	GEOST
1944.0	[m]	DC	GEOST
1959.0	[m]	DC	GEOST
1974.0	[m]	DC	GEOST
1986.0	[m]	DC	GEOST
2001.0	[m]	DC	GEOST
2019.0	[m]	DC	GEOST
2034.0	[m]	DC	GEOST
2049.0	[m]	DC	GEOST
2064.0	[m]	DC	GEOST
2079.0	[m]	DC	GEOST
2100.0	[m]	DC	GEOST
2130.0	[m]	DC	GEOST
2160.0	[m]	DC	GEOST
2190.0	[m]	DC	GEOST
2220.0	[m]	DC	GEOST
2250.0	[m]	DC	GEOST
2280.0	[m]	DC	GEOST
2310.0	[m]	DC	GEOST
2340.0	[m]	DC	GEOST
2370.0	[m]	DC	GEOST

2400.0	[m]	DC	GEOST
2430.0	[m]	DC	GEOST
2460.0	[m]	DC	GEOST
2490.0	[m]	DC	GEOST
2520.0	[m]	DC	GEOST
2550.0	[m]	DC	GEOST
2580.0	[m]	DC	GEOST
2610.0	[m]	DC	GEOST
2640.0	[m]	DC	GEOST
2670.0	[m]	DC	GEOST
2700.0	[m]	DC	GEOST
2730.0	[m]	DC	GEOST
2760.0	[m]	DC	GEOST
2790.0	[m]	DC	GEOST
2820.0	[m]	DC	GEOST
2850.0	[m]	DC	GEOST
2880.0	[m]	DC	GEOST
2909.0	[m]	DC	GEOST
2939.0	[m]	DC	GEOST
2969.0	[m]	DC	GEOST
2999.0	[m]	DC	GEOST
3005.0	[m]	DC	GEOST
3011.0	[m]	DC	GEOST
3017.0	[m]	DC	GEOST
3026.0	[m]	DC	GEOST
3029.0	[m]	C	GEOST
3033.0	[m]	C	GEOST
3038.0	[m]	C	GEOST
3042.0	[m]	C	GEOST
3045.9	[m]	C	GEOST
3050.0	[m]	C	GEOST
3053.3	[m]	C	GEOST
3055.0	[m]	SWC	GEOST
3060.0	[m]	SWC	GEOST
3070.0	[m]	SWC	GEOST
3080.0	[m]	DC	GEOST
3089.0	[m]	DC	GEOST
3110.0	[m]	SWC	GEOST
3115.0	[m]	SWC	GEOST
3120.0	[m]	SWC	GEOST

3125.0	[m]	SWC	GEOST
3130.0	[m]	SWC	GEOST
3140.0	[m]	SWC	GEOST
3150.0	[m]	C	GEOST
3160.0	[m]	SWC	GEOST
3171.0	[m]	SWC	GEOST
3185.0	[m]	SWC	GEOST
3194.0	[m]	DC	GEOST
3203.0	[m]	DC	GEOST
3212.5	[m]	SWC	GEOST
3221.0	[m]	DC	GEOST
3236.0	[m]	SWC	GEOST
3245.0	[m]	DC	GEOST
3257.0	[m]	DC	GEOST
3269.0	[m]	DC	GEOST
3281.0	[m]	DC	GEOST
3293.0	[m]	DC	GEOST
3305.0	[m]	DC	GEOST
3317.0	[m]	DC	GEOST
3331.0	[m]	SWC	GEOST
3341.0	[m]	DC	GEOST
3355.0	[m]	SWC	GEOST
3363.8	[m]	C	GEOST
3364.2	[m]	C	GEOST
3376.7	[m]	C	GEOST
3379.3	[m]	C	GEOST
3382.3	[m]	C	GEOST
3390.2	[m]	C	GEOST
3394.3	[m]	C	GEOST
3398.9	[m]	C	GEOST
3403.8	[m]	C	GEOST
3405.5	[m]	C	GEOST
3408.7	[m]	C	GEOST
3410.5	[m]	C	GEOST
3422.0	[m]	DC	GEOST
3431.0	[m]	DC	GEOST
3440.0	[m]	DC	GEOST
3449.0	[m]	DC	GEOST
3458.0	[m]	DC	GEOST
3467.0	[m]	DC	GEOST

3476.0	[m]	DC	GEOST
3485.0	[m]	DC	GEOST
3496.0	[m]	SWC	GEOST
3507.0	[m]	SWC	GEOST
3515.0	[m]	DC	GEOST
3524.0	[m]	SWC	GEOST
3533.0	[m]	DC	GEOST
3545.0	[m]	SWC	GEOST
3555.0	[m]	SWC	GEOST
3557.0	[m]	SWC	GEOST
3563.0	[m]	SWC	GEOST
3568.0	[m]	SWC	GEOST
3573.0	[m]	SWC	GEOST
3584.0	[m]	DC	GEOST
3596.0	[m]	DC	GEOST
3603.0	[m]	DC	STATO
3610.0	[m]	SWC	GEOST
3620.0	[m]	DC	GEOST
3629.0	[m]	DC	STATO
3635.0	[m]	DC	STATO
3640.0	[m]	DC	GEOST
3640.0	[m]	DC	STATO

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	TEST1	3371.20	3373.20		28.06.1992 - 15:00	YES

Lithostratigraphy

Top depth [mMD RKB]	Lithostrat. unit
159	NORDLAND GP
931	UTSIRA FM
989	HORDALAND GP
1842	ROGALAND GP
1842	BALDER FM

1921	SELE FM
1952	LISTA FM
2049	VÅLE FM
2061	SHETLAND GP
2061	JORSALFARE FM
2349	KYRRE FM
2882	BLODØKS FM
2999	CROMER KNOLL GP
3026	VIKING GP
3026	DRAUPNE FM
3125	HEATHER FM
3361	BRENT GP
3361	TARBERT FM
3448	NESS FM
3511	ETIVE FM
3524	RANNOCH FM
3555	DUNLIN GP
3555	DRAKE FM
3565	COOK FM

Geochemical information

Document name	Document format	Document size [MB]
1940_GCH_1	pdf	0.55
1940_GCH_2	pdf	0.60
1940_GCH_3	pdf	1.23
1940_GCH_4	pdf	1.79
1940_GCH_5	pdf	0.28

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

Document name	Document format	Document size [MB]
1940_01_WDSS_General_Information	pdf	0.46
1940_02_WDSS_completion_log	pdf	0.20

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

Document name	Document format	Document size [MB]
1940_34_10_36_Completion_log	pdf	2.10
1940_34_10_36_Completion_report	pdf	21.90

Drill stem tests (DST)

Test number	From depth MD [m]	To depth MD [m]	Choke size [mm]
1.0	3371	0	14.3

Test number	Final shut-in pressure [MPa]	Final flow pressure [MPa]	Bottom hole pressure [MPa]	Downhole temperature [°C]
1.0		14.000		

Test number	Oil [Sm3/day]	Gas [Sm3/day]	Oil density [g/cm3]	Gas grav. rel.air	GOR [m3/m3]
1.0	836	161490	0.861	0.685	194

Logs

Log type	Log top depth [m]	Log bottom depth [m]
CBL VDL GR	825	3574
CORGUN	3055	3634
DIFL ACL GR	1056	2087
DIFL ACL GR CAL	2097	3637
DIP	3215	3637
DLL MLL GR	2993	3637
FMT GR	3131	3553
MWD	159	3640
VSP	139	3570
ZDL CNL GR	2993	3636

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	220.0	36	222.0	0.00	LOT

INTERM.	20	1056.0	26	1058.0	1.60	LOT
INTERM.	13 3/8	2100.0	17 1/2	2103.0	1.76	LOT
LINER	7	2838.0	8 1/2	3625.0	0.00	LOT
INTERM.	9 5/8	2994.0	12 1/4	2997.0	1.97	LOT

Drilling mud

Depth MD [m]	Mud weight [g/cm3]	Visc. [mPa.s]	Yield point [Pa]	Mud type	Date measured
826	1.03	10.0		WATER BASED	
947	1.03	16.0		WATER BASED	
1171	1.30	20.0		WATER BASED	
1445	1.30	23.0		WATER BASED	
1737	1.30	25.0		WATER BASED	
1918	1.30	27.0		WATER BASED	
2015	1.30	26.0		WATER BASED	
2115	1.30	27.0		WATER BASED	
2241	1.35	27.0		WATER BASED	
2350	1.35	25.0		WATER BASED	
2396	1.39	27.0		WATER BASED	
2451	1.39	27.0		WATER BASED	
2612	1.39	28.0		WATER BASED	
2661	1.39	28.0		WATER BASED	
2774	1.39	29.0		WATER BASED	
2825	1.45	31.0		WATER BASED	
2880	1.50	32.0		WATER BASED	
3010	1.54	27.0		WATER BASED	
3050	1.47	26.0		WATER BASED	
3359	1.56	28.0		WATER BASED	
3363	1.47	22.0		WATER BASED	
3426	1.47	21.0		WATER BASED	
3586	1.47	21.0		WATER BASED	
3640	1.56	31.0		WATER BASED	

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]
1940_Formation_pressure_(Formasjonstrykk)	pdf	0.22