General information

Wellbore name	34/10-1
Type	EXPLORATION
Purpose	WILDCAT
Status	P&A
Factmaps in new window	link to map
Main area	NORTH SEA
Field	GULLFAKS
Discovery	34/10-1 Gullfaks
Well name	34/10-1
Seismic location	LINE ST 24.5 & SP 1373
Production licence	050
Drilling operator	Den norske stats oljeselskap a.s
Drill permit	197-L
Drilling facility	ROSS RIG (1)
Drilling days	80
Entered date	20.06.1978
Completed date	08.09.1978
Release date	08.09.1980
Publication date	05.12.2012
Purpose - planned	WILDCAT
Reentry	NO
Content	OIL
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]	138.0
Total depth (MD) [m RKB]	2460.0
Bottom hole temperature [°C]	58
Oldest penetrated age	LATE TRIASSIC
Oldest penetrated formation	LUNDE FM
Geodetic datum	ED50
NS degrees	61° 10' 46.84'' N
EW degrees	2° 12' 43.67'' E
NS UTM [m]	6783217.39
EW UTM [m]	457626.92
UTM zone	31
NPDID wellbore	424

Wellbore history

General

Well 34/10-1 was the first well to be drilled on the "Delta structure" (Gullfaks fault block) in the Northern North Sea. The primary objective of the well was to penetrate sandstones of Early to Middle Jurassic age and to evaluate their possible content of hydrocarbons.

Operations and results

Wildcat well 34/10-1 was spudded with the semi-submersible installation Ross Rig on 20 June 1978 and drilled to TD at 2460 m in the Late Triassic Lunde Formation. The 30" casing was set after considerable difficulty in getting through a section of boulders. A severe well kick was taken after a flow check at 1780 m, ca 3 m above top reservoir. Ca 440 barrels of mud were gained in the pit. Otherwise the operations proceeded without significant problems. No directional survey was run below1737 m. The well was drilled with seawater and gel slugs down to 214 m, with fresh water and gel from 214 m to 504 m, with seawater/gel/lignosulphonate from 504 m to 1970 m and with Seawater/gel/spersene/XP20 from 1970 m to TD.

First oil show, pale yellow fluorescence in limestone and siltstone, was recorded at 1370 m in the Hordaland Group. Similar shows continued down to top Brent Group level interrupted only by a short interval of no shows from 1579 to 1600 m. At 1555 in the Balder Formation trace oil in the mud was observed. Top reservoir, Tarbert Formation, was encountered at 1783 m directly underlying the Late Cretaceous Shetland Group. Oil was proven in sandstones all through the Middle Jurassic Brent Group down to top Drake Formation in the Dunlin Group. The oil/water contact was not observed in the well. Below reservoir level shows decreased and died out completely below 2325 m.

A total of 12 cores were recovered in the interval from 1782.0 to 1951.1 m and one core from 2232.5 to 2250.5 m. Three runs were made with the RFT and samples were taken at 1871 m (oil) and 2244 m (water, mud and mud filtrate).

The well was permanently abandoned on 8 September as an oil discovery.

Testing

Three drill stem tests were conducted in the Brent Formation.

DST 1 perforated the interval 1930 to 1935 m in the Rannoch Formation and produced 191 Sm3 oil and 20560 Sm3 gas /day through a 32/64" choke. No water was produced. The GOR was 108 Sm3/Sm3, the oil gravity was 28.9 deg API, and the gas gravity was 0.632 (air = 1).

DST 2 perforated the interval 1839 to 1844 m in the Etive Formation and produced 1049 Sm3 oil and 86930 Sm3 gas /day through a 36/64" choke. No water was produced. The GOR was 83 Sm3/Sm3, the oil gravity was 28.4 deg API, and the gas gravity was 0.61 (air = 1). The maximum bottom hole temperature recorded in the test was 71.7 deg C.

DST 3 perforated the interval 1788 to 1792 m in the Tarbert Formation and produced 323 Sm3 oil and 29365 Sm3 gas /day through a 17/64" choke. No water was produced. The GOR was 91 Sm3/Sm3, the oil gravity was 29 deg API, and the gas gravity was 0.62 (air = 1). The maximum bottom hole temperature recorded in the test was 69 deg C.

Cuttings at the Norwegian Offshore Directorate

Cutting sample, top depth [m]	Cutting samples, bottom depth [m]
210.00	2460.00

Cuttings available for sampling?	NO

Cores at the Norwegian Offshore Directorate

Core sample number	Core sample - top depth	Core sample - bottom depth	Core sample depth - uom
1	1782.0	1785.9	[m]
2	1790.5	1792.8	[m]
3	1802.5	1815.6	[m]
4	1819.0	1835.6	[m]
5	1835.8	1853.3	[m]
6	1853.3	1862.3	[m]
7	1865.4	1873.8	[m]
8	1875.0	1889.5	[m]
9	1893.5	1911.3	[m]
10	1911.3	1922.1	[m]
11	1923.1	1938.8	[m]
12	1938.8	1951.1	[m]
13	2232.5	2244.5	[m]

Total core sample length [m]	153.8
Cores available for sampling?	YES

Core photos


1782-1784m


1784-1785m


1790-1792m


1802-1805m


1805-1806m


1807-1810m


1810-1813m


1813-1815m


1819-1821m


1821-1824m


1824-1827m


1827-1829m


1829-1832m


1832-1835m


1835-1835m


1835-1838m


1838-1841m


1841-1843mj


1843-1846m


1846-1849m


1849-1852m


1852-1853m


1853-1855m


1855-1858m


1858-1861m


1861-1862m


1865-1868m


1868-1870m


1870-1873m


1873-1874m


1875-1877m


1877-1880m


1880-1883m


1883-1885m


1885-1888m


1888-1889m


1893-1896m


1896-1898m


1898-1901m


1901-1904m


1904-1907m


1907-1909m


1909-1911m


1911-1914m


1914-1916m


1916-1919m


1919-1922m


1923-1925m


1925-1928m


1928-1931m


1931-1933m


1933-1936m


1936-1938m


1938-1941m


1941-1944m


1944-1946m


1946-1949m


1949-1951m


2232-2235m


2235-2237m


2237-2240m


2240-2243m


2243-2244m

Palynological slides at the Norwegian Offshore Directorate

Sample depth	Depth unit	Sample type	Laboratory
1782.3	[m]	C	LAP
1791.5	[m]	C	LAP
1807.0	[m]	C	LAP
1809.2	[m]	C	LAP
1811.2	[m]	C	LAP
1812.7	[m]	C	LAP
1819.0	[m]	C	LAP
1819.9	[m]	C	LAP
1824.6	[m]	C	LAP
1826.0	[m]	C	LAP
1829.3	[m]	C	LAP
1830.3	[m]	C	LAP
1832.3	[m]	C	LAP
1833.5	[m]	C	LAP
1835.6	[m]	C	LAP
1937.7	[m]	C	LAP
1940.0	[m]	C	LAP
1941.3	[m]	C	LAP
1943.7	[m]	C	LAP
1944.5	[m]	C	LAP
1945.2	[m]	C	LAP
1946.8	[m]	C	LAP
1947.1	[m]	C	LAP
1949.0	[m]	C	LAP
2238.4	[m]	C	LAP

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	DST1	1930.00	1935.00		21.08.1978 - 00:00	YES
DST	DST3	1788.00	1792.00		29.08.1978 - 00:00	YES

Lithostratigraphy

Top depth [mMD RKB]	Lithostrat. unit
163	NORDLAND GP
936	UTSIRA FM
946	HORDALAND GP
1513	ROGALAND GP
1513	BALDER FM
1582	LISTA FM
1678	SHETLAND GP
1678	JORSALFARE FM
1718	KYRRE FM
1783	BRENT GP
1783	TARBERT FM
1797	NESS FM
1833	ETIVE FM
1871	RANNOCH FM
1935	BROOM FM
1946	DUNLIN GP
1946	DRAKE FM
2023	COOK FM
2081	BURTON FM
2120	AMUNDSEN FM
2268	STATFJORD GP
2268	NANSEN FM
2329	RAUDE FM
2367	HEGRE GP
2367	LUNDE FM

Geochemical information

Document name	Document format	Document size [MB]
424_GCH_1	pdf	0.66
424_GCH_2	pdf	3.66
424_GCH_3	pdf	1.04

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

Document name	Document format	Document size [MB]
424_01_WDSS_General_Information	pdf	0.22
424_03_WDSS_lithlog	pdf	0.06

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

Document name	Document format	Document size [MB]
424_34_10_1_A_palynostratigraphic_study_of_11 samples	pdf	0.84
424_34_10_1_ADT_report	pdf	7.17
424_34_10_1_Analysis_of_oil	pdf	0.89
424_34_10_1_Biostratigraphy	pdf	3.53
424_34_10_1_Biostratigraphy_of_interval_210m-2462m	pdf	7.30
424_34_10_1_Brent_formation_relief_program	pdf	1.88
424_34_10_1_Capilary_pressure_measurment	pdf	7.38
424_34_10_1_CompletionReport	pdf	23.14
424_34_10_1_Completion_report	PDF	29.02
424_34_10_1_Core_description	pdf	1.72
424_34_10_1_Core_photoes_core_1-13	pdf	201.96
424_34_10_1_Data_summary	pdf	39.05
424_34_10_1_Dipmeter_analysis	pdf	2.78
424_34_10_1_Final_report_core_1-13	pdf	3.29
424_34_10_1_Geological_prognosis_&_drilling_program_consideratio	pdf	4.27
424_34_10_1_Pressure_prediction	pdf	37.61
424_34_10_1_Reservoir_fluid_analysis_DST-3_flow-3	pdf	1.27
424_34_10_1_Reservoir_fluid_study_bottom_hole_sample	pdf	1.18
424_34_10_1_Reservoir_fluid_study_DST-2_flow-2	pdf	1.24
424_34_10_1_Source_rock_crude_oil_correlation	pdf	5.67
424_34_10_1_Source_rock_evaluation_(2)	pdf	4.92
424_34_10_1_Source_rock_evaluation	pdf	0.44
424_34_10_1_Special_core_analysis	pdf	18.18
424_34_10_1_Special_core_analysis_II	pdf	6.14
424_34_10_1_Special_core_analysis_study	pdf	6.46

424_34_10_1_Supplementary_report_DST_2_flow_3	pdf	0.76
424_34_10_1_Testrapport	pdf	2.12
424_34_10_1_True_boiling_point_distillation	pdf	2.35

Drill stem tests (DST)

Test number	From depth MD [m]	To depth MD [m]	Choke size [mm]
1.0	1930	1935	12.7
2.0	1839	1844	14.3
2.1	1839	1844	6.7
3.0	1788	1792	6.7

Test number	Final shut-in pressure [MPa]	Final flow pressure [MPa]	Bottom hole pressure [MPa]	Downhole temperature [°C]
1.0			13.500	
2.0			29.000	72
2.1			30.000	69
3.0			30.000	69

Test number	Oil [Sm3/day]	Gas [Sm3/day]	Oil density [g/cm3]	Gas grav. rel.air	GOR [m3/m3]
1.0	191	20560	0.881	0.632	108
2.0	1048	86930	0.885	0.610	83
2.1	323	29365	0.879	0.626	
3.0	322	28151	0.882	0.620	

Logs

Log type	Log top depth [m]	Log bottom depth [m]
CBL GR	1400	1771
CBL VDL GR CCL	1725	1950
CBL VDL GR CCL	1760	1925
DLL MSFL GR	1725	1969
FDC CNL GR CAL	1439	2460
FDC GR CAL	487	1454
GEODIP	1776	1970

HDT	1763	1970
HDT	1969	2460
ISF SON GR SP	213	2460
LSS GR	487	1454
LSS GR	1751	1965
MECH PROP LOG	1764	1960
MECH PROP LOG	1765	1960
MLL MC CAL	1969	2460
NGS	1765	2457
TDT	80	1735
VELOCITY	0	0

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	213.0	36	214.0	0.00	LOT
SURF.COND.	20	488.0	26	504.0	0.00	LOT
INTERM.	13 3/8	1441.0	17 1/2	1456.0	0.00	LOT
INTERM.	9 5/8	1765.0	12 1/4	1780.0	0.00	LOT
LINER	7	1969.0	8 1/2	1970.0	0.00	LOT
OPEN HOLE		2462.0	6	2462.0	0.00	LOT

Drilling mud

Depth MD [m]	Mud weight [g/cm3]	Visc. [mPa.s]	Yield point [Pa]	Mud type	Date measured
214	1.05			waterbased	
504	1.10			waterbased	
1288	1.19			waterbased	
1456	1.24			waterbased	
1554	1.49			waterbased	
1853	1.82	42.0		waterbased	
2158	1.76	43.0		waterbased	
2440	1.70	49.0		waterbased	
2462	1.83	52.0		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]
424_Formation_pressure_(Formasjonstrykk)	pdf	0.21