Generell informasjon

Brønnbane navn	34/10-13
Type	EXPLORATION
Formål	APPRAISAL
Status	P&A
Faktakart i nytt vindu	lenke til kart
Hovedområde	NORTH SEA
Felt	GULLFAKS
Funn	34/10-1 Gullfaks
Brønn navn	34/10-13
Seismisk lokalisering	3D - 185 SP: 385.
Utvinningstillatelse	050
Boreoperatør	Den norske stats oljeselskap a.s
Boretillatelse	300-L
Boreinnretning	DEEPSEA SAGA
Boredager	135
Borestart	24.08.1981
Boreslutt	05.01.1982
Frigitt dato	05.01.1984
Publiseringsdato	02.12.2014
Opprinnelig formål	APPRAISAL
Gjenåpnet	NO
Innhold	OIL
Funnbrønnbane	NO
1. nivå med hydrokarboner, alder	EARLY JURASSIC
1. nivå med hydrokarboner, formasjon.	STATFJORD GP
2. nivå med hydrokarboner, alder	LATE JURASSIC
2. nivå med hydrokarboner, formasjon	HEGRE GP
Avstand, boredekk - midlere havflate [m]	25.0
Vanndybde ved midlere havflate [m]	214.0
Totalt målt dybde (MD) [m RKB]	3392.0
Totalt vertikalt dybde (TVD) [m RKB]	3391.0
Maks inklinasjon [°]	3.8
Temperatur ved bunn av brønnbanen [°C]	108
Eldste penetrerte alder	LATE TRIASSIC

Eldste penetrerte formasjon	HEGRE GP
Geodetisk datum	ED50
NS grader	61° 12' 1.93'' N
ØV grader	2° 18' 3'' E
NS UTM [m]	6785486.52
ØV UTM [m]	462422.23
UTM sone	31
NPDID for brønnbanen	431

Brønnhistorie

General

Well 34/10-13 was drilled on a horst block in the eastern part of the Gullfaks Fault Block. The primary objective of the well was to test the sandstone of Early Jurassic age (Statfjord formation). The Secondary objective was Carnian sandstone.

Operations and results

Appraisal well 34/10-13 was spudded with the semi-submersible installation Deepsea Saga on 24 August 1981 and drilled to TD at 3392 m, 76 m into the Carnian sandstone. At 1725 m, the well started to flow. The influx was circulated out with 1.69 s.g. mud. A total of 21.5 days were lost due to a strike after the drilling of the 6" section had been initiated. The well was drilled with spud mud down to 300 m, with seawater gel from 300 m to 893 m, and with gel/lignosulphonate mud from 893 m to TD. The RFT tool stuck at 2882 m during sampling. The tool was left in the hole and the well was plugged back and tested.

First oil shows, typically cut and/or fluorescence on claystone and limestone cuttings, was recorded at 1350 m in the Hordaland Group. The shows were described more or less continuous down to top Statfjord reservoir at 1924 m. When drilling mudstones, limestone and marl in the Lista Formation from 1656 to 1701 m there was oil in the mud. Oil was found from top Statfjord Group at 1924 m and down to at least 2114 m in the Hegre Group where oil was tested on DST. No oil/water contact could be established in the Statfjord sandstone and pressure measurements in the Hegre Group were inconclusive. Shows were recorded on sandstones down to 2450 m. From petrophysical analyses the Statfjord Group had 70 m net pay with 27% average porosity and 24% average water saturation. The Hegre Group reservoir had 16.5 m net pay with average 27.8% porosity and 56% average water saturation. The Carnian sand was encountered at 3316 m. It was waterbearing without shows.

Sixteen cores were cut in the well. Fifteen cores were cut in succession from 1931 m to 2087 m in the Amundsen Formation and Statfjord Group and recovered a total of 150.8 m core (87% total recovery). The last core was cut from 3373.5 m to 3391.5 m in the Carnian sandstone with 92% recovery. RFT fluid samples were taken at 1936.5 m (oil and gas), 1940 m (oil and gas) and 2111 m (oil and gas).

The well was permanently abandoned on 5 January 1982 as an oil appraisal well on the Gullfaks Field.

Testing

Two drill stem tests were performed.

DST 1 tested the interval 2107 m to 2114 m in the Hegre Group. The test produced 440 Sm3 oil/day through a 32/64” choke. The GOR was 82.1 Sm3/Sm3 and the oil gravity was 31 °API. The temperature measured at gauge depth was 84 °C.

DST2 tested the interval 2003 to 2009 m in the Statfjord Group. The test produced 835 Sm3 oil/day through a 32/64” choke. The GOR was 92.5 Sm3/Sm3 and the oil gravity was 40.1 °API. Solution gas had a gravity of 0.82 (air = 1). The temperature measured at gauge depth was 79.8 °C.

Borekaks i Sokkeldirektoratet

Borekaksprøve, topp dybde [m]	Borekaksprøve, bunn dybde [m]
300.00	3378.00

Borekaks tilgjengelig for prøvetaking?	NO

Borekjerner i Sokkeldirektoratet

Kjerneprøve nummer	Kjerneprøve - topp dybde	Kjerneprøve - bunn dybde	Kjerneprøve dybde - enhet
1	1931.1	1931.3	[m]
2	1931.3	1941.8	[m]
4	1944.0	1959.8	[m]
5	1961.0	1961.9	[m]
6	1963.0	1973.7	[m]
7	1974.0	1987.3	[m]
8	1988.0	1997.2	[m]
9	2003.0	2011.2	[m]
10	2011.5	2017.5	[m]
11	2018.5	2034.1	[m]
12	2035.0	2044.7	[m]
13	2047.2	2062.9	[m]
14	2065.5	2075.4	[m]
15	2077.0	2085.0	[m]
16	3373.5	3390.1	[m]

Total kjerneprøve lengde [m]	150.0
Kjerner tilgjengelig for prøvetaking?	YES

Kjernebilder

1931-1931m

1931-1936m

1936-1941m

1944-1949m

1949-1954m

1954-1959m

1961-1962m

1963-1968m

1968-1973m

1974-1978m

1979-1984m

1984-1987m

1988-1993m

1993-1997m

2003-2008m

2008-2011m

2011-2016m

2016-2017m

2018-2023m

2023-2029m

2029-2034m

3379-3385m

2035-2040m

3385-3390m

2040-2044m

2047-2052m

2052-2058m

2058-2063m

2065-2070m

2070-2075m

2077-2082m

2082-2085m

3378-3374m

Palynologiske preparater i Sokkeldirektoratet

Prøve dybde	Dybde enhet	Prøve type	Laboratorie
1110.0	[m]	DC	GEOCH
1140.0	[m]	DC	GEOCH

1170.0	[m]	DC	GEOCH
1200.0	[m]	DC	GEOCH
1230.0	[m]	DC	GEOCH
1260.0	[m]	DC	GEOCH
1290.0	[m]	DC	GEOCH
1320.0	[m]	DC	GEOCH
1350.0	[m]	DC	GEOCH
1380.0	[m]	DC	GEOCH
1410.0	[m]	DC	GEOCH
1430.0	[m]	DC	GEOCH
1460.0	[m]	DC	GEOCH
1490.0	[m]	DC	GEOCH
1518.0	[m]	DC	GEOCH
1545.0	[m]	DC	GEOCH
1572.0	[m]	DC	GEOCH
1599.0	[m]	DC	GEOCH
1626.0	[m]	DC	GEOCH
1653.0	[m]	DC	GEOCH
1680.0	[m]	DC	GEOCH
1707.0	[m]	DC	GEOCH
1725.0	[m]	DC	GEOCH
1743.0	[m]	DC	GEOCH

Oljeprøver i Sokkeldirektoratet

Test type	Flaske nummer	Topp dyp MD [m]	Bunn dyp MD [m]	Væske type	Test tidspunkt	Prøver tilgjengelig
DST	TEST2	2003.00	2009.00		23.12.1981 - 21:15	YES

Litostratigrafi

Topp Dyb [mMD RKB]	Litostrat. enhet
239	NORDLAND GP
942	UTSIRA FM
956	HORDALAND GP
1539	ROGALAND GP
1539	BALDER FM

1596	LISTA FM
1707	SHETLAND GP
1905	DUNLIN GP
1905	AMUNDSEN FM
1924	STATFJORD GP
2052	HEGRE GP

Geokjemisk informasjon

Dokument navn	Dokument format	Dokument størrelse [KB]
431_GCH_1	pdf	1.00
431_GCH_2	pdf	0.34

Dokumenter - eldre Sokkeldirektoratets WDSS rapporter og andre relaterte dokumenter

Dokument navn	Dokument format	Dokument størrelse [KB]
431_01_WDSS_General_Information	pdf	0.20
431_02_WDSS_completion_log	pdf	0.24

Dokumenter - rapportert av utvinningstillatelsen (frigitt ihht til regelverk)

Dokument navn	Dokument format	Dokument størrelse [KB]
431_34_10_13_Completion_log	pdf	1.91
431_34_10_13_Completion_Report	pdf	24.61
431_34_10_13_Conventional_Core_Data	pdf	1.97
431_34_10_13_Paleontological_Stratigraphical_Final_Report	pdf	4.85
431_34_10_13_Petrofysisk_Evaluering	pdf	12.21
431_34_10_13_PVT_study	pdf	0.11
431_34_10_13_Reservoir_Fluid_Study	pdf	0.35
431_34_10_13_Sedimentological_Description	pdf	5.19
431_34_10_13_Well_Test_Report	pdf	10.91

Borestrengtester (DST)

Test nummer	Fra dybde MD [m]	Til dybde MD [m]	Reduksjonsventil størrelse [mm]
1.0	2107	2114	12.7
2.0	2003	2009	12.7

Test nummer	Endelig avstengningstrykk [MPa]	Endelig strømningstrykk [MPa]	Bunnhullstrykk [MPa]	Borehullstemperatur [°C]
1.0				
2.0				

Test nummer	Olje produksjon [Sm3/dag]	Gass produksjon [Sm3/dag]	Oljetetthet [g/cm3]	Gasstyngde rel. luft	GOR [m3/m3]
1.0	467	38000	0.876	0.686	80
2.0	860	82000	0.825	0.645	95

Logger

Type logg	Topp dyp for logg [m]	Bunn dyp for logg [m]
CBL VDL GR	694	2682
CYBERDIP	1717	3394
DIR	1720	3394
DLL MSFL GR	1717	2160
FDC CNL GR CAL	299	3394
GEODIP	1920	2055
HDT	1717	2687
ISF SON GR SP MSFL	299	3393
LSS GR	1898	2155
TDT GR	1920	2371
VDL	1914	2100
WAVEFORM	1914	2100

Foringsrør og formasjonsstyrketester

Type utforing	Utforing diam. [tommer]	Utforing dybde [m]	Brønnbane diam. [tommer]	Brønnbane dyp [m]	LOT/FIT slam eqv. [g/cm3]	Type formasjonstest
CONDUCTOR	30	299.0	36	300.0	0.00	LOT

SURF.COND.	20	869.0	26	893.0	1.47	LOT
INTERM.	13 3/8	1536.0	17 1/2	1542.0	1.80	LOT
INTERM.	9 5/8	1720.0	12 1/4	1725.0	1.95	LOT
LINER	7	2680.0	8 1/2	2700.0	1.96	LOT
OPEN HOLE		3391.5	6	3392.0	0.00	LOT

Boreslam

Dybde MD [m]	Egenvekt, slam [g/cm3]	Viskositet, slam [mPa.s]	Flytegrense [Pa]	Type slam	Dato, måling
300	1.06	70.0		waterbased	
875	1.11	48.0		waterbased	
1380	1.25	49.0		waterbased	
1630	1.60	50.0		waterbased	
1900	1.85	56.0		waterbased	
2425	1.86	53.0		waterbased	
3392	1.65	55.0		waterbased	

Trykkplott

Porertrykksdataene kommer fra logging i brønnen hvis ingen annen kilde er oppgitt. I noen brønner der trykk ikke er logget, er det brukt informasjon fra formasjonstester eller brønnspark. Trykkdataene er rapportert inn til Oljedirektoratet og videre prosessert og kvalitetssikret av IHS Markit.

Dokument navn	Dokument format	Dokument størrelse [KB]
431_Formation_pressure_(Formasjonstrykk)	pdf	0.22