



Generell informasjon

Brønnbane navn	31/4-10
Type	EXPLORATION
Formål	APPRAISAL
Status	P&A
Faktakart i nytt vindu	lenke til kart
Hovedområde	NORTH SEA
Felt	BRAGE
Funn	31/4-3 Brage
Brønn navn	31/4-10
Seismisk lokalisering	NH 9209- ROW 2078 & COLUMN 1224
Utvinningstillatelse	055
Boreoperatør	Norsk Hydro Produksjon AS
Boretillatelse	829-L
Boreinnretning	WEST VANGUARD
Boredager	30
Borestart	14.11.1995
Boreslutt	13.12.1995
Frigitt dato	13.12.1997
Publiseringsdato	06.01.2014
Opprinnelig formål	APPRAISAL
Gjenåpnet	NO
Innhold	OIL/GAS
Funnbrønnbane	NO
1. nivå med hydrokarboner, alder	LATE JURASSIC
1. nivå med hydrokarboner, formasjon.	SOGNEFJORD FM
2. nivå med hydrokarboner, alder	MIDDLE JURASSIC
2. nivå med hydrokarboner, formasjon	FENSFJORD FM
Avstand, boredekk - midlere havflate [m]	22.0
Vanndybde ved midlere havflate [m]	234.0
Totalt målt dybde (MD) [m RKB]	2350.0
Totalt vertikalt dybde (TVD) [m RKB]	2342.0
Maks inklinasjon [°]	2
Temperatur ved bunn av brønnbanen [°C]	94
Eldste penetrerte alder	MIDDLE JURASSIC



Eldste penetrerte formasjon	HEATHER FM
Geodetisk datum	ED50
NS grader	60° 37' 29.78" N
ØV grader	3° 11' 16.11" E
NS UTM [m]	6721185.71
ØV UTM [m]	510277.82
UTM sone	31
NPDID for brønnbanen	2617

Brønnhistorie

**General**

Well 31/4-10 was drilled to appraise the Brage Field on the Bjørgvin Arch in the North Sea. The main objective was to confirm hydrocarbons in the Sognefjord Formation. The secondary objectives were to obtain information about reservoir properties and stratigraphic development of the Fensfjord and Krossfjord Formations.

Operations and results

Appraisal well 31/4-10 was spudded with the semi-submersible installation West Vanguard on 14 November 1995 and drilled to TD at 2342 m in Middle Jurassic sediments in the Heather Formation. The well was drilled and logged without significant problems. It was drilled with spud mud down to 1010 m and with KCl/polymer mud from 1010 m to TD.

A 21 m thick Draupne Formation was penetrated from 2004 m to 2025 m. The Sognefjord Formation was encountered at 2025 m and a total of 4.7 m net pay was calculated in the interval between 2038.0 m and 2044.9 m. The average oil saturation over this interval is estimated to 50.6 %. The average porosity is calculated to 23 %. MDT pressure measurements gave an oil-water contact at 2045 m. Low saturations of residual hydrocarbons are observed in intervals below the oil-water contact down to bottom Sognefjord Formation at 2097.5 m. No gas-oil contact could be determined from pressure measurements or logs because of the low permeability over this interval. However, a gas-oil contact at 2034.5 m was inferred from hydrocarbon shows on the cores. The Fensfjord Formation was encountered at 2167.5 m and a total of 3.2 m net pay was calculated between 2167.5 m and 2171 m. MDT pressure measurements gave an oil-water contact at 2171 m. Low saturations of residual hydrocarbons are observed in intervals below the oil-water contact down to bottom Fensfjord Formation at 2217.5 m. The Krossfjord Formation was penetrated from 2269.5 m to 2277 m and was water bearing without shows.

Eleven cores were cut in the well. Cores 1 to 6 were cut from 2005 in the Draupne Formation, through the Sognefjord Formation and into the Heather Formation at 2114.6 m. One hundred percent recovery was obtained except for core 6, where only 46% recovery was obtained. Cores 7 to 11 were cut from 2171.5 m in the Fensfjord Formation to 2266 m in the Heather Formation. Good recovery was obtained. The recovery on core 11 included recovery of 3.9m from core 10 during running in hole with core 11. MDT oil samples were taken at 2038.5 m in the Sognefjord Formation and at 2168.7 m in the Fensfjord Formation.

The well was permanently abandoned on 13 December 1995 as an oil appraisal well.

Testing

No drill stem test was performed.

Borekaks i Sokkeldirektoratet

Borekaksprøve, topp dybde [m]	Borekaksprøve, bunn dybde [m]
1010.00	2350.00

Borekaks tilgjengelig for prøvetaking?	YES
--	-----



Borekjerne i Sokkeldirektoratet

Kjerneprøve nummer	Kjerneprøve - topp dybde	Kjerneprøve - bunn dybde	Kjerneprøve dybde - enhet
1	2005.0	2023.8	[m]
2	2023.8	2042.1	[m]
3	2042.1	2059.7	[m]
4	2059.7	2078.0	[m]
5	2078.0	2096.6	[m]
6	2096.6	2105.3	[m]
7	2171.5	2186.5	[m]
8	2189.5	2216.1	[m]
9	2217.0	2226.7	[m]
10	2227.0	2248.9	[m]
11	2250.1	2266.0	[m]

Total kjerneprøve lengde [m]	189.4
Kjerner tilgjengelig for prøvetaking?	YES

Kjernebilder



2005-2010m



2010-2015m



2015-2020m



2020-2023m



2023-2028m



2028-2033m



2033-2038m



2038-2042m



2042-2047m



2047-2052m



2052-2057m



2057-2059m



2059-2064m



2064-2069m



2069-2074m



2074-2078m



2078-2083m



2083-2088m



2088-2093m



2093-2096m



2096-2101m



2101-2105m



2171-2176m



2176-2181m



2181-2186m



2186-2186m



2189-2194m



2194-2199m



2199-2204m



2204-2209m



2209-2214m



2214-2216m



2217-2222m



2222-2226m



2227-2232m



2232-2237m



2237-2242m



2242-2247m



2247-2248m



2250-2255m



2255-2260m



2260-2265m



2265-2266m



Litostratigrafi

Topp Dyb [mMD RKB]	Litostrat. enhet
256	NORDLAND GP
742	UTSIRA FM
836	HORDALAND GP
1681	ROGALAND GP
1681	BALDER FM
1742	SELE FM
1774	LISTA FM
1944	SHETLAND GP
1991	CROMER KNOLL GP
2005	VIKING GP
2005	DRAUPNE FM
2025	SOGNEFJORD FM
2098	HEATHER FM
2168	FENSFJORD FM
2218	HEATHER FM
2270	KROSSFJORD FM
2278	HEATHER FM

Geokjemisk informasjon

Dokument navn	Dokument format	Dokument størrelse [KB]
2617 1	pdf	0.32

Dokumenter - rapportert av utvinningstillatelsen (frigitt ihht til regelverk)

Dokument navn	Dokument format	Dokument størrelse [KB]
2617 31 4 10 COMPLETION REPORT AND LOG	pdf	13.38

Logger





Type logg	Topp dyp for logg [m]	Bunn dyp for logg [m]
DLL MAFL LSS LDL CNL GR SP AMS	1930	2349
DLL MSFL LSS GR SP AMS	996	1986
MDT GR	2025	2275
MDT GR	2038	2039
MRIL GR	2010	2110
MWD - GR RES DIR	256	1990
VSP	700	2340

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	330.0	36	330.0	0.00	LOT
SURF.COND.	13 3/8	997.0	17 1/2	1010.0	0.00	LOT
INTERM.	9 5/8	1981.0	12 1/4	1990.0	0.00	LOT
OPEN HOLE		2350.0	8 1/2	2350.0	0.00	LOT

Boreslam

Dybde MD [m]	Egenvekt, slam [g/cm3]	Viskositet, slam [mPa.s]	flytegrense [Pa]	Type slam	Dato, måling
330	1.10			water based	
1488	1.25	27.0		water based	
1659	1.39	25.0		water based	
1831	1.17	15.0		water based	
1990	1.45	30.0		water based	
2055	1.17	13.0		water based	
2350	1.17	15.0		water based	

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]
2617 Formation pressure (Formasjonstrykk)	pdf	0.22

