Generell informasjon

Brønnbane navn	7120/12-2
Type	EXPLORATION
Formål	WILDCAT
Status	P&A
Faktakart i nytt vindu	lenke til kart
Hovedområde	BARENTS SEA
Funn	7120/12-2 (Alke Sør)
Brønn navn	7120/12-2
Seismisk lokalisering	722 272 SP: 175.
Utvinningstillatelse	061
Boreoperatør	Norsk Hydro Produksjon AS
Boretillatelse	284-L
Boreinnretning	TREASURE SEEKER
Boredager	150
Borestart	15.04.1981
Boreslutt	11.09.1981
Frigitt dato	11.09.1983
Publiseringsdato	11.02.2005
Opprinnelig formål	WILDCAT
Gjenåpnet	NO
Innhold	GAS/CONDENSATE
Funnbrønnbane	YES
1. nivå med hydrokarboner, alder	JURASSIC
1. nivå med hydrokarboner, formasjon.	STØ FM
2. nivå med hydrokarboner, alder	MIDDLE TRIASSIC
2. nivå med hydrokarboner, formasjon	SNADD FM
Avstand, boredekk - midlere havflate [m]	25.0
Vanndybde ved midlere havflate [m]	164.0
Totalt målt dybde (MD) [m RKB]	4680.0
Totalt vertikalt dybde (TVD) [m RKB]	4667.0
Maks inklinasjon [°]	9.25
Temperatur ved bunn av brønnbanen [°C]	115
Eldste penetrerte alder	PRE-DEVONIAN
Eldste penetrerte formasjon	BASEMENT

Geodetisk datum	ED50
NS grader	71° 7' 30.3'' N
ØV grader	20° 48' 19'' E
NS UTM [m]	7891571.43
ØV UTM [m]	492968.97
UTM sone	34
NPDID for brønnbanen	122

Brønnhistorie

General

The primary objectives of well 7120/12-2 were to test sandstone reservoirs of Middle to Early Jurassic age in the central compartment of the Alke structure, and a deep seismic marker interpreted to represent top of a possible carbonate reservoir of Permian age. A secondary objective was to test sandstones of Early Triassic age. The well was planned to be drilled to 5000 m or into basement rocks to serve as the deep commitment well on the licence.

Operations and results

Well 7120/12-2 was spudded with the semi-submersible installation Treasure Seeker on 15 April 1981 and drilled to TD at 4680 m in basement rocks. After setting the 20" casing the kill line outlet flange was accidentally damaged and 5 days were spent repairing the BOP. The well was drilled with bentonite/seawater mud down to 515 m and with lignosulphonate (Spersene / XP-20) mud from 515 m to TD. Severe problems were encountered with gumbo type clays during the interval from about 800 m to 1400 m.

A major fault was penetrated at 2410 m in the well, faulting out approximately 400 m of the Triassic section. This is evident from comparing the Triassic sequences penetrated in the well 7120/12-1 and 7120/12-2. Rocks of Permian age were encountered from 3657 m while metamorphic basement was encountered at 4664 m. Hydrocarbon bearing sandstones were encountered in the Middle to Late Jurassic and in the Middle to Late Triassic.

The "Alke Formation" from 1892 m to 2314 m (Stø, Nordmela, Tubåen , and most of the Fruholmen Formation) was found hydrocarbon bearing from 1888 m to the gas/water contact at 1981.5 m. This interval consisted of relatively clean, fine to occasionally coarse grained, homogeneous sandstones separated by thin silty and argillaceous beds. Towards the base, the sandstones were predominantly very fine to fine grained, becoming increasingly argillaceous and micaceous. The net pay was, from wire line logs, calculated to 76 m, with 20% average porosity and an average water saturation of 19%. RFT pressure recordings and sampling were successfully performed over the interval. This gave a clear gas gradient of 0.088 psi/ft with an underlying water gradient of 0.458 psi/ft.

The Middle to Late Triassic hydrocarbon-bearing interval from 2547 m to 2574 m (Snadd Formation) consisted of fine to very fine-grained sandstone beds with stringers and thin beds of limestone and calcareous cemented sandstone. The net pay was calculated to 14 m, with 23% average porosity and an average water saturation of 30 %. Due to hole conditions, no RFT sampling was performed in this sequence. RFT pressure readings were, however, run through the interval and gave a gas gradient of 0.076 psi/ft. Gas shows were also reported in the Late Triassic (2513 m to 2547 m, Snadd Formation), Early Triassic (2935 m to 3075 m, Kobbe Formation) and in Permian sandstones (3657 m to 3800 m, Ørret Formation). The water saturation in these intervals ranged from 50 -

100% and based on log interpretation, the hydrocarbons were assumed to be non-moveable. Very poor permeabilities were indicated in the Early Triassic and Permian intervals from RFT pressure readings.

Organic geochemical analyses showed rich potential for gas/condensate generation in the Late Jurassic Hekkingen Formation (1630 m to 1859 m), Below this level Early Jurassic to Middle Triassic sequences contained carbonaceous sequences and coal beds with potential for gas and possibly oil. All sediments down to 2500 m to 3000 m are immature. Migrant hydrocarbons were frequently detected all through the well. This could indicate contamination from oil in the mud, although the mud used should be water based.

Six conventional cores were cut in the Middle Jurassic Fuglen, Stø, and Nordmela Formations from 1888 m to 2050 m, and two were cut from 3671 m to 3689 m and 4117 m to 4128 m in Permian sandstones. A final core was cut at TD from 4675 m to 4680.5 m and recovered 5.5 m of gneiss. Two RFT samples at 1978 m and 1943.5 m recovered gas and small volumes of condensate.

The well was permanently abandoned on 11 September as a gas/condensate discovery.

Testing

Three drill stem tests were performed, one on the Triassic and two in the Middle Jurassic.

DST 1 perforated the interval 2562 m to 2568 m in the Middle Triassic Snadd Formation and flowed 417700 Sm3/day gas of gravity 0.62, and 25.1 Sm3/day condensate of gravity 55.92° API, through a 1/2" choke. The GOR was 16630 Sm3/Sm3.

DST 2 perforated the interval 1985 m to 1991 m in the water-zone in the Middle to Late Jurassic reservoir (lower Stø and upper Nordmela Formations) and flowed 160 Sm3 water/day through a 172/64"choke.

A sample labelled DST 2 was submitted to the NPD oil store. Since it contains condensate and not water it is probably a mis-labelled DST 1 or DST 3 sample.

DST 3 perforated the interval 1944 m to 1950 m Stø Formation) and flowed 758000 Sm3/day gas of gravity 0.626, and 52.5 Sm3/day condensate of gravity 64.4° API, through a 60/64" choke. The GOR was 14430 Sm3/Sm3.

Borekaks i Sokkeldirektoratet

Borekaksprøve, topp dybde [m]	Borekaksprøve, bunn dybde [m]
320.00	4680.00

Borekaks tilgjengelig for prøvetaking?	YES

Borekjerner i Sokkeldirektoratet

Kjerneprøve nummer	Kjerneprøve - topp dybde	Kjerneprøve - bunn dybde	Kjerneprøve dybde - enhet
1	1888.0	1903.5	[m]
2	1960.0	1979.4	[m]

3	1978.0	1994.9	[m]
4	1996.0	2013.2	[m]
5	2013.2	2031.9	[m]
6	2032.0	2050.0	[m]
7	3671.0	3688.4	[m]
8	4117.0	4128.1	[m]
9	4675.0	4680.5	[m]

Total kjerneprøve lengde [m]	139.7
Kjerner tilgjengelig for prøvetaking?	YES

Kjernebilder


1888-1890m


1890-1893m


1893-1895m


1895-1898m


1899-1901m


1901-1903m


1903-1904m


1960-1962m


1962-1965m


1965-1967m


1967-1970m


1970-1972m


1972-1975m


1975-1977m


1977-1978m


1978-1980m


1980-1983m


1983-1985m


1985-1988m


1988-1981m


1991-1993m


1993-1995m


1996-1998m


1998-2000m


2000-2003m


2003-2006m


2006-2008m


2008-2011m


2011-2014m


2014-2016m


2016-2019m


2019-2022m


2022-2024m


2024-2027m


2027-2030m


2030-2031m


2032-2034m


2034-2037m


2037-2039m


2039-2042m


2042-2045m


2045-2047m


2047-2050m


3671-3676m


3676-3681m


3681-3684m


3684-3688m


4117-4121m


4121-4124m


4124-4128m

4675-4678m

4678-4680m

Palynologiske preparater i Sokkeldirektoratet

Prøve dybde	Dybde enhet	Prøve type	Laboratorie
360.0	[m]	DC	OD
380.0	[m]	DC	OD
450.0	[m]	DC	OD
480.0	[m]	DC	OD
500.0	[m]	DC	OD
530.0	[m]	DC	OD
560.0	[m]	DC	OD
600.0	[m]	DC	OD
610.0	[m]	SWC	IKU
640.0	[m]	DC	OD
680.0	[m]	DC	OD
698.0	[m]	SWC	IKU
702.0	[m]	SWC	IKU
717.0	[m]	SWC	IKU
725.0	[m]	SWC	IKU
728.5	[m]	SWC	IKU
737.0	[m]	SWC	IKU
743.0	[m]	SWC	IKU
750.0	[m]	DC	OD
770.0	[m]	DC	OD
783.0	[m]	SWC	IKU
790.0	[m]	DC	OD
810.0	[m]	DC	OD
830.0	[m]	DC	OD
836.0	[m]	SWC	IKU
850.0	[m]	DC	OD
870.0	[m]	DC	OD
890.0	[m]	DC	OD
910.0	[m]	DC	OD

921.0	[m]	SWC	IKU
930.0	[m]	DC	OD
948.0	[m]	SWC	IKU
980.0	[m]	SWC	IKU
1019.0	[m]	SWC	IKU
1057.0	[m]	SWC	IKU
1091.0	[m]	SWC	IKU
1101.0	[m]	SWC	IKU
1148.0	[m]	SWC	IKU
1165.0	[m]	SWC	IKU
1184.0	[m]	SWC	IKU
1222.0	[m]	SWC	IKU
1256.0	[m]	SWC	IKU
1267.5	[m]	SWC	IKU
1290.0	[m]	SWC	IKU
1305.0	[m]	SWC	IKU
1316.0	[m]	SWC	IKU
1373.0	[m]	SWC	IKU
1415.0	[m]	SWC	IKU
1440.0	[m]	SWC	IKU
1450.0	[m]	SWC	IKU
1460.0	[m]	SWC	IKU
1463.0	[m]	SWC	IKU
1465.0	[m]	SWC	IKU
1490.0	[m]	SWC	IKU
1516.0	[m]	SWC	IKU
1537.0	[m]	SWC	IKU
1557.0	[m]	SWC	IKU
1561.0	[m]	SWC	IKU
1572.5	[m]	SWC	IKU
1615.0	[m]	SWC	IKU
1626.0	[m]	SWC	IKU
1633.0	[m]	SWC	IKU
1637.0	[m]	SWC	IKU
1643.0	[m]	SWC	IKU
1657.4	[m]	SWC	IKU
1665.0	[m]	SWC	IKU
1671.0	[m]	SWC	IKU
1687.0	[m]	SWC	IKU
1705.0	[m]	SWC	IKU

1716.5	[m]	SWC	IKU
1717.0	[m]	SWC	IKU
1764.0	[m]	SWC	IKU
1785.0	[m]	SWC	IKU
1797.0	[m]	SWC	IKU
1820.0	[m]	SWC	IKU
1827.0	[m]	SWC	IKU
1842.5	[m]	SWC	IKU
1895.0	[m]	SWC	IKU
1897.6	[m]	C	IKU
1901.0	[m]	C	ICHRON
1960.5	[m]	C	IKU
1960.5	[m]	C	ICHRON
1963.6	[m]	C	IKU
1966.1	[m]	C	ICHRON
1966.1	[m]	C	IKU
1966.4	[m]	C	IKU
1974.5	[m]	C	IKU
1976.3	[m]	C	IKU
1976.4	[m]	C	ICHRON
1983.9	[m]	C	ICHRON
1984.5	[m]	C	ICHRON
1992.7	[m]	C	ICHRON
1992.7	[m]	C	IKU
1996.6	[m]	C	ICHRON
1998.5	[m]	C	IKU
2001.8	[m]	C	ICHRON
2005.6	[m]	C	ICHRON
2007.0	[m]	C	IKU
2007.8	[m]	C	ICHRON
2010.6	[m]	C	ICHRON
2015.7	[m]	C	ICHRON
2018.5	[m]	C	ICHRON
2018.6	[m]	C	IKU
2020.9	[m]	C	ICHRON
2021.7	[m]	C	IKU
2025.4	[m]	C	ICHRON
2027.2	[m]	C	IKU
2027.4	[m]	C	ICHRON
2031.5	[m]	C	ICHRON

2032.7	[m]	C	ICHRON
2034.4	[m]	C	IKU
2034.4	[m]	C	ICHRON
2038.8	[m]	C	IKU
2038.8	[m]	C	ICHRON
2041.7	[m]	C	IKU
2043.7	[m]	C	ICHRON
2046.7	[m]	C	ICHRON
2046.8	[m]	C	IKU
2048.2	[m]	C	ICHRON
2049.5	[m]	C	ICHRON
2068.0	[m]	C	IKU
2106.0	[m]	C	IKU
2120.9	[m]	C	IKU
2122.5	[m]	C	IKU
2142.0	[m]	C	IKU
2160.0	[m]	C	IKU
2180.0	[m]	C	IKU
2202.0	[m]	C	IKU
2215.0	[m]	C	IKU
2262.0	[m]	C	IKU
2278.0	[m]	C	IKU
2284.5	[m]	C	IKU
2326.0	[m]	SWC	IKU
2348.0	[m]	C	UIB
2350.0	[m]	SWC	IKU
2365.0	[m]	C	UIB
2378.0	[m]	C	UIB
2393.0	[m]	C	UIB
2393.0	[m]	C	UIB
2398.0	[m]	C	UIB
2408.0	[m]	SWC	IKU
2421.0	[m]	SWC	IKU
2425.0	[m]	C	UIB
2443.0	[m]	C	UIB
2468.0	[m]	C	UIB
2476.0	[m]	SWC	IKU
2498.0	[m]	SWC	IKU
2510.0	[m]	C	UIB
2512.0	[m]	SWC	IKU

2515.0	[m]	C	UIB
2523.0	[m]	C	UIB
2533.0	[m]	C	UIB
2547.0	[m]	SWC	IKU
2554.0	[m]	SWC	IKU
2570.0	[m]	C	UIB
2577.0	[m]	SWC	IKU
2587.9	[m]	SWC	IKU
2590.0	[m]	C	UIB
2622.0	[m]	SWC	IKU
2625.0	[m]	C	UIB
2636.0	[m]	SWC	IKU
2645.0	[m]	C	UIB
2647.1	[m]	SWC	IKU
2664.1	[m]	SWC	IKU
2686.0	[m]	SWC	IKU
2703.0	[m]	SWC	IKU
2728.0	[m]	SWC	IKU
2740.0	[m]	SWC	IKU
2785.0	[m]	SWC	IKU
2799.9	[m]	SWC	IKU
2814.9	[m]	SWC	IKU
2830.0	[m]	SWC	IKU
2843.0	[m]	SWC	IKU
2855.0	[m]	SWC	IKU
2867.0	[m]	SWC	IKU
2878.0	[m]	SWC	IKU
2890.0	[m]	SWC	IKU
2912.0	[m]	SWC	IKU
2922.0	[m]	SWC	IKU
2935.0	[m]	SWC	IKU
2943.0	[m]	SWC	IKU
2954.0	[m]	SWC	IKU
2964.0	[m]	SWC	IKU
2981.9	[m]	SWC	IKU
2992.0	[m]	SWC	IKU
3018.0	[m]	SWC	IKU
3026.9	[m]	SWC	IKU
3038.0	[m]	SWC	IKU
3051.9	[m]	SWC	IKU

3061.0	[m]	SWC	IKU
3072.0	[m]	SWC	IKU
3085.0	[m]	SWC	IKU
3103.0	[m]	SWC	IKU
3120.0	[m]	SWC	IKU
3131.0	[m]	SWC	IKU
3157.0	[m]	SWC	IKU
3200.0	[m]	SWC	IKU
3222.0	[m]	SWC	IKU
3234.0	[m]	SWC	IKU
3265.0	[m]	SWC	IKU
3294.0	[m]	SWC	IKU
3319.0	[m]	SWC	IKU
3326.0	[m]	SWC	IKU
3349.0	[m]	SWC	IKU
3367.0	[m]	SWC	IKU
3391.0	[m]	SWC	IKU
3413.0	[m]	SWC	IKU
3432.0	[m]	SWC	IKU
3489.0	[m]	SWC	IKU
3497.0	[m]	SWC	IKU
3532.0	[m]	SWC	IKU
3551.0	[m]	SWC	IKU
3568.0	[m]	SWC	IKU
3591.0	[m]	SWC	IKU
3599.0	[m]	SWC	IKU
3624.0	[m]	SWC	IKU
3648.0	[m]	SWC	IKU
3650.0	[m]	DC	
3667.5	[m]	SWC	IKU
3682.3	[m]	C	OD
3682.5	[m]	C	IKU
3700.0	[m]	DC	
3703.0	[m]	SWC	IKU
3713.0	[m]	SWC	IKU
3734.0	[m]	SWC	IKU
3750.0	[m]	DC	
3750.5	[m]	SWC	IKU
3763.5	[m]	SWC	IKU
3789.0	[m]	SWC	IKU

3828.0	[m]	SWC	IKU
3850.0	[m]	DC	
3864.0	[m]	SWC	IKU
3899.5	[m]	SWC	IKU
3900.0	[m]	DC	
3982.0	[m]	SWC	IKU
4059.0	[m]	SWC	IKU
4077.5	[m]	SWC	IKU
4104.0	[m]	SWC	IKU
4121.1	[m]	C	IKU
4121.2	[m]	C	IKU
4121.2	[m]	C	OD
4123.8	[m]	C	IKU
4123.9	[m]	C	IKU
4126.8	[m]	C	IKU
4130.0	[m]	SWC	IKU
4141.5	[m]	SWC	IKU
4150.0	[m]	DC	
4158.0	[m]	SWC	IKU
4224.0	[m]	SWC	IKU
4250.0	[m]	SWC	IKU
4273.0	[m]	SWC	IKU
4292.5	[m]	SWC	IKU
4300.0	[m]	DC	
4310.0	[m]	SWC	IKU
4335.0	[m]	SWC	IKU
4360.5	[m]	SWC	IKU
4398.0	[m]	SWC	IKU
4417.0	[m]	SWC	IKU
4434.0	[m]	SWC	IKU
4448.5	[m]	SWC	IKU
4500.0	[m]	DC	
4535.5	[m]	SWC	IKU

Oljeprøver i Sokkeldirektoratet

Test type	Flaske nummer	Topp dyp MD [m]	Bunn dyp MD [m]	Væske type	Test tidspunkt	Prøver tilgjengelig
DST		1985.00	1991.00	CONDENSATE	03.09.1981 - 00:00	YES

Litostratigrafi

Topp Dyb [mMD RKB]	Litostrat. enhet
189	NORDLAND GP
463	SOTBAKKEN GP
463	TORSK FM
701	NYGRUNNEN GP
701	KVITING FM
745	ADVENTDALEN GP
745	KOLMULE FM
1309	KOLJE FM
1455	KNURR FM
1700	HEKKINGEN FM
1875	FUGLEN FM
1892	KAPP TOSCANA GP
1892	STØ FM
1978	NORDMELA FM
2152	TUBÅEN FM
2234	FRUHOLMEN FM
2354	SNADD FM
2927	SASSENDALEN GP
2927	KOBBE FM
3095	KLAPPMYSS FM
3552	HAVERT FM
3657	TEMPELFJORDEN GP
3657	ØRRET FM
3920	RØYE FM
3975	ØRRET FM
4031	RØYE FM
4076	ØRRET FM
4485	RØYE FM
4558	GIPSDALEN GP
4558	UGLE FM
4664	BASEMENT

Spleisede logger

Dokument navn	Dokument format	Dokument størrelse [KB]
122	pdf	0.92

Geokjemisk informasjon

Dokument navn	Dokument format	Dokument størrelse [KB]
122_1	pdf	6.13
122_2	pdf	2.79

Dokumenter - eldre Sokkeldirektoratets WDSS rapporter og andre relaterte dokumenter

Dokument navn	Dokument format	Dokument størrelse [KB]
122_01_WDSS_General_Information	pdf	0.12
122_02_WDSS_completion_log	pdf	0.36

Dokumenter - rapportert av utvinningstillatelsen (frigitt ihht til regelverk)

Dokument navn	Dokument format	Dokument størrelse [KB]
122_01_Completion_Report	pdf	16.22
122_02_Completion_log	pdf	3.33

Borestrengtester (DST)

Test nummer	Fra dybde MD [m]	Til dybde MD [m]	Reduksjonsven til størrelse [mm]
1.0	2562	2568	25.1
2.0	1985	1991	68.3
3.0	1944	1950	23.1

Test nummer	Endelig avstengningstrykk [MPa]	Endelig strømningstrykk [MPa]	Bunnhullstrykk [MPa]	Borehullstemperatur [°C]
1.0				77
2.0				66
3.0				66

Test nummer	Olje produksjon [Sm3/dag]	Gass produksjon [Sm3/dag]	Oljetetthet [g/cm3]	Gasstyngde rel. luft	GOR [m3/m3]
1.0	25	418000	0.755	0.620	16624
2.0					
3.0	53	758000	0.722	0.630	14425

Logger

Type logg	Topp dyp for logg [m]	Bunn dyp for logg [m]
CALI	3096	4675
CBL	1850	2002
CBL VDL	1850	3096
CST	610	1305
CST	1316	1717
CST	1747	2370
CST	2394	3061
CST	2785	3103
CST	3120	3703
CST	3713	4417
CST	3713	4177
CST	3920	4670
CST	4195	4670
CST	4195	4670
CYBERDIP	500	1719
CYBERDIP	2200	3116
CYBERDIP	3096	4675
DLL MSFL GR	1850	2164
DLL MSFL GR	2400	3115
DLL MSFL GR	3525	3913
FIL	2800	3115
HDT	500	4675

ISF BHC GR	500	1721
ISF LSS GR	189	512
ISF LSS GR	1707	4674
LDT CNL GR CAL	500	4675
LDT GR CAL	312	513
NGS	1850	2100
RFT	1888	2148
RFT	2165	3004
RFT	3141	3281
RFT	3555	3859
RFT	3766	3780
VELOCITY	727	4671
WFT	1850	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	312.0	36	313.0	0.00	LOT
SURF.COND.	20	502.0	26	515.0	1.74	LOT
INTERM.	13 3/8	1710.0	17 1/2	1724.0	1.92	LOT
INTERM.	9 5/8	3101.0	12 1/4	3116.0	2.08	LOT
OPEN HOLE		4680.0	8 3/8	4680.0	0.00	LOT

Boreslam

Dybde MD [m]	Egenvekt, slam [g/cm3]	Viskositet, slam [mPa.s]	Flytegrense [Pa]	Type slam	Dato, måling
515	1.12	51.0	12.0	WATER BASED	
1625	1.18	65.0	20.0	WATER BASED	
1888	1.36	46.0	8.0	WATER BASED	
2354	1.36	48.0	9.0	WATER BASED	
2985	1.40	48.0	4.0	WATER BASED	
3117	1.53	60.0	6.0	WATER BASED	
3532	1.59	49.0	6.0	WATER BASED	
3884	1.89	54.0	8.5	WATER BASED	
4103	1.93	54.0	11.0	WATER BASED	
4680	1.93	68.0	22.0	WATER BASED	

Tynnslip i Sokkeldirektoratet

Dybde	Enhet
4679.71	[m]
4124.00	[m]
4119.74	[m]
3684.90	[m]
3675.60	[m]
3671.20	[m]
2048.15	[m]

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]
122_Formation_pressure_(Formasjonstrykk)	pdf	0.29