

**General information**

Wellbore name	7120/1-4 S
Type	EXPLORATION
Purpose	APPRAISAL
Status	P&A
Press release	link to press release
Factmaps in new window	link to map
Main area	BARENTS SEA
Discovery	7120/1-3 (Gohta)
Well name	7120/1-4
Seismic location	LN09M03 FullStack inline 5010 & crossline 3633
Production licence	492
Drilling operator	Lundin Norway AS
Drill permit	1513-L
Drilling facility	ISLAND INNOVATOR
Drilling days	73
Entered date	23.05.2014
Completed date	03.08.2014
Release date	03.08.2016
Publication date	03.08.2016
Purpose - planned	APPRAISAL
Reentry	NO
Content	GAS
Discovery wellbore	NO
1st level with HC, age	PERMIAN
1st level with HC, formation	NO FORMAL NAME
Kelly bushing elevation [m]	30.0
Water depth [m]	331.5
Total depth (MD) [m RKB]	2520.0
Final vertical depth (TVD) [m RKB]	2520.0
Maximum inclination [°]	5.3
Bottom hole temperature [°C]	97
Oldest penetrated age	LATE PERMIAN
Oldest penetrated formation	RØYE FM
Geodetic datum	ED50
NS degrees	71° 56' 19.5" N
EW degrees	20° 10' 8.91" E
NS UTM [m]	7982516.01



EW UTM [m]	471248.44
UTM zone	34
NPDID wellbore	7429

Wellbore history

General

Well 7120/1-4 S was drilled on the 7120/1-3 Gotha structure, situated on the southern end of the Loppa High in the Barents Sea. The discovery well 7120/1-3 found oil and gas in Late Permian karst carbonates of the Røye Formation. The primary objective of 7120/1-4 S was to test the reservoir properties and hydrocarbon potential of the Gohta Karst prospect. The secondary objective was to test the reservoir properties and hydrocarbon potential of a potential sandstone sequences in the Kobbe, Klappmyss and Havert formations.

Operations and results

Appraisal well 7120/1-4 S was spudded with the semi-submersible installation Island Innovator on 23 May 2014 and drilled to TD at 2520 m (2520 m TVD) in the Late Permian Røye Formation. No significant problem was encountered in the operations. The well was originally planned as an "S" shaped well. This was due to geological hazards connected to a deep-seated fault. Since TD was set 450 m shallow to plan, no deviation was necessary and the well became vertical despite the "S" denotation in the well name. The well was drilled with seawater and hi-vis pills down to 665 m and with Aquadril mud from 665 m to TD.

The well encountered blocky sandstones in the upper (764.5-802.5 m) Snadd Formation and thin sandstone beds in the lower Snadd target (interval 1200 to 1300 m), but the reservoirs proved water filled. The Kobbe and Klappmyss formations had no reservoir development. A 12.5 m thick mainly gas bearing conglomeratic sandstone unit (interval 2301-2313.5 m), was found at the Permo-Triassic boundary. This unit had pressure gradient almost identical to that of 7120/1-3, indicating a pressure communication between 7120/1-3 and 7120/1-4 S. Stratigraphic age is uncertain but it is likely of Late Permian to Early Triassic in age. Carbonates consisting of partly dolomitic limestones with thin claystone laminae were found from the base of the cored conglomerates/breccia at 2315.77 m to TD at 2520 m. The Gohta Karst reservoir was poorly developed to absent in this well. The carbonates were hydrocarbon bearing, but due to poor reservoir quality, it was not possible to establish an oil-water contact.

Isolated hydrocarbon / oil shows were described at 750 m, 770 m, 850 m and 870 m. No further shows were observed before entering the conglomeratic breccia at 2301 m. Continuous shows were described from this depth to 2323 m, where it became more patchy. The deepest show described was at 2464 m.

A total of 112.25 m core was recovered in the interval 2306 to 2419.16 m (99.2% total recovery). MDT fluid samples were acquired from one station at 2308.57 m. The samples contained condensate. Single flash of the condensate gave a GOR in the range 5800 to 6800 Sm³/Sm³, liquid condensate density in the range 0.724 to 0.732 g/cm³, and gas gravity in the range 0.667 to 0.670 (air = 1).

The well was permanently abandoned on 3 August 2014 as an oil and gas appraisal well.

Testing

Two DST's were conducted.



DST 1A tested the carbonate oil zone in the interval 2335 to 2385 m. The test produced 30 Sm³ condensate and 160000 Sm³ gas through a 20/64" choke. It was found that the test produced gas from the gas zone above due to lack of cement behind the liner and that the tested carbonate interval contributed nothing to the flow.

DST 1A+B tested the interval 2335 to 2385 m + the conglomeratic breccia gas zone in the interval 2295 to 2312 m. This test produced 140 Sm³ condensate and 700000 Sm³ gas /day through a 52/64" choke. The GOR was 4500 Sm³/Sm³, the liquid condensate density was 0.730 g/cm³ and the gas gravity was 0.699 (air = 1). H₂S and CO₂ was less than 1 ppm and 1.1 %, respectively.

Cuttings at the Norwegian Offshore Directorate

Cutting sample, top depth [m]	Cutting samples, bottom depth [m]
680.00	2520.00

Cuttings available for sampling?	YES
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Cores at the Norwegian Offshore Directorate

Core sample number	Core sample - top depth	Core sample - bottom depth	Core sample depth - uom
1	2306.0	2332.6	[m]
2	2333.0	2361.3	[m]
3	2361.3	2364.2	[m]
4	2364.5	2391.3	[m]
5	2391.5	2419.2	[m]

Total core sample length [m]	112.3
Cores available for sampling?	YES

Palynological slides at the Norwegian Offshore Directorate

Sample depth	Depth unit	Sample type	Laboratory
680.0	[m]	DC	ROBERTSO
700.0	[m]	DC	ROBERT
720.0	[m]	DC	ROBERT
730.0	[m]	DC	ROBERT
740.0	[m]	DC	ROBERT
750.0	[m]	DC	ROBERT
760.0	[m]	DC	ROBERT
780.0	[m]	DC	ROBERT



800.0 [m]	DC	ROBERT
820.0 [m]	DC	ROBERT
840.0 [m]	DC	ROBERT
860.0 [m]	DC	ROBERT
880.0 [m]	DC	ROBERT
900.0 [m]	DC	ROBERT
920.0 [m]	DC	ROBERT
940.0 [m]	DC	ROBERT
960.0 [m]	DC	ROBERT
980.0 [m]	DC	
1000.0 [m]	DC	ROBERT
1020.0 [m]	DC	ROBERT
1040.0 [m]	DC	ROBERT
1060.0 [m]	DC	ROBERT
1080.0 [m]	DC	ROBERT
1100.0 [m]	DC	ROBERT
1120.0 [m]	DC	ROBERT
1140.0 [m]	DC	ROBERT
1160.0 [m]	DC	ROBERT
1180.0 [m]	DC	ROBERT
1200.0 [m]	DC	ROBERT
1220.0 [m]	DC	ROBERT
1240.0 [m]	DC	ROBERT
1260.0 [m]	DC	ROBERT
1280.0 [m]	DC	ROBERT
1300.0 [m]	DC	ROBERT
1320.0 [m]	DC	ROBERT
1340.0 [m]	DC	ROBERT
1360.0 [m]	DC	ROBERT
1380.0 [m]	DC	ROBERT
1400.0 [m]	DC	ROBERT
1430.0 [m]	DC	ROBERT
1440.0 [m]	DC	ROBERT
1460.0 [m]	DC	ROBERT
1480.0 [m]	DC	ROBERT
1500.0 [m]	DC	ROBERT
1520.0 [m]	DC	ROBERT
1540.0 [m]	DC	ROBERT
1560.0 [m]	DC	ROBERT
1580.0 [m]	DC	ROBERT



1600.0	[m]	DC	ROBERT
1620.0	[m]	DC	ROBERT
1640.0	[m]	DC	ROBERT
1660.0	[m]	DC	ROBERT
1680.0	[m]	DC	ROBERT
1700.0	[m]	DC	ROBERT
1710.0	[m]	DC	ROBERT
1725.0	[m]	DC	ROBERT
1740.0	[m]	DC	ROBERT
1755.0	[m]	DC	ROBERT
1770.0	[m]	DC	ROBERT
1785.0	[m]	DC	ROBERT
1800.0	[m]	DC	ROBERT
1815.0	[m]	DC	ROBERT
1845.0	[m]	DC	ROBERT
1860.0	[m]	DC	ROBERT
1880.0	[m]	DC	ROBERT
1910.0	[m]	DC	ROBERT
1925.0	[m]	DC	ROBERT
1940.0	[m]	DC	ROBERT
1955.0	[m]	DC	ROBERT
1970.0	[m]	DC	ROBERT
1985.0	[m]	DC	ROBERT
1995.0	[m]	DC	ROBERT
2000.0	[m]	DC	ROBERT
2015.0	[m]	DC	ROBERT
2030.0	[m]	DC	ROBERT
2045.0	[m]	DC	ROBERT
2060.0	[m]	DC	ROBERT
2075.0	[m]	DC	ROBERT
2085.0	[m]	DC	ROBERT
2100.0	[m]	DC	ROBERT
2115.0	[m]	DC	ROBERT
2131.0	[m]	DC	ROBERT
2149.0	[m]	DC	ROBERT
2167.0	[m]	DC	ROBERT
2185.0	[m]	DC	ROBERT
2203.0	[m]	DC	ROBERT
2221.0	[m]	DC	ROBERT
2239.0	[m]	DC	ROBERT



2257.0 [m]	DC	ROBERT
2275.0 [m]	DC	ROBERT
2281.0 [m]	DC	ROBERT
2287.0 [m]	DC	ROBERT
2290.0 [m]	DC	ROBERT
2293.0 [m]	DC	ROBERT
2296.0 [m]	DC	ROBERT
2299.0 [m]	DC	ROBERT
2302.0 [m]	DC	ROBERT
2306.0 [m]	DC	ROBERT
2306.0 [m]	C	APT
2307.3 [m]	C	APT
2309.5 [m]	C	ROBERT
2310.9 [m]	C	APT
2312.1 [m]	C	APT
2313.8 [m]	C	ROBERT
2315.5 [m]	C	APT
2315.5 [m]	C	ROBERT
2317.7 [m]	C	ROBERT
2323.8 [m]	C	ROBERT
2323.8 [m]	C	ROBERT
2327.4 [m]	C	ROBERT
2328.9 [m]	C	ROBERT
2343.9 [m]	C	ROBERT
2352.3 [m]	C	ROBERT
2358.5 [m]	C	ROBERT
2368.7 [m]	C	ROBERT
2373.8 [m]	C	ROBERT
2386.8 [m]	C	ROBERT
2393.0 [m]	C	ROBERT
2396.7 [m]	C	ROBERT
2409.0 [m]	C	ROBERT
2418.4 [m]	C	ROBERT

Lithostratigraphy

Top depth [mMD RKB]	Lithostrat. unit
362	NORDLAND GP
362	UNDIFFERENTIATED



389	UNDIFFERENTIATED
451	SOTBAKKEN GP
451	TORSK FM
733	KAPP TOSCANA GP
733	SNADD FM
2274	SASSENDALEN GP
2274	KOBBE FM
2285	KLAPPMYSS FM
2301	UNDEFINED GP
2301	UNDIFFERENTIATED
2314	TEMPELFJORDEN GP
2314	RØYE FM

Drill stem tests (DST)

Test number	From depth MD [m]	To depth MD [m]	Choke size [mm]
1.0	2295	2385	20.6

Test number	Final shut-in pressure [MPa]	Final flow pressure [MPa]	Bottom hole pressure [MPa]	Downhole temperature [°C]
1.0				90

Test number	Oil [Sm3/day]	Gas [Sm3/day]	Oil density [g/cm3]	Gas grav. rel.air	GOR [m3/m3]
1.0	140	700000	0.730	0.699	4500

Logs

Log type	Log top depth [m]	Log bottom depth [m]
DSL CN ZDL ORIT XMAC RTEK MLL	2109	2516
DSL FLEX MREX	2200	2514
DSL PCOR	2159	2507
DSL STAR HD ORIT UXPL	2109	2508
DSL VSP	1659	2499
GR MDT ADT	2302	2452
LWD - GR RES SON PWD DIR	361	1223



LWD - LWD-GR ABRES PWD DEN CAL N	1155	2520
LWD - NBGR PWD RES DIR DEN CAL N	2050	2305

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	441.6	36	445.0	0.00	
SURF.COND.	20	657.8	26	665.0	1.28	LOT
PILOT HOLE		675.0	9 7/8	675.0	0.00	
INTERM.	13 3/8	1217.0	17 1/2	1226.0	1.59	FIT
INTERM.	9 5/8	2111.0	12 1/4	2119.0	1.51	LOT
LINER	7	2520.0	8 1/2	2520.0	0.00	

Drilling mud

Depth MD [m]	Mud weight [g/cm3]	Visc. [mPa.s]	Yield point [Pa]	Mud type	Date measured
361	1.03	1.0		Water Based	
445	1.04	1.0		Water Based	
480	1.03	1.0		Water Based	
665	1.20	14.0		Water Based	
840	1.16	10.0		Water Based	
889	1.20	18.0		Water Based	
1157	1.21	15.0		Water Based	
1980	1.16	12.0		Water Based	
2119	1.20	17.0		Water Based	
2306	1.16	20.0		Water Based	
2520	1.16	17.0		Water Based	