General information

Wellbore name	7220/11-4
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	7220/11-1 (Alta)
Well name	7220/11-4
Seismic location	Survey LN15M02. Inline 2313. crossline 2669
Production licence	609
Drilling operator	Lundin Norway AS
Drill permit	1653-L
Drilling facility	LEIV EIRIKSSON
Drilling days	69
Entered date	10.05.2017
Completed date	17.07.2017
Plugged date	17.07.2017
Release date	17.07.2019
Publication date	17.07.2019
Purpose - planned	APPRAISAL
Reentry	NO
Content	OIL/GAS
Discovery wellbore	NO
1st level with HC, age	LATE PERMIAN
1st level with HC, formation	UNDEFINED GP
2nd level with HC, age	EARLY TRIASSIC
2nd level with HC, formation	UNDEFINED GP
Kelly bushing elevation [m]	25.0
Water depth [m]	402.0
Total depth (MD) [m RKB]	2282.0
Final vertical depth (TVD) [m RKB]	2280.0
Maximum inclination [°]	9.33
Bottom hole temperature [°C]	84
Oldest penetrated age	CARBONIFEROUS
Oldest penetrated formation	UGLE FM
Geodetic datum	ED50

NS degrees	72° 2' 27.88'' N
EW degrees	20° 33' 7.97'' E
NS UTM [m]	8002536.65
EW UTM [m]	690843.65
UTM zone	33
NPDID wellbore	8126

Wellbore history

General

Well 7220/11-4 was drilled to appraise the Alta discovery on the southern Loppa High in the Barents Sea. The primary objective was to delineate the eastern extent of the Alta discovery and prove the presence of hydrocarbon columns and fluid contacts similar to those established in the discovery well.

Operations and results

Appraisal well 7220/11-4 was spudded with the semi-submersible installation Leiv Eiriksson on 10 May 2017 and drilled to TD at 2282 m in the Carboniferous Ugle Formation. Operations proceeded without significant problems. The well was drilled with seawater and sweeps down to 471 m, with KCl/Polymer/GEM mud from 471 to 648 m and with Performadril mud with 3.0 – 3.6% glycol from 648 m to TD.

The top of the reservoir was encountered at 1903 m. The well encountered a gross hydrocarbon column of 46.3 m, comprising 1.6 m of gas and 44.7 m of oil in a sequence of Permian-Triassic clastic carbonate sediments, conglomerates and breccias. The gas-oil contact (GOC) was found at 1904.6 m and the free-water level (FWL) at 1949.3 m. The pressure data confirmed similar fluid contacts and gradients to those observed in the previous wells drilled on the Alta discovery, suggesting good communication across the large Alta structure.

Above the oil-bearing reservoir there were oil shows in the Snadd Formation at 620 m, 860 – 930 m, and 1080 – 1288 m. These were described with direct, cut and residue fluorescence. The strongest shows, at 620 m, were associated with high gas levels between 600 and 650 m. Below the oil reservoir oil shows were described down to 2061 m.

Seven cores were cut in the interval 1904 to 1994 m. Cores 1 – 5 were cut in the 8 ½" section, while cores 6 and 7 were cut in the 6" section. MDT fluid samples were taken in the 8 ½" section at 1903.2 m (gas), 1912.6 m (oil), 1920.52 m (oil), and 1934.71 m (oil). One XPT water sample was taken in the 6"section at 1988.49.

The well was permanently abandoned on 17 July 2017 as an oil and gas appraisal.

Testing

A DST was performed in the oil zone, the perforated interval was from 1923 to 1936.3 m in the oil zone. In the main flow the test produced 960 sm3 oil and 93800 Sm3 gas /day through a 56/64" choke. The GOR was 97 Sm3/Sm3, the oil density was 0.825 g/cm3 and the gas gravity was 0.706 (air = 1). Measured CO2 and H2S was up to 3% and 1.4 ppm, respectively. The static formation temperature estimated from Metrol Prolog test data is 71 °C at 1939.3 m.

Cuttings at the Norwegian Offshore Directorate

Cutting sample, top depth [m]	Cutting samples, bottom depth [m]
500.00	2282.00

Cuttings available for sampling?	YES

Cores at the Norwegian Offshore Directorate

Core sample number	Core sample - top depth	Core sample - bottom depth	Core sample depth - uom
1	1904.0	1914.7	[m]
2	1915.7	1934.0	[m]
3	1934.0	1941.8	[m]
4	1942.0	1960.2	[m]
5	1960.2	1970.4	[m]
6	1972.6	1990.8	[m]
7	1990.6	1991.8	[m]

Total core sample length [m]	84.7
Cores available for sampling?	YES

Lithostratigraphy

Top depth [mMD RKB]	Lithostrat. unit
427	NORDLAND GP
427	NAUST FM
500	SOTBAKKEN GP
500	TORSK FM
564	ADVENTDALEN GP
564	KOLJE FM
589	KAPP TOSCANA GP
589	SNADD FM
1842	SASSENDALEN GP
1842	KOBBE FM
1874	KLAPPMYSS FM
1886	HAVERT FM
1903	UNDEFINED GP
1956	GIPSDALEN GP

1956	ØRN FM
2015	FALK FM
2233	UGLE FM

Drill stem tests (DST)

Test number	From depth MD [m]	To depth MD [m]	Choke size [mm]
1.0	1923	1936	22.2

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

Test number	Oil [Sm3/day]	Gas [Sm3/day]	Oil density [g/cm3]	Gas grav. rel.air	GOR [m3/m3]
1.0	960	93800	0.825	0.706	97

Logs

Log type	Log top depth [m]	Log bottom depth [m]
ADT HRLA GR JAR	1823	1969
FMI PPC MSIP GR JAR	425	1970
FMI PPC MSIP GR JAR	1968	2264
MSCT GR	1836	1903
MSCT GR	1976	2118
MSCT GR	1983	2246
MWD - OTII BCPM	427	669
MWD - OTII LT BCPMII	2149	2282
MWD - OTII ST LT BCPMII	1994	2149
MWD - ZT RG OT BCPMII	1830	1904
MWD - ZT RG OT BCPMII	1970	1970
MWD - ZT RG OTII BCPM LT ST	669	1830
NEXT XMR GR JAR	1823	1961
PQ HY PO SRP IFA MS PC JAR	1988	2101
PQ HY PO SRP PQ IFA MS PC JAR	1902	1968
UBI ADT HRLA PEX HNGS GR JAR	1968	2254
UBI PEX GPIT PPC GR JAR	1823	1959

UIB GPIT PPC GR JAR	1967	2265
USIT CBL	1250	1964
VSI GR	436	2260
VSI GR	457	1965
XPT NEXT CMR GR JAR	1968	2251

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	493.0	36	493.0	0.00	
SURF.COND.	20	657.4	26	664.0	1.30	FIT
INTERM.	9 5/8	1823.8	12 1/4	1830.0	1.62	LOT
LINER	7	1968.6	8 1/2	1977.4	1.35	FIT
OPEN HOLE		2282.0	6	2282.0	0.00	

Drilling mud

Depth MD [m]	Mud weight [g/cm3]	Visc. [mPa.s]	Yield point [Pa]	Mud type	Date measured
426	1.05	45.0		SWEEPS	
453	1.50	22.0		KCL/Gem	
471	1.05	45.0		SWEEPS	
493	1.50	22.0		KCl/Polymer/GEM	
493	1.35	15.0		KCl/Polymer/GEM	
620	1.17	9.0		KCl/Gem/Polymer	
620	1.36	17.0		KCl/Polymer/GEM	
648	1.39	19.0		KCl/Polymer/GEM	
658	1.17	19.0		PerformaDril	
664	1.17	19.0		Performadril	
664	1.39	19.0		KCl/Polymer/GEM	
669	1.17	19.0		Performadril	
860	1.18	19.0		Performadril	
1018	1.17	19.0		Performadril	
1100	1.18	19.0		Performadril	
1270	1.20	19.0		Performadril	
1350	1.18	19.0		Performadril	
1452	1.17	9.0		KCl/Gem/Polymer	
1452	1.14	10.0		KCl/Gem/Polymer	

1475	1.20	19.0		Performadril	
1570	1.21	20.0		Performadril	
1788	1.14	10.0		KCl/Gem/Polymer	
1794	1.20	19.0		Performadril	
1830	1.14	20.0		Performadril	
1830	1.20	19.0		Performadril	
1835	1.14	21.0		Performadril	
2282	1.14	11.0		KCl/Gem/Polymer	
2282	1.13	1.0		KCl	