General information

Wellbore name	35/9-10 S
Type	EXPLORATION
Purpose	APPRAISAL
Status	P&A
Press release	link to press release
Factmaps in new window	link to map
Main area	NORTH SEA
Field	NOVA
Discovery	35/9-7 Nova
Well name	35/9-10
Seismic location	RD 1201 inline 2306 & crossline 872
Production licence	418
Drilling operator	Wintershall Norge AS
Drill permit	1478-L
Drilling facility	TRANSOCEAN ARCTIC
Drilling days	42
Entered date	16.10.2013
Completed date	26.11.2013
Release date	26.11.2015
Publication date	14.01.2016
Purpose - planned	APPRAISAL
Reentry	NO
Content	OIL/GAS
Discovery wellbore	NO
1st level with HC, age	LATE JURASSIC
1st level with HC, formation	INTRA HEATHER FM SS
Kelly bushing elevation [m]	24.0
Water depth [m]	365.0
Total depth (MD) [m RKB]	3619.0
Final vertical depth (TVD) [m RKB]	3132.0
Maximum inclination [°]	51.9
Oldest penetrated age	MIDDLE JURASSIC
Oldest penetrated formation	RANNOCH FM
Geodetic datum	ED50
NS degrees	61° 15' 7.1'' N
EW degrees	3° 41' 3.9'' E
NS UTM [m]	6791207.55
EW UTM [m]	536725.04

UTM zone	31
NPDID wellbore	7259

Wellbore history

General

Well 35/9-10 S was drilled to appraise the southeast flank of the 35/9-7 Skarfjell discovery. The Skarfjell discovery is situated on the Uer Terrace between the Fram and the Gjøa Fields in the North Sea. The primary objective was to prove additional oil reserves in the Late Jurassic Intra Heather Sandstones. Two such sandstones were expected.

Operations and results

Appraisal well 35/9-10 S was spudded with the semi-submersible installation Transocean Arctic on 16 October 2013 and drilled to TD at 3619 m (3132 m TVD) m in the Middle Jurassic Rannoch Formation. The well was drilled vertical down to ca 800 m and below ca 2920 m. The deviated section in between had a sail angle of ca 51 °. No significant problem was encountered in the operations. The well was drilled with spud mud down to 459 m, with KCl/GEM polymer mud from 459 m down to 898 m, and with XP-07 oil based mud from 898 m to TD.

The first Intra Heather Formation sandstone (IHS 2) was encountered at 3067 m (2581.6 m TVD). IHS 2 held a 13-meter gross gas column above an oil column of 49-meter gross in 3 thin sandstones. The IHS 2 has a 115 m gross thickness with 20% N/G at the 35/9-10 S location. The average porosity is 18% (10% cut off applied). Pressure data shows that this area has a lower reservoir pressure and is not in direct communication with the western and northern part of Skarfjell. The second Intra Heather Formation sandstone (IHS 1) was encountered at 3293 m (2807 m TVD) with a 16 m gross thickness. IHS 1 had a N/G of 56% and 15% porosity. The IHS 1 was found oil bearing, but the pressure data show a different pressure gradient than in the IHS 2, so there is no communication between the IHS 1 and 2. In addition, there is no pressure communication between IHS 1 and the western and northern part of Skarfjell. No oil shows were described other than in the Intra Heather sandstones.

A total of 109.5 m core was recovered in four cores. Cores one and two were cut from 3068 to 3105 m. Cores 3 and 4 were cut from 3136.5 to 3209 m. RCX fluid samples were taken in the IHS 2 reservoir at 3067.1 m (gas/condensate), 3076.4 m (oil), 3162.8 m (oil), and 3175.4 m (oil). IHS 1 was not sampled.

The well was plugged back for side tracking on 25 November 2013 as an oil and gas appraisal well.

Testing

No drill stem test was performed.

Cuttings at the Norwegian Offshore Directorate

Cutting sample, top depth [m]	Cutting samples, bottom depth [m]
910.00	3618.00

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	3068.0	3098.7	[m]
2	3099.5	3105.0	[m]
3	3136.5	3173.0	[m]
4	3173.0	3208.0	[m]

Total core sample length [m]	107.7
Cores available for sampling?	YES

Lithostratigraphy

Top depth [mMD RKB]	Lithostrat. unit
389	NORDLAND GP
389	UNDIFFERENTIATED
616	UTSIRA FM
656	HORDALAND GP
656	NO FORMAL NAME
1088	NO FORMAL NAME
1102	GRID FM
1181	FRIGG FM
1255	NO FORMAL NAME
1277	ROGALAND GP
1277	BALDER FM
1339	SELE FM
1398	LISTA FM
1550	NO FORMAL NAME
1680	LISTA FM
1974	VÅLE FM
2035	SHETLAND GP
2035	JORSALFARE FM
2214	KYRRE FM
2922	TRYGGVASON FM
2980	BLODØKS FM
2991	SVARTE FM

3040	VIKING GP
3040	DRAUPNE FM
3054	HEATHER FM
3067	INTRA HEATHER FM SS
3183	HEATHER FM
3278	INTRA HEATHER FM SS
3293	HEATHER FM
3517	BRENT GP
3517	NESS FM
3570	ETIVE FM
3580	RANNOCH FM

Logs

Log type	Log top depth [m]	Log bottom depth [m]
DSL CN ZDL ORIT XMAC HDIL	365	3619
DSL MREX	3015	3305
GHTU GWUS	1100	3600
GR 6TC IFX RLVP RCX SNTL	3067	3563
GR GXPL ORIT UXPL	2949	3619
GR PCOR	3054	3292
LWD - DIR	389	454
LWD - DIR ECD GR RES SON	2958	3619
LWD - DIR PWD GR RES	454	945
LWD - DIR PWD GR RES SON	945	2958

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	454.0	36	459.0	0.00	
SURF.COND.	20	896.0	26	898.0	1.69	
OPEN HOLE		945.0	17 1/2	945.0	0.00	
INTERM.	9 5/8	2949.0	12 1/4	2958.0	1.90	
OPEN HOLE		3619.0	8 1/2	3619.0	0.00	

Drilling mud

Depth MD [m]	Mud weight [g/cm3]	Visc. [mPa.s]	Yield point [Pa]	Mud type	Date measured
467	1.29	20.0		KCL Polymer	
737	1.29	16.0		KCL Polymer	
845	1.36	27.0		Yellow XP-07	
898	1.29	16.0		KCL Polymer	
949	1.36	24.0		Yellow XP-07	
1556	1.33	25.0		Yellow XP-07	
2235	1.33	27.0		Yellow XP-07	
2839	1.36	21.0		Yellow XP-07	
2958	1.28	20.0		Yellow XP-07	
3619	1.28	19.0		Yellow XP-07	