

**General information**

Wellbore name	35/9-8
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	35/9-8
Seismic location	inline 41904 & crossline 150128
Production licence	418
Drilling operator	Wintershall Norge AS
Drill permit	1437-L
Drilling facility	TRANSOCEAN ARCTIC
Drilling days	70
Entered date	01.02.2013
Completed date	11.04.2013
Release date	11.04.2015
Publication date	21.05.2015
Purpose - planned	APPRAISAL
Reentry	NO
Content	OIL
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]	368.0
Total depth (MD) [m RKB]	3256.0
Final vertical depth (TVD) [m RKB]	3255.0
Maximum inclination [°]	3.9
Bottom hole temperature [°C]	113
Oldest penetrated age	MIDDLE JURASSIC
Oldest penetrated formation	RANNOCH FM
Geodetic datum	ED50
NS degrees	61° 17' 6.97" N
EW degrees	3° 40' 32.14" E
NS UTM [m]	6794911.59



EW UTM [m]	536213.31
UTM zone	31
NPDID wellbore	7120

Wellbore history

General

Well 35/9-8 was drilled to appraise the 35/9-7 Skarfjell discovery on the Ryggsteinen Ridge north of the Troll Field in the North Sea. The main objective was to prove additional oil reserves in the Late Jurassic Intra-Heather Formation sandstones.

Operations and results

Appraisal well 35/9-8 was spudded with the semi-submersible installation Transocean Arctic on 1 February 2013 and drilled to TD at 3256 m in the Middle Jurassic Rannoch Formation. Operations proceeded without significant problems; the main cause for lost rig time was bad weather (155 hrs WOW). The well was drilled with seawater and hi-vis pills down to 461 m, with KCl/Polymer mud from 461 m to 895 m, and with Performadril water based mud from 895 m to TD.

The main target Intra Heather Formation Sandstone 2 (IH2) came in at 2740 m, 79 m high to prognosis. The gross thickness was found to be 135 m, which is much thicker than expected. Net/gross for the total IH2 unit is 0.62 with an average porosity of 17.8 %. The IH2 was oil bearing with the oil-water contact at 2806 m. Oil shows were described on cores down to 2830 m. The deeper Intra-Heather Formation sandstone (IH1), penetrated in 35/9-7, was not present at this location. The Middle Jurassic Brent Group section penetrated by the well was water bearing. No shows were described in the well outside of the IH2 sandstones.

A total of 140 m core was cut in six cores in IH2, from 2744 to 2884 m. The average recovery was 95.8 % and no core-log depth correction was required. RCI fluid samples were taken at 2770.5 m (oil), 2782.3 m (oil), 2793.4 m (oil), 2826 m (water+oil), and 2839.8 m (water).

The well was permanently abandoned on 11 April 2013 as an oil appraisal.

Testing

A Drill Stem Test was performed in the Intra-Heather Formation sandstone from the interval 2776 to 2789 m. The test produced at maximum flow rate 300 Sm³ oil and 53400 Sm³ gas /day through 26/64" choke. H₂S content was 0.6 ppm and the CO₂ content was 1.6%.

Cuttings at the Norwegian Offshore Directorate

Cutting sample, top depth [m]	Cutting samples, bottom depth [m]
910.00	3256.00

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	2744.1	2753.7	[m]
2	2755.0	2777.0	[m]
3	2778.3	2801.1	[m]
4	2802.0	2826.2	[m]
5	2826.2	2862.2	[m]
6	2862.5	2883.3	[m]

Total core sample length [m]	135.4
Cores available for sampling?	YES

Oil samples at the Norwegian Offshore Directorate

Test type	Bottle number	Top depth MD [m]	Bottom depth MD [m]	Fluid type	Test time	Samples available
MDT		2793.40	0.00	OIL	17.03.2013 - 00:00	YES
MDT		0.00	2770.50	OIL	17.03.2013 - 00:00	YES

Lithostratigraphy

Top depth [mMD RKB]	Lithostrat. unit
392	NORDLAND GP
650	UTSIRA FM
695	HORDALAND GP
1074	GRID FM
1108	FRIGG FM
1190	UNDIFFERENTIATED
1221	ROGALAND GP
1221	BALDER FM
1267	SELE FM
1280	LISTA FM
1343	NO FORMAL NAME
1557	LISTA FM



1666	VÅLE FM
1727	EGGA FM (INFORMAL)
1738	SHETLAND GP
1738	JORSALFARE FM
1862	KYRRE FM
2549	TRYGGVASON FM
2627	BLODØKS FM
2633	SVARTE FM
2705	CROMER KNOLL GP
2705	RØDBY FM
2714	VIKING GP
2714	DRAUPNE FM
2730	HEATHER FM
2740	INTRA HEATHER FM SS
2875	HEATHER FM
3146	BRENT GP
3146	TARBERT FM
3155	NESS FM
3205	ETIVE FM
3215	RANNOCH FM

Drill stem tests (DST)

Test number	From depth MD [m]	To depth MD [m]	Choke size [mm]
1.0	2776	2789	9.5

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	300	53400			

Logs



Log type	Log top depth [m]	Log bottom depth [m]
IMAGE RES AC	2540	3254
LWD - DIR PWD	392	461
LWD - DIR PWD GR RES SON	461	2543
LWD - DIR PWD GR RES SON BITRES	2543	2744
LWD - DIR PWD GR RES SON DEN NEU	2727	3256
NMR	2711	2910
RCI PRES SAM	2750	3211
SGR RES DEN SON	1945	3256
VSP	777	3256

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	458.0	36	461.0	0.00	
SURF.COND.	20	890.0	26	895.0	1.61	LOT
INTERM.	13 3/8	1310.4	17 1/2	1317.0	1.64	LOT
INTERM.	9 5/8	2536.0	12 1/4	2543.0	1.59	
LINER	7	3255.0	8 1/2	3256.0	0.00	

Drilling mud

Depth MD [m]	Mud weight [g/cm3]	Visc. [mPa.s]	Yield point [Pa]	Mud type	Date measured
445	1.05	26.0		HI VIS Sweeps	
472	1.29	10.0		KCL/POLYMER/Glykol WBM	
895	1.17	23.0		PERFORMADRIL WBM	
1006	1.19	33.0		PERFORMADRIL WBM	
1317	1.29	24.0		PERFORMADRIL WBM	
2460	1.31	32.0		PERFORMADRIL WBM	
2632	1.31	36.0		PERFORMADRIL WBM	



2803	1.31	30.0		PERFORMADRIL WBM	
3256	1.31			CaCl2 Brine	
3256	1.31	31.0		PERFORMADRIL WBM	
3256	1.33	15.0		Performadril	
3256	1.31			CaCl2 Brine	