

**General information**

Wellbore name	35/11-21 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
Discovery	35/12-2 (Grosbeak)
Well name	35/11-21
Seismic location	Inline: 8175. Xline: 28062
Production licence	248 I
Drilling operator	Wellesley Petroleum AS
Drill permit	1718-L
Drilling facility	TRANSOCEAN ARCTIC
Drilling days	41
Entered date	26.07.2018
Completed date	05.09.2018
Plugged date	05.09.2018
Release date	05.09.2020
Publication date	05.09.2020
Purpose - planned	WILDCAT
Reentry	NO
Content	OIL
Discovery wellbore	NO
1st level with HC, age	MIDDLE JURASSIC
1st level with HC, formation	NESS FM
2nd level with HC, age	MIDDLE JURASSIC
2nd level with HC, formation	ETIVE FM
Kelly bushing elevation [m]	24.0
Water depth [m]	360.0
Total depth (MD) [m RKB]	2800.0
Final vertical depth (TVD) [m RKB]	2588.0
Maximum inclination [°]	44.42
Bottom hole temperature [°C]	103
Oldest penetrated age	EARLY JURASSIC
Oldest penetrated formation	COOK FM
Geodetic datum	ED50
NS degrees	61° 9' 28.17" N



EW degrees	3° 38' 56.48" E
NS UTM [m]	6780701.21
EW UTM [m]	534929.97
UTM zone	31
NPDID wellbore	8533

Wellbore history

General

Well 35/11-21 S was drilled to appraise the 35/12-2 Grosbeak discovery on the Ryggsteinen Ridge in the North Sea. The primary objective was to explore the reservoir potential of the Ness Formation and to prove oil in the Etive Formation.

Operations and results

Appraisal well 35/11-21 S was spudded with the semi-submersible installation Transocean Arctic on 26.July 2018 and drilled to TD at 2800 m (2588 m TVD) m in the Early Jurassic Cook Formation. Operations proceeded without significant problems. The well was drilled with seawater and bentonite sweeps down to 449 m, with KCl/polymer/GEM mud from 449 to 996 m, and with Innover NS oil-based mud from 996 m to TD.

Top of Brent Group, Ness Formation was penetrated at 2595.2 m (2383 m TVD). The Ness and Etive formations were oil-bearing down to top Rannoch Formation at 2686 m (2474 m TVD). Of this ca 90 m oil column 45 m was effective reservoir sandstone with good to very good reservoir properties. In addition to shows in Ness-Etive, there were oil shows in Rannoch Formation sandstone, described as very weak patchy pale yellow direct fluorescence, very slow, very weak, blue white to pale yellow cut fluorescence, weak, pale yellow fluorescent residue. Otherwise there were no shows in the well.

Three 54 m cores were cut from 2566 to 2620.9 m, from 2620.90 to 2675.4 m, and from 2675.4 to 2729.8 m. Each core was cut with 100% recovery. MDT fluid samples were taken at 2615.5 m (oil), 2634.49 m (oil), 2657.54 m (oil), 2681 m (oil), and 2698.5 m (water).

The well was permanently abandoned on 5 September 2018 as an oil appraisal well.

Testing

A formation production test (DST) from 2625 to 2637 m in the Ness Formation was performed. The test produced 825 Sm³ oil and 92517 Sm³ gas /day through a 46/64" choke in the main flow. The GOR was 112 Sm³/Sm³. The gas contained 1.3% CO₂ and 1.9% H₂S. The DST temperature was 97°C.

Cuttings at the Norwegian Offshore Directorate

Cutting sample, top depth [m]	Cutting samples, bottom depth [m]
460.00	2800.00

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	2566.0	2620.9	[m]
2	2620.9	2675.4	[m]
3	2675.4	2729.8	[m]

Total core sample length [m]	163.8
Cores available for sampling?	YES

Lithostratigraphy

Top depth [mMD RKB]	Lithostrat. unit
384	NORDLAND GP
384	NO FORMAL NAME
579	UTSIRA FM
720	HORDALAND GP
720	NO FORMAL NAME
1142	NO FORMAL NAME
1375	ROGALAND GP
1375	BALDER FM
1450	SELE FM
1603	LISTA FM
1620	NO FORMAL NAME
1784	LISTA FM
1950	VÅLE FM
1990	SHETLAND GP
1990	JORSALFARE FM
2080	KYRRE FM
2318	VIKING GP
2318	FENSFJORD FM
2361	HEATHER FM
2390	INTRA HEATHER FM SS
2398	HEATHER FM
2595	BRENT GP
2595	NESS FM
2665	ETIVE FM



2686	RANNOCH FM
2724	OSEBERG FM
2758	DUNLIN GP
2758	UNDIFFERENTIATED
2771	COOK FM

Drill stem tests (DST)

Test number	From depth MD [m]	To depth MD [m]	Choke size [mm]
0.0	2625	2637	18.3

Test number	Final shut-in pressure [MPa]	Final flow pressure [MPa]	Bottom hole pressure [MPa]	Downhole temperature [°C]
0.0				97

Test number	Oil [Sm3/day]	Gas [Sm3/day]	Oil density [g/cm3]	Gas grav. rel.air	GOR [m3/m3]
0.0	825	92517			112

Logs

Log type	Log top depth [m]	Log bottom depth [m]
LWD - GR PWD RES CIB DEN NEU CAL	2451	2800
LWD - GR PWD RES VIB DIR SON	996	2451
LWD - PWD DIR	384	449
LWD - PWD RES GR VIB DIR SON	449	996
MDT	2595	2777
NEXT ADT PEX CMR	2445	2801
VIVSP GR	400	2798
ZAIP MSIP NGI	2400	2801

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	449.5	36	449.5	0.00	



INTERM.	13 3/8	990.2	17 1/2	996.0	1.46	FIT
INTERM.	9 5/8	2445.0	12 1/4	2451.0	1.52	FIT
LINER	7	2794.0	8 1/2	2800.0	0.00	

Drilling mud

Depth MD [m]	Mud weight [g/cm3]	Visc. [mPa.s]	Yield point [Pa]	Mud type	Date measured
449	1.39	27.0		KCL- GEM- Polymer WBM	
449	1.02			Water based bentonite sweeps	
878	1.33	18.0		INNOVERT OBM	
996	1.33	18.0		Innovert OBM	
996	1.39	32.0		KCl-Gem-Polymer	
1000	1.34	19.0		Innovert OBM	
2216	1.32	17.0		INNOVERT OBM	
2360	1.34	20.0		Innovert OBM	
2400	1.19	13.0		Innovert OBM	
2400	1.34	20.0		Innovert OBM	
2455	1.19	12.0		Innovert OBM	
2730	1.21	15.0		Innovert OBM	
2730	1.20	15.0		Innovert OBM	
2800	1.19	16.0		INNOVERT OBM	
2800	1.19	2.0		Packer Fluid	