

**General information**

Wellbore name	6406/12-4 S
Type	EXPLORATION
Purpose	WILDCAT
Status	P&A
Press release	link to press release
Factmaps in new window	link to map
Main area	NORWEGIAN SEA
Well name	6406/12-4
Seismic location	inline 5508.xline 5986
Production licence	586
Drilling operator	VNG Norge AS
Drill permit	1587-L
Drilling facility	TRANSOCEAN ARCTIC
Drilling days	56
Entered date	23.06.2015
Completed date	17.08.2015
Plugged date	17.08.2015
Release date	17.08.2017
Publication date	19.08.2017
Purpose - planned	WILDCAT
Reentry	NO
Content	OIL SHOWS
Discovery wellbore	NO
1st level with HC, age	LATE JURASSIC
1st level with HC, formation	ROGN FM
Kelly bushing elevation [m]	25.5
Water depth [m]	319.0
Total depth (MD) [m RKB]	4318.0
Final vertical depth (TVD) [m RKB]	3882.9
Maximum inclination [°]	43
Bottom hole temperature [°C]	128
Oldest penetrated age	LATE JURASSIC
Oldest penetrated formation	INTRA MELKE FM SS
Geodetic datum	ED50
NS degrees	64° 1' 7.48" N
EW degrees	6° 46' 31.29" E
NS UTM [m]	7101175.99
EW UTM [m]	391272.15



UTM zone	32
NPDID wellbore	7721

Wellbore history

General

Well 6406/12-4 S was drilled on the flank of the Frøya High close to the southern end of the Halten Terrace in the Norwegian Sea. The exploration objective was to test Intra Melke sandstone in the Boomerang South West Prospect, younger than the reservoir in the Pil discovery. The well also had as appraisal objective to core the transition into the top of the Pil discovery reservoir close to the established oil-water contact.

Operations and results

Wildcat well 6406/12-4 S was spudded with the semi-submersible installation Transocean Arctic on 23 June 2015 and drilled to TD at 4318 m (3882.9 m TVD) m in Late Jurassic Intra-Melke sandstone. The well was drilled vertical down to 1203 m. From 1203 m to 3660 m, the well was drilled deviated with a sail angle of 41°. From there and through the reservoir to final TD the sail angle was changed to ca 7°. Due to a highly overbalanced mud weight during drilling in the 8 1/2" section, a significant drill break was experienced in the Rogn Formation, with substantial mud losses to the formation at approximately 3746 m. This caused serious mud invasion into the formation. The well was drilled with seawater and sweeps down to 1210 m and with XP-07 oil based mud from 1210 m to TD.

The well encountered 26 m of Rogn Formation of good quality at 3726 m. A 196 m thick package of Spekk shales and siltstones followed down to top Melke Formation at 3946 m. Small amounts of oil was recovered in an RCX fluid sample from the Rogn Formation. Both this oil and pressure data from the Rogn Formation were seriously affected by the mud invasion, making it difficult to conclude on the nature of the oil. The petrophysical logs indicated hydrocarbon saturations of up to 20% across the cored interval in the Melke Formation sandstone. No oil shows above the mud were recorded in the Rogn Formation. Weak oil shows were described on cores and cuttings throughout the Melke Formation and Intra Melke sandstones.

A total of 41.95 m core was recovered in three cores from the interval 3941 to 3984.3 m (96.9% total recovery) across the base Spekk-top Melke boundary. An RCX fluid sample was taken at 3736 m (3281.3 m TVD) in the intra Spekk Formation sandstone. This sample contained 90 vol-% formation water, 5 vol-% mud filtrate and 5 vol-% reservoir oil. Further RCX samples recovered formation water at 3956.7 m, 3968.2 m, 3988.2 m and 4021.6 m in the Intra-Melke Formation sandstone

The well was permanently abandoned on 17 August 2015.

Testing

No drill stem test was performed.

Cuttings at the Norwegian Offshore Directorate

Cutting sample, top depth [m]	Cutting samples, bottom depth [m]
1210.00	4319.00



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	3941.0	3941.9	[m]
2	3942.5	3950.5	[m]
3	3950.7	3983.8	[m]

Total core sample length [m]	42.0
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		0.00	0.00	BASE OIL		YES
MDT		0.00	0.00	BASE OIL		YES
MDT		0.00	0.00	BASE OIL		YES

Lithostratigraphy

Top depth [mMD RKB]	Lithostrat. unit
345	NORDLAND GP
345	NAUST FM
1085	KAI FM
1160	HORDALAND GP
1160	BRYGGE FM
1850	ROGALAND GP
1850	TARE FM
1968	TANG FM
2215	SHETLAND GP
2215	SPRINGAR FM
2317	NISE FM



2539	KVITNOS FM
3251	CROMER KNOLL GP
3251	LANGE FM
3478	NO FORMAL NAME
3699	LYR FM
3726	VIKING GP
3726	ROGN FM
3753	SPEKK FM
3946	MELKE FM
3951	INTRA MELKE FM SS

Logs

Log type	Log top depth [m]	Log bottom depth [m]
HDIL XMAC ORIT ZDL CN DSL	360	4072
HDIL ZMAC ORIT ZDL CN DSL	3650	4322
MREX FLEX DSL	3650	4060
MWD - ATK ZTKR ZTKG COP OTK SDTK	2248	4318
MWD - DIR PWD	1	415
MWD - DIR PWD GR RES	415	1210
MWD - DIR PWD GR RES SON	1210	2248
PCOR	3726	4021
PCOR	3912	4267
RCX	3730	4025
RCX	4069	4308
UXPL ORIT GXPL GR	3650	4060
VSP	1745	4310

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	411.3	36	415.0	0.00	
SURF.COND.	20	1203.5	26	1210.0	1.66	FIT
PILOT HOLE		1210.0	9 7/8	1210.0	0.00	
INTERM.	13 3/8	2242.0	17 1/2	2248.0	1.69	FIT
INTERM.	9 5/8	3652.0	12 1/4	3660.0	1.79	FIT
OPEN HOLE		4318.0	8 1/2	4318.0	0.00	

**Drilling mud**

Depth MD [m]	Mud weight [g/cm3]	Visc. [mPa.s]	Yield point [Pa]	Mud type	Date measured
344	1.34	21.0		WBM	
1153	1.54	35.0		XP07 Low ECD	
1213	1.49	21.0		XP-07 Low ECD OBM	
1316	1.54	30.0		XP07 Low ECD	
1743	1.51	24.0		XP-07 Low ECD OBM	
1935	1.54	29.0		XP-07 Low ECD OBM	
2463	1.54	31.0		XP-07 Low ECD OBM	
2918	1.54	34.0		XP-07 Low ECD OBM	
3538	1.54	28.0		XP07 Low ECD	
3660	1.47	33.0		XP-07 Low ECD OBM	
3660	1.54	33.0		XP-07 Low ECD OBM	
3746	1.49	36.0		XP-07 Low ECD	
3942	1.39	23.0		XP07 Low ECD	
4318	1.39	33.0		XP07 Low ECD	
4318	1.39	27.0		XP07 Low ECD	