

**General information**

Wellbore name	6607/12-2 S
Type	EXPLORATION
Purpose	WILDCAT
Status	SUSPENDED
Press release	link to press release
Factmaps in new window	link to map
Main area	NORWEGIAN SEA
Field	ALVE NORD
Discovery	6607/12-2 S Alve Nord
Well name	6607/12-2
Seismic location	TO06 M02-inline5080 & crossline 3494
Production licence	127
Drilling operator	Total E&P Norge AS
Drill permit	1367-L
Drilling facility	SONGA DELTA
Drilling days	96
Entered date	22.07.2011
Completed date	25.10.2011
Plugged date	25.10.2011
Release date	25.10.2013
Publication date	25.10.2013
Purpose - planned	WILDCAT
Reentry	NO
Content	OIL/GAS
Discovery wellbore	YES
1st level with HC, age	MIDDLE JURASSIC
1st level with HC, formation	FANGST GP
2nd level with HC, age	EARLY JURASSIC
2nd level with HC, formation	BÅT GP
3rd level with HC, age	EARLY CRETACEOUS
3rd level with HC, formation	LANGE FM
Kelly bushing elevation [m]	29.0
Water depth [m]	369.0
Total depth (MD) [m RKB]	4404.0
Final vertical depth (TVD) [m RKB]	4274.0
Maximum inclination [°]	30
Bottom hole temperature [°C]	158
Oldest penetrated age	EARLY JURASSIC



Oldest penetrated formation	ÅRE FM
Geodetic datum	ED50
NS degrees	66° 1' 17.99" N
EW degrees	7° 51' 50.3" E
NS UTM [m]	7322976.96
EW UTM [m]	448482.96
UTM zone	32
NPDID wellbore	6642

Wellbore history

General

Well 6607/12-2 S was drilled on the Alve North structure about eight kilometres west of the Norne field. The primary exploration target for the well was to prove petroleum in Middle and Lower Jurassic reservoir rocks (Fangst and Båt group). The secondary exploration target was to prove petroleum in Cretaceous reservoir rocks (Cromer Knoll group). The Åre Formation should also be evaluated, but the probability of hydrocarbons here was considered low due to a dry Åre Formation in 6507/3-1. The well was designed to be suspended as a possible producer in the event of a discovery. For this reason it was placed as high as possible and in the centre of the structure, deviated and kept parallel to the main fault for keeping a safe distance from potential associated fractures and at the same time access the fluids as efficiently as possible.

Operations and results

Well 6607/12-2 S was spudded with the semi-submersible installation Songa Delta on 22 July and drilled to TD at 4404 m (4274 m TVD) in the Early Jurassic Åre Formation. The well was drilled as high as possible on the NW part of the structure, down to a kick off point above BCU at 3500 m, and then deviated at 30 deg angle in order to stay parallel to the main bounding fault. Drilling the well went without significant problems. A total of 30 days (8 days for Cretaceous and 22 days for Jurassic) was necessary to perform the wire line logging on this well. Three different logging sequences were needed: Cretaceous, Jurassic and Åre deepening to TD. Close to eight days was counted as lost time due to logging problems. The well was drilled with sea water and bentonite hi-vis pills down to 1355 m, with water based mud from 1355 m to 1981 m, and with oil based mud from 1981 m to TD.

The Cretaceous Lange Formation was encountered at 2862 m. Lange Sandstones were found hydrocarbon bearing in two units near the base. The Upper unit contained gas from 2994 m down to 3016 m and light oil from 3033 m down to 3057 m. The reservoir was a few meters net of thin sandstones interbedded in claystone. The Lower unit had 15 bar higher pressure than the gradient in the upper unit. It contained gas from 3094 to a GOC at 3137 and oil from there to an OWC at 3148.5 m. This reservoir was in thick medium to coarse grain sandstones with thin interbeds of claystone.

The Garn Formation was encountered at 3610 m (3587.5 m TVD), 15m deeper than expected. Except for a thin interval in the uppermost Garn, all reservoirs of the Fangst Group, Tofte Formation, and Tilje Formation had relatively poor reservoir properties. These reservoirs had gas from top Garn to a GOC at 3726 and oil down to an ODT at 3753 m. A second column with light oil was penetrated from 3760 to and ODT at 3780 m. The Tilje Formation contained condensate and light oil, but no contacts were established due to tight formation. The Åre Formation was encountered at 3935 m and contrary to expectation proved to contain hydrocarbons in thin or metric sandstones, with gas in the



upper section and condensate/light oil in deeper sections. The hydrocarbon bearing sandstones did not have a common pressure gradient. Condensate and light oil were sampled in the thickest reservoir, a 50m stack of medium to coarse sandstones. No oil shows above the oil based mud were recorded.

A 53 m core was cut from 3613 m to 3667 m in Garn/Not with 98% recovery. Wire line (MDT and RCI) fluid samples were taken in the Lange Formation at 3006.5 m (gas), 3055 m (light oil), 3071 m (water), 3122 m (gas), 3140.5 m (oil), 3146.0 m (oil), 3149.5 m (water and trace oil), 3157 m (water and trace oil). In the Jurassic wire line fluid samples were taken at 3614.3 m (dry gas/condensate), 3622.6 m (dry gas/condensate), 3702.9 m (dry gas/condensate), 3738.0 m (light oil), 3761.3 m (light oil), 3775 m (light oil), 3815 m (condensate/light oil), 3872.5 m (light oil), 3926.4 m (light oil), 3944 m (condensate/light oil), 4132 m (condensate/light oil), and 4248.5 m (condensate/light oil).

Due to rig schedule obligations drilling operations were stopped on 2 October at 4404 m in the Åre Formation in an oil down to situation. After logging and 11 days WOW the well was suspended on 25 October 2011 as an oil and gas discovery.

Testing

No drill stem test was performed.

Cuttings at the Norwegian Offshore Directorate

Cutting sample, top depth [m]	Cutting samples, bottom depth [m]
1360.00	4404.00

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	3613.0	3666.0	[m]

Total core sample length [m]	53.0
Cores available for sampling?	YES

Lithostratigraphy

Top depth [mMD RKB]	Lithostrat. unit
398	NORDLAND GP
398	NAUST FM
1376	KAI FM



1636	HORDALAND GP
1636	BRYGGE FM
1870	ROGALAND GP
1870	TARE FM
1912	TANG FM
1973	SHETLAND GP
1973	SPRINGAR FM
2102	NISE FM
2198	KVITNOS FM
2862	CROMER KNOLL GP
2862	LANGE FM
3258	VIKING GP
3258	SPEKK FM
3272	MELKE FM
3610	FANGST GP
3610	GARN FM
3633	NOT FM
3672	ILE FM
3753	BÅT GP
3753	ROR FM
3760	TOFTE FM
3815	TILJE FM
3935	ÅRE FM

Logs

Log type	Log top depth [m]	Log bottom depth [m]
GR CN MREX	3770	4070
GR CN ZDL MREX	3480	4211
GR CN ZDL RMEX	1971	3420
GR EI	3600	4215
GR EI XMAC F1 HDIL	1971	3495
GR HWGS QCNT CDT CMR	4100	4406
GR MDT SP	3727	3761
GR MDT SP	3775	3796
GR MDT SP	4230	4252
GR MDT SP PA	3613	3747
GR MDT SP PA	3642	3655
GR MREX	2840	3200



GR PPC GPIT MSIP AIT	3494	4407
GR RCI	2857	3157
GR RCI	3611	4174
GR RCI MINIDST	3055	3149
GR RCOR	3001	3265
GR RCOR	3863	4132
GR ZOVSP	1738	4207
HDIL XMEC EI	3395	4215
LWD - ASS PWD ECD GR DI	1981	3500
LWD - EWR DGR PWD DI	470	1355
LWD - PWD ECD GR DI	1355	1981
LWD - PWD ECD GR DI	4217	4404
LWD - RAB PWD ECD GR DI	3500	4217
VDL SBT GR CCL	2397	3494

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	464.0	36	470.0	0.00	
SURF.COND.	20	1348.0	26	1355.0	1.61	FIT
PILOT HOLE		1355.0	9 7/8	1355.0	0.00	
INTERM.	13 3/8	1972.0	17 1/2	1981.0	1.75	FIT
INTERM.	9 5/8	3494.0	12 1/4	3500.0	1.75	FIT
OPEN HOLE		4217.0	8 1/2	4217.0	0.00	

Drilling mud

Depth MD [m]	Mud weight [g/cm3]	Visc. [mPa.s]	Yield point [Pa]	Mud type	Date measured
783	1.06			SPUD MUD	
1355	1.45	16.0		AQUACOL KCL/POLYMER/GLY COL	
1380	1.45	16.0		AQUACOL KCL/POLYMER/GLY COL	
1981	1.59	35.0		CARBO TECH	
2203	1.60	41.0		CARBO TECH	
2442	1.48	34.0		CARBO TECH	



2850	1.60	44.0		CARBO TECH	
3500	1.60	39.0		CARBO TECH	
3667	1.45	30.0		CARBO TECH	
4217	1.46	31.0		CARBO TECH	
4217	1.46	28.0		CARBO TECH	
4367	1.46	30.0		CARBO TECH	
4404	1.46	29.0		CARBO TECH	

Pressure plots

The pore pressure data is sourced from well logs if no other source is specified. In some wells where pore pressure logs do not exist, information from Drill stem tests and kicks have been used. The data has been reported to the NPD, and further processed and quality controlled by IHS Markit.

Document name	Document format	Document size [MB]
6642 Formation pressure (Formasjonstrykk)	PDF	0.28

