General information

Wellbore name	6608/10-12
Type	EXPLORATION
Purpose	WILDCAT
Status	P&A
Press release	link to press release
Factmaps in new window	link to map
Main area	NORWEGIAN SEA
Field	SKULD
Discovery	6608/10-12 Skuld
Well name	6608/10-12
Seismic location	ST04M17-innline 534 & crossline 3680
Production licence	128
Drilling operator	StatoilHydro ASA
Drill permit	1204-L
Drilling facility	OCEAN VANGUARD
Drilling days	64
Entered date	19.10.2008
Completed date	21.12.2008
Release date	21.12.2010
Publication date	23.12.2010
Purpose - planned	WILDCAT
Reentry	NO
Content	OIL
Discovery wellbore	YES
1st level with HC, age	EARLY CRETACEOUS
1st level with HC, formation	LYSING FM
2nd level with HC, age	EARLY JURASSIC
2nd level with HC, formation	ÅRE FM
Kelly bushing elevation [m]	22.0
Water depth [m]	338.0
Total depth (MD) [m RKB]	3180.0
Final vertical depth (TVD) [m RKB]	3179.3
Maximum inclination [°]	3.8
Bottom hole temperature [°C]	104
Oldest penetrated age	LATE TRIASSIC
Oldest penetrated formation	RED BEDS (INFORMAL)
Geodetic datum	ED50
NS degrees	66° 13' 45.69'' N

EW degrees	8° 18' 45.7'' E
NS UTM [m]	7345831.65
EW UTM [m]	469084.89
UTM zone	32
NPDID wellbore	5949

Wellbore history

General

Well 6608/10-12 was drilled on the Dompap structure, about 17 kilometres north-northeast of the Norne field in the Norwegian Sea. The primary objective was to prove hydrocarbons in the Jurassic sandstones of the Båt group, Åre 2 and Åre 1 formations. Secondary objective in the main bore was to test for hydrocarbons in the Cretaceous Måke prospect, comprising Cretaceous Intra-Lange/Lysing Formation sandstone.

Operations and results

Well 6608/10-12 was spudded with the semi-submersible installation Ocean Vanguard on 19 October 2008 and drilled to TD at 3180 in the Late Triassic Red beds. No shallow gas was observed. Operations were delayed a number of times due to bad weather, but no significant operational problems were encountered. The well was drilled with spud mud down to 1415 m and with KCl/polymer/GEM GP mud from 1415 m to TD.

The well penetrated rocks of Quaternary, Tertiary, Cretaceous, Jurassic, and Triassic age. The Lysing Formation was penetrated at 2522 m to 2557 m with four meters of net oil bearing sandstone in the interval 2537 to 2542 m. No OWC was observed. Below the Lysing Formation a 42 m thick section of intra Lange Formation (middle Aptian) water bearing sandstone was encountered. Several Intra-Melke Formation sandstone units were encountered in the interval 2688 to 2738 m. These sandstones were water wet without shows. The main Åre reservoir section was encountered at 2770 m, 4 m deeper than prognosis. Oil was proven in the Åre 2 Formation. Pressure points indicated that the reservoir was oil-filled down to the base of Åre 2. No definitive OWC was observed.

Three cores were cut from 2777 to 2826.9 m in the Åre 2 Formation; a fourth core was cut from 2827 to 2845 m in the Åre 2 and Åre 1 Formation and a fifth core from 2845 to 2872 m in the Åre 1 Formation. Pressure points were taken in the Lysing Formation and in the Åre 1 and Åre 2 formations. MDT fluid samples were taken at 2539 m in the Lysing Formation (oil), at 2773 m in the Åre 2 Formation (oil), 2785.5 m in the Åre 2 Formation (oil), 2799.2 m in the Åre 2 Formation (oil), 2834.6 m in the Åre 2/1 formation boundary (water), 2836.7 m in the Åre 1 Formation (water and oil), and at 2846.9 m in the Åre 1 Formation (water). The oil / water mix sample taken at the top of Åre 1, indicate a potential transition zone. The Åre 2 sandstones was found to have a permeability range of 0.03 mD to 9000 mD with a porosity of 21 %. The numerous thin sandstone beds of the Åre 1 Formation shows a permeability range of 0.01 mD to 17000 mD with a porosity of 23 %.

Temperatures were measured on MDT but were not suitable for Horner correction. The temperature measured after the longest period without circulation, 177.5 hours, was 97 deg C, at 2875 m. This gives a gradient of 37 deg C/km from 4 deg C at seafloor.

A decision was taken to drill a sidetrack in order to find the OWC and prove enough hydrocarbon volumes for a commercial development. The well bore was plugged back and abandoned on 21 December 2008 as an oil discovery.

Testing

No drill stem test was performed.

Cuttings at the Norwegian Offshore Directorate

Cutting sample, top depth [m]	Cutting samples, bottom depth [m]
1420.00	3178.00

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	2777.0	2797.4	[m]
2	2797.4	2811.8	[m]
3	2812.4	2826.6	[m]
4	2827.0	2845.2	[m]
5	2845.2	2870.0	[m]

Total core sample length [m]	92.0
Cores available for sampling?	YES

Lithostratigraphy

Top depth [mMD RKB]	Lithostrat. unit
360	NORDLAND GP
360	NAUST FM
1403	KAI FM
1565	HORDALAND GP
1565	BRYGGE FM
1772	ROGALAND GP
1772	TARE FM
1834	TANG FM
1862	SHETLAND GP
1862	SPRINGAR FM
1982	NISE FM
2348	KVITNOS FM
2534	CROMER KNOLL GP
2534	LYSING FM
2539	LANGE FM
2599	LYR FM
2674	VIKING GP
2674	SPEKK FM
2677	MELKE FM
2688	INTRA MELKE FM SS
2738	FANGST GP
2738	NOT FM

2770	BÅT GP
2770	ÅRE FM
3060	GREY BEDS (INFORMAL)
3133	RED BEDS (INFORMAL)

Logs

Log type	Log top depth [m]	Log bottom depth [m]
FMI XPT MSIP EDTC ACTS ECRD	1650	3160
MDT	2785	2539
MDT	2834	2834
MDT MINI DST	2773	2836
MDT MINI DST	2799	2799
MDT SAMPLE	2846	2846
MDT XPT GR	2537	3125
MWD LWD - PP ARCVRS8 GR RES PWD	412	3180
MWD LWD - TELE DIR	362	412
PEX CMR	2499	2950
PEX CMR HRLA ACTS ECRD EDTC ECS	2499	3169
VSP GR ACTS	405	2945

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	408.0	36	412.0	0.00	LOT
SURF.COND.	13 3/8	1400.0	17 1/2	1415.0	1.57	LOT
INTERM.	9 5/8	2499.0	12 1/4	2500.0	1.96	LOT
OPEN HOLE		3180.0	8 1/2	3180.0	0.00	LOT

Drilling mud

Depth MD [m]	Mud weight [g/cm3]	Visc. [mPa.s]	Yield point [Pa]	Mud type	Date measured
1415	1.35	29.0		Spud Mud	
1415	1.39	15.0		KCl/Polymer/Glycol	
1415	1.35	29.0		Spud Mud	

1480	1.45	15.0		KCl/Polymer/Glycol	
1584	1.48	20.0		KCl/Polymer/Glycol	
1760	1.50	24.0		KCl/Polymer/Glycol	
2145	1.45	26.0		KCl/Polymer/GEM	
2305	1.50	20.0		KCl/Polymer/Glycol	
2430	1.50	18.0		KCl/Polymer/Glycol	
2500	1.51	18.0		KCl/Polymer/Glycol	
2696	1.35	19.0		KCl/Polymer/Glycol	
2788	1.35	21.0		KCl/Polymer/Glycol	
2796	1.35	18.0		KCl/Polymer/Glycol	
3180	1.37	27.0		KCl/Polymer/GEM	

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]
5949_Formation_pressure_(Formasjonstrykk)	pdf	0.28