

**General information**

Wellbore name	6406/3-5
Type	EXPLORATION
Purpose	WILDCAT
Status	P&A
Factmaps in new window	link to map
Main area	NORWEGIAN SEA
Well name	6406/3-5
Seismic location	LINJE 911 - 444 & SP 982
Production licence	091
Drilling operator	Den norske stats oljeselskap a.s
Drill permit	576-L
Drilling facility	WEST DELTA
Drilling days	60
Entered date	03.04.1988
Completed date	01.06.1988
Release date	01.06.1990
Publication date	18.05.2004
Purpose - planned	WILDCAT
Reentry	NO
Content	SHOWS
Discovery wellbore	NO
Kelly bushing elevation [m]	29.0
Water depth [m]	302.0
Total depth (MD) [m RKB]	4283.0
Final vertical depth (TVD) [m RKB]	4281.0
Maximum inclination [°]	4.5
Bottom hole temperature [°C]	92
Oldest penetrated age	EARLY JURASSIC
Oldest penetrated formation	TILJE FM
Geodetic datum	ED50
NS degrees	64° 58' 20.07" N
EW degrees	6° 58' 33.65" E
NS UTM [m]	7207070.27
EW UTM [m]	404464.42
UTM zone	32
NPDID wellbore	1227



Wellbore history

General

Well 6406/3-5 was designed to explore the Lambda structure and was the first well on the structure. The Lambda structure is a flat-lying horst situated in the NE corner of the block.

The primary purpose of the well was to find hydrocarbon accumulations of significant amounts in the Middle and Lower Jurassic sandstones of the Fangst Group and Tilje Formation. Secondary objectives were to verify the interpretation regarding the structural closure towards north, and to verify the geophysical and structural interpretation and improve the geological, paleontological and geochemical understanding of the area. The well was planned to TD in the Åre Formation.

Operations and results

Wildcat well 6406/3-5 was spudded with Smedvig Drilling semi-submersible rig West Delta on 3 April 1988 and drilled to a total depth of 4283 m in the Early Jurassic Tilje Formation. Shallow gas was registered at 570 m. After pulling out to cement this zone, it was impossible to get back into the hole again. After a new spud 3 May, the 30" was set at 418 m, and 20" at 538 m. A new shallow gas zone was registered at 813 m, and the mud was weighted to 1.35 g/cm. The circulation was lost at 1116 m, and the section was cemented. After this drilling progressed with a mud weight of 1.25 g/cm³. This resulted in lost circulation at 1340 m. Both times it was assumed that the circulation was lost in the zone around 562 m. The hole was cemented back and drilled to 607 m where a new leak-off test up to 1.34 g/cm was performed. This time there were no problems with the drilling to 1749 m (setting depth of 9 5/8" casing) with mud weight of 1.25 g/cm³. Further drilling to TD proceeded without significant problems. The well was drilled with spud mud down to 545 m, with gypsum/polymer mud from 545 m to 3841 m, and with gel/lignite/lignosulphonate mud from 3841 m to TD.

Top Fangst was encountered at 3817 m. There were weak shows in the top ten meters of the Garn Formation down to 3825 m, with increased resistivity on MWD down to approx. 3828 m. One run was done using Western Atlas FMT with HP and strain gauge. A total of 25 pre test points were measured. By drawing a line through pressure points in the Garn Formation, it gave a gradient of 0.99 g/cc. A normal water gradient of 1.02 g/cc was not achieved due to unstable pressure points in the lower Garn Formation. A pressure shift in the Ile Formation of approximately 75 psi (0.52 Mpa) was observed in the data. It was not possible to draw a gradient line due to few points in the Ile Formation, but a water gradient was interpreted. The Tilje Formation was found to be tight and interpreted as water bearing. One sample was taken in the upper Garn Formation at 3821 m. The sample contained a mixture of formation water and mud filtrate with traces of oil and gas. The chloride concentration of 9100 mg/l was found to be approximately three times higher than the chloride concentration from the mud filtrate (3000 mg/l). One core was cut in the interval 3815 m to 3837 m in the Garn Formation. As the well was not obligatory, and after it was observed that the Tilje Formation sandstones did not contain any hydrocarbons, the TD of the well was revised to TD in the lower part of the Tilje Formation instead of in the Åre Formation. The well was permanently abandoned on 1 June 1988 as a well with shows.

Testing

No drill stem test was performed

**Cuttings at the Norwegian Offshore Directorate**

Cutting sample, top depth [m]	Cutting samples, bottom depth [m]
550.00	4281.00

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	3815.0	3836.0	[m]

Total core sample length [m]	21.0
Cores available for sampling?	YES

Core photos

3815-3820m



3820-3825m



3825-3830m



3830-3835m



3835-3836m

Palynological slides at the Norwegian Offshore Directorate

Sample depth	Depth unit	Sample type	Laboratory
2000.0	[m]	DC	RRI
2010.0	[m]	DC	RRI
2030.0	[m]	DC	RRI
2050.0	[m]	DC	RRI
2070.0	[m]	DC	RRI
2090.0	[m]	DC	RRI
2110.0	[m]	DC	RRI
2130.0	[m]	DC	RRI
2150.0	[m]	DC	RRI
2170.0	[m]	DC	RRI
2190.0	[m]	DC	RRI



2210.0	[m]	DC	RRI
2230.0	[m]	DC	RRI
2250.0	[m]	DC	RRI
2262.0	[m]	DC	RRI
2280.0	[m]	DC	RRI
2292.0	[m]	DC	RRI
2310.0	[m]	DC	RRI
2322.0	[m]	DC	RRI
2340.0	[m]	DC	RRI
2352.0	[m]	DC	RRI
2370.0	[m]	DC	RRI
2382.0	[m]	DC	RRI
2400.0	[m]	DC	RRI
2412.0	[m]	DC	RRI
2430.0	[m]	DC	RRI
2442.0	[m]	DC	RRI
2460.0	[m]	DC	RRI
2472.0	[m]	DC	RRI
2490.0	[m]	DC	RRI
2502.0	[m]	DC	RRI
2520.0	[m]	DC	RRI
2532.0	[m]	DC	RRI
2550.0	[m]	DC	RRI
2562.0	[m]	DC	RRI
2580.0	[m]	DC	RRI
2592.0	[m]	DC	RRI
2610.0	[m]	DC	RRI
2622.0	[m]	DC	RRI
2640.0	[m]	DC	RRI
2802.0	[m]	DC	RRI
2817.0	[m]	DC	RRI
2832.0	[m]	DC	RRI
2847.0	[m]	DC	RRI
2862.0	[m]	DC	RRI
2877.0	[m]	DC	RRI
2952.0	[m]	DC	RRI
2967.0	[m]	DC	RRI
2982.0	[m]	DC	RRI
2997.0	[m]	DC	RRI
3012.0	[m]	DC	RRI



3027.0 [m]	DC	RRI
3042.0 [m]	DC	RRI
3057.0 [m]	DC	RRI
3072.0 [m]	DC	RRI
3087.0 [m]	DC	RRI
3102.0 [m]	DC	RRI
3117.0 [m]	DC	RRI
3135.0 [m]	DC	RRI
3150.0 [m]	DC	RRI
3165.0 [m]	DC	RRI
3180.0 [m]	DC	RRI
3195.0 [m]	DC	RRI
3675.0 [m]	DC	RRI
3693.0 [m]	DC	RRI
3823.9 [m]	C	RRI
3831.7 [m]	C	RRI
3939.0 [m]	DC	RRI
3954.0 [m]	DC	RRI
3969.0 [m]	DC	RRI
3984.0 [m]	DC	RRI
4014.0 [m]	DC	RRI
4059.0 [m]	DC	RRI
4089.0 [m]	DC	RRI
4119.0 [m]	DC	RRI
4134.0 [m]	DC	RRI
4164.0 [m]	DC	RRI
4179.0 [m]	DC	RRI
4194.0 [m]	DC	RRI
4209.0 [m]	DC	RRI
4224.0 [m]	DC	RRI
4239.0 [m]	DC	RRI
4254.0 [m]	DC	RRI
4263.0 [m]	DC	RRI
4281.0 [m]	DC	RRI

Lithostratigraphy

Top depth [mMD RKB]	Lithostrat. unit
333	NORDLAND GP



333	NAUST FM
1488	KAI FM
1897	HORDALAND GP
1897	BRYGGE FM
2253	ROGALAND GP
2253	TARE FM
2318	TANG FM
2382	SHETLAND GP
2382	SPRINGAR FM
2525	NISE FM
2780	KVITNOS FM
3179	CROMER KNOLL GP
3179	LYSING FM
3214	LANGE FM
3703	LYR FM
3732	VIKING GP
3732	SPEKK FM
3765	MELKE FM
3817	FANGST GP
3817	GARN FM
3907	NOT FM
3949	ILE FM
4012	BÅT GP
4012	ROR FM
4139	TILJE FM

Composite logs

Document name	Document format	Document size [MB]
1227	pdf	0.77

Geochemical information

Document name	Document format	Document size [MB]
1227_1	pdf	0.86



**Documents - older Norwegian Offshore Directorate WDSS reports and other related documents**

Document name	Document format	Document size [MB]
1227_01_WDSS_General_Information	pdf	0.25
1227_02_WDSS_completion_log	pdf	0.29

Documents - reported by the production licence (period for duty of secrecy expired)

Document name	Document format	Document size [MB]
1227_6406_3_5_COMPLETION_REPORT_AND_LOG	pdf	19.29

Logs

Log type	Log top depth [m]	Log bottom depth [m]
CBL VDL GR	778	1722
CDL CN SPL	3795	4289
DIFL ACL GR CDL	537	1712
DIFL BHC GR	3795	4289
DIFL BHC GR CDL	1722	3796
DIPLOG	3795	4289
FMT GR	3795	4289
MWD - GR RES ROP DIR	334	4280
VSP	334	4200

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	418.0	36	473.0	0.00	LOT
SURF.COND.	20	535.0	26	545.0	1.43	LOT
INTERM.	13 3/8	1722.0	17 1/2	1749.0	1.77	LOT
INTERM.	9 5/8	3797.0	12 1/4	3814.0	1.93	LOT
OPEN HOLE		4283.0	8 1/2	0.0	0.00	LOT



**Drilling mud**

Depth MD [m]	Mud weight [g/cm3]	Visc. [mPa.s]	Yield point [Pa]	Mud type	Date measured
236	1.04	100.0		WATER BASED	12.05.1987
236	1.09			WATER BASED	12.05.1987
348	1.03			WATER BASED	05.04.1988
380	1.03			WATER BASED	31.05.1988
400	1.04	100.0		WATER BASED	12.05.1987
418	1.10			WATER BASED	05.04.1988
473	1.05			WATER BASED	06.04.1988
475	1.03			WATER BASED	05.04.1988
545	1.20			WATER BASED	07.04.1988
545	1.20	45.0	5.0	WATER BASED	11.04.1988
545	1.03			WATER BASED	08.04.1988
577	1.23	49.0	5.0	WATER BASED	15.04.1988
610	1.20	15.0	4.0	WATER BASED	30.05.1988
723	1.04			WATER BASED	12.05.1987
723	1.04			WATER BASED	14.05.1987
723	1.07	48.0		WATER BASED	19.05.1987
723	1.17			WATER BASED	19.05.1987
823	1.20	53.0	6.0	WATER BASED	13.04.1988
873	1.19	37.0	11.0	WATER BASED	20.05.1987
905	1.20	51.0	7.5	WATER BASED	11.04.1988
1116	1.20	53.0	5.5	WATER BASED	12.04.1988
1116	1.20	47.0	5.5	WATER BASED	12.04.1988
1123	1.26	42.0	12.5	WATER BASED	20.05.1987
1276	1.31	38.0	10.1	WATER BASED	21.05.1987
1325	1.69	55.0	7.5	WATER BASED	30.05.1988
1352	1.23	48.0	6.0	WATER BASED	14.04.1988
1614	1.23	11.0	3.0	WATER BASED	18.04.1988
1749	1.26	15.0	3.0	WATER BASED	18.04.1988
1749	1.25	13.0	6.0	WATER BASED	18.04.1988
1756	1.70	21.0	4.0	WATER BASED	20.04.1988
2102	1.70	22.0	6.0	WATER BASED	21.04.1988
2102	1.60	18.0	3.0	WATER BASED	22.04.1988
2288	1.68	61.0	6.0	WATER BASED	27.04.1988
2318	1.69	55.0	7.5	WATER BASED	30.05.1988
2370	1.69	52.0	6.0	WATER BASED	27.04.1988
2370	1.69	65.0	8.5	WATER BASED	16.05.1988



2370	1.69	64.0	9.0	WATER BASED	27.04.1988
2370	1.69	59.0	7.5	WATER BASED	27.04.1988
2370	1.69	53.0	8.0	WATER BASED	27.04.1988
2370	1.69	54.0	7.5	WATER BASED	28.04.1988
2370	1.69	52.0	7.5	WATER BASED	29.04.1988
2370	1.69	66.0	9.5	WATER BASED	09.05.1988
2370	1.69	58.0	10.0	WATER BASED	09.05.1988
2370	1.69	58.0	11.0	WATER BASED	09.05.1988
2370	1.69	58.0	10.0	WATER BASED	13.05.1988
2370	1.70	55.0	10.0	WATER BASED	13.05.1988
2370	1.69	53.0	9.5	WATER BASED	13.05.1988
2370	1.69	58.0	10.5	WATER BASED	10.05.1988
2370	1.69	50.0	8.5	WATER BASED	16.05.1988
2370	1.69	60.0	9.0	WATER BASED	16.05.1988
2370	1.69	48.0	6.0	WATER BASED	18.05.1988
2370	1.69	60.0	5.5	WATER BASED	18.05.1988
2370	1.69	68.0	5.0	WATER BASED	19.05.1988
3208	1.69	28.0	8.0	WATER BASED	02.05.1988
3228	1.69	29.0	8.0	WATER BASED	02.05.1988
3303	1.69	26.0	9.0	WATER BASED	02.05.1988
3367	1.69	24.0	10.0	WATER BASED	03.05.1988
3437	1.69	24.0	10.0	WATER BASED	04.05.1988
3456	1.69	25.0	10.0	WATER BASED	05.05.1988
3456	1.69	24.0	9.0	WATER BASED	06.05.1988
3623	1.69	49.0	5.5	WATER BASED	27.05.1988
3815	1.24	52.0	3.0	WATER BASED	20.05.1988
3856	1.24	41.0	7.0	WATER BASED	26.05.1988
3906	1.24	19.0	3.0	WATER BASED	24.05.1988
4073	1.24	21.0	4.0	WATER BASED	24.05.1988
4140	1.24	27.0	3.0	WATER BASED	24.05.1988
4283	1.24	27.0	3.5	WATER BASED	24.05.1988
4283	1.24	27.0	3.5	WATER BASED	25.05.1988

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]
1227 Formation pressure (Formasjonstrykk)	pdf	0.28

