General information

Wellbore name	6608/10-2
Type	EXPLORATION
Purpose	WILDCAT
Status	P&A
Factmaps in new window	link to map
Main area	NORWEGIAN SEA
Field	NORNE
Discovery	6608/10-2 Norne
Well name	6608/10-2
Seismic location	NRGS 85 -NRGS84 - 451& SP. 780
Production licence	128
Drilling operator	Den norske stats oljeselskap a.s
Drill permit	701-L
Drilling facility	ROSS RIG (2)
Drilling days	94
Entered date	28.10.1991
Completed date	29.01.1992
Release date	29.01.1994
Publication date	21.12.2007
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
Kelly bushing elevation [m]	23.0
Water depth [m]	374.0
Total depth (MD) [m RKB]	3678.0
Final vertical depth (TVD) [m RKB]	3677.0
Maximum inclination [°]	4
Bottom hole temperature [°C]	133
Oldest penetrated age	LATE TRIASSIC
Oldest penetrated formation	ÅRE FM
Geodetic datum	ED50
NS degrees	66° 0' 49.35'' N
EW degrees	8° 4' 26.48'' E

NS UTM [m]	7321933.62
EW UTM [m]	457994.68
UTM zone	32
NPDID wellbore	1782

Wellbore history

General

Well 6608/10-2 is located on the Dønna Terrace offshore Mid Norway. The primary objective of the well was to test the hydrocarbon potential in the Middle Jurassic Fangst Group sandstones. Possible sandy equivalent to the Rogn Formation in the Viking Group was a secondary objective. The well was planned with TD at 3225 m with a commitment to drill into rocks of Triassic age.

Operations and results

Wildcat well 6608/10-2 was spudded with the semi-submersible installation Ross Rig on 28 October 1991 and drilled to TD at 3678 m in Late Triassic rocks of the Åre Formation. Some problems with tight hole were experienced between 1800 and 2300 m in the 12 1/4" section. Due to presence of hydrocarbons and the commitment to drill to Triassic the well was extended both in time and depth compared to programme. Technical operations went smoothly with little down-time. The well was drilled with seawater and hi-vis pills down to 874 m, with gypsum/PAC mud from 874 m to 2576 m, and with Ancotemp/bentonite mud from 2576 m to TD.

Shows were observed in limestone in the interval 2160 ? 2271 m in the Cretaceous Nise and Lyr Formations. Oil and gas were encountered in the Båt and Fangst Groups (Lower- Middle Jurassic). From FMT data and electric logs the gas-oil contact was interpreted at 2605 m, and the oil-water contact at 2713.5 m. The Rogn Formation equivalent was not present in the well.

A total of 141.5 m core was recovered in six cores from the interval 2590 ? 2741 m in the Fangst and Båt Groups. Two FMT wire line samples were collected; a gas sample at 2583.2 m and an oil sample at 2650.5 m.

The well was permanently abandoned on 29 January 1992 as an oil and gas discovery.

Testing

Four intervals were perforated and tested.

DST 1 tested the interval 2715 ? 2720 m in the in the lower Tofte Formation. The test produced 310 Sm3 water /day through a 2" choke. Maximum bottom hole temperature recorded in the test was 100 deg C.

DST 2 tested the interval 2673 ? 2695 m in the in the upper Tofte Formation. The test produced up to 1165 Sm3 oil and 108667 Sm3 gas /day through a 1.5" choke. The GOR in this flow was 93 Sm3/Sm3, the oil density was 0.856 g/cm3, the gas gravity was 0.65 (air =1), and the gas contained 1.8 % CO2 and 4 ppm H2S. Maximum bottom hole temperature recorded in the test was 98.4 deg C.

DST 3A tested the interval 2605 ? 2610 m in the in the lower Garn Formation. The production rate was measured to 33 Sm3 condensate and 582600 Sm3 gas/day through a 19.05 mm choke. The GOR was 17654 Sm3/Sm3. Maximum bottom hole temperature recorded in the test was 91.4 deg C.

DST 3B tested the interval 2590 - 2603 m in the in the Garn Formation. Maximum rates were recorded to 100 Sm3 condensate and 945000 Sm3 gas /day through a 38.1 mm choke. The GOR was 9450 Sm3/Sm3 in this flow, the condensate density was 0.783 g/cm3, the gas gravity was 0.645 (air = 1), and the gas contained 1.1 % CO2 and 0.5 ppm H2S. Maximum bottom hole temperature recorded in the test was 95.5 deg C

Cuttings at the Norwegian Offshore Directorate

Cutting sample, top depth [m]	Cutting samples, bottom depth [m]
890.00	3678.00

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	2590.0	2616.7	[m]
2	2617.6	2641.0	[m]
3	2646.0	2673.8	[m]
4	2674.0	2681.8	[m]
5	2686.0	2714.2	[m]
6	2714.2	2741.8	[m]

Total core sample length [m]	141.5
Cores available for sampling?	YES

Core photos


2590-2595m


2595-2600m


2600-2605m


2605-2610m


2610-2615m


2615-2616m


2617-2622m


2622-2627m


2627-2632m


2632-2637m


2637-2542m


2642-2646m


2646-2651m


2651-2656m


2656-2661m


2661-2666m


2666-2671m


2671-2673m


2674-2679m


2679-2681m


2686-2691m


2691-2696m


2696-2701m


2701-2706m


2706-2711m


2711-2714m


2714-2719m


2719-2724m


2724-2729m


2729-2734m


2734-2739m


2739-2741m

Palynological slides at the Norwegian Offshore Directorate

Sample depth	Depth unit	Sample type	Laboratory
1420.0	[m]	SWC	STATO
1553.0	[m]	SWC	STATO
1572.0	[m]	DC	RRI
1614.0	[m]	DC	RRI
1632.0	[m]	DC	RRI
1650.0	[m]	DC	RRI
1678.0	[m]	SWC	STATO
1680.0	[m]	DC	RRI

1684.0	[m]	SWC	STATO
1704.0	[m]	DC	RRI
1722.0	[m]	DC	RRI
1740.0	[m]	DC	RRI
1776.0	[m]	DC	RRI
1806.0	[m]	DC	RRI
1824.0	[m]	DC	RRI
1846.0	[m]	DC	RRI
1854.0	[m]	DC	RRI
1857.0	[m]	SWC	STATO
1860.0	[m]	SWC	STATO
1887.0	[m]	SWC	STATO
1898.0	[m]	SWC	STATO
1932.0	[m]	DC	RRI
1947.0	[m]	SWC	STATO
1953.0	[m]	SWC	STATO
1965.0	[m]	SWC	STATO
1985.0	[m]	SWC	STATO
1986.0	[m]	DC	RRI
2051.0	[m]	SWC	STATO
2085.0	[m]	SWC	STATO
2137.0	[m]	SWC	STATO
2200.0	[m]	SWC	STATO
2249.0	[m]	SWC	STATO
2256.0	[m]	SWC	STATO
2331.0	[m]	SWC	STATO
2348.0	[m]	SWC	STATO
2352.0	[m]	DC	STATO
2355.0	[m]	DC	STATO
2358.0	[m]	DC	STATO
2360.0	[m]	SWC	STATO
2368.0	[m]	SWC	STATO
2375.0	[m]	SWC	STATO
2385.0	[m]	SWC	STATO
2444.0	[m]	SWC	STATO
2481.0	[m]	DC	RRI
2490.0	[m]	DC	RRI
2502.0	[m]	DC	RRI
2511.0	[m]	DC	RRI
2523.0	[m]	DC	RRI

2532.0	[m]	DC	RRI
2550.0	[m]	DC	RRI
2559.0	[m]	DC	RRI
2576.0	[m]	DC	RRI
2615.6	[m]	C	STATOIL
2617.4	[m]	C	STATOIL
2618.8	[m]	C	STATO
2620.7	[m]	C	STATOI
2621.1	[m]	C	STATOI
2627.4	[m]	C	STATOI
2629.9	[m]	C	STATOI
2630.6	[m]	C	STATOI
2633.3	[m]	C	STATOI
2636.4	[m]	C	STATOI
2637.3	[m]	C	STATOI
2638.2	[m]	C	STATOI
2640.4	[m]	C	STATOI
2641.9	[m]	C	STATOI
2645.1	[m]	C	STATOI
2649.5	[m]	C	STATOI
2650.7	[m]	C	STATOI
2652.0	[m]	C	STATOI
2652.6	[m]	C	STATO
2653.4	[m]	C	STATOI
2654.2	[m]	C	STATOI
2657.6	[m]	C	STATOI
2659.8	[m]	C	STATO
2662.5	[m]	C	STATO
2678.3	[m]	C	STATO
2692.5	[m]	C	STATO
2701.5	[m]	C	STATO
2710.8	[m]	C	STATO
2721.5	[m]	C	STATO
2721.9	[m]	C	STATO
2724.5	[m]	C	STATO
2724.7	[m]	C	STATO
2726.0	[m]	C	STATO
2738.3	[m]	C	STATO
2761.0	[m]	SWC	STATO
2773.0	[m]	DC	RRI

2787.0	[m]	SWC	STATO
2794.0	[m]	DC	RRI
2818.0	[m]	DC	RRI
2822.0	[m]	SWC	STATO
2836.0	[m]	DC	RRI
2842.0	[m]	DC	RRI
2866.0	[m]	DC	RRI
2875.0	[m]	SWC	STATO
2884.0	[m]	DC	RRI
2896.0	[m]	DC	RRI
2908.0	[m]	DC	RRI
2918.5	[m]	SWC	STATO
2926.0	[m]	DC	RRI
2938.0	[m]	DC	RRI
2944.0	[m]	DC	RRI
2956.0	[m]	DC	RRI
2962.0	[m]	DC	RRI
2974.0	[m]	DC	RRI
2978.0	[m]	SWC	STATO
2992.0	[m]	DC	RRI
3004.0	[m]	DC	RRI
3016.0	[m]	DC	RRI
3025.0	[m]	SWC	STATO
3034.0	[m]	DC	RRI
3043.0	[m]	DC	RRI
3053.0	[m]	SWC	STATO
3063.0	[m]	DC	RRI
3072.0	[m]	DC	RRI
3080.0	[m]	SWC	STATO
3087.0	[m]	DC	RRI
3100.0	[m]	SWC	STATO
3117.0	[m]	DC	RRI
3125.0	[m]	SWC	STATO
3135.0	[m]	DC	RRI
3144.0	[m]	DC	RRI
3153.0	[m]	DC	RRI
3162.0	[m]	DC	RRI
3171.0	[m]	DC	RRI
3180.0	[m]	DC	RRI
3189.0	[m]	DC	RRI

3198.0	[m]	DC	RRI
3210.0	[m]	SWC	STATO
3219.0	[m]	DC	RRI
3229.5	[m]	SWC	STATO
3240.0	[m]	DC	RRI
3249.0	[m]	DC	RRI
3262.0	[m]	SWC	STATO
3280.0	[m]	SWC	STATO
3290.0	[m]	SWC	STATO
3309.0	[m]	DC	RRI
3318.0	[m]	DC	RRI
3325.0	[m]	SWC	STATO
3335.0	[m]	DC	RRI
3343.0	[m]	SWC	STATO
3354.0	[m]	DC	RRI
3363.0	[m]	DC	RRI
3370.0	[m]	SWC	STATO
3381.0	[m]	DC	RRI
3417.0	[m]	DC	RRI
3426.0	[m]	SWC	STATO
3435.0	[m]	DC	RRI
3453.0	[m]	DC	RRI
3481.5	[m]	SWC	STATO
3518.0	[m]	SWC	STATO
3528.0	[m]	DC	RRI
3537.0	[m]	DC	RRI
3558.0	[m]	DC	RRI
3570.5	[m]	SWC	STATO
3582.0	[m]	DC	RRI
3594.0	[m]	DC	RRI
3600.0	[m]	DC	RRI
3618.0	[m]	DC	RRI
3618.0	[m]	DC	OD
3627.0	[m]	SWC	STATO
3636.0	[m]	DC	RRI
3648.0	[m]	DC	RRI
3652.0	[m]	DC	OD
3653.0	[m]	SWC	STATO
3654.5	[m]	SWC	STATO
3660.9	[m]	SWC	STATO

3661.0	[m]	DC	OD
3669.0	[m]	DC	RRI
3670.0	[m]	DC	OD
3678.0	[m]	DC	RRI

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
DST	DST2	2673.00	2695.00		04.01.1992 - 16:30	YES
DST	DST3A	2603.00	2606.00		10.01.1992 - 09:30	YES
DST	DST3B	2603.00	2606.00		13.01.1992 - 20:00	YES

Lithostratigraphy

Top depth [mMD RKB]	Lithostrat. unit
397	NORDLAND GP
397	NAUST FM
1352	KAI FM
1565	HORDALAND GP
1565	BRYGGE FM
1857	ROGALAND GP
1857	TARE FM
1913	TANG FM
1951	SHETLAND GP
1951	SPRINGAR FM
2151	NISE FM
2253	CROMER KNOLL GP
2253	LYR FM
2347	VIKING GP
2347	SPEKK FM
2365	MELKE FM
2578	FANGST GP
2578	GARN FM
2611	NOT FM
2619	ILE FM

2659	BÅT GP
2659	ROR FM
2668	TOFTE FM
2720	TILJE FM
2819	ÅRE FM

Geochemical information

Document name	Document format	Document size [MB]
1782_1	pdf	0.27
1782_2	pdf	0.65
1782_3	pdf	0.10
1782_4	pdf	2.96

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

Document name	Document format	Document size [MB]
1782_01_WDSS_General_Information	pdf	0.81
1782_02_WDSS_completion_log	pdf	0.23

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

Document name	Document format	Document size [MB]
1782_6608_10_2_COMPLETION_REPORT_AND_LOG	pdf	42.32

Drill stem tests (DST)

Test number	From depth MD [m]	To depth MD [m]	Choke size [mm]
1.0	2715	2720	50.8
3.1	2673	2696	72.0
3.2	2605	2610	19.0
3.3	2590	2610	28.0

Test number	Final shut-in pressure [MPa]	Final flow pressure [MPa]	Bottom hole pressure [MPa]	Downhole temperature [°C]
1.0				100
3.1		30.000		98
3.2				91
3.3				95

Test number	Oil [Sm3/day]	Gas [Sm3/day]	Oil density [g/cm3]	Gas grav. rel.air	GOR [m3/m3]
1.0				0.680	
3.1	1165		0.847	0.660	93
3.2		582600		0.640	
3.3		945000		0.640	

Logs

Log type	Log top depth [m]	Log bottom depth [m]
ACBL GR	1563	2559
ACBL GR	2405	3319
CBL VDL GR	394	1520
DIFL ACL GR	867	3661
DIPLOG GR	1520	2140
DIPLOG GR	2559	3332
DIPLOG GR	3329	3661
DLL MLL SL	2559	2758
FMT HP GR	2579	2800
FMT HP GR	2650	2650
LWD - CDR CDN	2100	2573
MWD	465	3335
VELOCITY	930	3640
ZDL CNL CAL GR	1520	2141
ZDL CNL CAL GR	2559	3644
ZDL GR	867	1525

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	459.0	36	460.0	0.00	LOT
INTERM.	20	867.0	26	870.0	1.41	LOT
INTERM.	13 3/8	1520.0	17 1/2	1522.0	1.86	LOT
INTERM.	9 5/8	2561.0	12 1/4	2564.0	1.95	LOT
LINER	7	3330.0	8 1/2	3678.0	1.82	LOT

Drilling mud

Depth MD [m]	Mud weight [g/cm3]	Visc. [mPa.s]	Yield point [Pa]	Mud type	Date measured
886	1.03	23.0		WATER BASED	
920	1.20	20.0		WATER BASED	
1220	1.20	20.0		WATER BASED	
1540	1.37	29.0		WATER BASED	
1542	1.37	23.0		WATER BASED	
1727	1.50	24.0		WATER BASED	
1828	1.64	28.0		WATER BASED	
1911	1.62	36.0		WATER BASED	
2041	1.62	33.0		WATER BASED	
2561	1.20	15.0		WATER BASED	
2576	1.30	22.0		WATER BASED	
2579	1.20	14.0		WATER BASED	
2590	1.30	23.0		WATER BASED	
2674	1.30	20.0		WATER BASED	
2682	1.30	20.0		WATER BASED	
2741	1.30	22.0		WATER BASED	
3013	1.30	21.0		WATER BASED	
3051	1.30	20.0		WATER BASED	
3073	1.25	21.0		WATER BASED	
3276	1.20	15.0		WATER BASED	
3282	1.20	16.0		WATER BASED	
3330	1.20	15.0		WATER BASED	
3335	1.20	15.0		WATER BASED	
3445	1.20	18.0		WATER BASED	
3617	1.20	15.0		WATER BASED	
3678	1.20	17.0		WATER BASED	

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]
1782_Formation_pressure_(Formasjonstrykk)	pdf	0.30