General information

Wellbore name	6507/7-5
Type	EXPLORATION
Purpose	APPRAISAL
Status	P&A
Factmaps in new window	link to map
Main area	NORWEGIAN SEA
Field	HEIDRUN
Discovery	6507/7-2 Heidrun
Well name	6507/7-5
Seismic location	CN 8502 - 599 SP. 225
Production licence	095
Drilling operator	Conoco Norway Inc.
Drill permit	500-L
Drilling facility	NORTRYM
Drilling days	50
Entered date	16.01.1986
Completed date	06.03.1986
Release date	06.03.1988
Publication date	17.09.2007
Purpose - planned	APPRAISAL
Reentry	NO
Content	OIL/GAS
Discovery wellbore	NO
1st level with HC, age	MIDDLE JURASSIC
1st level with HC, formation	ILE FM
Kelly bushing elevation [m]	25.0
Water depth [m]	331.0
Total depth (MD) [m RKB]	2660.0
Final vertical depth (TVD) [m RKB]	2659.0
Maximum inclination [°]	2.8
Bottom hole temperature [°C]	92
Oldest penetrated age	EARLY JURASSIC
Oldest penetrated formation	TILJE FM
Geodetic datum	ED50
NS degrees	65° 21' 30.27'' N
EW degrees	7° 17' 35.08'' E
NS UTM [m]	7249656.78
EW UTM [m]	420590.94

UTM zone	32
NPDID wellbore	879

Wellbore history

General

Well 6507/7-5 is located on the northern part of the Halten Terrace off shore Mid Norway and was drilled to appraise the northern extension of the 6507/7-2 Heidrun Discovery. The primary objective was Middle and Lower Jurassic sands in a downthrown fault block located NNW of the 6507/7-2 well. Prognosed top Jurassic was at 2308 m.

Secondary objective was the Båt Group at an expected depth of 2394 m. Based on site survey, shallow gas could appear at 512, 570, 618, 746, and 799 m. Prognosed TD was 2675 m.

Operations and results

Appraisal well 6507/7-5 was spudded with the semi-submersible installation Nortrym on 16 January 1986 and drilled to TD at 2660 in the Early Jurassic Tilje Formation. The 26" hole section was drilled without marine riser to 1040 m, first as a 17 1/2" pilot hole with MWD logging, then opening up to 26". No shallow gas was recorded. The MWD quality was good, so no electric logging was performed in this section. Since no riser was used, all returns were to seafloor down to 1040 m. No significant problems were encountered during operations. The well was drilled with seawater and pre-hydrated gel down to 1040 m and with KCl/polymer mud from 1040 m to TD.

No sandstone of importance was encountered above the Middle Jurassic. A hiatus from Late Cretaceous Turonian to Late Jurassic Oxfordian/Kimmeridgian was observed at 2310 m. Sandstones of the Fangst Group were encountered at 2353 to 2424 m. Analysis of cores and logs indicated good to excellent porosity and permeability in these sandstones, with the best reservoir properties towards the top, in the Garn Formation.

Poor oil shows were observed in sandstone lenses in core no 1 from the Shetland Group (2255.0 - 2282.5 m), which consisted mainly of claystones. Visible shows of uniform light brown oil were observed on cores from top of the Garn Formation down to 2400 m. Below this depth the shows were occasionally more patchy, until at 2422 m core depth (2427 m loggers depth) where there was no longer any visible oil. The lowermost oil observed on the cores was not believed to represent the true OWC, but a change into impermeable lithologies. One RFT run was carried out in the 12 1/4" hole with the objective of establishing the OWC. Intersection of the oil and water gradients from the RFT pressure data suggested an OWC at ca 2475 m. The Early Jurassic Ti1je Formation of the Båt Group was penetrated at 2473.5 m and proved to be dry without shows.

Seventeen cores from the Late Cretaceous through to the Early Jurassic were cut from 2255 to 2644.5 m with 89.4 % recovery. Attempts were made to obtain a water sample on RFT at 2485 and 2485.5 m, but these were unsuccessful due to malfunction of the sample chamber.

The well was permanently abandoned on 6 March 1986 as an oil and gas appraisal.

Testing

Three DST tests were performed in this well.

DST 1 tested the interval 2418 m to 2424 m in the base of the Garn Formation. It

produced at maximum rates 751 Sm3 oil and 52358 Sm3 separator gas /day through a 2x1" choke. The separator GOR was 70 Sm3/Sm3, the oil gravity was 27.9 deg API, and the separator gas gravity was 0.65. The gas contained maximum 2% CO2 and no detectable H2S.

DST 2, was aborted due to a leak in the kill line and was re-tested as DST 2A.

DST 2A tested the interval 2355 m to 2375 m in the top of the Garn Formation. It produced at maximum rates 982 Sm3 oil and 85630 Sm3 separator gas /day through a 2x1" choke. The separator GOR was 87 Sm3/Sm3, the oil gravity was 31.3 deg API, and the separator gas gravity was 0.68. The gas contained maximum 2% CO2 and no detectable H2S.

None of the tests produced any bottom sediments or water.

The DST maximum recorded temperatures from the final flows of DST1 and DST2A were 85.7 deg C at 2421 m, and 82.6 deg C at 2365 m, respectively.

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Cuttings at the Norwegian Offshore Directorate

Cutting sample, top depth [m]	Cutting samples, bottom depth [m]
1050.00	2660.00

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	2255.0	2282.9	[m]
2	2282.5	2308.8	[m]
3	2308.5	2336.4	[m]
4	2336.0	2349.6	[m]
5	2362.0	2385.5	[m]
6	2390.0	2407.8	[m]
7	2411.0	2438.9	[m]
8	2439.0	2466.9	[m]
9	2467.0	2480.7	[m]
10	2482.0	2497.6	[m]
11	2501.0	2509.0	[m]
12	2512.0	2533.6	[m]
13	2538.0	2553.1	[m]
14	2556.0	2578.7	[m]
15	2581.5	2591.1	[m]
16	2596.5	2623.9	[m]

17	2625.0	2644.5	[m]

Total core sample length [m]	345.7
Cores available for sampling?	YES

Palynological slides at the Norwegian Offshore Directorate

Sample depth	Depth unit	Sample type	Laboratory
2255.0	[m]	C	OD
2257.0	[m]	C	OD
2258.0	[m]	C	OD
2260.0	[m]	C	OD
2261.0	[m]	C	OD
2262.0	[m]	C	OD
2263.5	[m]	C	OD
2264.4	[m]	C	OD
2265.6	[m]	C	OD
2266.5	[m]	C	OD
2267.5	[m]	C	OD
2268.5	[m]	C	OD
2269.5	[m]	C	OD
2270.5	[m]	C	OD
2271.5	[m]	C	OD
2272.5	[m]	C	OD
2273.5	[m]	C	OD
2274.5	[m]	C	OD
2275.5	[m]	C	OD
2276.5	[m]	C	OD
2277.5	[m]	C	OD
2278.5	[m]	C	OD
2279.5	[m]	C	OD
2280.5	[m]	C	OD
2281.5	[m]	C	OD
2282.5	[m]	C	OD
2283.5	[m]	C	OD
2284.5	[m]	C	OD
2285.5	[m]	C	OD
2286.5	[m]	C	OD
2287.5	[m]	C	OD

2288.5	[m]	C	OD
2289.5	[m]	C	OD
2290.5	[m]	C	OD
2291.5	[m]	C	OD
2292.5	[m]	C	OD
2293.5	[m]	C	OD
2294.5	[m]	C	OD
2295.5	[m]	C	OD
2296.5	[m]	C	OD
2297.5	[m]	C	OD
2298.5	[m]	C	OD
2299.5	[m]	C	OD
2300.5	[m]	C	OD
2301.5	[m]	C	OD
2302.5	[m]	C	OD
2303.6	[m]	C	OD
2304.5	[m]	C	OD
2305.5	[m]	C	OD
2306.5	[m]	C	OD
2307.5	[m]	C	OD
2308.7	[m]	C	OD
2309.0	[m]	C	OD
2309.5	[m]	C	OD
2310.5	[m]	C	OD
2311.5	[m]	C	OD
2312.5	[m]	C	OD
2312.5	[m]	C	OD
2314.5	[m]	C	OD
2316.5	[m]	C	OD
2319.5	[m]	C	OD
2322.5	[m]	C	OD
2325.5	[m]	C	OD
2328.5	[m]	C	OD
2331.5	[m]	C	OD
2334.5	[m]	C	OD
2336.6	[m]	C	OD
2342.5	[m]	C	OD
2348.0	[m]	C	OD
2348.6	[m]	C	OD
2378.7	[m]	C	OD

2405.8	[m]	C	OD
2417.0	[m]	C	OD
2417.3	[m]	C	OD
2418.7	[m]	C	OD
2438.5	[m]	C	OD

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		2418.00	2424.00		21.02.1986 - 00:00	YES
DST	TEST1	0.00	0.00		20.01.1987 - 00:00	YES
DST	DST2	2355.00	2375.00		25.02.1986 - 00:00	YES
DST		2355.00	2375.00		02.03.1986 - 00:00	YES
DST	TEST2A	2355.00	2375.00		02.03.1986 - 00:00	YES

Lithostratigraphy

Top depth [mMD RKB]	Lithostrat. unit
356	NORDLAND GP
356	NAUST FM
1482	KAI FM
1904	HORDALAND GP
1904	BRYGGE FM
1998	ROGALAND GP
1998	TARE FM
2025	TANG FM
2086	SHETLAND GP
2310	VIKING GP
2310	SPEKK FM
2316	MELKE FM
2353	FANGST GP
2353	GARN FM
2399	NOT FM

2409	ILE FM
2424	BÅT GP
2424	ROR FM
2474	TILJE FM

Composite logs

Document name	Document format	Document size [MB]
879_6507_7_5	pdf	0.45

Geochemical information

Document name	Document format	Document size [MB]
879_1	pdf	0.27
879_2	pdf	0.09
879_3	pdf	0.19

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

Document name	Document format	Document size [MB]
879_01_WDSS_General_Information	pdf	0.29
879_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]
879_01_Completion_Report	pdf	11.57
879_02_Completion_log	pdf	2.15

Drill stem tests (DST)

Test number	From depth MD [m]	To depth MD [m]	Choke size [mm]
1.0	2417	2424	35.9
2.0	2355	2375	35.9

Test number	Final shut-in pressure [MPa]	Final flow pressure [MPa]	Bottom hole pressure [MPa]	Downhole temperature [°C]
1.0	4.000	4.000	25.000	
2.0	4.000	5.000	25.000	

Test number	Oil [Sm3/day]	Gas [Sm3/day]	Oil density [g/cm3]	Gas grav. rel.air	GOR [m3/m3]
1.0	774	52000	0.890		67
2.0	953	85000	0.868		89

Logs

Log type	Log top depth [m]	Log bottom depth [m]
CBL VDL GR CCL	2125	2621
CYBERDIP	2228	2658
CYBERLOOK	2228	2516
DIL GR SP	2228	2516
DIL SLS GR SP	2228	2658
DLL MSFL GR SP	2228	2655
HRT	355	2177
ISF SLS MSFL GR	1032	2232
LDL CNL GR	1032	2233
LDL CNL GR	2228	2516
LDL CNL NGL	2228	2659
MWD - GR RES DIR	455	2240
NGT RATIOS	2228	2659
RFT GP	2358	2637
RFT HP	2358	2637
RFT SG	2358	2637
SHDT	2228	2658
SONIC WAVEFORM	2228	2658
VELOCITY	1036	2654

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	455.0	36	455.0	0.00	LOT
INTERM.	20	1033.0	26	1040.0	1.52	LOT
INTERM.	13 3/8	2228.0	17 1/2	2255.0	1.79	LOT
INTERM.	9 5/8	2659.0	12 1/4	2660.0	0.00	LOT

Drilling mud

Depth MD [m]	Mud weight [g/cm3]	Visc. [mPa.s]	Yield point [Pa]	Mud type	Date measured
426	1.03			WATER BASED	17.01.1986
1794	1.38			WATER BASED	25.01.1986
1905	1.39			WATER BASED	25.01.1986
2075	1.38	108.0	20.0	WATER BASED	05.03.1986
2098	1.34			WATER BASED	25.01.1986
2238	1.42			WATER BASED	25.01.1986
2248	1.42			WATER BASED	30.01.1986
2248	1.42			WATER BASED	31.01.1986
2248	1.42			WATER BASED	03.02.1986
2255	1.21			WATER BASED	03.02.1986
2283	1.20			WATER BASED	03.02.1986
2309	1.21			WATER BASED	01.02.1986
2362	1.22			WATER BASED	04.02.1986
2411	1.22			WATER BASED	06.02.1986
2451	1.02			WATER BASED	10.02.1986
2501	1.20			WATER BASED	10.02.1986
2512	1.20			WATER BASED	10.02.1986
2538	1.02			WATER BASED	10.02.1986
2582	1.20	24.0	9.0	WATER BASED	10.02.1986
2660	1.20	108.0	20.0	WATER BASED	14.02.1986
2660	1.20	108.0	20.0	WATER BASED	24.02.1986

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]
879_Formation_pressure_(Formasjonstrykk)	pdf	0.28