

**General information**

Wellbore name	6506/12-5
Type	EXPLORATION
Purpose	APPRAISAL
Status	P&A
Factmaps in new window	link to map
Main area	NORWEGIAN SEA
Field	ÅSGARD
Discovery	6506/12-3 Smørbukk Sør
Well name	6506/12-5
Seismic location	ST 8403 - 451 SP. 338
Production licence	094
Drilling operator	Den norske stats oljeselskap a.s
Drill permit	485-L
Drilling facility	DYVI DELTA
Drilling days	162
Entered date	17.10.1985
Completed date	27.03.1986
Release date	27.03.1988
Publication date	28.06.2007
Purpose - planned	APPRAISAL
Reentry	NO
Content	OIL
Discovery wellbore	NO
1st level with HC, age	LATE CRETACEOUS
1st level with HC, formation	LYSING FM
2nd level with HC, age	MIDDLE JURASSIC
2nd level with HC, formation	GARN FM
Kelly bushing elevation [m]	29.0
Water depth [m]	301.0
Total depth (MD) [m RKB]	4587.0
Final vertical depth (TVD) [m RKB]	4587.0
Bottom hole temperature [°C]	149
Oldest penetrated age	EARLY JURASSIC
Oldest penetrated formation	ÅRE FM
Geodetic datum	ED50
NS degrees	65° 2' 28.6" N
EW degrees	6° 58' 21.93" E
NS UTM [m]	7214766.40



EW UTM [m]	404557.55
UTM zone	32
NPDID wellbore	852

Wellbore history

General

Well 6506/12-5 was the third well drilled on the Smørbukkk Sør Discovery (Beta-structure) in block 6506/12, Haltenbanken area. The well was designed to appraise the hydrocarbon potential and define the hydrocarbon-water contacts. Primary target was Middle and Early Jurassic sandstone. The Fangst Group siltstone member was expected to be sealing at this depth. The well would also test if intervals within the Ror and Tilje formations also could be sealing rocks. Secondary target was the Late Cretaceous Lysing Formation of the Cromer Knoll Group.

Prognosed TD was in the Åre formation at 4559 m RKB.

Operations and results

Appraisal well 6506/12-5 was spudded with the semi-submersible installation Dyvi Delta on 17 October 1985 and drilled to TD at 4587 m in the Early Jurassic Åre Formation. The well was drilled with less than 2.5 deg deviation down to 4235 m. There were minor incidents with a failed anchor and lost circulation in the top hole. A poorly cemented 9 5/8" casing required 116 hours amendment before normal drilling could commence. The well was drilled with spud mud down to 393 m. From here a pilot hole was drilled to 1080 m using gypsum/polymer mud, and then opened up using spud mud. Further drilling was with gypsum/polymer mud from 1080 m to 3519 m, and with gel/lignite/lignosulphonate from 3519 m to TD. Shallow gas was not encountered.

Secondary target Lysing Formation came in at 3157 m and primary target Garn Formation at 3948 m. Hydrocarbons were encountered in both. An OWC was found in the Lysing Formation at 3178.2 m, and another OWC in the Garn Formation at 4010.5 m. The Not Formation as well as top of the Garn Formation was found to be sealing in this well.

Cores were cut in the Upper Cromer Knoll Lysing Sands and throughout most of the interval from the lower part of the Viking Group at 3910 m down to 4362 m in the Tilje Formation. A total of 429.43 m was recovered in 27 cores. Core no 9 in the Garn Formation was taken with a specially designed core barrel where the formation fluids that exude from the core is captured on a sponge lining the inside of the core barrel ("sponge core"). One SFT (Geco) was run in the Lysing Formation and 2 RFT runs (Schlumberger) were made in the Fangst and Båt Groups down to the Tilje Formation. A total of 82 pressure tests were performed in these runs and 45 of these gave reliable results. In addition, segregated samples were collected at 4 different depths; 3176 m, 3165.5 m, 4004 m, and 4029.5 m.

The well was permanently abandoned on 27 March 1986 as an oil and gas appraisal

Testing

Four DST-tests were carried out in the well.

DST 1 tested the interval 4025 m to 4040 m in the base part of the Garn Formation. It produced 250 m3 water/day through a 19.1 mm choke. The temperature recorded in this flow was 141 deg C.

DST 2 tested the interval 4004 m to 4009.5 m in the middle part of the Garn Formation.



It produced 140 Sm³ oil, 41 Sm³ gas and 40 m³ water /day through an 11.1 mm choke. The GOR was 293 Sm³/Sm³, the oil density was 0.835 g/cm³, and the gas gravity was 0.895 (air = 1). The temperature recorded in this flow was 140 deg C.

DST 3 tested the interval 3983 m to 3996 m in the middle part of the Garn Formation. It produced 2.4 Sm³ oil/day

through the bubble hose. The temperature recorded in this flow was 139 deg C.

DST 4 tested the interval 3174 m to 3177.5 m in the Lysing Formation. It produced 440 Sm³ light oil and 75 Sm³ gas/day through an 11.1 mm choke. The GOR was 170 Sm³/Sm³, the oil density was 0.800 g/cm³, and the gas gravity was 0.718 (air = 1). The temperature recorded in this flow was 112 deg C.

Cuttings at the Norwegian Offshore Directorate

Cutting sample, top depth [m]	Cutting samples, bottom depth [m]
400.00	4587.50

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	3148.0	3175.2	[m]
2	3175.2	3188.0	[m]
3	3910.0	3917.7	[m]
4	3918.0	3928.3	[m]
5	3929.0	3943.7	[m]
6	3944.0	3949.0	[m]
7	3949.0	3967.5	[m]
8	3967.5	3993.7	[m]
10	4004.0	4030.9	[m]
11	4031.0	4046.2	[m]
12	4046.5	4064.5	[m]
13	4064.5	4066.6	[m]
14	4067.0	4080.5	[m]
15	4085.0	4106.6	[m]
16	4112.0	4123.8	[m]
17	4124.0	4135.8	[m]
18	4136.0	4154.1	[m]
19	4154.0	4179.8	[m]
20	4180.0	4203.5	[m]



21	4205.0	4216.0	[m]
22	4245.0	4269.0	[m]
23	4271.0	4285.6	[m]
24	4286.0	4299.8	[m]
25	4305.0	4324.5	[m]
26	4327.0	4335.0	[m]
27	4335.0	4361.9	[m]

Total core sample length [m]	428.2
Cores available for sampling?	YES

Core photos

3148-3153m



3153-3158m



3158-3163m



3163-3168m



3168-3173m



3173-3175m



3175-3180m



3180-3185m



3185-3188m



3910-3916m



3916-3917m



3918-3924m



3924-3928m



3929-3935m



3935-3941m



3941-3943m



3944-3949m



3949-3955m



3955-3961m



3961-3967m



3967-3967m



3967-3973m



3973-3979m



3979-3985m



3985-3991m



3991-3993m



4004-4010m



4010-4016m



4016-4022m



4022-4028m



4028-4030m



4031-4037m



4037-4043m



4043-4036m



4046-4052m



4052-4058m



4058-4064m



4046-4046m



4064-4066m



4067-4073m



4073-4079m



4079-4080m



4085-4091m



4091-4097m



4097-4103m



4103-4106m



4112-4118m



4118-4123m



4124-4130m



4130-4135m



4136-4142m



4142-4148m



4148-4154m



4154-4154m



4154-4160m



4160-4166m



4166-4172m



4172-4178m



4178-4179m



4180-4186m



4186-4192m



4192-4198m



4198-4203m



4205-4211m



4211-4216m



4245-4251m



4251-4157m



4257-4263m



4263-4269m



4269-4270m



4271-4277m



4217-4283m



4283-4285m



4286-4292m



4292-4298m



4298-4299m



4305-4311m



4311-4317m



3217-4323m



4323-4324m



4327-4333m



4333-4334m



4335-4341m



4341-4347m



4347-4353m



4353-4359m



4359-4362m

Palynological slides at the Norwegian Offshore Directorate

Sample depth	Depth unit	Sample type	Laboratory
3148.9	[m]	C	OD
3149.5	[m]	C	
3155.0	[m]	C	
3155.6	[m]	C	OD
3156.5	[m]	C	
3159.4	[m]	C	
3160.3	[m]	C	OD
3161.2	[m]	C	OD
3161.9	[m]	C	
3165.0	[m]	C	OD
3165.9	[m]	C	
3166.0	[m]	C	OD
3166.3	[m]	C	
3168.0	[m]	C	
3170.0	[m]	C	
3170.4	[m]	C	OD
3172.0	[m]	C	
3173.5	[m]	C	
3174.7	[m]	C	OD
3174.8	[m]	C	
3175.3	[m]	C	
3177.3	[m]	C	
3178.0	[m]	C	



3178.8 [m]	C	OD
3179.3 [m]	C	
3180.5 [m]	C	
3182.6 [m]	C	
3182.7 [m]	C	OD
3183.9 [m]	C	OD
3184.0 [m]	C	
3184.6 [m]	C	
3185.4 [m]	C	OD
3185.5 [m]	C	
3185.8 [m]	C	
3185.9 [m]	C	OD
3187.0 [m]	C	
3187.4 [m]	C	
3188.0 [m]	C	
3436.0 [m]	SWC	STAT
3636.0 [m]	SWC	STAT
3680.0 [m]	SWC	STAT
3735.0 [m]	SWC	STAT
3747.0 [m]	SWC	STAT
3785.0 [m]	SWC	STAT
3792.0 [m]	SWC	STAT
3795.5 [m]	SWC	STAT
3796.5 [m]	SWC	STAT
3802.0 [m]	SWC	STAT
3806.5 [m]	SWC	STAT
3810.0 [m]	SWC	STAT
3812.0 [m]	SWC	STAT
3830.5 [m]	SWC	STAT
3832.0 [m]	SWC	STAT
3880.0 [m]	SWC	STAT
3945.8 [m]	C	HYDRO
3950.2 [m]	C	HYDRO
3963.4 [m]	C	HYDRO
3966.9 [m]	C	HYDRO
3974.5 [m]	C	HYDRO
3981.5 [m]	C	HYDRO
3986.5 [m]	C	HYDRO
3993.3 [m]	C	HYDRO
4004.5 [m]	C	HYDRO



4014.8	[m]	C	HYDRO
4021.5	[m]	C	HYDRO
4037.8	[m]	C	HYDRO
4043.5	[m]	C	HYDRO
4048.5	[m]	C	HYDRO
4052.7	[m]	C	HYDRO
4056.6	[m]	C	HYDRO
4056.6	[m]	C	HYDRO
4061.4	[m]	C	HYDRO
4065.6	[m]	C	HYDRO
4067.5	[m]	C	HYDRO
4071.8	[m]	C	HYDRO
4073.4	[m]	C	HYDRO
4077.6	[m]	C	HYDRO
4079.4	[m]	C	HYDRO
4088.6	[m]	C	HYDRO
4096.8	[m]	C	HYDRO
4102.3	[m]	C	HYDRO
4117.4	[m]	C	HYDRO
4123.5	[m]	C	HYDRO
4135.1	[m]	C	HYDRO
4141.6	[m]	C	HYDRO
4271.1	[m]	C	OD
4273.1	[m]	C	OD
4274.0	[m]	C	OD
4274.2	[m]	C	OD
4275.1	[m]	C	OD
4275.6	[m]	C	OD
4275.9	[m]	C	OD
4276.9	[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	DST2	4004.00	4009.50		21.02.1986 - 21:46	YES
DST	DST2B	0.00	0.00		23.02.1986 - 06:45	YES



DST	DST4	3145.00	3148.50		12.03.1986 - 23:10	YES
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Lithostratigraphy

Top depth [mMD RKB]	Lithostrat. unit
330	NORDLAND GP
330	NAUST FM
1335	KAI FM
1964	HORDALAND GP
1964	BRYGGE FM
2235	ROGALAND GP
2235	TARE FM
2283	TANG FM
2346	SHETLAND GP
3157	CROMER KNOLL GP
3157	LYSING FM
3187	LANGE FM
3780	VIKING GP
3780	SPEKK FM
3827	MELKE FM
3948	FANGST GP
3948	GARN FM
4040	NOT FM
4068	ILE FM
4138	BÅT GP
4138	ROR FM
4274	TILJE FM
4510	ÅRE FM

Geochemical information

Document name	Document format	Document size [MB]
852_1	pdf	0.64
852_2	pdf	7.99
852_3	pdf	0.58
852_4	pdf	4.88
852_5	pdf	14.84





852_6	pdf	0.09
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Documents - older Norwegian Offshore Directorate WDSS reports and other related documents

Document name	Document format	Document size [MB]
852_01_WDSS_General_Information	pdf	0.30

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

Document name	Document format	Document size [MB]
852_01_6506_12_5_Completion_report	pdf	3.08
852_02_6506_12_5_Completion_log	pdf	3.21

Drill stem tests (DST)

Test number	From depth MD [m]	To depth MD [m]	Choke size [mm]
1.0	4040	4025	19.0
1.1	4040	4025	19.0
2.0	4004	4010	19.0
2.1	4004	4010	19.0
4.0	3174	3178	15.9

Test number	Final shut-in pressure [MPa]	Final flow pressure [MPa]	Bottom hole pressure [MPa]	Downhole temperature [°C]
1.0	1.000	1.000	10.000	141
1.1				
2.0			41.000	140
2.1	40.000	16.000	41.000	
4.0	45.000	8.000	24.000	

Test number	Oil [Sm3/day]	Gas [Sm3/day]	Oil density [g/cm3]	Gas grav. rel.air	GOR [m3/m3]
1.0					
1.1					





2.0	208	55000	0.827		264
2.1	208	55000	0.827		264
4.0	590	116000	0.800		196

Logs

Log type	Log top depth [m]	Log bottom depth [m]
CBL GR	325	3827
CBL GR	979	2273
CBL GR	3066	3224
CBL GR	3069	3222
CBL GR	3740	4124
CBL VDL	3736	4018
CBL VDL GR	3080	3880
CDL CNS GR	388	4584
CET GR	3080	4038
DIL BCS GR	3880	4584
DIL LSS GR	388	3898
DLL MSF GR	3129	3247
DLL MSF GR	3900	4584
DLL MSFL GR	3880	4150
FED GR	3097	3899
ISF LSS MSFL GR	2274	4176
LDL CNL GR	2274	4177
LDL CNL NGS	3880	4586
LSAL	3883	4587
MWD - GR RES DIR	388	3897
NGS	3880	4586
RFT GR	3158	3183
RFT GR	3967	4484
RFT GR	3983	4161
SDT	3880	4581
SHDT GR	3880	4586
SWC GR	3423	3890
VELOCITY	2218	4580

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	392.0	36	400.0	0.00	LOT
SURF.COND.	20	1055.0	26	1080.0	1.69	LOT
INTERM.	13 3/8	2280.0	17 1/2	2296.0	1.91	LOT
INTERM.	9 5/8	3885.0	12 1/4	3901.0	1.95	LOT
LINER	7	4178.0		0.0	0.00	

Drilling mud

Depth MD [m]	Mud weight [g/cm3]	Visc. [mPa.s]	Yield point [Pa]	Mud type	Date measured
1080	1.12	15.0	10.0	WATER BASED	28.10.1985
1080	1.12	8.0	10.1	WATER BASED	29.10.1985
1198	1.12	5.0	8.0	WATER BASED	05.11.1985
1320	1.20	12.0	9.0	WATER BASED	05.11.1985
1607	1.30	12.0	10.0	WATER BASED	07.11.1985
1932	1.35	15.0	110.9	WATER BASED	07.11.1985
2129	1.45	18.0	12.8	WATER BASED	08.11.1985
2217	1.57	20.0	17.3	WATER BASED	11.11.1985
2217	1.50	18.0	14.8	WATER BASED	11.11.1985
2289	1.60	20.0	13.9	WATER BASED	11.11.1985
2289	1.64	17.0	9.0	WATER BASED	12.11.1985
2539	1.65	22.0	9.0	WATER BASED	18.11.1985
2539	1.72	24.0	8.0	WATER BASED	18.11.1985
2540	1.72	23.0	8.0	WATER BASED	18.11.1985
2585	1.72	23.0	8.0	WATER BASED	18.11.1985
2677	1.72	24.0	8.0	WATER BASED	18.11.1985
3000	1.72	27.0	8.0	WATERBASED	17.03.1986
3105	1.72	20.0	9.0	WATER BASED	25.11.1985
3174	1.61	14.0	8.0	WATERBASED	12.03.1986
3883	1.21	5.8	5.0	WATER BASED	24.12.1985
3903	1.22	13.0	6.0	WATER BASED	24.12.1985
3914	1.17	14.0	4.9	WATER BASED	11.02.1986
3914	1.17	17.0	4.9	WATER BASED	16.01.1986
3914	1.17	17.0	4.9	WATER BASED	11.02.1986
3914	1.17	15.0	4.9	WATER BASED	11.02.1986
3914	1.17	14.0	4.9	WATER BASED	14.02.1986
3929	1.22	15.0	4.1	WATER BASED	02.01.1986



4046	1.17	10.0	3.9	WATER BASED	06.01.1986
4180	1.12	16.0	3.3	WATER BASED	14.01.1986

Thin sections at the Norwegian Offshore Directorate

Depth	Unit
3175.05	[m]
3178.65	[m]
3182.35	[m]
3184.75	[m]
3158.10	[m]

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]
852 Formation pressure (Formasjonstrykk)	pdf	0.23

