

**General information**

Wellbore name	6406/3-4
Type	EXPLORATION
Purpose	APPRAISAL
Status	P&A
Factmaps in new window	link to map
Main area	NORWEGIAN SEA
Field	TRESTAKK
Discovery	6406/3-2 Trestakk
Well name	6406/3-4
Seismic location	ST 8710 - 201 SP. 870
Production licence	091
Drilling operator	Den norske stats oljeselskap a.s
Drill permit	563-L
Drilling facility	DYVI DELTA
Drilling days	96
Entered date	25.09.1987
Completed date	29.12.1987
Release date	29.12.1989
Publication date	18.05.2004
Purpose - planned	APPRAISAL
Reentry	NO
Content	OIL SHOWS
Discovery wellbore	NO
Kelly bushing elevation [m]	29.0
Water depth [m]	295.0
Total depth (MD) [m RKB]	4414.0
Final vertical depth (TVD) [m RKB]	4410.0
Maximum inclination [°]	6
Oldest penetrated age	EARLY JURASSIC
Oldest penetrated formation	TILJE FM
Geodetic datum	ED50
NS degrees	64° 53' 0.11" N
EW degrees	6° 50' 48.55" E
NS UTM [m]	7197370.60
EW UTM [m]	398030.83
UTM zone	32
NPDID wellbore	1173



Wellbore history

General

Well 6406/3-4 was drilled to appraise the Trestakk oil discovery made with well 6406/3-2. The primary purpose of the well was to appraise hydrocarbon accumulations of significant amounts in the Middle Jurassic reservoirs down flanks on the Trestakk structure. Secondary objectives were to check for hydrocarbon accumulations deeper than the structural closure of the main field, to verify the geophysical and structural interpretation, and improve the geological, paleontological and geochemical understanding of the area. Total depth was to be 50 m into the T11je Formation.

Operations and results

Appraisal well 6406/3-4 was spudded with the Dyvi Offshore semi-submersible installation Dyvi Delta on 25 September 1987 and drilled to TD at 4414 m in Early Jurassic Tilje Formation. The well was drilled with seawater and hi-vis pills down to 1179 m, with gypsum/polymer mud from 1179 m to 3984 m, and with gel/lignosulphonate mud from 3984 m to TD. Drilling proceeded without significant problems and there were no signs of shallow gas. An expected pressure build-up started in Paleocene and reached its maximum at 1.50 g/cm³ EMV in the top of Cretaceous. After this the over-pressure decreased and was at 1.42 g/cm³ EMV close to top Jurassic.

A very weak show was recorded in association with a 2.61% gas peak at 2469 m in the Springar Formation. From 2450 m in the Nise Formation to 2670 m shows were recorded on 50 % of sandstone samples. These shows appeared to be a volatile, light petroleum and continued, gradually disappearing, down to 2750 m in the Nise Formation. Top reservoir came in at 4018 m. There were good shows on cores down to 4078 m, but the reservoir qualities did not seem to be very good due to low permeability. In the Ile Formation poor shows were recorded on cores, indicating tight rocks or residual oil. Residual shows were recorded also in the Tofte Formation, while weak "background" shows were recorded in the Tilje Formation from 4372 m to TD. Geochemical analyses of core sample extracts were consistent with a suggested contact/spill point at 4039 m, and a change in the hydrocarbon shows characteristics was confirmed at 4052 m. The geochemical analyses further confirmed that core chip extracts from the interval 4021.18 m to 4051.94 m in the Garn Formation, and a DST sample from the same formation in the discovery well 6406/3-2 belonged to the same oil family. A proposed OWC at 4074 m was not verified by the geochemical analyses. Results of the well 6406/3-4 indicated that reservoir properties decreased down flanks on the structure. As a result the reserve estimates for the Trestakk structure for oil and associated gas were reduced after drilling this well. Six cores were cut, four in the Garn Formation in the interval 4020 - 4122 m, and two in the Ile Formation in the interval 4156 - 4213 m. Two FMT fluid samples were taken, one at 4105.3 m and another at 4108 m. The well was permanently abandoned on 29 December 1987 as a dry hole with shows.

Testing

Four drill stem tests were carried out, one in the Ile Formation (DST 1) and three in the Garn Formation (DST 2, 3 and 4). DST 1 (4175 m to 4198 m) produced 1.8 - 2 m³ fluid/day. No samples were taken. DST 2 (4103 m to 4117 m) produced 60 m³ water/day decreasing to 2.7 m³ water/day. Bottom hole samples were taken. DST 3 (4054 m to 4082 m) produced 7.4 m³ water/day decreasing to 4 m³ water /day. Bottom hole samples were taken. DST 4 (4025 m to 4044 m) produced 2.6 m³/day decreasing to 1.6 m³/day. No sampling.

**Cuttings at the Norwegian Offshore Directorate**

Cutting sample, top depth [m]	Cutting samples, bottom depth [m]
1190.00	4413.00

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	4020.0	4048.4	[m]
2	4048.4	4076.6	[m]
3	4076.5	4094.8	[m]
4	4094.8	4122.7	[m]
5	4156.0	4184.3	[m]
6	4185.0	4212.8	[m]

Total core sample length [m]	158.9
Cores available for sampling?	YES

Core photos

4020-4025m



4025-4030m



4030-4035m



4035-4040m



4040-4045m



4045-4048m



4048-4053m



4053-4058m



4058-4063m



4063-4068m



4068-4073m



4073-4078m



4078-4083m



4083-4088m



4088-4093m



4068-4073m

4073-4076m

4076-4081m

4081-4086m

4086-4091m



4091-4094m

4094-4099m

4099-4104m

4104-4109m

4109-4114m



4114-4119m

4119-4122m

4156-4161m

4161-4166m

4166-4171m



4171-4176m

4181-4184m

4176-4181m

4185-4190m

4190-4195m



4195-4200m

4200-4205m

4205-4210m

4210-4212m

Palynological slides at the Norwegian Offshore Directorate

Sample depth	Depth unit	Sample type	Laboratory
2475.0	[m]	DC	RRI
2490.0	[m]	DC	RRI
2505.0	[m]	DC	RRI
2520.0	[m]	DC	RRI
2535.0	[m]	DC	RRI
2550.0	[m]	DC	RRI
2565.0	[m]	DC	RRI



2580.0	[m]	DC	RRI
2628.0	[m]	DC	RRI
2649.0	[m]	DC	RRI
2655.0	[m]	DC	RRI
2682.0	[m]	DC	RRI
2712.0	[m]	DC	RRI
2724.0	[m]	DC	RRI
2742.0	[m]	DC	RRI
2754.0	[m]	DC	RRI
2772.0	[m]	DC	RRI
2784.0	[m]	DC	RRI
2802.0	[m]	DC	RRI
2814.0	[m]	DC	RRI
2832.0	[m]	DC	RRI
2844.0	[m]	DC	RRI
2874.0	[m]	DC	RRI
2892.0	[m]	DC	RRI
2904.0	[m]	DC	RRI
2944.0	[m]	DC	RRI
2952.0	[m]	DC	RRI
2964.0	[m]	DC	RRI
2982.0	[m]	DC	RRI
3012.0	[m]	DC	RRI
3026.0	[m]	DC	RRI
3042.0	[m]	DC	RRI
3044.0	[m]	DC	RRI
3054.0	[m]	DC	RRI
3084.0	[m]	DC	RRI
3114.0	[m]	DC	RRI
3129.0	[m]	DC	RRI
3144.0	[m]	DC	RRI
3159.0	[m]	DC	RRI
3174.0	[m]	DC	RRI
3184.0	[m]	DC	RRI
3204.0	[m]	DC	RRI
3214.0	[m]	DC	RRI
3234.0	[m]	DC	RRI
3249.0	[m]	DC	RRI
3264.0	[m]	DC	RRI
3279.0	[m]	DC	RRI



3294.0 [m]	DC	RRI
3304.0 [m]	DC	RRI
3324.0 [m]	DC	RRI
3339.0 [m]	DC	RRI
3354.0 [m]	DC	RRI
3369.0 [m]	DC	RRI
3384.0 [m]	DC	RRI
3399.0 [m]	DC	RRI
3414.0 [m]	DC	RRI
3429.0 [m]	DC	RRI
3434.0 [m]	DC	RRI
3444.0 [m]	DC	RRI
3454.0 [m]	DC	RRI
3459.0 [m]	DC	RRI
3474.0 [m]	DC	RRI
3489.0 [m]	DC	RRI
3504.0 [m]	DC	RRI
3519.0 [m]	DC	RRI
3534.0 [m]	DC	RRI
3549.0 [m]	DC	RRI
3564.0 [m]	DC	RRI
3579.0 [m]	DC	RRI
3594.0 [m]	DC	RRI
3604.0 [m]	DC	RRI
3624.0 [m]	DC	RRI
3639.0 [m]	DC	RRI
3644.0 [m]	DC	RRI
3654.0 [m]	DC	RRI
3669.0 [m]	DC	RRI
3684.0 [m]	DC	RRI
3714.0 [m]	DC	RRI
3729.0 [m]	DC	RRI
3744.0 [m]	DC	RRI
3759.0 [m]	DC	RRI
3774.0 [m]	DC	RRI
3789.0 [m]	DC	RRI
3804.0 [m]	DC	RRI
3819.0 [m]	DC	RRI
3834.0 [m]	DC	RRI
3849.0 [m]	DC	RRI



3864.0 [m]	DC	RRI
3879.0 [m]	DC	RRI
3894.0 [m]	DC	RRI
3909.0 [m]	DC	RRI
3924.0 [m]	DC	RRI
3990.0 [m]	DC	RRI
3996.0 [m]	DC	RRI
3999.0 [m]	DC	RRI
4002.0 [m]	DC	RRI
4008.0 [m]	DC	RRI
4011.0 [m]	DC	RRI
4014.0 [m]	DC	RRI
4017.0 [m]	DC	RRI
4023.0 [m]	DC	RRI
4029.0 [m]	C	RRI
4030.0 [m]	C	RRI
4034.0 [m]	C	RRI
4035.0 [m]	C	RRI
4041.0 [m]	C	RRI
4042.0 [m]	C	RRI
4046.0 [m]	C	RRI
4049.0 [m]	C	RRI
4054.0 [m]	C	RRI
4062.0 [m]	C	RRI
4068.0 [m]	C	RRI
4074.0 [m]	C	RRI
4079.0 [m]	C	RRI
4080.0 [m]	C	RRI
4087.0 [m]	C	RRI
4088.0 [m]	C	RRI
4089.0 [m]	C	RRI
4090.0 [m]	C	RRI
4096.0 [m]	C	RRI
4100.0 [m]	C	RRI
4105.0 [m]	C	RRI
4107.0 [m]	C	RRI
4114.0 [m]	C	RRI
4116.0 [m]	C	RRI
4118.0 [m]	C	RRI
4121.0 [m]	C	RRI



4122.0 [m]	C	RRI
4137.0 [m]	DC	RRI
4140.0 [m]	DC	RRI
4152.0 [m]	DC	RRI
4156.0 [m]	C	RRI
4158.0 [m]	C	RRI
4160.0 [m]	C	RRI
4161.0 [m]	C	RRI
4166.0 [m]	C	RRI
4170.0 [m]	C	RRI
4171.0 [m]	C	RRI
4174.0 [m]	C	RRI
4176.0 [m]	C	RRI
4181.0 [m]	C	RRI
4182.0 [m]	C	RRI
4185.0 [m]	C	RRI
4187.0 [m]	C	RRI
4192.0 [m]	C	RRI
4194.0 [m]	C	RRI
4198.0 [m]	C	RRI
4204.0 [m]	C	RRI
4212.0 [m]	DC	RRI
4221.0 [m]	C	RRI
4227.0 [m]	DC	RRI
4230.0 [m]	DC	RRI
4239.0 [m]	DC	RRI
4245.0 [m]	DC	RRI
4260.0 [m]	DC	RRI
4275.0 [m]	DC	RRI
4290.0 [m]	DC	RRI
4305.0 [m]	DC	RRI
4320.0 [m]	DC	RRI
4335.0 [m]	DC	RRI
4350.0 [m]	DC	RRI
4365.0 [m]	DC	RRI
4380.0 [m]	DC	RRI
4395.0 [m]	DC	RRI

Lithostratigraphy



Top depth [mMD RKB]	Lithostrat. unit
325	NORDLAND GP
325	NAUST FM
1514	KAI FM
1994	HORDALAND GP
1994	BRYGGE FM
2314	ROGALAND GP
2314	TARE FM
2380	TANG FM
2437	SHETLAND GP
2437	SPRINGAR FM
2655	NISE FM
2974	KVITNOS FM
3278	CROMER KNOLL GP
3278	LANGE FM
3884	LYR FM
3908	VIKING GP
3908	SPEKK FM
3949	MELKE FM
4025	FANGST GP
4025	GARN FM
4121	NOT FM
4162	ILE FM
4224	BÅT GP
4224	ROR FM
4272	TOFTE FM
4299	ROR FM
4372	TILJE FM

Composite logs

Document name	Document format	Document size [MB]
1173	pdf	0.65

Geochemical information





Document name	Document format	Document size [MB]
1173 1	pdf	1.28

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

Document name	Document format	Document size [MB]
1173 01 WDSS General Information	pdf	0.45
1173 02 WDSS completion log	pdf	0.39

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

Document name	Document format	Document size [MB]
1173 6406 3 4 COMPLETION REPORT AND LOG	pdf	29.39

Drill stem tests (DST)

Test number	From depth MD [m]	To depth MD [m]	Choke size [mm]
1.0	4175	4198	25.4
2.0	4103	4117	7.9
3.0	4054	4082	4.0

Test number	Final shut-in pressure [MPa]	Final flow pressure [MPa]	Bottom hole pressure [MPa]	Downhole temperature [°C]
1.0			43.000	
2.0			41.000	
3.0			40.000	

Test number	Oil [Sm3/day]	Gas [Sm3/day]	Oil density [g/cm3]	Gas grav. rel.air	GOR [m3/m3]
1.0					
2.0					
3.0					





Logs

Log type	Log top depth [m]	Log bottom depth [m]
CBL VDL	430	1330
CBL VDL	2500	3974
CBL VDL	3817	4380
CDL CN SPL GR	3974	4406
DIFL ACL GR	3974	4414
DIFL ACL GR CDL	323	1177
DIFL ACL GR CDL	1156	2665
DIFL ACL GR CDL	2648	3984
DLL MLL GR	3974	4412
FMTHP GR	4027	4391
FMTHP GR	4033	4105
FMTHP GR	4103	4402
HRDIP	3974	4411
MWD - GR RES ROP DIR	442	4341
VSP	440	4350

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	436.0	36	442.0	0.00	LOT
SURF.COND.	20	1157.0	26	1179.0	1.60	LOT
INTERM.	13 3/8	2648.0	17 1/2	2692.0	1.87	LOT
INTERM.	9 5/8	3970.0	12 1/4	3984.0	1.98	LOT
LINER	7	4414.0	8 1/2	4414.0	0.00	LOT

Drilling mud

Depth MD [m]	Mud weight [g/cm3]	Visc. [mPa.s]	Yield point [Pa]	Mud type	Date measured
375	1.03			WATER BASED	29.12.1987
442	1.05	9400.0		WATER BASED	28.09.1987
442	1.05	105.0		WATER BASED	28.09.1987
507	1.03			WATER BASED	28.12.1987
526	1.03			WATER BASED	28.12.1987



586	1.06	4400.0	4.5	WATER BASED	28.12.1987
731	1.05	120.0		WATER BASED	28.09.1987
1101	1.05	100.0		WATER BASED	29.09.1987
1179	1.05	95.0		WATER BASED	30.09.1987
1179	1.05	100.0		WATER BASED	01.10.1987
1179	1.05	100.0		WATER BASED	02.10.1987
1179	1.05	100.0		WATER BASED	05.10.1987
1179	1.06	1500.0	5.1	WATER BASED	05.10.1987
1179	1.05	1200.0	3.4	WATER BASED	05.10.1987
1182	1.06	1500.0	4.7	WATER BASED	06.10.1987
1442	1.12	1300.0	4.2	WATER BASED	07.10.1987
1676	1.20	1400.0	4.2	WATER BASED	08.10.1987
1945	1.50	1900.0	4.2	WATER BASED	09.10.1987
2014	1.24	16.0	3.5	WATER BASED	23.11.1987
2387	1.69	6300.0	4.5	WATER BASED	22.12.1987
2387	1.69	6300.0	4.5	WATER BASED	23.12.1987
2450	1.60	18.0	8.0	WATER BASED	14.10.1987
2450	1.60	20.0	8.0	WATER BASED	16.10.1987
2525	1.69	5300.0	4.5	WATER BASED	21.12.1987
2525	1.70	5000.0	3.0	WATER BASED	21.12.1987
2525	1.69	5100.0	3.5	WATER BASED	21.12.1987
2538	1.69	6000.0	4.5	WATER BASED	28.12.1987
2648	1.53	17.0	7.0	WATER BASED	22.10.1987
2648	1.53	12.0	9.0	WATER BASED	26.10.1987
2648	1.53	13.0	9.0	WATER BASED	27.10.1987
2648	1.53	16.0	6.5	WATER BASED	02.11.1987
2648	1.53	16.0	7.0	WATER BASED	06.11.1987
2648	1.53	49.0	5.0	WATER BASED	19.10.1987
2648	1.53	50.0	4.0	WATER BASED	19.10.1987
2648	1.53	19.0	5.0	WATER BASED	19.10.1987
2648	1.53	21.0	6.0	WATER BASED	20.10.1987
2648	1.53	19.0	70.0	WATER BASED	21.10.1987
2648	1.53	16.0	7.0	WATER BASED	23.10.1987
2648	1.53	16.0	7.0	WATER BASED	26.10.1987
2648	1.53	16.0	8.0	WATER BASED	26.10.1987
2648	1.53	15.0	9.0	WATER BASED	28.10.1987
2648	1.53	13.0	8.0	WATER BASED	29.10.1987
2648	1.53	18.0	8.0	WATER BASED	30.10.1987
2648	1.53	17.0	16.0	WATER BASED	02.11.1987
2648	1.53	18.0	7.5	WATER BASED	02.11.1987



2648	1.53	17.0	6.5	WATER BASED	03.11.1987
2648	1.53	17.0	6.0	WATER BASED	04.11.1987
2648	1.53	15.0	6.0	WATER BASED	05.11.1987
2648	1.53	53.0	6.0	WATER BASED	09.11.1987
2648	1.53	12.0	5.0	WATER BASED	09.11.1987
2648	1.53	12.0	4.0	WATER BASED	11.11.1987
2665	1.60	20.0	8.0	WATER BASED	16.10.1987
3175	1.69	24.0	3.5	WATER BASED	18.12.1987
3175	1.53	25.0	2.0	WATER BASED	17.12.1987
3759	1.53	23.0	2.0	WATER BASED	16.12.1987
3970	1.24	16.0	3.5	WATER BASED	23.11.1987
3970	1.24	17.0	3.0	WATER BASED	23.11.1987
3970	1.24	18.0	3.0	WATER BASED	23.11.1987
3970	1.24	16.0	3.0	WATER BASED	24.11.1987
3970	1.24	21.0	4.0	WATER BASED	25.11.1987
3970	1.23	15.0	4.0	WATER BASED	18.11.1987
3970	1.24	17.0	8.0	WATER BASED	18.11.1987
3970	1.24	16.0	8.0	WATER BASED	19.11.1987
3970	1.24	17.0	4.0	WATER BASED	20.11.1987
3970	1.24	15.0	8.0	WATER BASED	12.11.1987
3970	1.24	16.0	6.0	WATER BASED	13.11.1987
3970	1.24	14.0	8.0	WATER BASED	16.11.1987
3970	1.22	14.0	4.0	WATER BASED	16.11.1987
3970	1.22	16.0	8.0	WATER BASED	16.11.1987
4050	1.24	19.0	3.0	WATER BASED	14.12.1987
4050	1.24	19.0	2.5	WATER BASED	15.12.1987
4086	1.24	19.0	3.0	WATER BASED	14.12.1987
4086	1.24	18.0	3.0	WATER BASED	08.12.1987
4086	1.24	19.0	3.0	WATER BASED	09.12.1987
4086	1.24	19.0	3.0	WATER BASED	10.12.1987
4086	1.24	18.0	3.0	WATER BASED	11.12.1987
4098	1.24	19.0	3.0	WATER BASED	07.12.1987
4125	1.24	6600.0	3.0	WATER BASED	03.12.1987
4125	1.24	6400.0	3.0	WATER BASED	04.12.1987
4125	1.24	20.0	3.0	WATER BASED	07.12.1987
4125	1.24	19.0	3.0	WATER BASED	07.12.1987
4125	1.24	6100.0	3.0	WATER BASED	02.12.1987
4156	1.22	16.0	8.0	WATER BASED	16.11.1987
4371	1.24	6800.0	3.5	WATER BASED	30.11.1987
4371	1.24	6600.0	3.5	WATER BASED	30.11.1987



4371	1.24	21.0	4.0	WATER BASED	01.12.1987
4371	1.24	6700.0	3.5	WATER BASED	30.11.1987
4414	1.24	17.0	4.0	WATER BASED	20.11.1987

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]
1173 Formation pressure (Formasjonstrykk)	PDF	0.22

