

**General information**

Wellbore name	2/12-2 S
Type	EXPLORATION
Purpose	APPRAISAL
Status	P&A
Factmaps in new window	link to map
Main area	NORTH SEA
Discovery	2/12-1 Mjølner
Well name	2/12-2
Seismic location	NH 8702 ROW 306 COLUMN 453
Production licence	113
Drilling operator	Norsk Hydro Produksjon AS
Drill permit	629-L
Drilling facility	MÆRSK JUTLANDER
Drilling days	212
Entered date	15.02.1990
Completed date	14.09.1990
Release date	14.09.1992
Publication date	17.09.2007
Purpose - planned	WILDCAT
Reentry	NO
Content	SHOWS
Discovery wellbore	NO
Kelly bushing elevation [m]	22.0
Water depth [m]	70.0
Total depth (MD) [m RKB]	5757.0
Final vertical depth (TVD) [m RKB]	5337.4
Maximum inclination [°]	31.3
Bottom hole temperature [°C]	162
Oldest penetrated age	TRIASSIC
Oldest penetrated formation	SMITH BANK FM
Geodetic datum	ED50
NS degrees	56° 13' 54.28" N
EW degrees	3° 42' 16.63" E
NS UTM [m]	6232233.96
EW UTM [m]	543683.97
UTM zone	31
NPDID wellbore	1416



Wellbore history

General

Well 2/12-2 S is located just 400 m south-west of the 2/12-1 Freja discovery well. The Freja Discovery (named Mjølner up to 1998) lie in a complex faulted area in the North Sea between the Feda Graben to the west and the Gertrude Graben to the east, just north of the border from Danish sector. The reservoir is very deep, ca 4900 m, and the reservoir pressure is one of the highest on the Norwegian continental shelf. Well 2/12-2 S was designed to drill on segment E in the Freja Discovery. Segment E is separated from segment A by a major fault. It was not known if this fault is sealing or not. The main objective for the well was to test the mapped hydrocarbon in place in a Late Jurassic sand unit west of the 2/12-1 compartment. There was no secondary target level known at the time of planning. The well was designed for further use as an oil producer and/ or for extended/ long term testing. Shallow gas was predicted at 467 m and 534 m.

Operations and results

Well 2/12-2 S was spudded with the semi-submersible installation Mærsk Jutlander on 15 February 1990 and drilled to TD at 5757 m (5337 m TVD RKB) in rocks of Triassic age. A total of 73 days (34%) was counted as lost time in this well. It was drilled deviated from below the 30" casing shoe, with kick-off at 219 m. Drilling proceeded with only minor problems down to planned TD for the 17 1/2" section at 2790 m. When pulling out the string stuck at 2631 m. It was backed off at 2280 m, leaving a fish in the hole. The well was plugged back and sidetracked from 2102 m. Drilling commenced to 2800 m where the 13 3/8" casing was set. When drilling out cement in the top 12 1/4" section the pipe stuck again and eventually a second fish was left in the hole. A second technical sidetrack was performed with kick-off between 2602 and 2632 m. A third incident of stuck pipe occurred at 3585 m, but this time the pipe was freed and drilling could commence. After setting the 7" liner shoe at 5008 m a BOP test failed and the BOP stack was pulled for repair. The well was drilled with spud mud down to 1302 m, with KCl/polymer mud from 1302 m to 4681 m. After the pipe got stuck at 3585 m a pipe-lax solution was spotted and Magcolube was added. From 4681 m to TD the mud was changed to a high-temperature mud by adding pre-hydrated bentonite, Resinex, Polydrill, HTHP Desco, and Alcomer. No shallow gas was encountered

The main target, an Intra-Haugesund Formation Sand, was encountered water bearing at 5525 m (5116 m TVD). Shows were observed in chalk, limestone and claystone in the Cretaceous. Good shows were seen in claystone, dolomite and sandstones of the Late Jurassic Tyne group from 4325 m to 5525 m. Below 4800 m the shows were only observed in dolomite stringers.

One conventional core was cut in the interval 5530.0 to 5542.0 m with 76.5 % recovery. A total of 117 sidewall cores were attempted in five runs. Only 20 sidewall cores were recovered. Attempts were made to obtain RFT pressures in the Late Jurassic sand unit, but no formation pressure measurements were recorded, either due to seal failure or tight formation. No RFT fluid samples were taken. A maximum pore pressure gradient of 2.03 was is thought to occur between 5000 m (4608 m TVD) and 5150 m (4755 m TVD) based on maximum deflection of sonic log data.

The well was suspended on 14 September 1990 as a dry 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]
1330.00	5720.00

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	5530.0	5539.2	[m]

Total core sample length [m]	9.2
Cores available for sampling?	YES

Core photos

5530-5535m



5535-5539m

Palynological slides at the Norwegian Offshore Directorate

Sample depth	Depth unit	Sample type	Laboratory
2310.0	[m]	DC	RRI
2340.0	[m]	DC	RRI
2370.0	[m]	DC	RRI
2400.0	[m]	DC	RRI
2430.0	[m]	DC	RRI
2490.0	[m]	DC	RRI
2520.0	[m]	DC	RRI
2580.0	[m]	DC	RRI
2610.0	[m]	DC	RRI
2670.0	[m]	DC	RRI



2700.0 [m]	DC	RRI
2730.0 [m]	DC	RRI
2760.0 [m]	DC	RRI
2790.0 [m]	DC	RRI
2820.0 [m]	DC	RRI
2850.0 [m]	DC	RRI
2880.0 [m]	DC	RRI
2910.0 [m]	DC	RRI
2940.0 [m]	DC	RRI
2970.0 [m]	DC	RRI
3000.0 [m]	DC	RRI
3030.0 [m]	DC	RRI
3060.0 [m]	DC	RRI
3090.0 [m]	DC	RRI
3120.0 [m]	DC	RRI
3150.0 [m]	DC	RRI
3180.0 [m]	DC	RRI
3210.0 [m]	DC	RRI
3250.0 [m]	DC	RRI
3285.0 [m]	DC	RRI
3315.0 [m]	DC	RRI
3340.0 [m]	DC	RRI
3370.0 [m]	DC	RRI
3400.0 [m]	DC	RRI
3435.0 [m]	DC	RRI
3460.0 [m]	DC	RRI
3490.0 [m]	DC	RRI
4220.0 [m]	DC	RRI
4245.0 [m]	DC	RRI
4250.0 [m]	DC	RRI
4255.0 [m]	DC	RRI
4260.0 [m]	DC	RRI
4270.0 [m]	DC	RRI
4275.0 [m]	DC	RRI
4280.0 [m]	DC	RRI
4285.0 [m]	DC	RRI
4290.0 [m]	DC	RRI
4295.0 [m]	DC	RRI
4300.0 [m]	DC	RRI
4312.0 [m]	DC	RRI



4372.0	[m]	DC	RRI
4402.0	[m]	DC	RRI
4432.0	[m]	DC	RRI
4470.0	[m]	DC	RRI
4620.0	[m]	DC	RRI
4647.0	[m]	DC	RRI
4680.0	[m]	DC	RRI
4710.0	[m]	DC	RRI
4740.0	[m]	DC	RRI
4760.0	[m]	DC	RRI
4790.0	[m]	DC	RRI
4820.0	[m]	DC	RRI
4850.0	[m]	DC	RRI
4880.0	[m]	DC	RRI
4950.0	[m]	DC	RRI
5020.0	[m]	DC	RRI
5037.0	[m]	DC	RRI
5697.0	[m]	DC	RRI
5757.0	[m]	DC	RRI

Lithostratigraphy

Top depth [mMD RKB]	Lithostrat. unit
93	NORDLAND GP
1730	HORDALAND GP
3299	ROGALAND GP
3299	BALDER FM
3313	SELE FM
3363	LISTA FM
3419	VÅLE FM
3429	SHETLAND GP
3429	EKOFISK FM
3446	TOR FM
3910	HOD FM
4184	BLODØKS FM
4187	HIDRA FM
4215	CROMER KNOLL GP
4215	RØDBY FM
4232	SOLA FM



4253	TUXEN FM
4282	ÅSGARD FM
4325	TYNE GP
4325	MANDAL FM
4355	FARSUND FM
5175	HAUGESUND FM
5537	NO GROUP DEFINED
5537	SMITH BANK FM

Composite logs

Document name	Document format	Document size [MB]
1416	pdf	0.80

Geochemical information

Document name	Document format	Document size [MB]
1416 1	pdf	0.63
1416 2	pdf	0.22

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

Document name	Document format	Document size [MB]
1416 01 WDSS General Information	pdf	0.25
1416 02 WDSS completion log	pdf	0.28

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

Document name	Document format	Document size [MB]
1416 2 12 2 S COMPLETION REPORT AND LOG	pdf	26.15

Logs





Log type	Log top depth [m]	Log bottom depth [m]
CBL VDL	2400	2717
CBL VDL	4095	4993
CBL VDL	4290	3500
CST GR	4805	5010
CST GR	5017	5392
CST GR	5022	5527
CST GR	5408	5683
CST GR	5483	5527
DIL SDT GR SP	177	744
DIL SDT GR SP	2602	5764
FMS4 AMS	4306	5765
GYRO	900	4240
LDL CNL GR AMS	2602	3410
LDL CNL GR AMS	4306	5484
LDL CNL NGL AMS	5325	5764
LDL GR AMS	3428	4288
MFC	100	4258
MWD - GR RES DIR	93	5010
RFT AMS	5502	5592
VSP	1000	5700

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	177.0	36	180.0	0.00	LOT
INTERM.	20	1295.0	26	1300.0	1.76	LOT
INTERM.	13 3/8	2751.0	17 1/2	2755.0	1.94	LOT
INTERM.	9 5/8	4305.0	12 1/4	4310.0	2.17	LOT
LINER	7	5008.0	8 1/2	5757.0	2.25	LOT

Drilling mud

Depth MD [m]	Mud weight [g/cm3]	Visc. [mPa.s]	Yield point [Pa]	Mud type	Date measured
101	1.20			WATER BASED	20.02.1990
177	1.20	17.0	20.0	WATER BASED	20.02.1990



178	1.00	17.0	20.0	WATER BASED	20.02.1990
182	1.00	17.0	20.0	WATER BASED	20.02.1990
451	1.20	26.0	61.0	WATER BASED	20.02.1990
768	1.20			WATER BASED	21.02.1990
1094	1.20	19.0	63.0	WATER BASED	22.02.1990
1296	1.20	19.0	55.0	WATER BASED	23.02.1990
1312	1.20	26.0	14.0	WATER BASED	05.03.1990
1320	1.20	18.0	14.0	WATER BASED	06.03.1990
1320	1.20	25.0	21.0	WATER BASED	26.02.1990
1320	1.20	20.0	17.0	WATER BASED	26.02.1990
1320	1.20	19.0	50.0	WATER BASED	26.02.1990
1320	1.20	16.0	52.0	WATER BASED	27.02.1990
1320	1.20	17.0	51.0	WATER BASED	28.02.1990
1320	1.20	19.0	50.0	WATER BASED	01.03.1990
1320	1.20	21.0	50.0	WATER BASED	02.03.1990
1397	1.20	15.0	10.0	WATER BASED	08.03.1990
1699	1.58	25.0	10.0	WATER BASED	12.03.1990
1890	1.58	30.0	10.0	WATER BASED	13.03.1990
1975	1.58	25.0	10.0	WATER BASED	13.03.1990
2102	1.62	33.0	11.0	WATER BASED	20.03.1990
2102	1.63	32.0	7.0	WATER BASED	20.03.1990
2105	1.58	29.0	12.0	WATER BASED	13.03.1990
2107	1.60	40.0	10.0	WATER BASED	20.03.1990
2123	1.58	28.0	9.0	WATER BASED	16.03.1990
2126	1.59	28.0	10.0	WATER BASED	20.03.1990
2459	1.58	25.0	9.0	WATER BASED	21.03.1990
2467	1.58	33.0	8.0	WATER BASED	13.03.1990
2540	1.59	27.0	12.0	WATER BASED	22.03.1990
2558	1.85	13.0	15.0	WATER BASED	13.09.1990
2607	1.65	33.0	10.0	WATER BASED	03.05.1990
2651	1.60	33.0	9.0	WATER BASED	23.03.1990
2657	1.59	30.0	9.0	WATER BASED	26.03.1990
2682	1.65	33.0	11.0	WATER BASED	04.05.1990
2698	1.65	37.0	11.0	WATER BASED	10.05.1990
2750	1.59	29.0	9.0	WATER BASED	26.03.1990
2781	1.53			WATER BASED	02.04.1990
2781	1.62	25.0	8.0	WATER BASED	30.03.1990
2784	1.55	28.0	12.0	WATER BASED	04.04.1990
2784	1.55	28.0	12.0	WATER BASED	04.04.1990
2784	1.53	28.0	5.0	WATER BASED	05.04.1990



2784	1.53	30.0	14.0	WATER BASED	09.04.1990
2784	1.53	29.0	13.0	WATER BASED	09.04.1990
2784	1.53	30.0	14.0	WATER BASED	11.04.1990
2784	1.53	29.0	14.0	WATER BASED	18.04.1990
2784	1.53	36.0	13.0	WATER BASED	18.04.1990
2784	1.53	31.0	15.0	WATER BASED	18.04.1990
2784	1.53	32.0	9.0	WATER BASED	18.04.1990
2784	1.53	34.0	8.0	WATER BASED	18.04.1990
2784	1.53	25.0	7.0	WATER BASED	06.04.1990
2784	1.53	32.0	15.0	WATER BASED	09.04.1990
2784	1.53	30.0	14.0	WATER BASED	10.04.1990
2784	1.53	31.0	13.0	WATER BASED	18.04.1990
2787	1.65	38.0	10.0	WATER BASED	26.04.1990
2787	1.53	30.0	14.0	WATER BASED	19.04.1990
2787	1.65	34.0	15.0	WATER BASED	24.04.1990
2787	1.65	38.0	14.0	WATER BASED	24.04.1990
2787	1.65	38.0	12.0	WATER BASED	24.04.1990
2787	1.65	33.0	9.0	WATER BASED	24.04.1990
2787	1.65	34.0	9.0	WATER BASED	25.04.1990
2787	1.65	33.0	10.0	WATER BASED	27.04.1990
2790	1.58	33.0	8.0	WATER BASED	14.03.1990
2790	1.58	31.0	10.0	WATER BASED	15.03.1990
2800	1.62	23.0	9.0	WATER BASED	26.03.1990
2800	1.62	30.0	9.0	WATER BASED	27.03.1990
2800	1.62	27.0	8.0	WATER BASED	28.03.1990
2800	1.62	28.0	8.0	WATER BASED	30.03.1990
2906	1.65	34.0	15.0	WATER BASED	10.05.1990
3147	1.65	31.0	12.0	WATER BASED	10.05.1990
3346	1.65	33.0	12.0	WATER BASED	10.05.1990
3412	1.65	36.0	8.0	WATER BASED	10.05.1990
3448	1.65	35.0	10.0	WATER BASED	10.05.1990
3448	1.65	31.0	10.0	WATER BASED	14.05.1990
3460	1.65	33.0	9.0	WATER BASED	14.05.1990
3460	1.65	30.0	11.0	WATER BASED	14.05.1990
3471	1.65	37.0	11.0	WATER BASED	14.05.1990
3483	1.65	35.0	11.0	WATER BASED	15.05.1990
3555	1.65	38.0	11.0	WATER BASED	16.05.1990
3569	1.65	38.0	13.0	WATER BASED	21.05.1990
3585	1.68	43.0	12.0	WATER BASED	21.05.1990
3585	1.70	35.0	13.0	WATER BASED	21.05.1990



3585	1.66	33.0	13.0	WATER BASED	21.05.1990
3585	1.66	28.0	16.0	WATER BASED	22.05.1990
3645	1.66	35.0	10.0	WATER BASED	25.05.1990
3645	1.66	34.0	10.0	WATER BASED	23.05.1990
3683	1.66	34.0	9.0	WATER BASED	28.05.1990
3705	1.66	32.0	9.0	WATER BASED	28.05.1990
3755	1.66	37.0	10.0	WATER BASED	28.05.1990
3813	1.65	37.0	12.0	WATER BASED	28.05.1990
3832	1.65	38.0	13.0	WATER BASED	29.05.1990
3985	1.65	40.0	12.0	WATER BASED	30.05.1990
4003	1.85	22.0	2.0	WATER BASED	05.09.1990
4003	1.85	18.0	2.0	WATER BASED	06.09.1990
4003	1.85	18.0	2.0	WATER BASED	07.09.1990
4003	1.85	13.0	4.0	WATER BASED	10.09.1990
4003	1.85	14.0	4.0	WATER BASED	10.09.1990
4003	1.85	34.0	14.0	WATER BASED	10.09.1990
4003	1.85	24.0	14.0	WATER BASED	11.09.1990
4143	1.65	38.0	10.0	WATER BASED	31.05.1990
4167	1.66	37.0	11.0	WATER BASED	05.06.1990
4207	1.66	38.0	12.0	WATER BASED	05.06.1990
4223	1.75	39.0	12.0	WATER BASED	05.06.1990
4223	1.80	40.0	12.0	WATER BASED	05.06.1990
4223	1.80	40.0	13.0	WATER BASED	05.06.1990
4223	1.80	41.0	12.0	WATER BASED	06.06.1990
4223	1.80	42.0	12.0	WATER BASED	07.06.1990
4223	1.80	42.0	12.0	WATER BASED	08.06.1990
4223	1.80	41.0	13.0	WATER BASED	11.06.1990
4224	1.80	39.0	12.0	WATER BASED	11.06.1990
4228	1.80	39.0	12.0	WATER BASED	11.06.1990
4233	1.80	41.0	11.0	WATER BASED	12.06.1990
4259	1.80	41.0	12.0	WATER BASED	13.06.1990
4276	1.80	37.0	12.0	WATER BASED	14.06.1990
4278	1.80	38.0	13.0	WATER BASED	14.06.1990
4306	1.80	41.0	12.0	WATER BASED	18.06.1990
4313	1.80	38.0	11.0	WATER BASED	18.06.1990
4313	1.80	29.0	10.0	WATER BASED	18.06.1990
4313	1.80	32.0	8.0	WATER BASED	19.06.1990
4313	1.80	32.0	8.0	WATER BASED	20.06.1990
4313	1.80	32.0	8.0	WATER BASED	21.06.1990
4313	1.80	31.0	9.0	WATER BASED	22.06.1990



4313	1.80	31.0	9.0	WATER BASED	25.06.1990
4313	1.80	24.0	8.0	WATER BASED	25.06.1990
4313	1.80	26.0	9.0	WATER BASED	27.06.1990
4313	1.81	27.0	7.0	WATER BASED	02.07.1990
4313	1.80	31.0	8.0	WATER BASED	25.06.1990
4313	1.80	24.0	7.0	WATER BASED	26.06.1990
4313	1.80	30.0	8.0	WATER BASED	28.06.1990
4313	1.80	27.0	7.0	WATER BASED	02.07.1990
4326	2.02	29.0	8.0	WATER BASED	02.07.1990
4346	2.02	29.0	8.0	WATER BASED	02.07.1990
4417	2.06	27.0	12.0	WATER BASED	03.07.1990
4454	2.08	23.0	10.0	WATER BASED	04.07.1990
4473	2.08	29.0	5.0	WATER BASED	05.07.1990
4482	2.08	23.0	6.0	WATER BASED	09.07.1990
4567	2.08	23.0	9.0	WATER BASED	09.07.1990
4579	2.08	23.0	6.0	WATER BASED	09.07.1990
4681	2.08	25.0	6.0	WATER BASED	09.07.1990
4769	2.08	22.0	7.0	WATER BASED	10.07.1990
4791	2.08	23.0	6.0	WATER BASED	11.07.1990
4815	2.07	23.0	6.0	WATER BASED	12.07.1990
4816	2.08	21.0	7.0	DUMMY	13.07.1990
4863	2.08	22.0	7.0	DUMMY	16.07.1990
4954	2.08	26.0	7.0	DUMMY	16.07.1990
4960	2.08	28.0	2.0	WATER BASED	04.09.1990
5010	2.08	22.0	5.0	WATER BASED	06.08.1990
5010	2.08	23.0	6.0	DUMMY	16.07.1990
5010	2.08	24.0	6.0	DUMMY	17.07.1990
5010	2.08	25.0	5.0	DUMMY	18.07.1990
5010	2.08	20.0	3.0	DUMMY	19.07.1990
5010	2.08	21.0	4.0	DUMMY	20.07.1990
5010	2.08	20.0	3.0	DUMMY	23.07.1990
5010	2.08	20.0	5.0	DUMMY	23.07.1990
5010	2.08	20.0	5.0	DUMMY	23.07.1990
5010	2.08	21.0	8.0	DUMMY	24.07.1990
5010	2.08	22.0	7.0	DUMMY	25.07.1990
5010	2.08	19.0	4.0	WATER BASED	27.07.1990
5010	2.08	29.0	4.0	WATER BASED	30.07.1990
5010	2.08	29.0	4.0	WATER BASED	30.07.1990
5010	2.08	25.0	4.0	WATER BASED	30.07.1990
5010	2.08	22.0	4.0	WATER BASED	31.07.1990



5010	2.08	22.0	4.0	WATER BASED	01.08.1990
5010	2.08	20.0	5.0	WATER BASED	02.08.1990
5010	2.08	21.0	4.0	WATER BASED	03.08.1990
5010	2.08	21.0	4.0	WATER BASED	06.08.1990
5010	2.08	21.0	4.0	WATER BASED	06.08.1990
5035	2.08	22.0	4.0	WATER BASED	09.08.1990
5056	2.08	21.0	4.0	WATER BASED	10.08.1990
5151	2.08	21.0	5.0	WATER BASED	13.08.1990
5185	2.08	19.0	6.0	WATER BASED	13.08.1990
5210	2.08	22.0	4.0	WATER BASED	13.08.1990
5223	2.08	19.0	6.0	WATER BASED	14.08.1990
5325	2.08	20.0	5.0	WATER BASED	15.08.1990
5334	2.08	22.0	3.0	WATER BASED	27.08.1990
5390	2.08	22.0	6.0	WATER BASED	16.08.1990
5487	2.08	20.0	4.0	WATER BASED	17.08.1990
5501	2.08	20.0	4.0	WATER BASED	20.08.1990
5501	2.08	21.0	4.0	WATER BASED	20.08.1990
5501	2.08	21.0	4.0	WATER BASED	20.08.1990
5501	2.08	20.0	3.0	WATER BASED	21.08.1990
5530	2.08	22.0	4.0	WATER BASED	22.08.1990
5542	2.08	19.0	4.0	WATER BASED	23.08.1990
5617	2.08	23.0	2.0	WATER BASED	27.08.1990
5703	2.08	22.0	3.0	WATER BASED	27.08.1990
5757	2.08	22.0	3.0	WATER BASED	29.08.1990
5757	2.08	24.0	3.0	WATER BASED	29.08.1990
5757	2.08	21.0	3.0	WATER BASED	31.08.1990
5757	2.08	21.0	3.0	WATER BASED	03.09.1990
5757	2.08	21.0	3.0	WATER BASED	03.09.1990
5757	2.08	21.0	3.0	WATER BASED	03.09.1990