



Generell informasjon

Brønnbane navn	2/12-1
Type	EXPLORATION
Formål	WILDCAT
Status	P&A
Faktakart i nytt vindu	lenke til kart
Hovedområde	NORTH SEA
Funn	2/12-1 Mjølner
Brønn navn	2/12-1
Seismisk lokalisering	NP 85C - 81 SP. 2293
Utvinningstillatelse	113
Boreoperatør	Norsk Hydro Produksjon AS
Boretillatelse	530-L
Boreinnretning	TREASURE SCOUT
Boredager	150
Borestart	14.10.1986
Boreslutt	12.03.1987
Frigitt dato	12.03.1989
Publiseringsdato	26.10.2009
Opprinnelig formål	WILDCAT
Gjenåpnet	NO
Innhold	OIL
Funnbrønnbane	YES
1. nivå med hydrokarboner, alder	LATE JURASSIC
1. nivå med hydrokarboner, formasjon.	ULA FM
Avstand, boredekk - midlere havflate [m]	23.0
Vanndybde ved midlere havflate [m]	70.0
Totalt målt dybde (MD) [m RKB]	4795.0
Totalt vertikalt dybde (TVD) [m RKB]	4793.0
Maks inklinasjon [°]	4.4
Temperatur ved bunn av brønnbanen [°C]	151
Eldste penetrerte alder	EARLY PERMIAN
Eldste penetrerte formasjon	ROTLIEGEND GP
Geodetisk datum	ED50
NS grader	56° 14' 4.07" N
ØV grader	3° 42' 27.5" E



NS UTM [m]	6232538.56
ØV UTM [m]	543868.06
UTM sone	31
NPDID for brønnbanen	1014

Brønnhistorie

General

Well 2/12-1 is located in the Feda Graben in the southern North Sea, ca 1.5 m north of the Danish/Norwegian border. The main objective of the well was to prove the extension of the Danish "Gert" discovery into block 2/12. The primary target was Middle Jurassic sandstones, prognosed at 4826 m. Possible secondary targets were Early Jurassic and Triassic sandstones. Structural closure was not defined at Top Shetland or Base Cretaceous levels, but minor stratigraphic trapping was considered possible in this area. Prognosed TD was 5125 m.

Operations and results

Wildcat well 2/12-1 was spudded with the semi-submersible installation Treasure Scout on 14 October 1986 and drilled to TD at 4795 m in volcanic breccia of the Early Permian Rotliegend Group. Drilling proceeded without significant problems down to 3970 m where gas problems were experienced. The hole was cleaned up, and dual induction/sonic log was run. Due to increasing gas recordings 9 5/8" casing was set at 3978 m. The remaining logging program in this section was therefore not run, and sidewall cores were not taken. At 4705 m a drill- break was experienced. The hole was circulated, tested, and drilled to 4714 m. During logging the tool got stuck and the string was cut. The fish was stuck at 3842 m, and loosening was unsuccessful. 7" liner was set at 3826 m and cemented. During circulation hydrocarbons started to flow in between 9 5/8" shoe and 7" liner. The well was closed and heavy mud was squeezed into the formation. After 3 weeks the fish was pulled out of the hole. The well was drilled with spud mud down to 1015 m, with KCl/polymer mud from 1015 m to 4050 m, and with Lignosulphonate mud from 4050 m to TD

Well 2/12-1 encountered 71 m of oil bearing Late Jurassic Ula Formation sandstone from 4597 - 4668 m. The top of the reservoir was 229 m shallower than originally prognosed. The gross sand interval of 71 m contained 56.6 m net sand. The sandstone was generally clean, very fine to fine grained and well sorted. No Free Water level (FWL) was observed down to the sandstone/shale lower reservoir boundary at 4668 m. The oil gradient is the same as for the Gert-1 well.

Oil shows were reported from carbonates in the Late Cretaceous (at the base of the Hydra Formation) from 3895 to 3917 m, the Early Cretaceous (Åsgard Formation) from 3955 to 3988 m, and the Late Permian Zechstein Group from 4674.5 to 4684.5 m. Petrophysical analysis showed no net pay intervals in the Cretaceous sections but for the Permian limestones, out of a gross total interval of 6.5 m carbonate section a net reservoir interval of 4 m with a net pay of 1.1 m was defined. For this net pay interval an average porosity of 7.8 % and a water saturation of 35 % were calculated. Shows were also reported on claystones, dolomites, limestones, siltstones, and thin sandstone stringers at 3988 - 4610 m in the Farsund and Haugesund Formations.

Three conventional cores were cut over the interval 4633 m to 4673.5 m (driller's depth). Coring started in the Ula Formation consisting of sandstone with basal coal, shale and conglomerate. It continued through 2.5 m of ?Triassic claystone and stopped in late Permian claystones and limestones at 4673.5 m. RFT wire line fluid samples were taken at 4645.4 m (gas and water/mud filtrate) and at 4610.1 m (gas, oil, and water/mud filtrate) .



The well was permanently abandoned on 12 March 1987 as an oil and gas discovery.

Testing

Two DST tests were performed in the Ula Formation.

DST 1 was performed from the interval 4630 - 4647 m. It produced 1051 Sm³ oil and 176400 Sm³ gas /day on a 9.54 mm choke. The GOR was 168 Sm³/Sm³, the oil density was 0.828 and the gas gravity was 0.835 (air = 1) with 0.5 % CO₂ and 5 ppm H₂S. The bottom hole temperature, measured at 4642.3 m, was 147.5 deg C.

DST 2 was performed from the interval 4600 - 4612 m. It produced 1629 Sm³ oil and 213600 Sm³ gas /day on a 14.29 mm choke. The GOR was 131 Sm³/Sm³, the oil density was 0.828 and the gas gravity was 0.828 (air = 1) with 1.5 % CO₂ and 0 ppm H₂S. The bottom hole temperature, measured at 4581.92 m, was 148.1 deg C.

Borekaks i Sokkeldirektoratet

Borekaksprøve, topp dybde [m]	Borekaksprøve, bunn dybde [m]
1020.00	4795.00

Borekaks tilgjengelig for prøvetaking?	YES
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Borekjerne i Sokkeldirektoratet

Kjerneprøve nummer	Kjerneprøve - topp dybde	Kjerneprøve - bunn dybde	Kjerneprøve dybde - enhet
1	4633.0	4650.9	[m]
2	4651.0	4660.5	[m]
3	4662.0	4672.5	[m]

Total kjerneprøve lengde [m]	37.9
Kjerner tilgjengelig for prøvetaking?	YES

Kjernebilder



4633-4638m



4638-4643m



4643-4648m



4648-4653m



4653-4658m



4658-4664m



4664-4669m



4669-4672m

Palynologiske preparater i Sokkeldirektoratet

Prøve dybde	Dybde enhet	Prøve type	Laboratorie
2663.3	[m]	C	HRS
3970.0	[m]	SWC	OD
3996.0	[m]	SWC	RRI
3997.0	[m]	DC	OD
4010.0	[m]	DC	OD
4020.0	[m]	DC	OD
4030.0	[m]	DC	OD
4040.0	[m]	SWC	RRI
4050.0	[m]	DC	OD
4060.0	[m]	DC	OD
4070.0	[m]	DC	OD
4080.0	[m]	DC	OD
4090.0	[m]	DC	OD
4105.0	[m]	SWC	RRI
4120.0	[m]	DC	OD
4135.0	[m]	DC	OD
4150.0	[m]	DC	OD
4172.0	[m]	SWC	RRI
4190.0	[m]	DC	OD
4210.0	[m]	DC	OD
4220.0	[m]	SWC	RRI
4240.0	[m]	DC	OD
4260.0	[m]	DC	OD
4280.0	[m]	DC	OD
4300.0	[m]	DC	OD
4320.0	[m]	DC	OD
4330.0	[m]	DC	OD
4340.0	[m]	DC	OD
4350.0	[m]	DC	OD



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4370.0 [m]	DC	OD
4390.0 [m]	DC	OD
4400.0 [m]	DC	OD
4400.0 [m]	SWC	RRI
4420.0 [m]	DC	OD
4420.0 [m]	SWC	RRI
4440.0 [m]	DC	OD
4460.0 [m]	DC	OD
4470.0 [m]	DC	OD
4470.0 [m]	SWC	RRI
4490.0 [m]	DC	OD
4500.0 [m]	DC	OD
4520.0 [m]	DC	OD
4540.0 [m]	DC	OD
4550.0 [m]	DC	OD
4560.0 [m]	DC	OD
4570.0 [m]	DC	OD
4580.0 [m]	DC	OD
4590.0 [m]	DC	OD
4607.0 [m]	DC	OD
4607.0 [m]	SWC	RRI
4627.0 [m]	DC	OD
4628.0 [m]	SWC	RRI
4633.5 [m]	C	OD
4635.6 [m]	C	OD
4638.4 [m]	C	OD
4640.0 [m]	C	OD
4641.0 [m]	C	OD
4643.5 [m]	C	OD
4644.5 [m]	C	OD
4653.3 [m]	C	OD
4654.4 [m]	C	OD
4657.7 [m]	C	OD
4660.0 [m]	C	OD
4660.2 [m]	C	OD
4660.3 [m]	C	OD
4660.4 [m]	C	OD
4663.3 [m]	C	OD
4663.9 [m]	C	OD
4668.1 [m]	DC	HRS



4668.1	[m]	C	HRS
4668.7	[m]	C	OD
4687.0	[m]	SWC	RRI

Oljeprøver i Sökkeldirektoratet

Test type	Flaske nummer	Topp dyp MD [m]	Bunn dyp MD [m]	Væske type	Test tidspunkt	Prøver tilgjengelig
DST	DST1	4630.00	4647.00		22.12.1986 - 00:00	YES
DST	DST2	4600.00	4612.00		18.12.1986 - 00:00	YES

Litostratigrafi

Topp Dyb [mMD RKB]	Litostrat. enhet
93	NORDLAND GP
1594	HORDALAND GP
2985	ROGALAND GP
2985	BALDER FM
2994	SELE FM
3045	LISTA FM
3084	VÅLE FM
3107	SHETLAND GP
3107	EKOFISK FM
3125	TOR FM
3358	HOD FM
3698	BLODØKS FM
3709	HIDRA FM
3917	CROMER KNOLL GP
3917	RØDBY FM
3955	ÅSGARD FM
3988	TYNE GP
3988	FARSUND FM
4365	HAUGESUND FM
4597	VESTLAND GP
4597	ULA FM
4672	NO GROUP DEFINED
4672	SMITH BANK FM



4674	ZECHSTEIN GP
4684	ROTLIEGEND GP

Geokjemisk informasjon

Dokument navn	Dokument format	Dokument størrelse [KB]
1014 1	pdf	0.50
1014 2	pdf	2.06
1014 3	pdf	0.42
1014 4	pdf	11.89
1014 5	pdf	2.48
1014 6	pdf	0.41

Dokumenter - eldre Sokkeldirektoratets WDSS rapporter og andre relaterte dokumenter

Dokument navn	Dokument format	Dokument størrelse [KB]
1014 01 WDSS General Information	pdf	0.39
1014 02 WDSS completion log	pdf	0.31

Dokumenter - rapportert av utvinningstillatelsen (frigitt ihht til regelverk)

Dokument navn	Dokument format	Dokument størrelse [KB]
1014 01 2 12 1 Completion report	pdf	10.63
1014 02 2 12 1 Completion Log	pdf	3.95

Borestrengtester (DST)

Test nummer	Fra dybde MD [m]	Til dybde MD [m]	Reduksjonsven til størrelse [mm]
1.0	4630	4647	9.5
2.0	4600	4612	14.3

Test nummer	Endelig avstengningstrykk [MPa]	Endelig strømningstrykk [MPa]	Bunnhullstrykk [MPa]	Borehullstemperatur [°C]
1.0				





2.0				
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Test nummer	Olje produksjon [Sm3/dag]	Gass produksjon [Sm3/dag]	Oljetetthet [g/cm3]	Gasstygnde rel. luft	GOR [m3/m3]
1.0	1051	176000	0.828	0.835	168
2.0	1629	214000	0.828	0.828	131

Logger

Type logg	Topp dyp for logg [m]	Bunn dyp for logg [m]
CBL VDL	1623	4656
CST	3980	4714
DIL BHC LSS SP GR	2885	4797
DLL MSFL SP GR	3976	4713
LDL CNL CAL GR	2867	4716
MWD - GR RES DIR	92	3986
MWD - GR RES DIR	4023	4633
RFT	4528	4651
RFT	4599	4707
RFT	4610	4610
SHDT GR	3976	4717
TEMP ASNT	3000	4658
VSP	1100	4790

Foringsrør og formasjonsstyrketester

Type utforing	Utforing diam. [tommer]	Utforing dybde [m]	Brønnbane diam. [tommer]	Brønnbane dyp [m]	LOT/FIT slam eqv. [g/cm3]	Type formasjonstest
CONDUCTOR	30	178.0	36	178.0	0.00	LOT
SURF.COND.	20	998.0	26	1015.0	1.70	LOT
INTERM.	13 3/8	2500.0	17 1/2	2515.0	2.02	LOT
INTERM.	9 5/8	3978.0	12 1/4	3986.0	2.21	LOT
LINER	7	4714.0	8 1/2	4716.0	2.42	LOT
OPEN HOLE		4795.0	6	4795.0	0.00	LOT

Boreslam



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Dybde MD [m]	Egenvekt, slam [g/cm3]	Viskositet, slam [mPa.s]	Flytegrense [Pa]	Type slam	Dato, måling
123	1.03	21.0	5.0	WATER BASED	12.03.1987
178	1.25			WATER	14.10.1986
319	1.05			WATER	16.10.1986
895	1.82	21.0	5.0	WATER	10.03.1987
895	1.82	21.0	5.0	WATER BASED	11.03.1987
944	1.05			WATER	17.10.1986
1015	1.03			WATER	20.10.1986
1015	0.00	10.0	6.0	WATER	20.10.1986
1015	0.00	6.0	9.0	WATER	20.10.1986
1015	0.00	6.0	9.0	WATER	21.10.1986
1348	1.21	26.0	12.0	WATER	22.10.1986
1598	1.60	29.0	17.0	WATER	23.10.1986
1905	1.60	40.0	13.0	WATER	26.10.1986
2000	1.60	49.0	17.0	WATER	26.10.1986
2247	1.60	43.0	17.0	WATER	26.10.1986
2257	1.60	38.0	17.0	WATER	27.10.1986
2387	1.60	40.0	16.0	WATER	28.10.1986
2448	1.60	38.0	16.0	WATER	29.10.1986
2515	1.60	38.0	16.0	WATER	30.10.1986
2515	1.60	40.0	13.0	WATER BASED	02.11.1986
2515	1.60	37.0	12.0	WATER BASED	02.11.1986
2650	1.60	25.0	9.0	WATER BASED	02.11.1986
2874	1.60	34.0	10.0	WATER BASED	03.11.1986
2961	1.60	25.0	10.0	WATER BASED	04.11.1986
3059	1.60	32.0	9.0	WATER BASED	05.11.1986
3123	1.60	30.0	10.0	WATER BASED	06.11.1986
3210	1.60	33.0	10.0	WATER BASED	11.11.1986
3220	1.60	32.0	10.0	WATER BASED	11.11.1986
3233	1.60	32.0	11.0	WATER BASED	11.11.1986
3306	1.60	33.0	12.0	WATER BASED	09.11.1986
3323	1.60	32.0	11.0	WATER BASED	12.11.1986
3416	1.60	32.0	10.0	WATER BASED	13.11.1986
3535	1.60	33.0	12.0	WATER BASED	14.11.1986
3636	1.60	31.0	11.0	WATER BASED	17.11.1986
3678	1.60	31.0	11.0	WATER BASED	17.11.1986
3750	1.82	23.0	6.0	WATER	09.03.1987
3780	0.00			WATER	27.02.1987



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3780	2.14	35.0	6.0	WATER	26.02.1987
3780	0.00	55.0	9.0	WATER	02.03.1987
3782	1.60	32.0	11.0	WATER BASED	17.11.1986
3851	1.60	31.0	11.0	WATER BASED	18.11.1986
3874	1.60	30.0	10.0	WATER BASED	19.11.1986
3880	1.60	30.0	10.0	WATER BASED	20.11.1986
3900	1.60	30.0	11.0	WATER BASED	21.11.1986
3901	1.60	30.0	9.0	WATER BASED	24.11.1986
3918	1.60	28.0	9.0	WATER BASED	24.11.1986
3954	1.60	28.0	9.0	WATER BASED	24.11.1986
3960	1.60	28.0	8.0	WATER BASED	25.11.1986
3986	1.66	33.0	8.0	WATER BASED	26.11.1986
3986	1.82	38.0	9.0	WATER BASED	25.11.1986
3986	1.82	37.0	9.0	WATER BASED	30.11.1986
3986	1.82	37.0	8.0	WATER BASED	30.11.1986
3986	1.98	39.0	9.0	WATER BASED	02.12.1986
3986	1.82	37.0	9.0	WATER BASED	27.11.1986
4019	1.98	40.0	8.0	WATER BASED	02.12.1986
4025	1.98	39.0	8.0	WATER BASED	03.12.1986
4050	1.98	40.0	10.0	WATER BASED	04.12.1986
4065	2.02	39.0	10.0	WATER BASED	06.12.1986
4089	2.05	39.0	8.0	WATER BASED	06.12.1986
4155	2.05	38.0	9.0	WATER BASED	06.12.1986
4229	2.05	35.0	8.0	WATER BASED	08.12.1986
4305	2.23	43.0	8.0	WATER	05.03.1987
4305	0.00	50.0	5.0	WATER	09.03.1987
4305	0.00	46.0	5.0	WATER	09.03.1987
4305	0.00	50.0	6.0	WATER	09.03.1987
4308	2.05	36.0	8.0	WATER BASED	09.12.1986
4402	2.05	34.0	8.0	WATER BASED	10.12.1986
4420	2.23	43.0	6.0	WATER	03.03.1987
4420	0.00	60.0	5.0	WATER	05.03.1987
4482	2.07	35.0	8.0	WATER BASED	11.12.1986
4557	2.07	33.0	7.0	WATER BASED	14.12.1986
4567	2.14	33.0	5.0	WATER	25.02.1987
4567	0.00	38.0	5.0	WATER	02.03.1987
4567	0.00	46.0	4.0	WATER	02.03.1987
4609	2.12	33.0	7.0	WATER BASED	14.12.1986
4618	2.14	29.0	7.0	WATER	13.02.1987
4618	0.00	26.0	5.0	WATER	13.02.1987



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4618	0.00	29.0	6.0	WATER	18.02.1987
4618	0.00	28.0	6.0	WATER	18.02.1987
4618	0.00	32.0	7.0	WATER	19.02.1987
4618	0.00	27.0	5.0	WATER	20.02.1987
4618	0.00	28.0	5.0	WATER	24.02.1987
4618	0.00	55.0	6.0	WATER	24.02.1987
4618	0.00	36.0	5.0	WATER	24.02.1987
4618	0.00	49.0	5.0	WATER	24.02.1987
4618	0.00	26.0	5.0	WATER	18.02.1987
4625	2.14	30.0	7.0	WATER	11.02.1987
4633	2.12	27.0	5.0	WATER BASED	14.12.1986
4633	2.12	26.0	5.0	WATER BASED	15.12.1986
4633	2.14	27.0	5.0	WATER BASED	16.12.1986
4651	2.14	27.0	5.0	WATER BASED	17.12.1986
4661	2.14	26.0	5.0	WATER BASED	18.12.1986
4668	2.14	28.0	4.0	WATER BASED	20.12.1986
4677	2.14	32.0	5.0	WATER	02.02.1987
4677	0.00	31.0	5.0	WATER	03.02.1987
4677	0.00	30.0	5.0	WATER	04.02.1987
4677	0.00	29.0	5.0	WATER	09.02.1987
4677	0.00	28.0	5.0	WATER	09.02.1987
4677	0.00	27.0	5.0	WATER	09.02.1987
4677	0.00	26.0	7.0	WATER	10.02.1987
4690	2.14	27.0	4.0	WATER BASED	20.12.1986
4714	2.14	29.0	4.0	WATER BASED	23.12.1986
4714	2.14	29.0	4.0	WATER BASED	29.12.1986
4714	2.14	29.0	4.0	WATER BASED	30.12.1986
4714	2.14	25.0	4.0	WATER BASED	30.12.1986
4714	2.14	32.0	14.0	WATER BASED	30.12.1986
4714	2.14	30.0	13.0	WATER BASED	02.01.1987
4714	2.14	30.0	12.0	WATER BASED	02.01.1987
4714	2.14	43.0	16.0	WATER BASED	05.01.1987
4714	2.14	35.0	16.0	WATER BASED	05.01.1987
4714	2.14	34.0	15.0	WATER BASED	05.01.1987
4714	2.14	33.0	9.0	WATER BASED	09.01.1987
4714	0.00	34.0	8.0	WATER	09.01.1987
4714	0.00	32.0	7.0	WATER	12.01.1987
4714	0.00	29.0	7.0	WATER	13.01.1987
4714	0.00	28.0	7.0	WATER	14.01.1987
4714	0.00	29.0	7.0	WATER	15.01.1987



4714	0.00	30.0	7.0	WATER	16.01.1987
4714	0.00	30.0	7.0	WATER	19.01.1987
4714	0.00	26.0	6.0	WATER	19.01.1987
4714	0.00	27.0	6.0	WATER	19.01.1987
4714	0.00	29.0	6.0	WATER	20.01.1987
4714	0.00	26.0	6.0	WATER	21.01.1987
4714	0.00	28.0	6.0	WATER	22.01.1987
4714	0.00	29.0	7.0	WATER	23.01.1987
4714	0.00	32.0	5.0	WATER	26.01.1987
4714	0.00	31.0	5.0	WATER	26.01.1987
4714	0.00	33.0	6.0	WATER	26.01.1987
4714	2.14	28.0	4.0	WATER BASED	23.12.1986
4714	2.14	26.0	3.0	WATER BASED	30.12.1986
4714	2.25	30.0	18.0	WATER BASED	02.01.1987
4714	2.14	35.0	16.0	WATER BASED	06.01.1987
4714	2.14	36.0	17.0	WATER BASED	07.01.1987
4716	2.14	31.0	5.0	WATER	27.01.1987
4721	2.14	31.0	5.0	WATER	28.01.1987
4747	2.14	34.0	5.0	WATER	29.01.1987
4778	2.14	33.0	5.0	WATER	30.01.1987
4795	2.14	34.0	5.0	WATER	02.02.1987

Tynnslip i Sokkeldirektoratet

Dybde	Enhet
4637.00	[m]
4646.00	[m]
4656.00	[m]
4662.00	[m]
4665.00	[m]
4671.00	[m]

Trykkplott

Porertrykksdataene kommer fra logging i brønnen hvis ingen annen kilde er oppgitt. I noen brønner der trykk ikke er logget, er det brukt informasjon fra formasjonstester eller brønnspark. Trykkdataene er rapportert inn til Oljedirektoratet og videre prosessert og kvalitetssikret av IHS Markit.





Dokument navn	Dokument format	Dokument størrelse [KB]
1014 Formation pressure (Formasjonstrykk)	pdf	0.21

