Generell informasjon

Brønnbane navn	9/2-1
Type	EXPLORATION
Formål	WILDCAT
Status	P&A
Faktakart i nytt vindu	lenke til kart
Hovedområde	NORTH SEA
Felt	YME
Funn	9/2-1 Yme
Brønn navn	9/2-1
Seismisk lokalisering	ST 8626 - 212 SP 160
Utvinningstillatelse	114
Boreoperatør	Den norske stats oljeselskap a.s
Boretillatelse	538-L
Boreinnretning	DYVI DELTA
Boredager	67
Borestart	21.02.1987
Boreslutt	28.04.1987
Frigitt dato	28.04.1989
Publiseringsdato	22.04.2005
Opprinnelig formål	WILDCAT
Gjenåpnet	NO
Innhold	OIL
Funnbrønnbane	YES
1. nivå med hydrokarboner, alder	LATE JURASSIC
1. nivå med hydrokarboner, formasjon.	SANDNES FM
Avstand, boredekk - midlere havflate [m]	29.0
Vanndybde ved midlere havflate [m]	99.0
Totalt målt dybde (MD) [m RKB]	3756.0
Totalt vertikalt dybde (TVD) [m RKB]	3755.0
Maks inklinasjon [°]	3.3
Temperatur ved bunn av brønnbanen [°C]	116
Eldste penetrerte alder	LATE TRIASSIC
Eldste penetrerte formasjon	SKAGERRAK FM
Geodetisk datum	ED50
NS grader	57° 49' 58.1'' N

ØV grader	4° 31' 27.92'' E
NS UTM [m]	6411261.00
ØV UTM [m]	590526.87
UTM sone	31
NPDID for brønnbanen	1038

Brønnhistorie

General

Well 9/2-1 was drilled in a new separate structure and designed to test the hydrocarbon potential of the Egersund Basin. The main target of the well was to test sandstones of middle Jurassic age. Furthermore, the well was expected to improve the paleontological, the geological and the geochemical understanding of the area.

Operations and results

Wildcat well 9/2-1 was spudded with the semi-submersible installation Dyvi Delta on 21 February 1987 and drilled to TD at 3756 m in the Triassic Skagerrak Formation. The well was drilled with a 36" bit down to 189 m, but the drill bit got stuck due to boulders and the string had to be blown off just above the bit. The well was respudded 23 February 1987 and this time a 17 1/2" pilot hole was drilled before opening to 36". It was drilled to 587 m without a riser. NPD gave suspension from conventional logging through this sequence because the MWD log was of good quality, with continuity and correlatable to other wells in the area. Further drilling proceeded without significant problems. The well was drilled with spud mud down to 788 m and with gypsum/polymer mud from 788 m to TD.

The top of the Jurassic sand (Sandnes Formation) was reached at 3174 m, 178 m deeper than prognosed. The oil water contact was difficult to determine exactly from logs, but was believed to be somewhere in the transition zone between 3230 and 3239 m. There were good shows down to 3240 m. Core and log analysis indicated a fairly low porosity sandstone with small amounts of silt, shale and limestone. Compaction, quartz cementation, calcite cement, and clay minerals occurring as fine-grained pore filling aggregates, are the main porosity-reducing factor in the reservoir. The core and log analysis indicate a general trend of decreasing reservoir quality with increasing depth. The Bryne Formation at 3309 m to 3601 m was water wet. Organic geochemical analyses show many intervals with good to excellent source rock potential. The best of these is the Late Jurassic shales of the Tau Formation with TOC in the range 1.0 to 4.3 % and hydrogen index from 140 to 560 mg HC/g TOC. Also coals and shales of the Bryne Formation and shales of the Fjerritslev Formation show good source potential. Analyses of the DST 3 oil indicate a maturity corresponding to a source with %Ro = 0.8 to 0.9 (peak oil window), more mature than any source horizon penetrated in the well location. The chemical and isotopic composition of the oil correlate primarily with extracts from the Tau shales, but has also some resemblance with shale extracts from the Fjerritslev Formation. The Bryne coals and shales appear to be the least likely candidate as source for the oil. The gas from DST 3 has a rather unusual isotopic composition that indicates a mixed source.

One core was cut in the interval 3113 m to 3123 m, and 4 cores in the interval 3174 m to 3287 m. Two FMT runs were performed for fluid and pressure sampling. Several of the pressure readings were affected by super charge due to low formation permeability. The poor quality of the data made it difficult to draw conclusive fluid gradients and to determine an oil/water contact. Four FMT fluid samples were taken at 3346.5 m, 3251.6 m, 3251.0 m, and 3245.0 m. All samples were drained on the rig and all contained mud filtrate.

The well was permanently abandoned on 28 April 1987 as an oil and gas discovery.

Testing

Three DST's were performed to test the oil and water bearing sandstones of Jurassic age. DST 1 perforated the interval from 3245 m to 3263 m, DST 2 perforated 3220 m to 3236 m, and DST 3 perforated 3177 m to 3210 m. The well response from DST 1 (water test) and DST 2 was very poor due to formations of very low permeability. No reservoir fluid was produced to surface during the tests. DST 3 was a successful oil test of the upper part of the oil-bearing reservoir. It produced during main flow 659 m3 oil and 18452 Sm3 gas per day through a 9.53 mm choke. GOR was 28 m3/m3, oil density was 0.834 g/cm3, gas gravity was 0.818 (air = 1) with 1.8 ppm H2S and 3 % CO2.

Borekaks i Sokkeldirektoratet

Borekaksprøve, topp dybde [m]	Borekaksprøve, bunn dybde [m]
793.00	3756.00

Borekaks tilgjengelig for prøvetaking?	YES

Borekjerner i Sokkeldirektoratet

Kjerneprøve nummer	Kjerneprøve - topp dybde	Kjerneprøve - bunn dybde	Kjerneprøve dybde - enhet
1	3111.0	3123.5	[m]
2	3174.0	3202.2	[m]
3	3202.2	3215.8	[m]
4	3231.0	3259.2	[m]
5	3259.3	3287.6	[m]

Total kjerneprøve lengde [m]	110.7
Kjerner tilgjengelig for prøvetaking?	YES

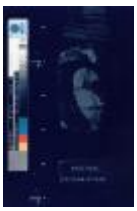
Kjernebilder


3111-3123m


3111-3123m


3111-3123m


3111-3123m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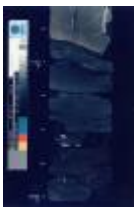
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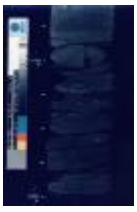
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3174-3202m


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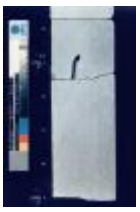
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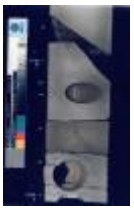
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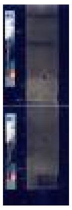
3174-3202m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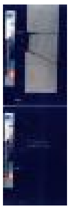
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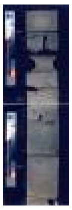
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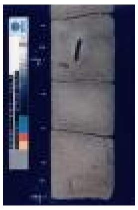
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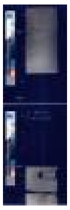
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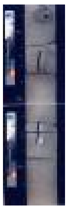
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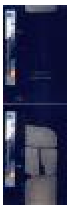
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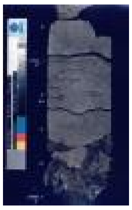
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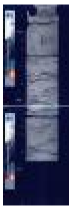
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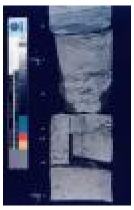
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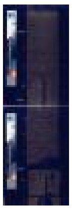
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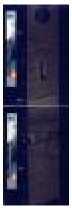
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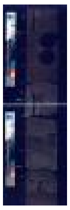
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3174-3202m


3174-3202m


3202-3216m


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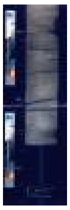
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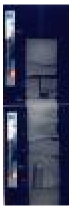
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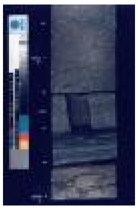
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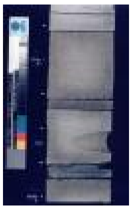
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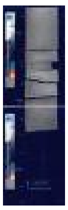
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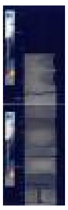
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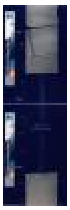
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Palynologiske preparater i Sokkeldirektoratet

Prøve dybde	Dybde enhet	Prøve type	Laboratorie
2606.0	[m]	SWC	GEAR
2619.0	[m]	SWC	GEARH
2630.0	[m]	SWC	GEARH
2641.0	[m]	SWC	GEARH
2655.0	[m]	SWC	GEARH
2675.0	[m]	SWC	GEARH
2709.0	[m]	SWC	GEARH
2727.0	[m]	SWC	GEARH
2808.5	[m]	SWC	GEARH
2858.0	[m]	SWC	GEARH
2880.0	[m]	SWC	GEARH
2910.0	[m]	SWC	GEARH
2921.0	[m]	SWC	GEARH
2943.0	[m]	SWC	GEARH
2957.0	[m]	SWC	GEARH
2981.0	[m]	SWC	GEARH
2989.0	[m]	SWC	GEARH
3000.0	[m]	SWC	GEARH
3017.5	[m]	SWC	GEARH
3035.5	[m]	SWC	GEARH
3047.0	[m]	SWC	GEARH
3078.0	[m]	SWC	GEARH
3099.0	[m]	SWC	GEARH
3111.2	[m]	C	GEARH
3114.7	[m]	C	GEARH
3117.8	[m]	C	GEARH
3120.6	[m]	C	GEARH
3123.0	[m]	C	GEARH
3174.4	[m]	C	GEARH
3185.6	[m]	C	GEARH
3190.6	[m]	C	GEARH
3250.4	[m]	C	GEARH
3253.9	[m]	C	GEARH
3258.5	[m]	C	GEARH
3261.0	[m]	C	GEARH
3269.6	[m]	C	GEARH

3278.0	[m]	C	GEARH
3281.9	[m]	C	GEARH
3328.0	[m]	SWC	GEARH
3391.0	[m]	SWC	GEARH
3410.0	[m]	SWC	GEARH
3424.0	[m]	SWC	GEARH
3437.0	[m]	SWC	GEARH
3460.0	[m]	SWC	GEARH
3508.0	[m]	SWC	GEARH
3518.0	[m]	SWC	GEARH
3540.0	[m]	SWC	GEARH
3582.5	[m]	SWC	GEARH
3618.0	[m]	SWC	GEARH
3657.0	[m]	SWC	GEARH
3679.0	[m]	SWC	GEARH
3686.0	[m]	SWC	GEARH

Oljeprøver i Sokkeldirektoratet

Test type	Flaske nummer	Topp dyp MD [m]	Bunn dyp MD [m]	Væske type	Test tidspunkt	Prøver tilgjengelig
DST	TEST3	3177.00	3210.00		20.04.1987 - 00:00	YES

Litostratigrafi

Topp Dyb [mMD RKB]	Litostrat. enhet
128	NORDLAND GP
515	HORDALAND GP
710	ROGALAND GP
710	BALDER FM
731	SELE FM
740	LISTA FM
756	VÅLE FM
765	SHETLAND GP
765	EKOFISK FM
829	TOR FM
1114	HOD FM

1445	BLODØKS FM
1482	CROMER KNOLL GP
1482	SOLA FM
1601	ÅSGARD FM
2483	BOKNFJORD GP
2483	FLEKKEFJORD FM
2550	SAUDA FM
2993	TAU FM
3097	EGERSUND FM
3162	VESTLAND GP
3162	SANDNES FM
3309	BRYNE FM
3601	NO GROUP DEFINED
3601	FJERRITSLEV FM
3685	NO GROUP DEFINED
3685	SKAGERRAK FM

Spleisede logger

Dokument navn	Dokument format	Dokument størrelse [KB]
1038	pdf	0.58

Geokjemisk informasjon

Dokument navn	Dokument format	Dokument størrelse [KB]
1038_1	pdf	1.30
1038_2	pdf	2.23
1038_3	pdf	1.59
1038_4	pdf	0.23

Dokumenter - eldre Sokkeldirektoratets WDSS rapporter og andre relaterte dokumenter

Dokument navn	Dokument format	Dokument størrelse [KB]
1038_01_WDSS_General_Information	pdf	0.38
1038_02_WDSS_completion_log	pdf	0.30

Dokumenter - rapportert av utvinningstillatelsen (frigitt ihht til regelverk)

Dokument navn	Dokument format	Dokument størrelse [KB]
1038_9_2_1_COMPLETION_REPORT_AND_LOG	pdf	22.83

Borestrengtester (DST)

Test nummer	Fra dybde MD [m]	Til dybde MD [m]	Reduksjonsventil størrelse [mm]
1.0	3245	3263	12.7
2.0	3220	3236	12.7
3.0	3177	3210	14.3
3.1	3177	3210	9.5
3.2	3177	3210	11.1

Test nummer	Endelig avstengningstrykk [MPa]	Endelig strømningstrykk [MPa]	Bunnhullstrykk [MPa]	Borehullstemperatur [°C]
1.0	1.000		35.000	
2.0			28.000	
3.0		6.000	28.000	
3.1	11.000	8.000	28.000	
3.2	11.000	4.000	34.000	

Test nummer	Olje produksjon [Sm3/dag]	Gass produksjon [Sm3/dag]	Oljetetthet [g/cm3]	Gasstyngde rel. luft	GOR [m3/m3]
1.0					
2.0	3		0.834		
3.0	850	20400	0.835	0.803	24
3.1	580	14500	0.825	0.845	25
3.2	660	18480	0.829	0.845	28

Logger

Type logg	Topp dyp for logg [m]	Bunn dyp for logg [m]
ACBL VDL GR	1780	2571
ACBL VDL GR	2392	3283
CDL CNL GR CAL	2571	3743
CDL GR CAL	757	2600
DIFL BHC AC GR SP CAL	757	3742
DLL MLL GR	3150	3400
FMT	3178	3579
FMT	3245	3251
HR DIP	2975	3743
MWD - GR RES DIR	198	3756
SPECTRALOG	3150	3740
VELOCITY	900	2500

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	189.0	36	318.0	0.00	LOT
INTERM.	13 3/8	757.0	17 1/2	788.0	1.54	LOT
INTERM.	9 5/8	2571.0	12 1/4	2603.0	1.95	LOT
LINER	7	3756.0	8 1/2	3756.0	0.00	LOT

Boreslam

Dybde MD [m]	Egenvekt, slam [g/cm3]	Viskositet, slam [mPa.s]	Flytegrense [Pa]	Type slam	Dato, måling
318	1.05			WATERBASED	26.02.1987
768	1.05			WATERBASED	02.03.1987
788	1.02			WATER BASED	02.03.1987
788	0.00			WATERBASED	02.03.1987
1028	1.09	14.0	6.2	WATERBASED	03.03.1987
1303	1.09	19.0	6.2	WATERBASED	04.03.1987
1426	1.09	16.0	5.3	WATERBASED	05.03.1987
1768	1.10	18.0	5.8	WATERBASED	06.03.1987
1989	1.10	14.0	4.8	WATER BASED	09.03.1987
2317	1.10	13.0	6.5	WATERBASED	09.03.1987
2482	1.11	12.0	6.2	WATER BASED	10.03.1987

2600	1.11	12.0	5.7	WATER BASED	11.03.1987
2600	1.11	12.0	5.7	WATER BASED	12.03.1987
2600	1.12	13.0	5.7	WATER BASED	13.03.1987
2603	1.13	11.0	4.8	WATER BASED	16.03.1987
2707	1.13	12.0	5.3	WATER BASED	16.03.1987
2807	1.13	13.0	5.3	WATER BASED	16.03.1987
2888	1.13	12.0	5.7	WATER BASED	17.03.1987
2992	1.16	18.0	5.3	WATER BASED	18.03.1987
3085	1.20	15.0	4.8	WATER BASED	19.03.1987
3117	1.22	15.0	5.3	WATER BASED	20.03.1987
3130	1.25	8.0	2.9	WATER BASED	24.04.1987
3139	1.22	15.0	5.2	WATER BASED	23.03.1987
3175	1.25	17.0	5.7	WATER BASED	24.03.1987
3202	1.22	14.0	3.8	WATER BASED	23.03.1987
3202	1.23	14.0	5.3	WATER BASED	23.03.1987
3263	1.25	15.0	4.8	WATER BASED	25.03.1987
3300	1.26	15.0	4.8	WATER BASED	26.03.1987
3340	1.26	14.0	3.4	WATER BASED	09.04.1987
3340	1.26	14.0	3.3	WATER BASED	09.04.1987
3340	1.25	14.0	4.0	WATER BASED	09.04.1987
3340	1.26	12.0	3.4	WATER BASED	09.04.1987
3340	1.25	12.0	3.4	WATER BASED	14.04.1987
3340	1.25	12.0	3.4	WATER BASED	15.04.1987
3386	1.26	20.0	6.2	WATER BASED	30.03.1987
3460	1.25	22.0	7.2	WATER BASED	30.03.1987
3521	1.25	20.0	7.2	WATER BASED	30.03.1987
3611	1.25	20.0	6.2	WATER BASED	30.03.1987
3643	1.25	18.0	5.2	WATER BASED	01.04.1987
3688	1.25	20.0	5.7	WATER BASED	01.04.1987
3756	1.25	16.0	3.8	WATER BASED	03.04.1987
3756	1.25	21.0	6.2	WATER BASED	06.04.1987
3756	1.25	17.0	3.4	WATER BASED	06.04.1987
3756	1.25	20.0	5.7	WATER BASED	06.04.1987
3756	1.25	19.0	5.7	WATER BASED	08.04.1987
3756	1.25	18.0	4.3	WATERBASED	09.04.1987
3756	1.25	19.0	5.7	WATER BASED	03.04.1987
3756	1.25	17.0	3.8	WATER BASED	07.04.1987

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]
1038_Formation_pressure_(Formasjonstrykk)	pdf	0.22