Generell informasjon

Brønnbane navn	35/3-2
Type	EXPLORATION
Formål	WILDCAT
Status	P&A
Faktakart i nytt vindu	lenke til kart
Hovedområde	NORTH SEA
Funn	35/3-2 Agat
Brønn navn	35/3-2
Seismisk lokalisering	TLGS 78-01 SP.2945
Utvinningstillatelse	041
Boreoperatør	Saga Petroleum ASA
Boretillatelse	249-L
Boreinnretning	SEDCO 707
Boredager	161
Borestart	19.05.1980
Boreslutt	26.10.1980
Frigitt dato	26.10.1982
Publiseringsdato	18.05.2004
Opprinnelig formål	WILDCAT
Gjenåpnet	NO
Innhold	GAS/CONDENSATE
Funnbrønnbane	YES
1. nivå med hydrokarboner, alder	EARLY CRETACEOUS
1. nivå med hydrokarboner, formasjon.	AGAT FM
Avstand, boredekk - midlere havflate [m]	24.0
Vanndybde ved midlere havflate [m]	272.0
Totalt målt dybde (MD) [m RKB]	4400.0
Totalt vertikalt dybde (TVD) [m RKB]	4396.0
Maks inklinasjon [°]	5.3
Temperatur ved bunn av brønnbanen [°C]	147
Eldste penetrerte alder	PRE-DEVONIAN
Eldste penetrerte formasjon	BASEMENT
Geodetisk datum	ED50
NS grader	61° 51' 5.98'' N
ØV grader	3° 46' 28.22'' E

NS UTM [m]	6858062.65
ØV UTM [m]	540764.96
UTM sone	31
NPDID for brønnbanen	136

Brønnhistorie

General

Whereas Saga Petroleum operated license 041, BP operated wildcat well 35/3-2 under license 041 by special agreement. The well was the second well drilled on this block, 35/3-1 was abandoned in the Middle Jurassic due to high calculated pore pressures. Well 35/3-2 was drilled on a westerly dipping fault block. The primary target of the well was Early Jurassic sandstone, secondary targets were any other Jurassic sandstones encountered.

Operations and results

Wildcat well 35/3-2 was spudded with the semi-submersible installation Sedco 707 on 19 May 1980 and drilled to TD at 4400 m in ?Caledonian age basement rocks. The well was drilled with seawater and gel down to 902 m, with gypsum/CMC mud from 902 m to 2305 m, with Poly RX/Drispac from 2305 m to 3833m, and with Poly RX/Lignosulfonate mud from 3833 m to TD. The well started to flow while drilling the 24" hole. Heavy mud was pumped down the hole, but there was very little difference between the fracture gradient and the bottom hole pressure and returns were lost several times. A loss/gain situation was maintained until the casing setting depth was reached. When running the 18 5/8" casing the string parted and 22 joints were left in the hole. The string was recovered successfully, and a new string was run and cemented without problems.

The well penetrated strata from Tertiary through Jurassic and Triassic before reaching basement. Hydrocarbon shows were encountered in Lower Cretaceous and Lower Jurassic sands. The primary target Jurassic sandstones were found to be very tight, and no DST was carried out in these. In stead two zones in the Lower Cretaceous Sandstone were tested, producing water and gas/condensate respectively. The lower Cretaceous sands are interpreted as submarine fan deposits. The Lower Jurassic coarsening upward sequences may represent offshore open marine bars cut by tidal channel deposits and capped by a transgressive marine sheet sand. Log evaluation indicated 13.7 meters net pay in the Lower Cretaceous, with an average porosity of 15 % and an average water saturation of 64.3 %. The RFT pressure gradients suggested that a gas-water contact exists at 3585 m. Log interpretation showed moveable hydrocarbons to 3588.5 m and formation water below 3591 m. A possible 8.8 meters of net hydrocarbon bearing thin sand stringers were penetrated in the Lower Jurassic sequence.

Two FIT fluid samples were taken through the 9 5/8" casing. The first FIT was run at 3675.5 m. Total recovery was 1 litre of gas and 22 litres of flocculated mud with trace of oil. The second FIT was run at 3750.5 m. Total recovery was 1 litre of mud filtrate/water and 10 litres of flocculated mud. This sample had no measurable gas volume. Two RFT segregated samples were taken in the Early Cretaceous Agat Formation. A segregated sample was collected in the gas-bearing interval at 3565.5 m, and both chambers were found to contain gas only with no trace of mud filtrate. The second sample collected in the water-bearing interval at 3593 m recovered 7.5 litres of water and 13.1 litres of gas in the 2-3/4 gallon chamber, and 3.8 litres of water with 3.4 litres of gas in the 1-gallon chamber. Analysis of the water samples indicated that mud filtrate had been recovered. RFT sampling in the Early Jurassic at 4073 m, 4024.5 m, and 3939 m was unsuccessful and recovered only mud filtrate and water. Seven cores were cut in the well. Cores 1 to 4 were cut in the Agat Formation from 3593.3 m to 3641 m, core 5 was cut in the Agat Formation from 3690.7 m to 3708.3 m, core 6 was cut in the Lower Jurassic from 3944.5

m to 3960 m, and core 7 was cut in the Lower Jurassic from 3998.2 m to 4010 m.

The well was plugged and abandoned as a gas/condensate discovery (Agat) on October 1980.

Testing

Two drill stem tests were carried out in the Early Cretaceous Agat Formation. DST1 perforated the interval 3599 m to 3605 m. This test produced water at a rate of 555 Sm3/day through a 38/64" choke. The gas dissolved in the water showed no H2S and only traces of C02. DST2 perforated the intervals 3547 m to 3552, 3555.5 m to 3558, and 3562 m to 3566 m. It produced 1082000 Sm3 gas/day through a 38/64" choke. The final flow rate with the choke at 32/64 was 736000 Sm3/day. Because of a failure on the condensate metering system on the separator condensate flow rates were measured by flowtank dipping. A final condensate/gas ratio of approximately 10 bbl/MMSCF (5.6 x 10-5 Sm3/Sm3, corresponding to GOR = 18000 Sm3/Sm3) has been estimated. The gas gravity was 0.62 (air =1) and the condensate density was 0.815 g/cm3

Borekaks i Sokkeldirektoratet

Borekaksprøve, topp dybde [m]	Borekaksprøve, bunn dybde [m]
470.00	4400.00

Borekaks tilgjengelig for prøvetaking?	YES

Borekjerner i Sokkeldirektoratet

Kjerneprøve nummer	Kjerneprøve - topp dybde	Kjerneprøve - bunn dybde	Kjerneprøve dybde - enhet
1	3593.2	3610.8	[m]
2	3611.0	3613.3	[m]
3	3613.3	3617.3	[m]
4	3625.0	3641.0	[m]
5	3690.7	3710.2	[m]
6	3944.5	3960.4	[m]
7	3998.2	4010.1	[m]

Total kjerneprøve lengde [m]	87.2
Kjerner tilgjengelig for prøvetaking?	YES

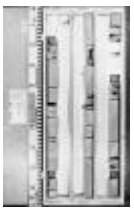
Kjernebilder


3593-3596m


3596-3598m


3598-3601m


3601-3604m


3604-3606m


3606-3609m

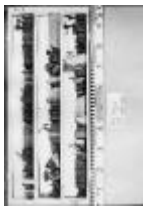

3609-3610m


3611-3614m


3613-3616m


3616-2617m


3625-3627m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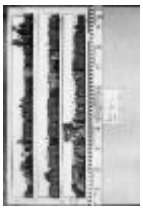
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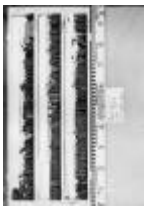
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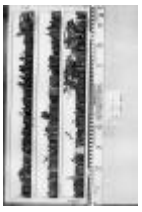
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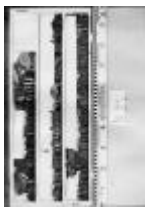
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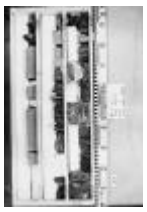
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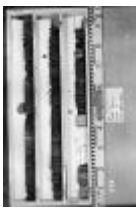
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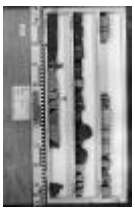
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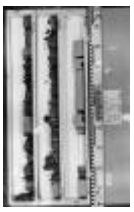
3698-3701m


3701-3704m


3704-3706m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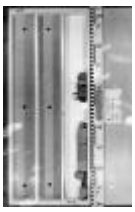
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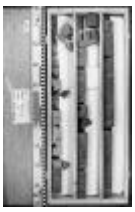
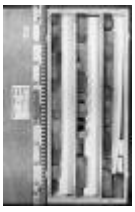

3944-3947m


3947-3949m


3949-3952m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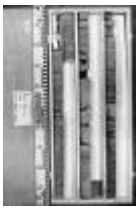
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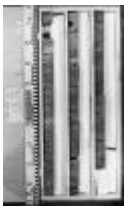
3958-3960m

Palynologiske preparater i Sokkeldirektoratet

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1560.0	[m]	DC	OD
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1900.0	[m]	DC	OD
2100.0	[m]	DC	OD
2300.0	[m]	DC	OD
2500.0	[m]	DC	OD
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2900.0	[m]	DC	OD
2950.0	[m]	DC	OD
3000.0	[m]	DC	OD
3180.0	[m]	DC	OD
3200.0	[m]	DC	OD
3250.0	[m]	DC	OD
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3601.8	[m]	C	OD
3602.8	[m]	C	OD

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Litostratigrafi

Topp Dyb [mMD RKB]	Litostrat. enhet
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975	HORDALAND GP
975	NO FORMAL NAME
1332	ROGALAND GP
1332	BALDER FM
1348	LISTA FM
1520	SHETLAND GP
1520	JORSALFARE FM
1665	KYRRE FM
2864	TRYGGVASON FM
3190	BLODØKS FM
3207	SVARTE FM
3447	CROMER KNOLL GP
3447	RØDBY FM
3528	AGAT FM
3722	ÅSGARD FM
3819	DUNLIN GP
3819	DRAKE FM
3920	COOK FM
3946	BURTON FM

3975	AMUNDSEN FM
4143	STATFJORD GP
4167	BASEMENT

Spleisede logger

Dokument navn	Dokument format	Dokument størrelse [KB]
136	pdf	0.73

Geokjemisk informasjon

Dokument navn	Dokument format	Dokument størrelse [KB]
136_1	pdf	1.18
136_2	pdf	1.34
136_3	pdf	0.57
136_4	pdf	1.95
136_5	pdf	1.95
136_6	pdf	1.94

Dokumenter - eldre Sokkeldirektoratets WDSS rapporter og andre relaterte dokumenter

Dokument navn	Dokument format	Dokument størrelse [KB]
136_01_WDSS_General_Information	pdf	0.13
136_02_WDSS_completion_log	pdf	0.27

Dokumenter - rapportert av utvinningstillatelsen (frigitt ihht til regelverk)

Dokument navn	Dokument format	Dokument størrelse [KB]
136_35_3_2_COMPLETION_REPORT_AND_LOG	pdf	15.35

Borestrengtester (DST)

Test nummer	Fra dybde MD [m]	Til dybde MD [m]	Reduksjonsventil størrelse [mm]
1.0	3599	3605	15.0
2.0	3552	3566	15.0

Test nummer	Endelig avstengningstrykk [MPa]	Endelig strømningstrykk [MPa]	Bunnhullstrykk [MPa]	Borehullstemperatur [°C]
1.0				
2.0				

Test nummer	Olje produksjon [Sm3/dag]	Gass produksjon [Sm3/dag]	Oljetetthet [g/cm3]	Gasstyngde rel. luft	GOR [m3/m3]
1.0					
2.0	53	1082000	0.819	0.620	

Logger

Type logg	Topp dyp for logg [m]	Bunn dyp for logg [m]
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CBL CCL	296	1020
CBL VDL CCL GR	3400	3821
CST	3300	3834
DLL GR	3821	4397
DLL MSFL GR	3450	3834
FDC CNL GR	3450	3834
FDC CNL GR	3821	4125
FDC CNL GR	4401	4425
HDT	3300	3834
HDT	3300	3834
HDT	3821	4401
HRT CCL	0	2350
HRT CCL	250	841
HRT CCL	285	990
ISF BHC MSFL GR SP CAL	4124	4400
ISF BHCS MSFL GR SP CAL	3821	4124
ISF BHCS MSFL SP GR CAL	250	2305
ISF BHCS MSFL SP GR CAL	2287	3834

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	430.0	36	436.0	0.00	LOT
SURF.COND.	18 5/8	868.0	24	875.0	0.00	LOT
INTERM.	13 3/8	2262.0	17 1/2	2280.0	0.00	LOT
INTERM.	9 5/8	3797.0	12 1/4	3808.0	1.63	LOT
LINER	7	4400.0	8 3/8	4400.0	0.00	LOT

Boreslam

Dybde MD [m]	Egenvekt, slam [g/cm3]	Viskositet, slam [mPa.s]	Flytegrense [Pa]	Type slam	Dato, måling
662	0.00			seawater	
900	1.08			watermud	
1522	1.10			watermud	
2290	1.23	43.0		watermud	
2603	1.32	53.0		watermud	
3090	1.34	50.0		watermud	
3575	1.42	54.0		watermud	
3617	1.42	52.0		watermud	
3833	1.47	55.0		watermud	
4400	1.57	58.0		watermud	

Tynnslip i Sokkeldirektoratet

Dybde	Enhet
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3594.55	[m]
3595.70	[m]
3596.65	[m]
3597.65	[m]
3598.60	[m]
3599.60	[m]
3600.85	[m]
3601.80	[m]
3602.80	[m]

3603.90	[m]
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3606.75	[m]
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3609.90	[m]
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3614.68	[m]
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3954.30	[m]
3955.80	[m]
3956.85	[m]
3957.90	[m]
3958.90	[m]
3960.20	[m]
3999.35	[m]
4001.00	[m]
4002.15	[m]
4003.15	[m]
4004.37	[m]
4005.30	[m]
4006.95	[m]
4007.90	[m]
4008.60	[m]
4009.70	[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]
136_Formation_pressure_(Formasjonstrykk)	pdf	0.22