



General information





Wellbore name	35/3-2
Type	EXPLORATION
Purpose	WILDCAT
Status	P&A
Factmaps in new window	link to map
Main area	NORTH SEA
Discovery	35/3-2 Agat
Well name	35/3-2
Seismic location	TLGS 78-01 SP.2945
Production licence	041
Drilling operator	Saga Petroleum ASA
Drill permit	249-L
Drilling facility	SEDCO 707
Drilling days	161
Entered date	19.05.1980
Completed date	26.10.1980
Release date	26.10.1982
Publication date	18.05.2004
Purpose - planned	WILDCAT
Reentry	NO
Content	GAS/CONDENSATE
Discovery wellbore	YES
1st level with HC, age	EARLY CRETACEOUS
1st level with HC, formation	AGAT FM
Kelly bushing elevation [m]	24.0
Water depth [m]	272.0
Total depth (MD) [m RKB]	4400.0
Final vertical depth (TVD) [m RKB]	4396.0
Maximum inclination [°]	5.3
Bottom hole temperature [°C]	147
Oldest penetrated age	PRE-DEVONIAN
Oldest penetrated formation	BASEMENT
Geodetic datum	ED50
NS degrees	61° 51' 5.98" N
EW degrees	3° 46' 28.22" E
NS UTM [m]	6858062.65
EW UTM [m]	540764.96
UTM zone	31
NPDID wellbore	136



Wellbore history

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 CO₂. 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

Cuttings at the Norwegian Offshore Directorate

Cutting sample, top depth [m]	Cutting samples, bottom depth [m]
470.00	4400.00

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	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 core sample length [m]	87.2
Cores available for sampling?	YES

Core photos

3593-3596m



3596-3598m



3598-3601m



3601-3604m



3604-3606m



3606-3609m



3609-3610m



3611-3614m



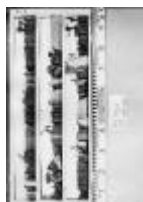
3613-3616m



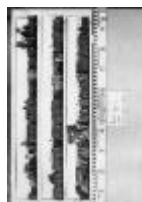
3616-2617m



3625-3627m



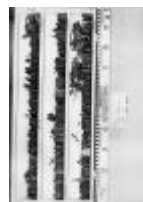
3627-3630m



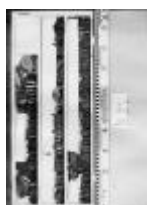
3630-3633m



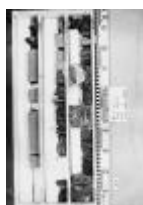
3633-3635m



3635-3638m



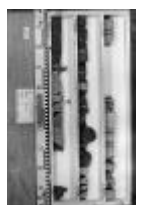
3638-3641m



3690-3693m



3693-3696m



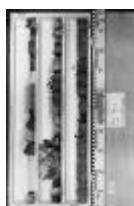
3696-3698m



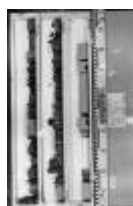
3698-3701m



3701-3704m



3704-3706m



3706-3709m



3709-3710m



3944-3947m



3947-3949m



3949-3952m



3952-3955m



3955-3958m



3958-3960m

Palynological slides at the Norwegian Offshore Directorate

Sample depth	Depth unit	Sample type	Laboratory
800.0	[m]	DC	OD
900.0	[m]	DC	OD
1000.0	[m]	DC	OD



1200.0 [m]	DC	OD
1400.0 [m]	DC	OD
1500.0 [m]	DC	OD
1520.0 [m]	DC	OD
1540.0 [m]	DC	OD
1560.0 [m]	DC	OD
1650.0 [m]	DC	OD
1680.0 [m]	DC	OD
1700.0 [m]	DC	OD
1900.0 [m]	DC	OD
2100.0 [m]	DC	OD
2300.0 [m]	DC	OD
2500.0 [m]	DC	OD
2700.0 [m]	DC	OD
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
3300.0 [m]	DC	OD
3500.0 [m]	DC	OD
3593.0 [m]	DC	OD
3593.8 [m]	C	OD
3594.6 [m]	C	OD
3595.7 [m]	C	OD
3596.7 [m]	C	OD
3597.7 [m]	C	OD
3598.6 [m]	C	OD
3599.6 [m]	C	OD
3600.9 [m]	C	OD
3601.8 [m]	C	OD
3602.8 [m]	C	OD
3603.9 [m]	C	OD
3604.7 [m]	C	OD
3605.8 [m]	C	OD
3606.8 [m]	C	OD
3607.9 [m]	C	OD
3608.9 [m]	C	OD
3609.9 [m]	C	OD



3611.4 [m]	C	OD
3612.5 [m]	C	OD
3613.6 [m]	C	OD
3614.7 [m]	C	OD
3615.2 [m]	C	OD
3616.1 [m]	C	OD
3616.9 [m]	C	ROBERTSO
3623.0 [m]	DC	OD
3625.0 [m]	C	OD
3626.0 [m]	C	OD
3626.8 [m]	C	ROBERTSO
3627.7 [m]	C	OD
3628.1 [m]	C	OD
3629.2 [m]	C	OD
3629.5 [m]	C	OD
3629.5 [m]	C	OD
3630.0 [m]	C	ROBERTSO
3630.0 [m]	C	OD
3631.6 [m]	C	OD
3632.8 [m]	C	OD
3633.0 [m]	C	ROBERTSO
3634.1 [m]	C	OD
3635.5 [m]	C	OD
3636.3 [m]	C	ROBERTSO
3637.3 [m]	C	OD
3638.4 [m]	C	OD
3639.5 [m]	C	ROBERTSO
3640.8 [m]	C	OD
3690.8 [m]	C	ROBERTSO
3692.3 [m]	C	OD
3692.3 [m]	C	OD
3693.5 [m]	C	OD
3694.0 [m]	C	ROBERTSO
3695.0 [m]	C	OD
3696.0 [m]	C	OD
3697.0 [m]	C	ROBERTSO
3697.7 [m]	C	OD
3697.8 [m]	C	OD
3698.0 [m]	C	OD
3698.8 [m]	C	OD



3699.3 [m]	C	OD
3700.0 [m]	C	OD
3700.0 [m]	C	ROBERTSO
3700.8 [m]	C	OD
3701.8 [m]	C	OD
3702.9 [m]	C	OD
3703.9 [m]	C	OD
3704.0 [m]	C	ROBERTSO
3705.0 [m]	C	OD
3706.0 [m]	C	OD
3707.0 [m]	C	OD
3708.0 [m]	C	ROBERTSO
3710.0 [m]	C	OD
3710.0 [m]	DC	OD
3710.1 [m]	C	ROBERTSO
3800.0 [m]	DC	OD
3821.0 [m]	DC	OD
3839.0 [m]	DC	OD
3860.0 [m]	DC	OD
3902.0 [m]	DC	OD
3945.0 [m]	C	OD
3946.2 [m]	C	OD
3947.7 [m]	C	OD
3948.9 [m]	C	OD
3950.0 [m]	C	OD
3950.0 [m]	DC	OD
3950.9 [m]	C	OD
3952.0 [m]	C	OD
3953.2 [m]	C	OD
3954.3 [m]	C	OD
3955.8 [m]	C	OD
3956.9 [m]	C	OD
3957.9 [m]	C	OD
3958.9 [m]	C	OD
3960.2 [m]	C	OD
3998.2 [m]	C	OD
3999.4 [m]	C	OD
4000.0 [m]	C	OD
4001.0 [m]	C	OD
4001.0 [m]	DC	OD



4002.2	[m]	C	OD
4003.2	[m]	C	OD
4004.4	[m]	C	OD
4005.3	[m]	C	OD
4007.0	[m]	C	OD
4007.9	[m]	C	OD
4008.6	[m]	C	OD
4009.7	[m]	C	OD

Lithostratigraphy

Top depth [mMD RKB]	Lithostrat. unit
297	NORDLAND GP
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

Composite logs





Document name	Document format	Document size [MB]
136	pdf	0.73

Geochemical information

Document name	Document format	Document size [MB]
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

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

Document name	Document format	Document size [MB]
136_01_WDSS_General_Information	pdf	0.13
136_02_WDSS_completion_log	pdf	0.27

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

Document name	Document format	Document size [MB]
136_35_3_2_COMPLETION_REPORT_AND_LOG	pdf	15.35

Drill stem tests (DST)

Test number	From depth MD [m]	To depth MD [m]	Choke size [mm]
1.0	3599	3605	15.0
2.0	3552	3566	15.0

Test number	Final shut-in pressure [MPa]	Final flow pressure [MPa]	Bottom hole pressure [MPa]	Downhole temperature [°C]
1.0				





2.0				
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Test number	Oil [Sm3/day]	Gas [Sm3/day]	Oil density [g/cm3]	Gas grav. rel.air	GOR [m3/m3]
1.0					
2.0	53	1082000	0.819	0.620	

Logs

Log type	Log top depth [m]	Log bottom depth [m]
	0	0
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

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	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
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Drilling mud

Depth MD [m]	Mud weight [g/cm3]	Visc. [mPa.s]	Yield point [Pa]	Mud type	Date measured
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	

Thin sections at the Norwegian Offshore Directorate

Depth	Unit
3593.75	[m]
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]
3604.65	[m]
3605.75	[m]
3606.75	[m]
3607.90	[m]
3608.90	[m]
3609.90	[m]
3611.40	[m]
3612.45	[m]



3613.60	[m]
3614.68	[m]
3615.20	[m]
3616.10	[m]
3625.00	[m]
3625.98	[m]
3628.10	[m]
3629.20	[m]
3629.45	[m]
3629.50	[m]
3632.82	[m]
3637.25	[m]
3692.25	[m]
3692.30	[m]
3693.50	[m]
3695.00	[m]
3696.00	[m]
3697.70	[m]
3697.75	[m]
3698.00	[m]
3698.75	[m]
3699.30	[m]
3700.75	[m]
3702.85	[m]
3703.85	[m]
3704.95	[m]
3705.95	[m]
3706.95	[m]
3747.70	[m]
3748.90	[m]
3950.93	[m]
3952.02	[m]
3953.15	[m]
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]

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]
136 Formation pressure (Formasjonstrykk)	pdf	0.22

