



General information

Wellbore name	29/6-1
Type	EXPLORATION
Purpose	WILDCAT
Status	P&A
Factmaps in new window	link to map
Main area	NORTH SEA
Field	MARTIN LINGE
Discovery	29/6-1
Well name	29/6-1
Seismic location	BP 80 - 021 SP 302
Production licence	043
Drilling operator	BP Norway Limited U.A.
Drill permit	307-L
Drilling facility	SEDCO 707
Drilling days	210
Entered date	12.10.1981
Completed date	09.05.1982
Release date	09.05.1984
Publication date	01.08.2010
Purpose - planned	APPRAISAL
Reentry	NO
Content	GAS/CONDENSATE
Discovery wellbore	YES
1st level with HC, age	MIDDLE JURASSIC
1st level with HC, formation	BRENT GP
Kelly bushing elevation [m]	24.0
Water depth [m]	124.7
Total depth (MD) [m RKB]	4832.0
Final vertical depth (TVD) [m RKB]	4785.0
Maximum inclination [°]	25.3
Bottom hole temperature [°C]	166
Oldest penetrated age	LATE TRIASSIC
Oldest penetrated formation	LUNDE FM
Geodetic datum	ED50
NS degrees	60° 32' 17.94" N
EW degrees	1° 59' 24.05" E
NS UTM [m]	6711948.14
EW UTM [m]	444581.73



UTM zone	31
NPDID wellbore	375

Wellbore history

General

Well 29/6-1 was drilled ca 2 km west of the UK border on the eastern margin of the East Shetland Basin. The primary objective was the Brent Group in a fault block separate from the Hild structure some few km to the southwest. The secondary objective was the Statfjord formation.

Operations and results

Wildcat well 29/6-1 was spudded with the semi-submersible installation SEDCO 707 on and drilled to TD at 4832 m.

The well was spudded by "Sedco 707" on 12.10.81. When drilling the 17 1/2" pilot hole (with 1.1 sg mud) in the 24" section, mud losses occurred at 870 m. The hole was displaced to seawater and operations continued down to 1205 m where the 24" casing was set. Further drilling went with increasing mud weights due to tight hole problems, to a point where the overbalance considerably reduced penetration rate. Due to high deviation the pipe became differentially stuck at 4664 m. The well was planned to be vertical, but ended up severely deviated. From 3973 m to 4097 m hole inclination increased from 5 degrees to 10.5 degrees, increasing to 15.5 degrees by 4155 m, as a result of the increased dip of the bedding planes. At 4155 m a pendulum drill assembly was used but the hole inclination continued to increase to 19.5 degrees. By 4211 m the angle had reduced to 17 degrees but again increased to a maximum of 21 degrees by 4457 m, and then decreased to 20.25 degrees by 4570 m. Below this depth, surveys were not possible due to the hole conditions with overpull and stuck pipe on the connections and tight hole on trips. Keyseating, washout in the sandstones and the swelling nature of the clays in the Dunlin formation added to the problem caused by hole angle. At TD Schlumberger HDT log was run and the hole angle had built up to 25.25 degrees, and it was estimated that TVD was 47 m less than MD. The well was drilled with gel/seawater/Drispac down to 294 m, with gel/seawater/Lost circulation material from 294 m to 1205 m, with gypsum/Lignosulphonate/CMC from 1205 m to 2552 m, with Lignosulphonate/CMC from 2552 m to 3783 m, and with Lignosulphonate from 3783 m to TD.

The Base Cretaceous Unconformity was penetrated at 3807 m where a thick section of Late Jurassic mudstones including 110 m Draupne Formation was encountered. The Brent Group clastic sediments were reached at 4204.5 m and found to be gas/condensate bearing. The sandstones were highly overpressured and 15 m of net pay was proved. The GWC was estimated at 4230 m (4195.1 m TVD MSL) using RFT data. The Statfjord Formation was water bearing.

Methane gas with a weak oil show was observed on sandstone at 1830 m in Paleocene. There were further weak shows (yellow natural fluorescence with colourless cut) in the Shetland Group from 3610 to 3805 m, and there were similar weak shows throughout the Brent Group ("Dull yellow fluorescence becoming very dull orange yellow downhole, fast yellow to milky white cut fluorescence becoming very slow downhole, no natural cut colour"). Similar weak shows were seen also in the Amundsen Formation sands at 4664 to 4729 m and a further 10 m into the underlying Statfjord Formation.

Seven cores were taken in the interval 4219 to 4340 m in the 8 3/8" section in the Tarbert and Ness Formations. RFT water samples were taken at 4235.5 m and at



4289.7 m (mud filtrate only).

The well was permanently abandoned on 9 May 1982 as a gas/condensate discovery.

Testing

Three drill stem tests were performed in the Tarbert Formation of the Bren Group. The upper DST produced gas and condensate; the two deeper produced only water.

DST 1 perforated the interval 4287 to 4301 m. It consisted of a 5 minutes initial flow period and a 34 minutes initial shut in. The well then flowed formation water with small quantities of gas containing 11% CO₂ for 642 minutes before being shut in for 796 minutes. The final flow rate was 192 m³ water/day through a 4/64" choke. Samples were taken both at the wellhead and at the separator throughout the test. Water salinity was 71000 ppm NaCl. The maximum temperature recording taken at gauge depth 4285.66 m was 151.2 deg C.

DST 2 perforated the interval 4256 to 4260 m. It consisted of a flow period of 1065 minutes (no hydrocarbons observed) and a build up period of 973 minutes. The final flow rate was 44 m³ water/day through a 4/64" choke. The maximum temperature recording taken at gauge depth 4254.98 m was 150.9 deg C.

DST 3 perforated the interval 4208.5 to 4218.3 m in the uppermost Tarbert Formation. It consisted of 5 minutes initial flow followed by a 63 minutes build up and a main flow of gas and condensate (439 minutes). The final flow rate was 305822 Sm³ gas (10.8 MMft³) with 2% CO₂. H₂S was not detected during the test. The condensate gas ratio was 138 STB/MM ft³ (GOR = 1291 Sm³/Sm³), condensate gravity was 44 deg API, and the separator gas gravity was 0.71 (air = 1). The maximum temperature recording taken at gauge depth 4203.14 m was 152.2 deg C.

Cuttings at the Norwegian Offshore Directorate

Cutting sample, top depth [m]	Cutting samples, bottom depth [m]
290.00	4818.00

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	4219.5	4238.0	[m]
2	4238.0	4256.0	[m]
3	4256.0	4274.0	[m]
4	4274.0	4292.0	[m]
5	4292.0	4310.0	[m]
6	4310.0	4328.2	[m]
7	4328.2	4339.7	[m]

Total core sample length [m]	120.1
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Cores available for sampling?	YES
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Core photos



4219-4225m



4225-4231m



4231-4237m



4237-4237m



4238-4244m



4244-4250m



4250-4356m



4256-4262m



4262-4268m



4268-4274m



4274-4280m



4280-4286m



4286-4292m



4292-4298m



4298-4309m



4304-4310m



4310-4316m



4316-4322m



4322-4328m



4328-4328m



4328-4334m



4334-4339m

**Palynological slides at the Norwegian Offshore Directorate**

Sample depth	Depth unit	Sample type	Laboratory
4512.0	[m]	DC	FUGRO
4542.0	[m]	DC	FUGRO
4572.0	[m]	DC	FUGRO
4602.0	[m]	DC	FUGRO
4629.0	[m]	DC	FUGRO
4659.0	[m]	DC	FUGRO
4692.0	[m]	DC	FUGRO
4719.0	[m]	DC	FUGRO
4728.0	[m]	DC	FUGRO
4797.0	[m]	DC	FUGRO

Lithostratigraphy

Top depth [mMD RKB]	Lithostrat. unit
149	NORDLAND GP
447	UTSIRA FM
865	NO FORMAL NAME
890	HORDALAND GP
890	SKADE FM
969	NO FORMAL NAME
1224	NO FORMAL NAME
1249	NO FORMAL NAME
1320	GRID FM
1520	NO FORMAL NAME
1827	FRIGG FM
1881	ROGALAND GP
1881	BALDER FM
1900	SELE FM
1922	HEIMDAL FM
2083	LISTA FM
2320	VÅLE FM
2348	SHETLAND GP
2348	EKOFISK FM
2373	JORSALFARE FM
2678	KYRRE FM
3632	TRYGGVASON FM
3743	BLODØKS FM



3777	SVARTE FM
3807	VIKING GP
3807	DRAUPNE FM
3915	HEATHER FM
4205	BRENT GP
4205	TARBERT FM
4221	NESS FM
4458	ETIVE FM
4474	RANNOCH FM
4489	BROOM FM
4500	DUNLIN GP
4500	DRAKE FM
4546	COOK FM
4607	BURTON FM
4645	AMUNDSEN FM
4729	STATFJORD GP
4786	HEGRE GP
4786	LUNDE FM

Composite logs

Document name	Document format	Document size [MB]
375	pdf	0.76

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

Document name	Document format	Document size [MB]
375_01_WDSS_General_Information	pdf	0.21
375_02_WDSS_completion_log	pdf	0.30

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

Document name	Document format	Document size [MB]
375_29_6_1_COMPLETION_REPORT_DRILLING	pdf	12.90
375_29_6_1_CUTTINGS_SAMPLE_BOOK_1	PDF	4.05





375 29 6 1 DRILLING PROGRAMME	PDF	3.01
375 29 6 1 DRILLING PROPOSAL	PDF	3.45
375 29 6 1 DRILL STEM TESTING FIELD REPORT	PDF	7.85
375 29 6 1 GEOLOGICAL COMPLETION REPORT	PDF	6.88
375 29 6 1 GLOBAL INTERPRETATION	PDF	19.48
375 29 6 1 HIGH RESOLUTION DIPMETER ARROW LISTING - RUN NO 8A	PDF	2.13
375 29 6 1 OPERATIONAL DRILL STEM TESTING PROGRAMME	PDF	1.07
375 29 6 1 PETROLEUM ENGINEERING COMPLETION REPORT	pdf	6.96
375 29 6 1 PRESSURE SURVEY REPORT RUN NO 1 DST 2	PDF	1.04
375 29 6 1 PRESSURE SURVEY REPORT TEST NO DST1 RUN NO 1	PDF	2.15
375 29 6 1 THE BIOSTRATIGRAPHY	PDF	0.80
375 29 6 1 WELL TESTING REPORT	PDF	6.20

Drill stem tests (DST)

Test number	From depth MD [m]	To depth MD [m]	Choke size [mm]
1.0	4287	4301	0.0
2.0	4256	4260	0.0
3.0	4208	4218	3.2

Test number	Final shut-in pressure [MPa]	Final flow pressure [MPa]	Bottom hole pressure [MPa]	Downhole temperature [°C]
1.0				
2.0				
3.0				

Test number	Oil [Sm ³ /day]	Gas [Sm ³ /day]	Oil density [g/cm ³]	Gas grav. rel.air	GOR [m ³ /m ³]
1.0					
2.0					
3.0	220	300000	0.808	0.705	1363





Logs

Log type	Log top depth [m]	Log bottom depth [m]
CALI	3775	4832
CBL VDL GR	3500	4338
CBL VDL GR	3570	3228
CBL VDL GR	3570	4338
CBL VDL GR	4150	4280
CYBERDIP	3775	4832
CYBERLOOK	4150	4457
DLL MSFL GR SP CAL	4100	4433
FDC CNL GR CAL	4300	4831
HDT	3775	4832
HRT CCL	10	981
HRT CCL	10	2385
ISF BHC GR CAL	4100	4413
ISF BHC GR SP	149	1190
ISF BHC GR SP	2336	3778
ISF BHC GR SP	3775	4232
ISF MSFL BHC GR SP	1182	2550
ISF MSFL BHC GR SP CAL	4350	4832
LDL CNL GR CAL	4140	4416
LDL CNL GR CAL	4300	4830
NGT	3775	4830
RFT GR	3772	4457
RFT GR	3772	4236
RFT GR	3772	4832
RFT GR	3772	4832
V5	530	4832

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	287.0	36	294.0	0.00	LOT
SURF.COND.	18 5/8	1183.0	24	1205.0	1.76	LOT
INTERM.	13 3/8	2541.0	17 1/2	2557.0	1.85	LOT
INTERM.	9 5/8	3772.0	12 1/4	3783.0	2.15	LOT
LINER	7	4375.0	8 3/8	4832.0	0.00	LOT

**Drilling mud**

Depth MD [m]	Mud weight [g/cm3]	Visc. [mPa.s]	Yield point [Pa]	Mud type	Date measured
400	1.09	85.0		waterbased	
1200	1.10	40.0		waterbased	
1570	1.26	43.0		waterbased	
2100	1.33	60.0		waterbased	
3000	1.38	46.0		waterbased	
3950	2.00	56.0		waterbased	
4460	1.97	55.0		waterbased	
4750	1.94	60.0		waterbased	

Thin sections at the Norwegian Offshore Directorate

Depth	Unit
4328.50	[m]
4323.10	[m]
4317.80	[m]
4312.70	[m]
4303.20	[m]
4299.00	[m]
4294.00	[m]
4289.20	[m]
4281.30	[m]
4275.00	[m]
4271.00	[m]
4259.20	[m]
4237.00	[m]
4231.90	[m]
4228.50	[m]
4225.00	[m]
4222.08	[m]
4219.90	[m]
4249.50	[m]
4230.00	[m]
4257.40	[m]
4220.20	[m]
42661.90	[m]



4261.90	[m]
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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]
375 Formation pressure (Formasjonstrykk)	pdf	0.22

