



Generell informasjon

Brønnbane navn	15/9-17
Type	EXPLORATION
Formål	WILDCAT
Status	P&A
Faktakart i nytt vindu	lenke til kart
Hovedområde	NORTH SEA
Felt	SLEIPNER ØST
Funn	15/9-17 Loke
Brønn navn	15/9-17
Seismisk lokalisering	610 - 168 SP 93
Utvinningstillatelse	046
Boreoperatør	Den norske stats oljeselskap a.s
Boretillatelse	356-L
Boreinnretning	WEST VANGUARD
Boredager	112
Borestart	09.12.1982
Boreslutt	30.03.1983
Frigitt dato	30.03.1985
Publiseringsdato	10.04.2015
Opprinnelig formål	WILDCAT
Gjenåpnet	NO
Innhold	GAS/CONDENSATE
Funnbrønnbane	YES
1. nivå med hydrokarboner, alder	PALEOCENE
1. nivå med hydrokarboner, formasjon.	HEIMDAL FM
2. nivå med hydrokarboner, alder	TRIASSIC
2. nivå med hydrokarboner, formasjon	SKAGERRAK FM
3. nivå med hydrokarboner, alder	MIDDLE JURASSIC
3. nivå med hydrokarboner, formasjon	VESTLAND GP
Avstand, boredekk - midlere havflate [m]	22.0
Vanndybde ved midlere havflate [m]	85.0
Totalt målt dybde (MD) [m RKB]	3120.0
Totalt vertikalt dybde (TVD) [m RKB]	3116.0
Maks inklinasjon [°]	1.5



Temperatur ved bunn av brønnbanen [°C]	108
Eldste penetrerte alder	TRIASSIC
Eldste penetrerte formasjon	SMITH BANK FM
Geodetisk datum	ED50
NS grader	58° 26' 44.19" N
ØV grader	1° 56' 53.58" E
NS UTM [m]	6478951.28
ØV UTM [m]	438602.65
UTM sone	31
NPDID for brønnbanen	60

Brønnhistorie

General

Well 15/9-17 was drilled on the Sleipner Terrace in the Viking Graben of the North Sea. The primary objectives were to test possible hydrocarbon accumulations in the Paleocene Heimdal Formation and in Jurassic/Triassic sandstones.

Operations and results

Wildcat well 15/9-17 was spudded with the semi-submersible installation West Vanguard and drilled to 3120 m in the Triassic Smith Bank Formation. A 12 1/4" pilot hole was drilled down to 519 m, but no indications of shallow gas was found. Bad weather caused some delay. Bad weather and repeated BOP problems caused some down time. The well was drilled with spud mud down to 500 m, with gypsum/polymer mud from 519 m to 2616 m, with Lignosulphonate/Drispac mud from 2616 m to 2950 m, and with Drispac from 2950 m to TD.

Both the Heimdal Formation and the Mesozoic sandstones contained gas and were tested.

The log evaluation indicated top of the hydrocarbon column in the Heimdal Formation at 2377.5 m. The logs indicated the gas/water contact at 2418.5 m, while pressure data gave a gas/water contact a bit shallower, at 2413 m. Weak and spotted shows were recorded on cored sandstones in the Heimdal Formation below the contact down to 2425 m, and from 2442 to 2450 m.

The top of the hydrocarbon column in the Mesozoic sandstones was at 2715 m (top Vestland Group). The column extended down into the Triassic. No definite gas/water contact was found but could be as deep as 2848 m. Shows were recorded on cored sandstones throughout this reservoir, getting weaker with depth.

No shows were seen outside of the hydrocarbon bearing sections in the well

Ten cores were cut. Cores 1 to 5 were cut from 2382 to 2460 m. The recovery was 100% except for core 4, which had only 46% recovery. No core-log depth shift was required for these cores. Cores 6 to 9 were cut from 2714 to 2775.4 m with 100% recovery. The core-log shift was from 1.1 m to 0.45 m. Core 10 was cut from 2810 to 2828.9 m with 100% recovery. The core-log shift was 1.0 m. wire line logs were run in the well. RFT fluid samples were taken at 2308.3 m (mud filtrate), 2729.3 m (gas, condensate and mud filtrate), 2802.7 m (gas, condensate and mud filtrate), and 2844.8 m (gas, condensate and mud filtrate).



The well was suspended on 30 March 1983 as a gas and condensate discovery.

Testing

Three Drill Stem Tests were conducted.

DST 1 tested the interval 2802 to 2814.5 m. It produced 590000 Sm³ gas and 210 Sm³ condensate /day through a 19.05" choke. The GOR was 2800 Sm³/Sm³. Traces of sand and water were produced. Dräger measurements indicated 0.5 - 1.0% of CO₂ and no H₂S. The downhole temperature was 100 °C.

DST 2 tested the interval 2726.5 to 2741.5 m. It produced 570000 Sm³ gas and 205 Sm³ condensate /day through a 19.05" choke. The GOR was 2780 Sm³/Sm³. An average BSW of 0.5% was produced throughout the test. Dräger measurements indicated 0.5% of CO₂ and no H₂S. The downhole temperature was 97.8 °C.

DST 3 tested the interval 2381.5 to 2414 m. It produced 525000 Sm³ gas and 280 Sm³ condensate /day through a 19.05" choke. The GOR was 1875 Sm³/Sm³. Between 0.4 - 0.9% BSW was measured during the final flow. No. CO₂ and H₂S was measured. The downhole temperature was 90 °C.

Borekaks i Sokkeldirektoratet

Borekaksprøve, topp dybde [m]	Borekaksprøve, bunn dybde [m]
170.00	3119.00

Borekaks tilgjengelig for prøvetaking?	YES
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Borekjerter i Sokkeldirektoratet

Kjerneprøve nummer	Kjerneprøve - topp dybde	Kjerneprøve - bunn dybde	Kjerneprøve dybde - enhet
1	2382.0	2392.0	[m]
2	2392.0	2407.5	[m]
3	2407.5	2425.0	[m]
4	2425.3	2441.1	[m]
5	2442.0	2451.3	[m]
6	2714.0	2723.1	[m]
7	2723.2	2741.2	[m]
8	2741.2	2757.5	[m]
9	2757.5	2775.4	[m]
10	2810.0	2828.9	[m]

Total kjerneprøve lengde [m]	148.3
Kjerter tilgjengelig for prøvetaking?	YES



Kjernebilder



2382-2387m



2387-2392m



2392-2399m



2399-2406m



2406-2407m



2407-2414m



2414-2421m



2421-2425m



2425-2432m



2432-2439m



2439-2441m



2442-2449m



2449-2450m



2714-2721m



2721-2723m



2723-2730m



2730-2737m



2737-2741m



2741-2748m



2748-2755m



2755-2757m



2757-2764m



2764-2771m



2771-2775m



2810-2817m



2817-2824m



2824-2828m

Palynologiske preparater i Søkeldirektoratet

Prøve dybde	Dybde enhet	Prøve type	Laboratorie
2609.0	[m]	SWC	RRI

Oljeprøver i Søkeldirektoratet

Test type	Flaske nummer	Topp dyp MD [m]	Bunn dyp MD [m]	Væske type	Test tidspunkt	Prøver tilgjengelig
DST	TEST1	2803.00	2813.00		13.08.1983 - 00:00	YES
DST	TEST2	2776.00	2741.00		18.03.1983 - 00:00	YES
DST	TEST3	2385.00	2405.00	WATER	24.03.1983 - 02:30	YES

Litostratigrafi

Topp Dyb [mMD RKB]	Litostrat. enhet
107	NORDLAND GP
832	UTSIRA FM
1210	HORDALAND GP
2203	ROGALAND GP
2203	BALDER FM
2253	SELE FM
2304	LISTA FM
2378	HEIMDAL FM
2486	SHETLAND GP
2486	EKOFISK FM
2491	TOR FM
2612	HOD FM



2679	BLØDØKS FM
2704	CROMER KNOLL GP
2704	RØDBY FM
2712	VIKING GP
2712	DRAUPNE FM
2715	VESTLAND GP
2741	SKAGERRAK FM
2847	SMITH BANK FM

Dokumenter - eldre Sokkeldirektoratets WDSS rapporter og andre relaterte dokumenter

Dokument navn	Dokument format	Dokument størrelse [KB]
60_01_WDSS_General_Information	pdf	0.18
60_02_WDSS_completion_log	pdf	0.28

Dokumenter - rapportert av utvinningstillatelsen (frigitt ihht til regelverk)

Dokument navn	Dokument format	Dokument størrelse [KB]
60_15_9_17_Completion_report_and_log	pdf	24.07

Borestrengtester (DST)

Test nummer	Fra dybde MD [m]	Til dybde MD [m]	Reduksjonsven til størrelse [mm]
1.0	2802	2814	19.0
2.0	2726	2741	19.0
3.0	2381	2414	19.0

Test nummer	Endelig avstengningstrykk [MPa]	Endelig strømningstrykk [MPa]	Bunnhullstrykk [MPa]	Borehullstemperatur [°C]
1.0				
2.0				
3.0				





Test nummer	Olje produksjon [Sm3/dag]	Gass produksjon [Sm3/dag]	Oljetetthet [g/cm3]	Gasstyngde rel. luft	GOR [m3/m3]
1.0	210	590000			2800
2.0	205	570000			2780
3.0	280	525000			1875

Logger

Type logg	Topp dyp for logg [m]	Bunn dyp for logg [m]
CST GR	2190	3109
DLL MSFL GR	2330	2910
HDT	1121	3120
ISF BHC GR MSFL	168	3118
LDT CNL GR	500	3119
NGS	1121	3108
RFT	2379	2477
VELOCITY	210	3110

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	169.0	36	169.0	0.00	LOT
SURF.COND.	20	500.0	26	519.0	1.41	LOT
INTERM.	13 3/8	1120.0	17 1/2	1130.0	1.83	LOT
INTERM.	9 5/8	2601.0	12 1/4	2616.0	1.75	LOT
LINER	7	2948.0	8 1/2	2950.0	1.80	LOT
OPEN HOLE		3120.0	6	3120.0	0.00	LOT

Boreslam

Dybde MD [m]	Egenvekt, slam [g/cm3]	Viskositet, slam [mPa.s]	Flytegrense [Pa]	Type slam	Dato, måling
210	1.05			waterbased	
725	1.11			waterbased	
1535	1.13			waterbased	
2250	1.20			waterbased	
2665	1.35			waterbased	



3010	1.25			waterbased	
3120	1.25			waterbased	

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]
60_Formalion_pressure_(Formasjonstrykk)	pdf	0.22

