



Generell informasjon

Brønnbane navn	31/3-1
Type	EXPLORATION
Formål	APPRAISAL
Status	P&A
Faktakart i nytt vindu	lenke til kart
Hovedområde	NORTH SEA
Felt	TROLL
Funn	31/6-1 (Troll Øst)
Brønn navn	31/3-1
Seismisk lokalisering	ST 8116 - 138 SP 481
Utvinningstillatelse	085
Boreoperatør	Den norske stats oljeselskap a.s
Boretillatelse	379-L
Boreinnretning	DEEPSEA BERGEN
Boredager	88
Borestart	17.07.1983
Boreslutt	13.10.1983
Frigitt dato	13.10.1985
Publiseringsdato	15.02.2006
Opprinnelig formål	WILDCAT
Gjenåpnet	NO
Innhold	GAS
Funnbrønnbane	NO
1. nivå med hydrokarboner, alder	LATE JURASSIC
1. nivå med hydrokarboner, formasjon.	SOGNEFJORD FM
2. nivå med hydrokarboner, alder	MIDDLE JURASSIC
2. nivå med hydrokarboner, formasjon	FENSFJORD FM
Avstand, boredekk - midlere havflate [m]	23.0
Vanndybde ved midlere havflate [m]	334.0
Totalt målt dybde (MD) [m RKB]	2374.0
Totalt vertikalt dybde (TVD) [m RKB]	2374.0
Maks inklinasjon [°]	2.15
Temperatur ved bunn av brønnbanen [°C]	73
Eldste penetrerte alder	TRIASSIC



Eldste penetrerte formasjon	HEGRE GP
Geodetisk datum	ED50
NS grader	60° 46' 47.86" N
ØV grader	3° 44' 3.4" E
NS UTM [m]	6738661.73
ØV UTM [m]	539989.88
UTM sone	31
NPDID for brønnbanen	20

Brønnhistorie

General

The wildcat 31/3-1 was drilled ca 17 km NNE of well 13/6-1 in the Troll East area. The two wells were drilled at the same time and together they established the existence of a Troll East gas field. The objective of 31/3-1 was to test possible gas and oil accumulations in sandstones of Late to Middle Jurassic age. Secondary objective was to test possible hydrocarbon accumulations in Middle to Early Jurassic and Late Triassic.

Operations and results

Wildcat well 31/3-1 was spudded with the semi-submersible installation Deepsea Bergen on 17 July 1983 and drilled to TD at 2374 m in the Triassic Hegre Group. No significant problems occurred during drilling except some technical problems when running the BOP for the 26" section. The well was drilled with spud mud down to 865 m, with KCl/polymer from 865 m to 1300 m, with gel/lignosulphonate from 1300 m to 1833 m, and with lignite/lignosulphonate from 1833 m to TD.

Top reservoir (Sognefjord Formation) was encountered at 1351.5 m. The Sognefjord, Heather, and Fensfjord Formations were found to hold a gas column of ca 220 m gas down to an approximate 4 m oil column. The OWC was at ca 1576m. Geochemical analyses of the reservoir gas show clear signs of biodegradation. Neither the Early Jurassic nor the Late Triassic contained hydrocarbons.

Twelve cores were cut continuously from 1351 m to 1610 m in the Late and Middle Jurassic reservoir sequences. FMT fluid samples were taken at 1374.2 m, 1570 m, 1574.2 m, and 1579.2 m.

The well was permanently abandoned on 13 October 1983 as a gas appraisal well.

Testing

Two DST's were performed, and gas was produced from both. DST 1 was performed from the interval 1519 m to 1529 m and produced 842400 Sm³ gas /day on a 22 mm choke. The gas had a gravity of 0.635 (air = 1). DST2 was performed from the interval 1373 m to 1383 m and produced 733500 Sm³ gas /day on a 19 mm choke. The gas had a gravity of 0.635 (air = 1). Turbulence was a problem during the tests. Although stable static bottom hole temperatures were not obtained the data indicated a reservoir temperature of 54.8 deg C at 1353 m. With a seafloor temperature of 4 deg C this correspond to a linear temperature gradient of 51 deg C/km from top reservoir to the sea floor.



Borekaks i Sokkeldirektoratet

Borekaksprøve, topp dybde [m]	Borekaksprøve, bunn dybde [m]
430.00	2374.00

Borekaks tilgjengelig for prøvetaking?	YES
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Borekjerne i Sokkeldirektoratet

Kjerneprøve nummer	Kjerneprøve - topp dybde	Kjerneprøve - bunn dybde	Kjerneprøve dybde - enhet
1	1351.0	1362.3	[m]
2	1366.0	1371.5	[m]
3	1372.0	1390.7	[m]
4	1391.0	1405.2	[m]
5	1407.0	1424.0	[m]
6	1424.3	1442.3	[m]
7	1442.6	1461.3	[m]
8	1461.0	1480.0	[m]
9	1480.0	1498.0	[m]
10	1498.1	1516.8	[m]
11	1516.0	1535.4	[m]
12	1535.4	1553.6	[m]
13	1553.9	1572.6	[m]
14	1572.6	1578.6	[m]
15	1591.3	1610.0	[m]

Total kjerneprøve lengde [m]	240.0
Kjerner tilgjengelig for prøvetaking?	YES

Kjernebilder



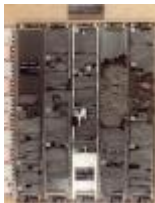
1351-1356m



1356-1361m



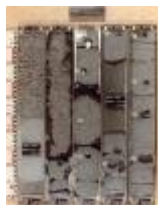
1361-1362m



1366-1371m



1371-1372m



1372-1377m



1377-1382m



1382-1387m



1387-1390m



1391-1396m



1396-1401m



1401-1405m



1406-1411m



1411-1416m



1416-1421m



1421-1424m



1424-1429m



1429-1434m



1434-1439m



1439-1442m



1442-1447m



1447-1452m



1452-1457m



1457-1461m



1461-1466m



1466-1471m



1471-1476m



1476-1480m



1480-1485m



1485-1490m



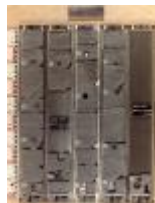
1490-1495m



1495-1498m



1498-1503m



1503-1508m



1508-1513m



1513-1516m



1516-1521m



1521-1526m



1526-1531m



1531-1535m



1535-1540m



1540-1545m



1545-1550m



1550-1553m



1553-1558m



1558-1563m



1563-1568m



1568-1572m



1572-1577m



1577-1581m



1582-1587m



1587-1590m



1591-1596m



1596-1601m



1601-1605m



1606-1610m

Palynologiske preparater i Sokkeldirektoratet

Prøve dybde	Dybde enhet	Prøve type	Laboratorie
610.0	[m]	DC	GEOCH
640.0	[m]	DC	GEOCH
670.0	[m]	DC	GEOCH



700.0 [m]	DC	GEOCH
730.0 [m]	DC	GEOCH
760.0 [m]	DC	GEOCH
790.0 [m]	DC	GEOCH
820.0 [m]	DC	GEOCH
850.0 [m]	DC	GEOCH
880.0 [m]	DC	GEOCH
909.0 [m]	DC	GEOCH
930.0 [m]	SWC	IKU
936.0 [m]	DC	GEOCH
963.0 [m]	DC	GEOCH
990.0 [m]	DC	GEOCH
1017.0 [m]	DC	GEOCH
1026.0 [m]	SWC	IKU
1038.0 [m]	SWC	IKU
1044.0 [m]	DC	GEOCH
1071.0 [m]	DC	GEOCH
1098.0 [m]	DC	GEOCH
1100.0 [m]	SWC	IKU
1125.0 [m]	DC	GEOCH
1152.0 [m]	DC	GEOCH
1157.0 [m]	SWC	IKU
1179.0 [m]	DC	GEOCH
1206.0 [m]	DC	GEOCH
1219.0 [m]	SWC	IKU
1224.0 [m]	DC	GEOCH
1229.0 [m]	SWC	IKU
1233.0 [m]	DC	GEOCH
1251.0 [m]	DC	GEOCH
1282.0 [m]	SWC	IKU
1290.0 [m]	SWC	IKU
1312.0 [m]	SWC	IKU
1317.0 [m]	SWC	IKU
1322.0 [m]	SWC	IKU
1342.0 [m]	SWC	IKU
1612.0 [m]	SWC	IKU
1780.0 [m]	SWC	IKU
1825.0 [m]	SWC	IKU
1845.0 [m]	SWC	IKU
1865.0 [m]	SWC	IKU



1900.0	[m]	SWC	IKU
1920.0	[m]	SWC	IKU
1980.0	[m]	DC	IKU
2040.0	[m]	SWC	IKU

Oljeprøver i Sokkeldirektoratet

Test type	Flaske nummer	Topp dyp MD [m]	Bunn dyp MD [m]	Væske type	Test tidspunkt	Prøver tilgjengelig
DST	TEST1	1519.00	1529.00	OIL	22.09.1983 - 14:50	YES
DST	TEST2	1373.00	1383.00		04.10.1983 - 15:30	YES

Litostratigrafi

Topp Dyb [mMD RKB]	Litostrat. enhet
357	NORDLAND GP
531	HORDALAND GP
931	ROGALAND GP
931	BALDER FM
1038	SELE FM
1136	LISTA FM
1225	VÅLE FM
1235	SHETLAND GP
1273	CROMER KNOLL GP
1273	RØDBY FM
1320	VIKING GP
1320	DRAUPNE FM
1352	SOGNEFJORD FM
1497	HEATHER FM
1516	FENSFJORD FM
1668	KROSSFJORD FM
1779	HEATHER FM
1796	BRENT GP
1844	DUNLIN GP
1844	DRAKE FM
1945	COOK FM
1992	AMUNDSEN FM



2001	JOHANSEN FM
2088	AMUNDSEN FM
2105	STATFJORD GP
2160	HEGRE GP

Spleisede logger

Dokument navn	Dokument format	Dokument størrelse [KB]
20	pdf	0.50

Geokjemisk informasjon

Dokument navn	Dokument format	Dokument størrelse [KB]
20_1	pdf	5.74
20_2	pdf	0.29
20_3	pdf	1.74
20_4	pdf	0.22
20_5	pdf	3.56
20_6	pdf	0.36

Dokumenter - eldre Søkeldirektoratets WDSS rapporter og andre relaterte dokumenter

Dokument navn	Dokument format	Dokument størrelse [KB]
20_01_WDSS_General_Information	pdf	0.19
20_02_WDSS_completion_log	pdf	0.25

Dokumenter - rapportert av utvinningstillatelsen (frigitt ihht til regelverk)

Dokument navn	Dokument format	Dokument størrelse [KB]
20_01_31_3_1_Completion_Report_and_Completion_log	PDF	30.93
20_02_31_3_1_Final_well_report_by_Exlog	pdf	5.87
20_03_31_3_1_Final_well_report_encl_01	pdf	2.89
20_04_31_3_1_Final_well_report_encl_02	pdf	0.64
20_05_31_3_1_Final_well_report_encl_03	pdf	0.45





20 06 31 3 1 Final well report encl 04	pdf	0.35
20 31 3 1 Biostratigrafisk analyse	pdf	7.92
20 31 3 1 Biostratigraphy by IKU	pdf	7.34
20 31 3 1 Clay contrib to obs.prod.loss	pdf	4.45
20 31 3 1 Comp.of reserv Fluids DST1,2	pdf	0.44
20 31 3 1 Completion fluids by Statoil	pdf	0.78
20 31 3 1 Core gamma surface log	pdf	0.35
20 31 3 1 DST 1-2 pre-post gravel pack by Otis	pdf	12.58
20 31 3 1 Formation res.factor analysis	pdf	0.30
20 31 3 1 Geochem.analyse TOC	pdf	0.21
20 31 3 1 Geochem.correlation of HC	pdf	1.83
20 31 3 1 Geochemistry source rock Evaluation	pdf	3.80
20 31 3 1 Geolog.progn and drilling progr	pdf	2.09
20 31 3 1 Geolog.progn and drilling progr encl 01	pdf	0.90
20 31 3 1 Geolog.progn and drilling progr encl 02	pdf	0.16
20 31 3 1 Grain size distr.analysi	pdf	3.15
20 31 3 1 Gravel Pack Operations	pdf	1.27
20 31 3 1 Gravel Pack Operations encl 01	pdf	0.16
20 31 3 1 Gravel Pack Operations encl 02	pdf	0.14
20 31 3 1 High Acc.press.temp.meas	pdf	4.47
20 31 3 1 High Acc.press.temp.meas	pdf	5.56
20 31 3 1 High acc.press.temp.meas encl 01	pdf	0.17
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Faktasider

Brønnbane / Leting

Utskriftstidspunkt: 12.5.2024 - 11:15

20 31 3 1 High Acc.press.temp e encl 03	pdf	0.03
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20 31 3 1 High Acc.press.temp e Flopetrol	pdf	4.52
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20 31 3 1 Mud and Res.gas Geochemistry	pdf	0.37
20 31 3 1 Multivariat behandling by Rogforsk	pdf	0.61
20 31 3 1 Overlagringstrykk	pdf	1.09
20 31 3 1 Palynofacies and stratigraphy	pdf	40.84
20 31 3 1 Petrophysical evaluation	pdf	1.42
20 31 3 1 Petrophysical evaluation encl 01	pdf	0.41
20 31 3 1 Petrophysical evaluation encl 02	pdf	2.21
20 31 3 1 Point counting test	pdf	0.13
20 31 3 1 Press.survey rep.test1 run1	pdf	1.27
20 31 3 1 Press.survey rep.test1 run2	pdf	2.18
20 31 3 1 Press.survey rep.test2 run1	pdf	0.92
20 31 3 1 Press.survey rep.test2 run3	pdf	1.87
20 31 3 1 Press.survey rep.test2 run4	pdf	1.25
20 31 3 1 Routine core analysis	pdf	4.46
20 31 3 1 Special core analysis	pdf	9.10
20 31 3 1 Special core analysis by Robert son	pdf	2.28
20 31 3 1 Special core analysis rev report by Geco	pdf	6.00
20 31 3 1 TBP distillation of stock tank	pdf	0.67
20 31 3 1 Tritiated water in the mud	pdf	0.55
20 31 3 1 Troll single well Geochemical study	pdf	0.21
20 31 3 1 Use of tritiated water	pdf	2.63
20 31 3 1 Weesite Gas Analysis	pdf	0.46
20 31 3 1 Well test report FMT no.1,2	pdf	5.40
20 31 3 1 Und av GravelPack vaesker	pdf	1.27

Borestrengtester (DST)





Test nummer	Fra dybde MD [m]	Til dybde MD [m]	Reduksjonsven til størrelse [mm]
1.0	1519	1529	16.9
2.0	1373	1383	12.7

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		355000			
2.0		479000			

Logger

Type logg	Topp dyp for logg [m]	Bunn dyp for logg [m]
4ARM DIP/STRATDIP	1288	2374
ACBL	355	1285
ACBL	1000	1814
CDL CNL GR CAL	1285	2372
CDL GR CAL	845	1299
DIFL BHC AC	350	866
DIFL BHC AC GR SP CAL	845	2374
DLL MLL GR	1285	1835
FMT	1352	1695
PROLOG	1340	1650
VELOCITY	1110	2375

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	421.0	36	422.0	0.00	LOT
SURF.COND.	20	849.0	26	865.0	1.55	LOT



INTERM.	13 3/8	1285.5	17 1/2	1300.0	1.66	LOT
INTERM.	9 5/8	1815.5	12 1/4	1835.0	1.65	LOT
OPEN HOLE		2374.0	8 1/2	2374.0	0.00	LOT

Boreslam

Dybde MD [m]	Egenvekt, slam [g/cm3]	Viskositet, slam [mPa.s]	Flytegrense [Pa]	Type slam	Dato, måling
450	1.07	51.0		seawater	
1000	1.08	53.0		seawater	
1260	1.28	22.0		seawater	
1775	1.30	60.0		seawater	
1950	1.12	53.0		seawater	

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]
20 Formation pressure (Formasjonstrykk)	pdf	0.20

