

**General information**

Wellbore name	31/2-10
Type	EXPLORATION
Purpose	APPRAISAL
Status	P&A
Factmaps in new window	link to map
Main area	NORTH SEA
Field	TROLL
Discovery	31/2-1 (Troll Vest)
Well name	31/2-10
Seismic location	79-410 SP 668 AND 8007-328 SP 612
Production licence	054
Drilling operator	A/S Norske Shell
Drill permit	346-L
Drilling facility	BORGNY DOLPHIN
Drilling days	30
Entered date	02.10.1982
Completed date	31.10.1982
Release date	31.10.1984
Publication date	19.12.2007
Purpose - planned	APPRAISAL
Reentry	NO
Content	DRY
Discovery wellbore	NO
Kelly bushing elevation [m]	25.0
Water depth [m]	331.0
Total depth (MD) [m RKB]	1833.0
Final vertical depth (TVD) [m RKB]	1833.0
Maximum inclination [°]	3.25
Bottom hole temperature [°C]	51
Oldest penetrated age	MIDDLE JURASSIC
Oldest penetrated formation	FENSFJORD FM
Geodetic datum	ED50
NS degrees	60° 47' 38.94" N
EW degrees	3° 29' 39.46" E
NS UTM [m]	6740119.84
EW UTM [m]	526908.33
UTM zone	31
NPDID wellbore	90



Wellbore history

General

Well 31/2-10 was drilled as an appraisal well in the Troll West oil province in the Northern North Sea. The main objectives were to define the top and intra reservoir markers in this area of the Troll West, establish the extent of the 27.5 m oil column in the area in which the GOC is at 1541 m sub-sea (1567 m RKB), and to determine the reserves potential in the structurally low area east-north of well 31/2-5 and south east of 31/2-7.

Operations and results

The site survey revealed, typical for the area, numerous pockmarks. These had a fairly random distribution of 15 to 20 per km². Although the size of individual pockmarks varied, average sizes were between 30 and 40 m wide at the rim, and 3 to 4 m deep at the centre. At the location itself no pockmark was seen.

Well 31/2-10 was spudded with the semi-submersible installation Borgny Dolphin on 2 October 1982 and drilled to TD at 1833 m, 40 m into in the Early Jurassic Fensfjord Formation. After drilling the 36" section, a 14 3/4" pilot hole was drilled to 810 m. The hole was then logged without indication of shallow gas before opening up to 26". One and a half days were lost during coring due to bad weather. The well was drilled with spud mud down to 472 m, with gel/seawater from 472 m to 810 m, with KCl/polymer mud from 810 m to 1530 m, and with seawater/Drispac from 130 m to TD.

Top Jurassic was encountered with a 35 m thick Draupne shale. The Sognefjord Formation sands were encountered at 1600 m, below the prognosed OWC. The Heather Formation came in at 1733 m, and the Fensfjord Formation at 1793 m. From top Sognefjord Formation to 1647 m bleeding oil and oil stained grains were noted on the cores. However the petrophysical interpretation concluded the sands to be water bearing.

Ten cores were taken in the interval 1575 m to 1741.5 m and 127.98 m (77%) was recovered. All cores were taken in fibreglass sleeves to achieve better recovery in the loose sands. One RFT run was made between 1601.5 and 1817.5 m and confirmed a water gradient. No wire line fluid samples were taken.

The well was permanently abandoned on 31 October as a dry well.

Testing

No drill stem test was performed.

Cuttings at the Norwegian Offshore Directorate

Cutting sample, top depth [m]	Cutting samples, bottom depth [m]
510.00	1831.00

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	1575.3	1580.2	[m]
2	1585.0	1592.5	[m]
3	1599.0	1617.0	[m]
4	1617.5	1634.4	[m]
5	1637.0	1655.3	[m]
6	1655.5	1674.0	[m]
7	1674.0	1686.4	[m]
8	1692.0	1704.4	[m]
9	1704.5	1723.0	[m]
10	1723.0	1741.5	[m]

Total core sample length [m]	145.7
Cores available for sampling?	YES

Core photos



1575-1580m



1580-1581m



1585-1590m



1590-1592m



1599-1604m



1604-1609m



1609-1615m



1615-1617m



1617-1622m



1622-1628m



1628-1633m



1633-1634m



1637-1642m



1642-1647m



1647-1653m



1653-1655m



1655-1660m



1660-1666m



1666-1671m



1671-1674m



1674-1679m



1679-1684m



1684-1687m



1692-1697m



1697-1703m



1703-1704m



1704-1709m



1709-1715m



1715-1720m



1720-1722m



1723-1728m



1728-1733m



1733-1739m



1739-1741m

Palynological slides at the Norwegian Offshore Directorate

Sample depth	Depth unit	Sample type	Laboratory
1565.0	[m]	SWC	SHELL
1569.0	[m]	SWC	SHELL
1571.6	[m]	SWC	SHELL
1576.7	[m]	C	SHELL
1585.0	[m]	C	SHELL
1591.0	[m]	C	SHELL
1591.4	[m]	C	SHELL
1601.5	[m]	SWC	SHELL
1608.0	[m]	C	SHELL



1610.7	[m]	C	SHELL
1611.9	[m]	C	SHELL
1613.4	[m]	C	SHELL
1617.5	[m]	C	SHELL
1630.8	[m]	C	SHELL
1632.6	[m]	C	SHELL
1640.7	[m]	C	SHELL
1646.2	[m]	C	SHELL
1648.9	[m]	C	SHELL
1655.3	[m]	C	SHELL
1659.0	[m]	C	SHELL
1684.6	[m]	C	SHELL
1693.8	[m]	C	SHELL
1694.7	[m]	C	SHELL
1697.2	[m]	C	SHELL
1702.0	[m]	C	SHELL
1704.3	[m]	C	SHELL
1724.8	[m]	C	SHELL
1732.7	[m]	C	SHELL
1741.5	[m]	C	SHELL
1746.0	[m]	SWC	SHELL
1755.8	[m]	SWC	SHELL
1762.0	[m]	SWC	SHELL
1769.4	[m]	SWC	SHELL
1775.0	[m]	SWC	SHELL
1782.0	[m]	SWC	SHELL
1786.4	[m]	SWC	SHELL
1792.7	[m]	SWC	SHELL
1795.5	[m]	SWC	SHELL
1803.5	[m]	SWC	SHELL
1808.2	[m]	SWC	SHELL
1820.3	[m]	SWC	SHELL

Lithostratigraphy

Top depth [mMD RKB]	Lithostrat. unit
356	NORDLAND GP
739	HORDALAND GP
1279	ROGALAND GP



1279	BALDER FM
1363	SELE FM
1388	LISTA FM
1535	SHETLAND GP
1535	EKOFISK FM
1539	HARDRÅDE FM
1555	CROMER KNOLL GP
1565	VIKING GP
1565	DRAUPNE FM
1600	SOGNEFJORD FM
1733	HEATHER FM
1793	FENSFJORD FM

Geochemical information

Document name	Document format	Document size [MB]
90_1	pdf	0.39
90_2	pdf	0.50
90_3	pdf	0.34

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

Document name	Document format	Document size [MB]
90_01_WDSS_General_Information	pdf	0.17
90_02_WDSS_completion_log	pdf	0.12

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

Document name	Document format	Document size [MB]
90_01_31_2_10_Completion_Report_and_Completion_log	PDF	7.82
90_02_31_2_10_Biostratigraphy_appraisal	pdf	0.09
90_02_31_2_10_Biostratigraphy_appraisal_encl_1	pdf	1.26
90_02_31_2_10_Drilling_programme	pdf	1.23
90_02_31_2_10_Drilling_programme_encl_1	pdf	0.25





90 02 31 2 10 Geochemical investig of 3 core samples	pdf	0.37
90 02 31 2 10 Production test programme	pdf	1.39
90 02 31 2 10 Routine core analysis	pdf	2.40
90 02 31 2 10 Sedimentologi av kjerne	pdf	16.19
90 02 31 2 10 Source rock analysis	pdf	0.34
90 02 31 2 10 Source rock analysis encl 1	pdf	0.04
90 02 31 2 10 Well summary	pdf	1.02

Logs

Log type	Log top depth [m]	Log bottom depth [m]
CBL VDL	500	1515
CST	794	1520
CST	1520	1820
DLL MSFL GR CAL	1515	1824
HDT	1515	1833
ISF BHC GR	350	810
ISF BHC GR	794	1526
ISF BHC GR	1515	1831
LDT CNL GR	794	1528
LDT CNL GR CAL	455	811
LDT CNL NGT CAL	1515	1833
RFT	0	0
WST	550	1820

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	454.0	36	472.0	0.00	LOT
SURF.COND.	20	793.0	26	810.0	1.51	LOT
INTERM.	13 3/8	1514.0	17 1/2	1530.0	1.59	LOT
OPEN HOLE		1575.0	12 1/4	1575.0	0.00	LOT
OPEN HOLE		1833.0	8 1/2	1833.0	0.00	LOT

Drilling mud





Depth MD [m]	Mud weight [g/cm3]	Visc. [mPa.s]	Yield point [Pa]	Mud type	Date measured
490	1.05			waterbased	
790	1.07			waterbased	
900	1.18			waterbased	
1250	1.30			waterbased	
1350	1.35			waterbased	
1500	1.35			waterbased	
1833	1.18			waterbased	

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]
90_Formalion_pressure_(Formasjonstrykk)	pdf	0.19

