General information

Wellbore name	31/5-2 R
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	31/5-2
Seismic location	ST 8007 - 132 SP 884
Production licence	085
Drilling operator	Saga Petroleum ASA
Drill permit	391-L2
Drilling facility	TREASURE SAGA
Drilling days	79
Entered date	13.06.1984
Completed date	30.08.1984
Plugged and abondon date	30.08.1984
Release date	30.08.1986
Publication date	18.12.2008
Purpose - planned	APPRAISAL
Reentry	YES
Reentry activity	TESTING
Content	OIL/GAS
Discovery wellbore	NO
1st level with HC, age	LATE JURASSIC
1st level with HC, formation	SOGNEFJORD FM
Kelly bushing elevation [m]	26.0
Water depth [m]	316.0
Total depth (MD) [m RKB]	2500.0
Final vertical depth (TVD) [m RKB]	2500.0
Maximum inclination [°]	2
Bottom hole temperature [°C]	87
Oldest penetrated age	TRIASSIC
Oldest penetrated formation	HEGRE GP
Geodetic datum	ED50
NS degrees	60° 43' 33.29'' N
EW degrees	3° 32' 52.74'' E

NS UTM [m]	6732542.72
EW UTM [m]	529894.43
UTM zone	31
NPDID wellbore	499

Wellbore history

General

Well 31/5-2 R is a re-entry of well 31/5-2. The overall purpose of these wells was to test the reservoir quality, the oil/gas columns, and the hydrocarbon/water contact in the area. The objective of the re-entry was to undertake drill stem testing of the reservoir.

Operations and results

Appraisal well 31/5-2 was re-entered (31/5-2 R) with the semi-submersible installation Treasure Saga. The rig arrived location on 10 June 1984 but due to problems with anchor handling, and on establishing 4 guidelines to well head before running BOP on riser the well was not re-entered before 13 June. After the bridge plug was retrieved at 642 m the hole was circulated with seawater and finally displaced with CaCl brine. Due to the complexity of the tests, equipment failures and an unplanned third test, the duration of the testing period was 67 days, 42 days longer than prognosed.

After testing the well was permanently abandoned on 30 August 1984 as an oil and gas appraisal.

Testing

Three drill stem tests were performed.

DST 1 tested the interval 1577 - 1581 m and produced maximum 1000 m3 oil + water /day trough a 25.4 mm choke. The GOR was 53 Sm3 /Sm3 at 10.3 bar and 60 deg C throughout the test. The corresponding WHP was 22 bar with a nitrogen injection rate of 11.5 m/min. The water production started in the beginning and increased continuously through the test. The final water cut was 62%. The oil density was 0.896 g/cm3 and the gas gravity (air = 1) was 0.66.

DST 2 tested the interval 1574 - 1576 m and produced maximum 1290 m3 oil + water/day through 44.5 + 23.8 mm choke. The GOR was 53 Sm3 /Sm3 with separator conditions of 3.8 bar and 29degC. The corresponding WHP was 15 bar. The water production started after 50 hours of flow and the water cut increased to 34%. The oil density was 0.89 g/cm3 and the gas gravity (air = 1) was 0.66.

DST 3 tested the interval 1546.5 - 1554.5 m produced 1200000 Sm3 of gas / day trough a 44.5 mm choke. The gas/condensate ratio was 41700 Sm3/Sm3 at separator conditions of 32 bar and 12 deg C. The corresponding WHP was 70 bars. The liquid (condensate) density was 0.78 g/cm3 and the gas gravity (air = 1) was 0.61.

The maximum temperatures recorded during the tests were 68.3 deg C in DST 1, 73.8 deg C in DST 2, and 68.3 deg C in DST3. The reported reservoir pressure was 157.6 bar at 1575 m in the oil zone and 157.9 bars at 1550.5 m in the gas zone.

Oil samples at the Norwegian Offshore Directorate

Test type	Bottle number	Top depth MD [m]	Bottom depth MD [m]	Fluid type	Test time	Samples available
DST		1577.00	1581.00	OIL	01.07.1984 - 00:00	YES
DST	DST2	1574.00	1576.00	OIL	09.08.1984 - 20:00	YES
DST	DST2,1	1576.00	1574.00	OIL	02.08.1984 - 19:00	YES
DST	DST3	1546.50	1554.00		24.08.1984 - 00:00	YES
DST	DST3B	1554.50	1546.50	CONDENSATE	25.08.1984 - 00:00	YES

Lithostratigraphy

Top depth [mMD RKB]	Lithostrat. unit
342	NORDLAND GP
670	HORDALAND GP
1210	ROGALAND GP
1210	BALDER FM
1286	SELE FM
1382	LISTA FM
1432	SHETLAND GP
1432	HARDRÅDE FM
1441	UNDIFFERENTIATED
1450	CROMER KNOLL GP
1450	RØDBY FM
1465	ÅSGARD FM
1475	VIKING GP
1475	DRAUPNE FM
1516	INTRA DRAUPNE FM SS
1521	SOGNEFJORD FM
1642	HEATHER FM
1674	FENSFJORD FM
1826	KROSSFJORD FM
1908	HEATHER FM
1957	BRENT GP
2036	DUNLIN GP
2036	DRAKE FM

2176	COOK FM
2194	AMUNDSEN FM
2225	JOHANSEN FM
2323	AMUNDSEN FM
2336	STATFJORD GP
2393	HEGRE GP

Geochemical information

Document name	Document format	Document size [MB]
499_1	pdf	0.58
499_2	pdf	0.24
499_3	pdf	4.00

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

Document name	Document format	Document size [MB]
499_01_WDSS_General_Information	pdf	0.24
499_02_WDSS_completion_log	pdf	0.24

Drill stem tests (DST)

Test number	From depth MD [m]	To depth MD [m]	Choke size [mm]
1.0	1577	1581	25.4
2.0	1574	1576	44.5
3.0	1546	1554	44.5

Test number	Final shut-in pressure [MPa]	Final flow pressure [MPa]	Bottom hole pressure [MPa]	Downhole temperature [°C]
1.0	0.200		14.900	
2.0	0.140		12.700	
3.0	6.800		14.800	

Test number	Oil [Sm3/day]	Gas [Sm3/day]	Oil density [g/cm3]	Gas grav. rel.air	GOR [m3/m3]
1.0	447		0.896	0.066	53
2.0	1089		0.890	0.660	53
3.0		1240000	0.780	0.610	