General information

Wellbore name	6507/5-5
Type	EXPLORATION
Purpose	APPRAISAL
Status	P&A
Press release	link to press release
Factmaps in new window	link to map
Main area	NORWEGIAN SEA
Field	SKARV
Discovery	6507/5-1 Skarv
Well name	6507/5-5
Seismic location	bpn00ml Pl 212 xline1765-inline1203
Production licence	212
Drilling operator	BP Amoco Norge AS
Drill permit	1021-L
Drilling facility	WEST ALPHA
Drilling days	79
Entered date	28.11.2001
Completed date	14.02.2002
Release date	14.02.2004
Publication date	08.03.2004
Purpose - planned	APPRAISAL
Reentry	NO
Content	OIL
Discovery wellbore	NO
1st level with HC, age	MIDDLE JURASSIC
1st level with HC, formation	GARN FM
Kelly bushing elevation [m]	18.0
Water depth [m]	375.0
Total depth (MD) [m RKB]	3948.0
Final vertical depth (TVD) [m RKB]	3948.0
Maximum inclination [°]	6.6
Bottom hole temperature [°C]	155
Oldest penetrated age	EARLY JURASSIC
Oldest penetrated formation	ÅRE FM
Geodetic datum	ED50
NS degrees	65° 42' 8.01'' N
EW degrees	7° 35' 45.36'' E
NS UTM [m]	7287623.70

EW UTM [m]	435533.04
UTM zone	32
NPDID wellbore	4428

Wellbore history

General

The Skarv structure is located in the Nordland II area west of the Nordland Ridge on the Dønna Terrace. The structure consists of three fault segments called A, B, and C. Well 6507/5-5 was drilled on the B-segment. The primary objective of the well was to appraise hydrocarbons in sandstones of the Early to Middle Jurassic Garn, Ile, and Tilje Formations. Secondary objective was to verify significant hydrocarbon columns (> 10 m continuous columns) in the Cretaceous Lange Formation.

Operations and results

Appraisal well 6507/5-5 was spudded in the second attempt with the semi-submersible installation West Alpha on 28 November 2002 and drilled to TD at 3950 m in the Early Jurassic Åre Formation. No shallow gas was encountered. While drilling, a leak in the 9 5/8" casing was discovered and repaired. The well was drilled with gel and seawater down to 1051 m, with KCl/Polymer/Glycol mud from 1051 m to 2100 m, with oil based mud (ENVIROMUL NAP) from 2100 to 3642 m, and with KCl/Polymer mud from 3642 m to TD.

Top Lysing Formation came in at 2735.6 m TVD MSL, top Lange Formation at 2739 m TVD MSL, top Garn Formation at 3629.5 m TVD MSL, top Ile Formation at 3722.5 m TVD MSL, top Tilje Formation at 3811.6 m TVD MSL, and top Åre Formation at 3905.2 m TVD MSL. A 55 m oil column with an oil-down-to contact was encountered in the Garn Formation. Amplitude anomalies showed good structural correlation between the A-, B-, and C -fault segments, but hydrocarbon phase could not be predicted. The Lysing Formation was tight with no shows. Weak and questionable shows (oil based mud) were seen in cuttings from carbonate lithologies in the Lange Formation in the form of visible and UV fluorescent residue. Such shows were observed in the intervals 2951 m to 2985 m, 3022 m to 3030 m, and 3432 m to 3469 m. Shows in the form of visible and UV fluorescent residue were observed also in sandstone cuttings from the interval 3630 m to 3663 m in the Garn Formation.

One 81 m core was cut from 3655 m to 3736 m from the Garn and into the Not Formation. The full core length was recovered, but the core was ejected at rig floor due to gas expansion and 12.2 m of the core was damaged. The damaged interval was puzzled together onshore, but the interval between 3668.25 m and 3672 m was not submitted to the NPD. Forty-five pressure points were taken. MDT fluid samples recovered oil from 3668 m and 3653 m. The samples appeared to be of good quality and without contamination. The well was permanently abandoned on 14 February 2002 as an oil appraisal.

Testing

The Garn Formation was perforated from 3651.5 m to 3706.5 m. The main flow produced oil at a rate of 5880 barrels/day (935 Sm3/day) with a 64/64" choke with a total of 5264 bbl (8364 Sm3) of oil produced in 30 hours. Gas rate was 5.8 mmscf/day (164238 Sm3 gas/day), giving a GOR of 176 Sm3/Sm3 during the main flow. Samples were taken on sample chambers on the test string and from the separator outlet and the wellhead. Mean down-hole temperature (DST temperature) was 132.9°C. Mean oil density was 0.855 g/cm3 and mean gas gravity was 0.735 (air = 1); mean CO2 content in gas was 3.5%.

Cuttings at the Norwegian Offshore Directorate

Cutting sample, top depth [m]	Cutting samples, bottom depth [m]
1060.00	3950.00

Cuttings available for sampling?	YES

Cores at the Norwegian Offshore Directorate

Core sample number	Core sample - top depth	Core sample - bottom depth	Core sample depth - uom
1	3654.7	3736.0	[m]

Total core sample length [m]	81.3
Cores available for sampling?	YES

Core photos


3654-3659m


3659-3664m


3664-3667m


3667-3672m


3672-3677m


3677-3682m


3682-3687m


3687-3692m


3692-3697m


3697-3702m


3702-3707m


3707-3712m


3712-3717m


3717-3722m


3737-3722m


3722-3727m


3727-3732m


3732-3736m

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		0.00	0.00			YES

Lithostratigraphy

Top depth [mMD RKB]	Lithostrat. unit
393	NORDLAND GP
393	NAUST FM
1394	KAI FM
1889	HORDALAND GP
1889	BRYGGE FM
2022	ROGALAND GP
2022	TARE FM
2063	TANG FM
2107	SHETLAND GP
2107	SPRINGAR FM
2181	NISE FM
2556	KVITNOS FM
2754	CROMER KNOLL GP
2754	LYSING FM
2757	LANGE FM
3327	LYR FM
3339	VIKING GP
3339	SPEKK FM
3372	MELKE FM
3648	FANGST GP

3648	GARN FM
3723	NOT FM
3742	ILE FM
3774	BÅT GP
3774	ROR FM
3831	TILJE FM
3925	ÅRE FM

Composite logs

Document name	Document format	Document size [MB]
4428	pdf	0.45

Geochemical information

Document name	Document format	Document size [MB]
4428_1	pdf	3.86

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

Document name	Document format	Document size [MB]
4428_65067_5_5_COMPOSITE_PLOT	.pdf	1.84
4428_6507_5_5_COMPLETION_REPORT	.PDF	0.49
4428_6507_5_5_DRILLING_REPORT	.PDF	12.50

Drill stem tests (DST)

Test number	From depth MD [m]	To depth MD [m]	Choke size [mm]
1.0	3561	3706	25.0

Test number	Final shut-in pressure [MPa]	Final flow pressure [MPa]	Bottom hole pressure [MPa]	Downhole temperature [°C]
1.0	7.400			133

Test number	Oil [Sm3/day]	Gas [Sm3/day]	Oil density [g/cm3]	Gas grav. rel.air	GOR [m3/m3]
1.0	940	164256	0.855	0.735	176

Logs

Log type	Log top depth [m]	Log bottom depth [m]
DSI HRLA GR EMS	3440	3946
DSI IPLT GR	2100	3644
IPLT GR	3644	3946
MDT GR	3644	3946
MDT GR	3653	3885
MWD - LWD DIR	471	1060
MWD - LWD MPR GR	1060	3950
VSI-VSP/CHK	1322	3946

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	466.0	36	471.0	0.00	LOT
INTERM.	20	1051.0	26	1060.0	1.56	LOT
INTERM.	13 3/8	2100.0	17 1/2	2106.0	1.90	LOT
LINER	9 5/8	3642.0	12 1/4	3643.0	0.00	LOT
LINER	7	3948.0	8 1/2	3948.0	0.00	LOT

Drilling mud

Depth MD [m]	Mud weight [g/cm3]	Visc. [mPa.s]	Yield point [Pa]	Mud type	Date measured
393	0.17			SPUD MUD	
471	0.17			SPUD MUD	
1060	0.14			SPUD MUD	
3643	1.25			KCL	
3643	1.25			WATER/BRINE	
3643	1.63	28.0		KCL	

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]
4428_Formation_pressure_(Formasjonstrykk)	pdf	0.29