General information

Wellbore name	2/11-1
Type	EXPLORATION
Purpose	APPRAISAL
Status	P&A
Factmaps in new window	link to map
Main area	NORTH SEA
Field	VALHALL
Discovery	2/8-6 Valhall
Well name	2/11-1
Seismic location	LINE 70 - 17.
Production licence	033
Drilling operator	Amoco Norway Oil Company
Drill permit	29-L
Drilling facility	ORION
Drilling days	82
Entered date	14.07.1969
Completed date	03.10.1969
Release date	03.10.1971
Publication date	18.01.2007
Purpose - planned	WILDCAT
Reentry	NO
Content	OIL
Discovery wellbore	NO
1st level with HC, age	LATE CRETACEOUS
1st level with HC, formation	TOR FM
Kelly bushing elevation [m]	27.0
Water depth [m]	68.0
Total depth (MD) [m RKB]	4691.0
Maximum inclination [°]	11
Bottom hole temperature [°C]	133
Oldest penetrated age	LATE JURASSIC
Oldest penetrated formation	HAUGESUND FM
Geodetic datum	ED50
NS degrees	56° 14' 16.98'' N
EW degrees	3° 27' 7.05'' E
NS UTM [m]	6232804.37
EW UTM [m]	528015.41
UTM zone	31
NPDID wellbore	168

Wellbore history

General

Exploration well 2/11-1 is located on the southern periphery of the Valhall Field in the North Sea. The objective of this early wildcat was to test all horizons down to the Rotliegendes, estimated at 14100 ft (4298 m). Top Permian was expected at 10300 ft (3139 m). Planned TD was at 15000 ft (4572 m).

The well is Reference Well for the Åsgard, Sola, and Rødby Formations.

Operations and results

Well was spudded with the semi-submersible installation on and drilled to TD at 4691 m in the Late Jurassic Tyne Group. The well started to build angle from below ca 3500 m with maximum 11 deg deviation at 4444 m. Otherwise no significant drilling problems were reported from this deep well. The well was drilled water based down to 3432 m and with an invert oil mud (Vertoil) from 3432 m to TD.

Top Paleocene, Balder Formation, was encountered at 2590 m. Top chalks of the Shetland Group (Tor Formation) was encountered at 2635 m. In addition to shows from the gas detector, free oil was seen floating on the mud pits and samples showed good fluorescence and cut through the interval 2585 m to 2633 m (Balder, Sele, and Lista Formations). Post-well geochemical analyses reported significant oil staining down to 2776 m. By testing live oil was confirmed in the uppermost Tor Formation. The tests were inconclusive with regard to an OWC, but the logs indicated that the contact was at 2655 m. Base Cretaceous was at 3555 m. The well did not reach Permian sediments; in stead the well drilled 1136 m in Late Jurassic shale (Mandal, Farsund and Haugesund Formations) before final TD was set. One conventional core was cut from 3864 to 3878 m in the Farsund formation.No wire line fluid samples were taken.

The well was permanently abandoned on 3 October 1969 as a minor discovery. After the 2/8-6 Valhall Discovery well was drilled 6 years later well 2/11-1 was re-classified to oil appraisal well for the Valhall Field.

Testing

Five drill-stem tests were conducted. DST 1 from 2632 m to 2638.3 m (Lista and topmost Tor Formations) gave some oil to the surface, but rates declined rapidly to no flow, so no viable measurements were obtained. DST 2 and 3 from 2593.8 m to 2604.5 m (Balder - Sele Formations) gave no flow to surface. DST 4 from 2628.6 - 2640.8 m plus 2645.7 - 2650.5 m (Tor Formation) gave gas and oil to the surface at rates of 12686 Sm3 gas and 146 Sm3 oil/day in the final, 4 hours and 42 min flow. The GOR was 87 Sm3/Sm3. Flow rates decreased during the test and the figures were derived from the last readings. DST 5 from 2645.7 - 2650.5 m (Tor Formation) gave no flow to the surface, but 274 m fluid was reversed out after the test and the fluid contained ca 20% oil.

Cores at the Norwegian Offshore Directorate

Core sample number	Core sample - top depth	Core sample - bottom depth	Core sample depth - uom
1	3863.6	3878.3	[m]

Total core sample length [m]	14.6

Cores available for sampling?	YES

Lithostratigraphy

Top depth [mMD RKB]	Lithostrat. unit
95	NORDLAND GP
1136	HORDALAND GP
2590	ROGALAND GP
2590	BALDER FM
2600	SELE FM
2610	LISTA FM
2635	SHETLAND GP
2635	TOR FM
2662	HOD FM
2860	BLODØKS FM
2863	HIDRA FM
2887	CROMER KNOLL GP
2887	RØDBY FM
2910	SOLA FM
2988	TUXEN FM
3063	ÅSGARD FM
3555	TYNE GP
3555	MANDAL FM
3728	FARSUND FM
4075	HAUGESUND FM

Geochemical information

Document name	Document format	Document size [MB]
168_1	pdf	1.28
168_2	pdf	1.83
168_3	pdf	0.90
168_4	pdf	0.98
168_5	pdf	0.42
168_6	pdf	0.33
168_7	pdf	0.13
168_8	pdf	4.96

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

Document name	Document format	Document size [MB]
168_01_WDSS_General_Information	pdf	0.19

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

Document name	Document format	Document size [MB]
168_01_2_11_1_Completion_Report	pdf	19.28
168_02_2_11_1_Completion_log.1	pdf	3.15
168_2_11_1_Biostratigraphic_and_wireline_log_correlation	pdf	5.52
168_2_11_1_Engineering_and_geological_data_1968	pdf	20.45
168_2_11_1_Geochemical_analysis_of_core_samples_1983	pdf	1.85
168_2_11_1_Geochemical_analyses_of_an_oil_sample_1979	pdf	0.79
168_2_11_1_Paleontological_age_and_Environmental_Determination_1971	pdf	3.38
168_2_11_1_Preliminary_results_of_biostratigraphic_and_petroleumgeochemical_studies	pdf	1.88
168_2_11_1_Preliminary_results_of_petroleum_geochemical_studies_1978	pdf	1.47
168_2_11_1_Scanning_Electron_Micropscope_study_1971	pdf	115.37
168_2_11_1_Source_Rock_Evaluation_1971	pdf	0.56
168_2_11_1_Source_Rock_Evaluation_Tertiary_Basin_1971	pdf	0.37

Documents - Norwegian Offshore Directorate papers

Document name	Document format	Document size [MB]
168_01_NPD_Paper_No.7_Lithology_Well_2_11_1	pdf	12.73
168_02_NPD_Paper_No.7_Interpreted_Lithology_log_Well_2_11_1	pdf	74.28

168_03_NPD_Paper_No.32_Late_Cretaceous-early_Tertiary_Correlation_chart_Valhall-Hod_Fields_Profile_1__Well_2_11_1	pdf	0.54
168_04_NPD_Paper_No.32_Late_Jurassic-early_Tertiary_Correlation_chart_Profile_3__Well_2_11_1	pdf	0.74
168_05_NPD_Paper_No.32_Stratigraphic_Correlation_chart_Profile_5__Well_2_11_1	pdf	0.69

Drill stem tests (DST)

Test number	From depth MD [m]	To depth MD [m]	Choke size [mm]
1.0	2633	2639	0.0
2.0	2595	2605	0.0
3.0	2629	2651	0.0
4.0	2646	2651	12.5

Test number	Final shut-in pressure [MPa]	Final flow pressure [MPa]	Bottom hole pressure [MPa]	Downhole temperature [°C]
1.0				
2.0				
3.0				
4.0				

Test number	Oil [Sm3/day]	Gas [Sm3/day]	Oil density [g/cm3]	Gas grav. rel.air	GOR [m3/m3]
1.0					
2.0					
3.0					
4.0	72				

Logs

Log type	Log top depth [m]	Log bottom depth [m]
CBL	2561	2683
CDM	2439	4692
DIL	1720	4692
EPIN	2530	2835
FDC	365	3451

GR	91	365
GR CCL	2561	2683
IES	365	1721
LL-7	2530	2835
MLL-C	2530	2835
SGR-C	365	4692
SNP	2530	2835
SNP	2530	2835
VSLOCITY	365	4692

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	131.0	36	139.0	0.00	LOT
SURF.COND.	20	365.0	26	383.0	0.00	LOT
INTERM.	13 3/8	1720.0	17 1/2	1736.0	0.00	LOT
INTERM.	9 5/8	3443.0	12 1/4	3450.0	0.00	LOT
OPEN HOLE		4693.0	8 1/2	4693.0	0.00	LOT

Drilling mud

Depth MD [m]	Mud weight [g/cm3]	Visc. [mPa.s]	Yield point [Pa]	Mud type	Date measured
382	1.11	48.0		water-based	
1280	1.31	44.0		water-based	
1735	1.60	51.0		water-based	
2004	1.65	55.0		water-based	
2914	1.67	50.0		water-based	
3374	1.62	56.0		water-based	
3700	1.79	58.0		water-based	
3876	1.55	67.0		water-based	

Thin sections at the Norwegian Offshore Directorate

Depth	Unit
12695.00	[ft]