

**General information**

Wellbore name	6608/10-7
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	URD
Discovery	6608/10-6 Svale
Well name	6608/10-7
Seismic location	ST9301:inline 2448 & crossline2344
Production licence	128
Drilling operator	Den norske stats oljeselskap a.s
Drill permit	1000-L
Drilling facility	BORGLAND DOLPHIN
Drilling days	55
Entered date	30.03.2001
Completed date	23.05.2001
Release date	23.05.2003
Publication date	07.11.2005
Purpose - planned	APPRAISAL
Reentry	NO
Content	OIL
Discovery wellbore	NO
1st level with HC, age	MIDDLE JURASSIC
1st level with HC, formation	INTRA MELKE FM SS
2nd level with HC, age	EARLY JURASSIC
2nd level with HC, formation	ÅRE FM
Kelly bushing elevation [m]	31.0
Water depth [m]	377.0
Total depth (MD) [m RKB]	2319.0
Final vertical depth (TVD) [m RKB]	2318.0
Maximum inclination [°]	3.1
Bottom hole temperature [°C]	84
Oldest penetrated age	EARLY JURASSIC
Oldest penetrated formation	ÅRE FM
Geodetic datum	ED50
NS degrees	66° 4' 41.5" N



EW degrees	8° 14' 43.28" E
NS UTM [m]	7329017.24
EW UTM [m]	465853.10
UTM zone	32
NPDID wellbore	4273

Wellbore history

**General**

The main objective of well 6608/10-7 was to test the extent of hydrocarbons in Late to Early Jurassic sandstones in the Melke- and Åre Formation, down flanks of well 6608/10-6, and if possible prove fluid contacts. Another objective, originally designated to a possible sidetrack of well 6608/10-7, was to perform an interference test in the Åre Formation towards well 6608/10-6. A sidetrack was to be drilled if analysis of formation water samples confirmed high content of

Barium. This would demand information about communication towards 6608/10-6 from a position further down flanks than the 6608/10-7 position.

Operations and results

Appraisal well 6608/10-7 was spudded with the semi-submersible installation Borgland Dolphin on 30 March 2001 and drilled to TD at 2319 m in Early Jurassic sediments of the Åre Formation. No shallow gas was observed by the ROV at the wellhead. The well was drilled with seawater and hi-vis sweeps down to 1315 m and with Aquadrill PAC/Glycol/KCL water base mud system from 1315 m to TD.

Oil shows appeared at ca 1800 m (top Cromer Knoll Group) and disappeared below 2018 m (top Båt Group). Two reservoir zones were penetrated, a Melke Formation Sandstone member and the Åre Formation. A silty/sandy Not Formation was also encountered, but it did not have the same reservoir quality as the two previously mentioned. The sandstone sequence of the Melke Formation proved to be oil bearing. The main part of the oil bearing reservoir zone was cored. Oil was observed down to top Not Formation at 2007 m. No oil-water contact was encountered. Weak hydrocarbon shows were seen in core chips from the Not Formation. The Åre Formation proved to be water filled up to its top at 2018 m. The water samples proved to have a Barium content lower than the limit set for requiring the sidetrack to be drilled. The observed formation tops were not in accordance with the prognosis. The difference between the prognosis and the observations for Tertiary and Cretaceous formation tops seem to vary a bit. Typically, the Tertiary and Cretaceous formation tops, as well as the base Cretaceous unconformity were encountered deeper than prognosed. The top of the Melke Formation sandstone sequences, the Not Formation and the Åre Formation were encountered shallower than prognosed, but within the given uncertainties.

A total of 8 cores were cut in the reservoirs from 1955 m to 2101.5 m. An MDT oil sample was taken at 1967.8 m in the Melke Formation sandstone unit, while MDT water samples were taken at 2155.5 m and 2052.2 m in the Åre Formation.

The well was permanently abandoned on 23 May 2001 as an oil appraisal well.

Testing

Pressure memory gauges had been installed in well bore 6608/10-6, in November 2000. The gauges were retrieved in August 2001. A water injection test was conducted in 6608/10-7 on 7 May 2001 and the pressure response was measured in well bore 6608/10-6 R2. Pressure response was seen within 24 hours after the injection started, proving good communication over the 1520 m between the two wells. The pressure gauges also recorded temperature, and after eight and a half months the temperature, at 1854 m, had reached 64.1 deg C. Interestingly, but not important for the test, the temperature increased steadily throughout the period. The temperature increase over the last 230 days of the period was only 0.25 deg C.

After the water injection test in Åre the Melke Formation sand was perforated from 1950 m to 1980 m for a production test. The initial pressure in Melke when initiating the test was 10 bar above the logged MDT pressure. This had to be caused by the injection test in Åre, making the results from the production test invalid.

**Cuttings at the Norwegian Offshore Directorate**

Cutting sample, top depth [m]	Cutting samples, bottom depth [m]
1320.00	2318.00

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	1955.0	1966.1	[m]
2	1973.5	1986.9	[m]
3	1987.0	1993.7	[m]
4	1993.5	1998.7	[m]
5	1998.3	2024.2	[m]
6	2024.2	2052.2	[m]
7	2052.2	2074.0	[m]
8	2074.0	2101.0	[m]

Total core sample length [m]	139.1
Cores available for sampling?	YES

Palynological slides at the Norwegian Offshore Directorate

Sample depth	Depth unit	Sample type	Laboratory
1955.3	[m]	C	WESTLB
1957.7	[m]	C	WESTLB
1961.6	[m]	C	WESTLB
1964.6	[m]	C	WESTLB
1973.7	[m]	C	WESTLB
1977.7	[m]	C	WESTLB
1982.5	[m]	C	WESTLB
1985.5	[m]	C	WESTLB
1987.4	[m]	C	WESTLB
1990.5	[m]	C	WESTLB
1992.9	[m]	C	WESTLB
1993.6	[m]	C	WESTLB
1996.7	[m]	C	WESTLB



1998.4	[m]	C	WESTLB
1998.6	[m]	C	WESTLB
2001.1	[m]	C	WESTLB
2003.7	[m]	C	WESTLB
2006.5	[m]	C	WESTLB
2009.9	[m]	C	WESTLB
2012.5	[m]	C	WESTLB
2013.5	[m]	C	WESTLB
2016.5	[m]	C	WESTLB
2017.7	[m]	C	WESTLB
2018.8	[m]	C	WESTLB
2019.7	[m]	C	WESTLB
2022.9	[m]	C	WESTLB
2024.4	[m]	C	WESTLB
2030.0	[m]	C	WESTLB
2034.7	[m]	C	WESTLB
2039.0	[m]	C	WESTLB
2042.7	[m]	C	WESTLB
2043.3	[m]	C	WESTLB
2048.7	[m]	C	WESTLB
2055.0	[m]	C	WESTLB
2057.8	[m]	C	WESTLB
2059.7	[m]	C	WESTLB
2060.5	[m]	C	WESTLB
2065.3	[m]	C	WESTLB
2069.0	[m]	C	WESTLB
2072.9	[m]	C	WESTLB
2074.3	[m]	C	WESTLB
2079.4	[m]	C	WESTLB
2083.9	[m]	C	WESTLB
2086.4	[m]	C	WESTLB
2089.5	[m]	C	WESTLB
2089.7	[m]	C	WESTLB
2095.5	[m]	C	WESTLB
2100.4	[m]	C	WESTLB

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
MDT		0.00	0.00	OIL	30.04.2001 - 02:26	YES

Lithostratigraphy

Top depth [mMD RKB]	Lithostrat. unit
408	NORDLAND GP
408	NAUST FM
1409	KAI FM
1529	HORDALAND GP
1529	BRYGGE FM
1602	ROGALAND GP
1602	TARE FM
1745	TANG FM
1763	SHETLAND GP
1763	SPRINGAR FM
1803	CROMER KNOLL GP
1803	LYR FM
1902	VIKING GP
1902	MELKE FM
1948	INTRA MELKE FM SS
2007	FANGST GP
2007	NOT FM
2018	BÅT GP
2018	ÅRE FM

Composite logs

Document name	Document format	Document size [MB]
4273	pdf	0.29

Geochemical information





Document name	Document format	Document size [MB]
4273_1	pdf	3.55

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

Document name	Document format	Document size [MB]
4273_6608_10_7_COMPLETION_LOG	.pdf	8.37
4273_6608_10_7_COMPLETION_REPORT	.PDF	2.70

Logs

Log type	Log top depth [m]	Log bottom depth [m]
CMR ECS HNGS	1790	2310
FMI DSI GR	780	2317
MDT GR	1808	1810
MDT GR	1951	2248
MDT GR	1967	1967
MDT GR	2155	2155
MWD - DGR EWD PWD	465	1315
MWD - DGR EWR PWD BAT	1319	1955
MWD - DGR EWR PWD BAT	2102	2319
MWD - DGR EWR-4 PWD	1975	2102
MWD - PWD	1276	1319
PEX HRLA	1305	2320
ZVSP	800	2310

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	468.0	36	470.0	0.00	LOT
SURF.COND.	13 3/8	1305.0	17 1/2	1310.0	1.56	LOT
LINER	7	2319.0	8 1/2	2319.0	0.00	LOT

Drilling mud





Depth MD [m]	Mud weight [g/cm3]	Visc. [mPa.s]	Yield point [Pa]	Mud type	Date measured
424	1.03			SEAWATER/BENT.	
487	1.03			SEAWATER/BENT.	
920	1.03			SEAWATER/BENT.	
1315	1.03			SEAWATER/BENT.	
1640	1.30	32.0		KCL/GLYCOL/PAC	
1955	1.26	30.0		KCL/GLYCOL/PAC	
2319	1.26	22.0		KCL/GLYCOL/PAC	

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]
4273 Formation pressure (Formasjonstrykk)	pdf	0.27

