

**General information**

Wellbore name	34/7-10
Type	EXPLORATION
Purpose	APPRAISAL
Status	P&A
Factmaps in new window	link to map
Main area	NORTH SEA
Field	SNORRE
Discovery	34/4-1 Snorre
Well name	34/7-10
Seismic location	G/E 3D 1983 LINJE 185 SP. 445
Production licence	089
Drilling operator	Saga Petroleum ASA
Drill permit	527-L
Drilling facility	TREASURE SAGA
Drilling days	65
Entered date	26.08.1986
Completed date	29.10.1986
Release date	29.10.1988
Publication date	03.12.2014
Purpose - planned	WILDCAT
Reentry	NO
Content	OIL
Discovery wellbore	NO
1st level with HC, age	EARLY JURASSIC
1st level with HC, formation	STATFJORD GP
Kelly bushing elevation [m]	26.0
Water depth [m]	300.0
Total depth (MD) [m RKB]	3000.0
Final vertical depth (TVD) [m RKB]	2999.0
Maximum inclination [°]	1.4
Bottom hole temperature [°C]	109
Oldest penetrated age	LATE TRIASSIC
Oldest penetrated formation	LUNDE FM
Geodetic datum	ED50
NS degrees	61° 25' 2.64" N
EW degrees	2° 7' 36.23" E
NS UTM [m]	6809754.99
EW UTM [m]	453388.15



UTM zone	31
NPDID wellbore	947

Wellbore history

General

Well 34/7-10 was drilled on the southern end of the Snorre Field. The primary purpose of well 34/7-10 was to prove Statfjord Group reserves in the south-east Snorre. Further objectives were to test the Statfjord Group thickness and sand distribution, to test the extent and quality of the middle Statfjord member and to establish a Statfjord Group OWC and reservoir parameters of the Statfjord Group and underlying upper Lunde Formation.

Operations and results

Appraisal well 34/7-10 was spudded with the semi-submersible installation Treasure Saga on 26 August 1986 and drilled to TD at 3000 m in the Late Triassic Lunde Formation. Drilling proceeded without significant problems. The well was drilled with spud mud down to 430 m, with gel mud from 430 m to 918 m, with gypsum/polymer mud from 918 m to 2413 m, and with KCl mud from 2413 m to TD.

Apart from the sandy Utsira Formation of Late Miocene age, a Late Oligocene (1314 - 1324 m) and a Late Eocene (1377 - 1387 m) sandstone unit within the Hordaland Group, the upper section down to Jurassic proved mainly claystones. The Jurassic consists of a silty Dunlin Group and a sandy Statfjord Formation. The Triassic consists of claystones with minor sandstones in the upper part and alternating sandstones/ claystones from 2800 m and down to TD. First traces of shows were seen at 2120 m in silty laminas of the Shetland Group. These are described as weak dark yellow fluorescence with slowly streaming light yellow cut. From 2250 m and down to top Statfjord Group oil reservoir at 2531.5 m silt and sandstone show weak to moderate dull yellow to bright yellow fluorescence and slowly streaming blue white to milky white cut. The residue is yellow to light brown in colour. Below the OWC at 2621 m shows continued down to 2635 m where both shows and cut became poorer.

The Statfjord Group was encountered at 2531.5 m with a gross thickness of 105 m. It was hydrocarbon-bearing down to the OWC at 2621 m. The average log porosity in the oil zone was 22.1%, the net/gross was 0.33 and the average water saturation was 32%. The OWC was established from pressure gradients and from well logs. However, low oil rates were obtained also in DST1 in the interval 2632.7 - 2636.7 m. It is probable that this is an isolated body of sand.

A total of 14 cores were cut and recovered during drilling of the well. The cores were cut in the interval 2522 - 2663 m. A total of 122.3 m of cores were recovered, corresponding to an average recovery of 86.7%. The core to log depth shifts varied between + 1.0 m to - 0.5 m. FMT fluid samples were taken at 2532.5 m (8.8 l oil and 2.8 l mud filtrate in 2 3/4 gallon chamber), 2601.0 m (mud filtrate and a little oil), and at 2634.5 m (mud filtrate with trace oil)

The well was permanently abandoned on 29 October 1986 as an oil appraisal well.

Testing

Four drill stem tests were performed.

DST 1 tested the interval 2632.7 - 2636.7 m, 20 m below the observed OWC as seen from well logs and pressure data. It produced 2.7 to 5.4 Sm³ oil/day through a 6.4 mm



choke in the main flow period. The maximum bottom hole temperature in the test was 81.8 °C.

DST 2 tested the interval 2609.4 - 2614.9 m. It produced 222 Sm3 oil through a 12.7 mm choke. The GOR was 77.1 Sm3/Sm3 and the stock tank oil density was 0.8278 g/cm3. The maximum bottom hole temperature in the test was 96.8 °C.

DST 3 tested the interval 2561.0 - 2570.5 m. It produced 961 Sm3 oil/day through a 12.7 mm choke. The GOR was 48 Sm3/Sm3 and the stock tank oil density was 0.8277 g/cm3. The maximum bottom hole temperature in the test was 95.4 °C.

DST 4 tested the interval 2548.4 - 2551.9 m. It produced 273 Sm3 oil/day through a 6.4 mm choke. The GOR was 69 Sm3/Sm3. The maximum bottom hole temperature in the test was 95 °C.

Cuttings at the Norwegian Offshore Directorate

Cutting sample, top depth [m]	Cutting samples, bottom depth [m]
430.00	2999.00

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	2522.0	2539.1	[m]
2	2540.5	2551.6	[m]
3	2552.5	2558.4	[m]
4	2558.5	2574.0	[m]
5	2574.0	2577.7	[m]
6	2592.0	2598.0	[m]
7	2599.5	2602.0	[m]
8	2602.0	2608.5	[m]
9	2608.5	2617.5	[m]
10	2617.5	2624.0	[m]
11	2624.0	2635.5	[m]
12	2635.5	2641.5	[m]
13	2641.5	2655.0	[m]
14	2655.0	2663.0	[m]

Total core sample length [m]	122.8
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Cores available for sampling?	YES
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Core photos



2522-2527m



2527-2532m



2532-2537m



2537-2539m



2540-2545m



2545-2550m



2550-2551m



2552-2557m



2557-2558m



2558-2563m



2563-2568m



2568-2573m



2573-2574m



2574-2577m



2592-2597m



2597-2598m



2599-2602m



2602-2607m



2607-2608m



2608-2613m



2613-2617m



2617-2622m



2622-2624m



2624-2629m



2629-2634m



2634-2635m



2635-2640m



2640-2641m



2641-2646m



2646-2651m



2651-2655m



2655-2660m



2660-2663m

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	TEST1	2606.70	2610.70		07.10.1986 - 00:00	YES
DST	TEST2	2583.40	2588.90	OIL	11.10.1986 - 00:00	YES
DST	TEST3	2535.00	2544.50		17.10.1986 - 00:00	YES
DST	DST4	2549.00	2551.50		22.10.1986 - 13:14	YES

Lithostratigraphy

Top depth [mMD RKB]	Lithostrat. unit
326	NORDLAND GP
1084	UTSIRA FM
1093	HORDALAND GP
1682	ROGALAND GP
1682	BALDER FM
1728	SELE FM
1800	LISTA FM
1863	SHETLAND GP
1863	JORSALFARE FM



2145	KYRRE FM
2394	CROMER KNOLL GP
2400	DUNLIN GP
2400	BURTON FM
2440	AMUNDSEN FM
2531	STATFJORD GP
2531	NANSEN FM
2562	EIRIKSSON FM
2620	RAUDE FM
2683	HEGRE GP
2683	LUNDE FM

Geochemical information

Document name	Document format	Document size [MB]
947_GCH_1	pdf	0.24
947_GCH_2	pdf	2.69

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

Document name	Document format	Document size [MB]
947_01_WDSS_General_Information	pdf	0.28
947_02_WDSS_completion_log	pdf	0.26

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

Document name	Document format	Document size [MB]
947_34_7_10_Completion_log	pdf	1.80
947_34_7_10_Completion_report	pdf	14.01

Drill stem tests (DST)

Test number	From depth MD [m]	To depth MD [m]	Choke size [mm]
1.0	2637	2633	6.4
2.0	2615	2610	12.7





3.0	2571	2561	12.7
4.0	2552	2549	6.4

Test number	Final shut-in pressure [MPa]	Final flow pressure [MPa]	Bottom hole pressure [MPa]	Downhole temperature [°C]
1.0		15.000	37.000	82
2.0		2.000	37.000	90
3.0		10.000	38.000	95
4.0		11.000	38.000	78

Test number	Oil [Sm3/day]	Gas [Sm3/day]	Oil density [g/cm3]	Gas grav. rel.air	GOR [m3/m3]
1.0	3		8.470		
2.0	219	17000	8.770		78
3.0	960	45000	0.838	0.838	47
4.0	272	18000	0.835	0.835	66

Logs

Log type	Log top depth [m]	Log bottom depth [m]
CBL	400	1904
CDL CNL GR	1906	3000
COREGUN	1930	2966
DIFL LS BHC	901	3000
DIP	1906	3000
DLL MSFL GR	1906	2700
FMT	2442	2685
FMT	2533	2874
MWD - GR RES	428	3000
VSP	481	2974
ZEDL	2500	3000

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	423.0	36	430.0	0.00	LOT



SURF.COND.	20	901.0	26	918.0	1.55	LOT
INTERM.	13 3/8	1907.0	17 1/2	1920.0	1.81	LOT
INTERM.	9 5/8	2755.0	12 1/4	3000.0	0.00	LOT

Drilling mud

Depth MD [m]	Mud weight [g/cm3]	Visc. [mPa.s]	Yield point [Pa]	Mud type	Date measured
326	1.07			WATER BASED	01.09.1986
428	1.07			WATER BASED	01.09.1986
430	1.07			WATER BASED	04.09.1986
730	1.11	7.0	17.8	WATER BASED	04.09.1986
918	1.13	8.0	18.7	WATER BASED	04.09.1986
918	1.15	9.0	24.9	WATER BASED	04.09.1986
918	1.11			WATER BASED	09.09.1986
918	1.11	21.0	11.1	WATER BASED	09.09.1986
1323	1.11	18.0	9.6	WATER BASED	09.09.1986
1665	1.30	24.0	14.4	WATER BASED	09.09.1986
1920	1.40	29.0	11.5	WATER BASED	09.09.1986
1920	1.45	20.0	5.8	WATER BASED	12.09.1986
1920	1.45	16.0	4.8	WATER BASED	15.09.1986
1963	1.50	19.0	6.8	WATER BASED	15.09.1986
2058	1.50	20.0	8.7	WATER BASED	15.09.1986
2280	1.65	24.0	8.7	WATER BASED	15.09.1986
2413	1.70	35.0	8.7	WATER BASED	15.09.1986
2440	1.70	29.0	6.3	WATER BASED	22.09.1986
2440	1.70	30.0	8.7	WATER BASED	22.09.1986
2440	1.70	27.0	8.7	WATER BASED	09.10.1986
2440	1.70	34.0	8.7	WATER BASED	27.10.1986
2440	1.70	33.0	7.7	WATER BASED	22.09.1986
2522	1.70	28.0	7.7	WATER BASED	15.09.1986
2550	1.70	33.0	7.7	WATER BASED	15.09.1986
2556	1.70	34.0	8.7	WATER BASED	20.10.1986
2558	1.70	34.0	8.7	WATER BASED	21.10.1986
2558	1.70	34.0	8.7	WATER BASED	27.10.1986
2558	1.70	34.0	8.7	WATER BASED	03.11.1986
2570	1.70	28.0	6.8	WATER BASED	15.09.1986
2578	1.70	29.0	5.3	WATER BASED	22.09.1986
2581	1.70	35.0	8.7	WATER BASED	20.10.1986



2581	1.70	36.0	8.2	WATER BASED	20.10.1986
2581	1.70	31.0	8.7	WATER BASED	20.10.1986
2581	1.70	35.0	9.1	WATER BASED	20.10.1986
2596	1.70	28.0	7.2	WATER BASED	22.09.1986
2627	1.70	22.0	7.7	WATER BASED	15.10.1986
2627	1.70	24.0	7.2	WATER BASED	15.10.1986
2627	1.70	26.0	8.7	WATER BASED	20.10.1986
2648	1.70	27.0	6.8	WATER BASED	23.09.1986
2663	1.70	27.0	5.3	WATER BASED	23.09.1986
2700	1.70	32.0	8.7	WATER BASED	30.09.1986
2722	1.70	29.0	8.7	WATER BASED	30.09.1986
2724	1.70	27.0	8.2	WATER BASED	09.10.1986
2755	1.70	28.0	8.2	WATER BASED	09.10.1986
2755	1.70	29.0	8.7	WATER BASED	09.10.1986
2770	1.70	25.0	7.2	WATER BASED	09.10.1986
2823	1.70	27.0	7.7	WATER BASED	30.09.1986
2973	1.70	28.0	7.7	WATER BASED	30.09.1986
3000	1.71	26.0	8.2	WATER BASED	30.09.1986
3000	1.71	29.0	6.8	WATER BASED	09.10.1986
3000	1.71	35.0	9.1	WATER BASED	09.10.1986

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]
947 Formation pressure (Formasjonstrykk)	pdf	0.21

