

WDSS Report

Date: 22/10/96

PB/SKR

Page: 1 / 4

Well no:	Operator:
2/04-16	SAGA

Well

<p>Coordinates : 56° 40' 37.23" N 03° 09' 02.07" E</p> <p>License no : 146</p> <p>Rig : TREASURE SAGA</p> <p>Contractor : WILRIG A/S</p> <p>Bottom hole temp: 150 °C</p> <p>Spud. date : 91.05.07</p> <p>Compl. date : 91.11.04</p> <p>Spud. class : WILDCAT</p> <p>Compl. class : SUSP.</p> <p>Seisloca : BB-87-043A, SP. 10870</p>	<p>UTM coord. : 6281583.13 N 509226.66 E</p> <p>Permit no : 680</p> <p>Rig type : SEMI-SUB.</p> <p>Elev. KB : 26 M</p> <p>Water depth : 68 M</p> <p>Total depth : 4996 M</p> <p>Form. at TD : JURASSIC</p> <p>Prod.form. :</p>
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Licensees

20.000000 ELF PETROLEUM NORGE AS
 20.000000 SAGA PETROLEUM A.S.
 50.000000 DEN NORSKE STATS OLJESELSKAP A.S
 10.000000 AMERADA HESS NORGE AS

Casing and Leak-off Tests

Type	Casing diam	Depth below KB	Hole diam.	Hole depth below KB	Lot mud eqv. g/cm3
CONDUCTOR	30	167.0	36	170.0	
INTERM.	24	410.0	30	424.0	1.44
INTERM.	18 5/8	937.0	24	951.0	1.85
INTERM.	14	2897.0	17 1/2	2912.0	1.93
INTERM.	10 3/4	4632.0	12 1/2	4650.0	2.20
INTERM.	7 5/8	4892.0	9 1/2	4910.0	2.35
OPEN HOLE		4963.0	6	4996.0	

WDSS Report

Date: 22/10/96

PB/SKR

Page: 2 / 4

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2/04-16	SAGA

Conventional Cores

Core no.	Intervals cored meters	Recovery m	%
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Mud

Depth	Mud weight	Visc.	Mud type
424.0	1.20	9.0	WATER BASED
431.0	1.27	11.0	WATER BASED
770.0	1.27	4.0	WATER BASED
951.0	1.25	17.0	WATER BASED
968.0	1.40	31.0	WATER BASED
1335.0	1.60	31.0	WATER BASED
1427.0	1.70	39.0	WATER BASED
2871.0	1.72	65.0	WATER BASED
2897.0	1.72	40.0	WATER BASED
2927.0	1.72	40.0	WATER BASED
2933.0	1.72	44.0	WATER BASED
4441.0	1.68	25.0	WATER BASED
4473.0	1.68	25.0	WATER BASED
4491.0	1.72	33.0	WATER BASED
4512.0	1.75	35.0	WATER BASED
4547.0	1.75	25.0	WATER BASED
4583.0	1.75	27.0	WATER BASED
4594.0	1.80	29.0	WATER BASED
4632.0	2.13	19.0	WATER BASED
4650.0	1.85	27.0	WATER BASED
4655.0	2.00	28.0	WATER BASED
4697.0	2.03	31.0	WATER BASED
4727.0	2.06	26.0	WATER BASED
4742.0	2.10	25.0	WATER BASED
4754.0	2.12	28.0	WATER BASED
4910.0	2.13	19.0	WATER BASED
4935.0	2.20	43.0	WATER BASED
4951.0	2.13	25.0	WATER BASED
4996.0	2.18	51.0	WATER BASED

WDSS Report

Date: 22/10/96

PB/SKR

Page: 3 / 4

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Drill Stem Test (intervals and pressures)

Test no.	Test interval meter	Choke size	Pressure (psi) WHP	BTHP	FFP
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Drill Stem Test (recovery)

Test no.	Oil Sm3/d	Gas Sm3/d	Oil grav. g/cm3	Gas grav. rel. air	GOR m3/m3
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Drill Bit Cuttings and Wet Samples

Sample type	Interval below KB	Number of samples
WET SAMPLES	430 - 4905	480
CUTTINGS	430 - 4995	270

Shallow Gas

Interval below KB	Remarks

Available Logs

Log type	Intervals logged	1/200	1/500	
AMS	409.0 - 914.0			
AMS	936.0 - 2880.0			
CBL VDL GR	1725.0 - 2800.0			
CBL VDL GR	3045.0 - 4620.0			
CDM AP/SHDT MSD	2900.0 - 4654.0			
CDM AP/SHDT MSD	4638.0 - 4905.0			
DIL DLL MSFL LSS SP	409.0 - 4912.0			
DIL LSS MSFL GR	4634.0 - 4912.0			

WDSS Report

Date: 22/10/96

PB/SKR

Page: 4 / 4

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2/04-16	SAGA

DIL LSS MSFL SP GR	409.0 - 948.0			
DLL MSFL LSS GR SP	936.0 - 2899.0			
DLL MSFL LSS SP GR	2894.0 - 4652.0			
LDL CNL GR	409.0 - 4912.0			
LDL CNL GR	2894.0 - 4655.0			
LDL CNL GR	4634.0 - 4912.0			
LDL GR CALI	936.0 - 2889.0			
MWD	94.0 - 4651.0			
RFT PRETEST	4790.0 - 4901.0			
RWD	94.0 - 4650.0			
SHDT GR	2894.0 - 4655.0			
SHDT GR	4634.0 - 4914.0			
SYNTHETIC SEISMOGRAM				
WELL SITE LITHOLOGY	100.0 - 4995.0			
VELOCITY LOG	425.0 - 4909.0			
VSP	1000.0 - 4630.0			
VSP-COMPOSITE	500.0 - 5000.0			
ZERO OFFSET VSP				

Main operations for well: 2/4-16

Main operation: DRILLING

Sub operation:	Minutes:	Hours:	% of total:
BOP ACTIVITIES	4860	81,0	3,83
BOP/WELLHEAD EQ	5850	97,5	4,61
CASING	14280	238,0	11,26
CIRC/COND	7560	126,0	5,96
DRILL	58590	976,5	46,20
HOLE OPEN	1830	30,5	1,44
OTHER	630	10,5	0,50
PRESS DETECTION	960	16,0	0,76
REAM	1440	24,0	1,14
SURVEY	630	10,5	0,50
TRIP	26790	446,5	21,13
UNDERREAM	1830	30,5	1,44
WAIT	1560	26,0	1,23
Total	126810	2113,5	100,00

Main operation: FORMATION EVAL

Sub operation:	Minutes:	Hours:	% of total:
CIRC SAMPLES	180	3,0	1,54
CIRC/COND	360	6,0	3,08
LOG	10920	182,0	93,33
RFT/FIT	90	1,5	0,77
TRIP	150	2,5	1,28
Total	11700	195,0	100,00

Main operation: INTERRUPTION

Sub operation:	Minutes:	Hours:	% of total:
FISH	56640	944,0	47,26
MAINTAIN/REP	18930	315,5	15,79
OTHER	5610	93,5	4,68
WAIT	8430	140,5	7,03
WELL CONTROL	30240	504,0	25,23
Total	119850	1997,5	100,00

Main operation: MOVING

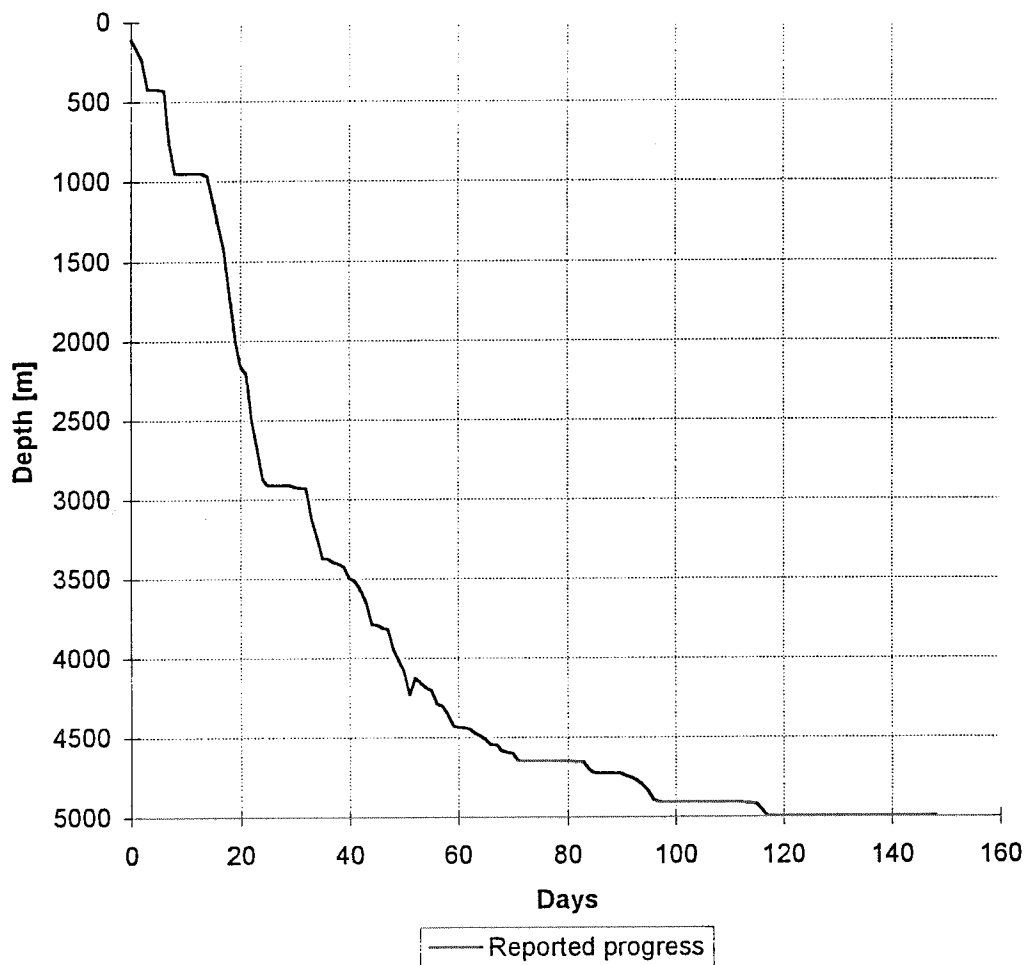
Sub operation:	Minutes:	Hours:	% of total:
ANCHOR	1080	18,0	20,45
TRANSIT	4200	70,0	79,55
Total	5280	88,0	100,00

Main operation: PLUG & ABANDON

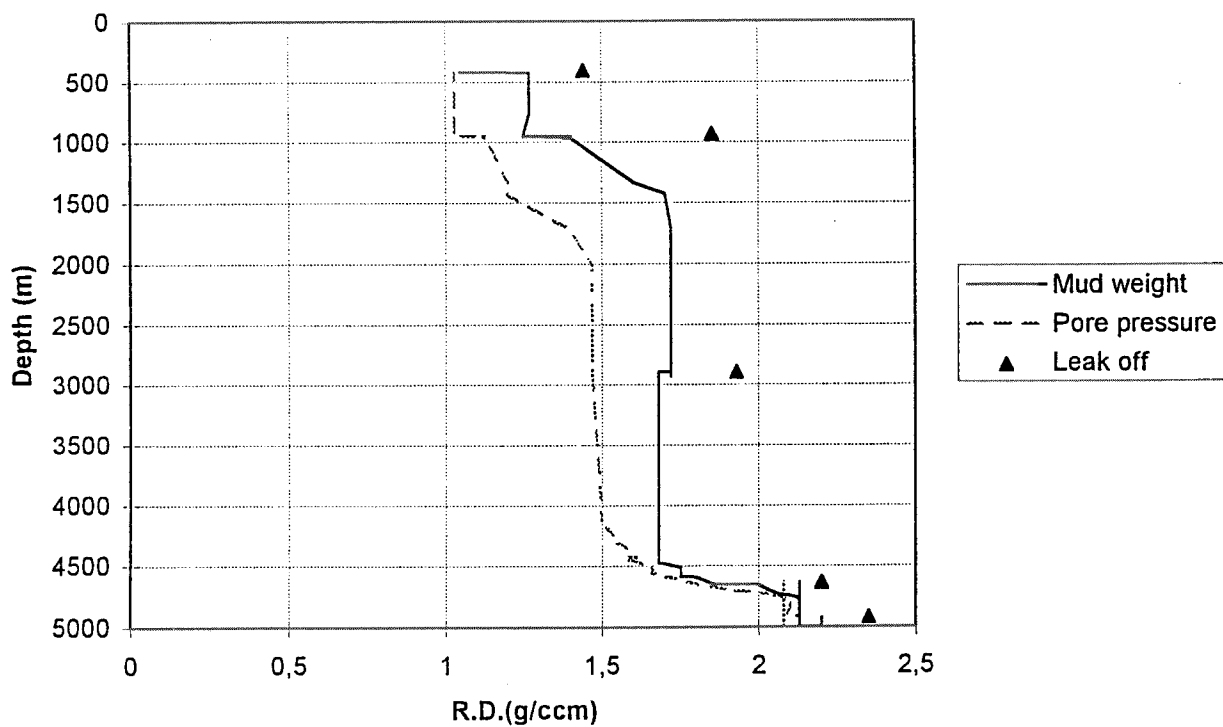
Sub operation:	Minutes:	Hours:	% of total:
CEMENT PLUG	90	1,5	2,14
CIRC/COND	300	5,0	7,14
EQUIP RECOVERY	960	16,0	22,86
OTHER	360	6,0	8,57
TRIP	2190	36,5	52,14
WAIT	300	5,0	7,14
Total	4200	70,0	100,00

Total time used: Hours

Depth vs time for well: 2/4-16



Composite plot for well: 2/4-16



Well History 2/4-16.

General:

Well 2/4-16 was designed to drill on an area located at the eastern margin of the Feda Graben. Geologically the area consists of three sub-platforms. These are separated by large NW-SE striking normal faults downfaulted to the southwest and stepping down to the Feda Graben in the southern part of the block. The northernmost part of the block covers the transition zone between the Hydra High to the N-NW and the Steinbit Terrace to the W-NW. The 2/4-16 well was located in the centre of the license area on the same down faulted segment as the 2/4-13, 14 and 15 wells. Shallow gas was predicted from seismic anomalies at 10 different levels, and several precautions and actions were carried out to be able to handle potential shallow gas.

The main objective of the well was to test the Late Jurassic exploration concept, that was expected to be a thick Late Jurassic sand resting unconformably on the the Middle Jurassic, which formed the basis for the 2/4-14 well. Seismic mapping of the downfaulted segment shows dipping reflectors being truncated along the western crest of the fault segment. This gives a Pre-Cretaceous multiple layered structural closure, reservoir seal is provided by Late Jurassic and Early Cretaceous shales. A secondary objective for the well was to penetrate the Middle Jurassic and 150 m into the Triassic sequence to test for possible hydrocarbon bearing sandstones sequences.

Operations:

Wildcat well 2/4-16 was spudded by the semi-submersible rig Treasure Saga 7 May 1991 and completed 4 November 1991 at a depth of 4996 m RKB in rocks of Early Jurassic age. Shallow gas was detected at 522 , 606 , 628 and at 675 m RKB while drilling of 9 7/8" pilot hole. While drilling through very hard chalk rocks in the 12.6" section severe problems to the drilling equipment was experienced. The hard rocks also caused ten washouts, 8.5 days of total delay, as well as two fishing jobs. In addition the vibration together with high temperature caused twelve failures to the MWD tools, and also problems related to equipment deliveries. Several other misfortunes were experienced all the way down to TD, wherof uncontrolled flowing of the well in the 6" section was the most important one. A total of 371 sidewall cores were attempted, and 147 were recovered. No conventional cores were cut. The well was temporay plugged and abandoned with minor hydrocarbon shows.

Testing:

No DST tests were performed in this well.

Geological Tops.

Well:.2/4-16

	Depth m (RKB).
Nordland Group	94.0
Hordaland Group	1798.0
Rogaland Group	3140.0
Balder Fm	3140.0
Sele Fm	3155.0
Lista Fm	3189.0
Vidar Fm	3238.0
Lista Fm	3254.0
Våle Fm	3292.0
Shetland Group	3317.0
Ekofisk Fm	3317.0
Tor Fm	3435.0
Hod Fm	3920.0
Blodoks Fm	4575.0
Hidra Fm	4598.0
Cromer Knoll Group	4638.0
Rodby Fm	4638.0
Tuxen Fm	4678.0
Åsgard Fm	4699.0
Tyne Group	4737.0
Mandal Fm	4737.0
Farsund Fm	4770.0
Haugesund Fm	4828.0
Vestland Group	4877.0
Bryne Fm	4877.0
T.D.	4996.0