

Well no :	31/5-4 A	Operator :	HYDRO
Coordinates :	60° 43' 16.19" N 03° 33' 43.06" E	UTM coord. :	673202010 N 53066148 E
Licence no :	85	Permit no :	656
Rig :	TRANSOCEAN 8	Rig type :	SEMI-SUB.
Contractor :	TRANSNOR A/S	Elev. KB :	23 M
Bottom hole temp:	65 °C	Water depth :	340 M
Spud. date :	90.10.10	Total depth :	2603 M
Compl. date :	90.12.13	Form. at TD	L.JURASSIC
Spud. class :	APPRAISAL	Prod.form. :	
Compl. class :	SUSP. OIL/GAS		
Seisloca :			

## LICENSEES

9,000000	NORSK HYDRO PRODUKSJON A.S
6,000000	SAGA PETROLEUM A.S.
82,000000	DEN NORSKE STATS OLJESELSKAP A.S
1,000000	TOTAL NORGE A.S
2,000000	ELF PETROLEUM NORGE A/S.

## CASING AND LEAK-OFF TESTS

Type	Casing diam.	Depth below KB	Hole diam.	Hole depth below KB	Lot mud eqv. g/cm3
CONDUCTOR	30	424,0	36	430,0	
INTERM.	18 5/8	924,0	24	930,0	1,45
INTERM.	13 3/8	1567,0	17 1/2	1570,0	1,40
INTERM.	9 5/8	1803,0	12 1/4	1806,0	1,40

## DRILL BIT CUTTINGS AND WET SAMPLES

Sample type	Interval below KB	Number of samples

## SHALLOW GAS

Interval below KB	Remarks

## AVAILABLE LOGS

Log type	Intervals
AMS	1803,0 - 2595,0
CBL VDL CCL AMS GR	1392,0 - 1793,0
CDN	1800,0 - 2600,0

Log type	Intervals	
CDR	435,0	- 1729,0
CDR CDN	435,0	- 2604,0
DITE DSIT AMS GR	1550,0	- 1798,0
DLL MSFL GR AMS	1803,0	- 2595,0
GR CCL IN D.P.	1433,0	- 1800,0
LDL CNL AMS GR	1567,0	- 1879,0
LDL CNL GR	1566,0	- 1799,0
MUD	944,0	- 2603,0

## Main operations for well: 31/5-4 A

### Main operation: COMPLETION

Sub operation:	Minutes:	Hours:	% of total:
BOP/WELLHEAD EQ	9090	151,5	25,48
CIRC/COND	3780	63,0	10,60
COMPL STRING	1410	23,5	3,95
FLOW	8670	144,5	24,31
OTHER	4050	67,5	11,35
SAND CONTROL	1350	22,5	3,78
STIMULATE	2280	38,0	6,39
WAIT	30	0,5	0,08
WIRE LINE	5010	83,5	14,05
Total	35670	594,5	100,00

### Main operation: DRILLING

Sub operation:	Minutes:	Hours:	% of total:
BOP ACTIVITIES	360	6,0	1,56
BOP/WELLHEAD EQ	390	6,5	1,69
CASING	4800	80,0	20,81
CIRC/COND	840	14,0	3,64
DRILL	6300	105,0	27,31
OTHER	30	0,5	0,13
REAM	450	7,5	1,95
SURVEY	3510	58,5	15,21
TRIP	6390	106,5	27,70
Total	23070	384,5	100,00

### Main operation: FORMATION EVAL

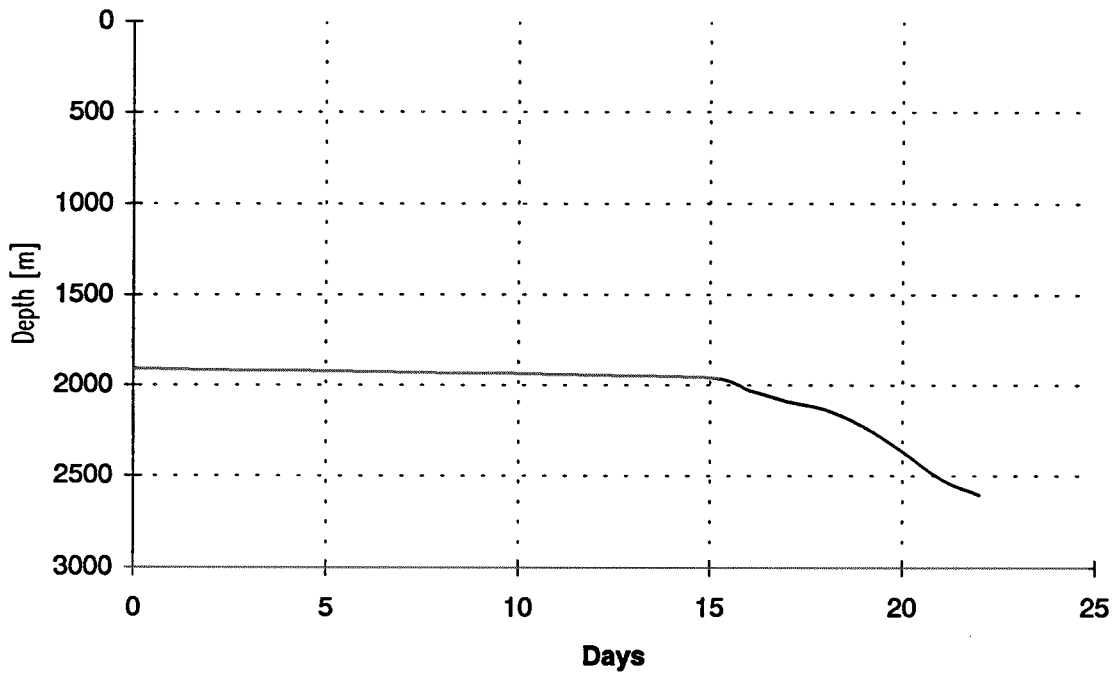
Sub operation:	Minutes:	Hours:	% of total:
CIRC/COND	180	3,0	2,15
LOG	6780	113,0	81,00
OTHER	120	2,0	1,43
TRIP	1290	21,5	15,41
Total	8370	139,5	100,00

### Main operation: INTERRUPTION

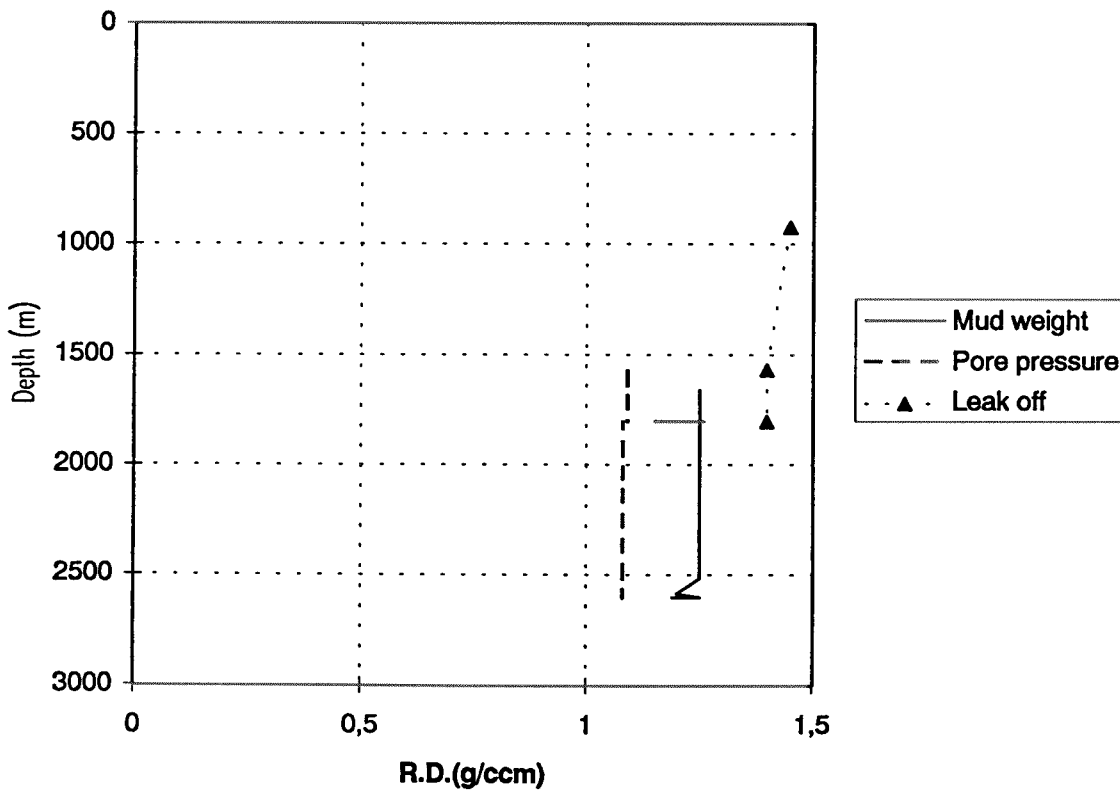
Sub operation:	Minutes:	Hours:	% of total:
MAINTAIN/REP	11010	183,5	49,66
OTHER	3990	66,5	18,00
SIDETRACK	2970	49,5	13,40
WAIT	4200	70,0	18,94
Total	22170	369,5	100,00

Total time used:  Hours

**Depth vs time for well: 31/5-4 A**



**Composite plot for well: 31/5-4 A**



# Well History 31/5-4 A - 31/5-4 AR.

## General:

Well 31/5-4 A was a planned sidetrack of well 31/5-4 S designed to drill a horizontal part of the Sognefjord formation. The total deviation of both wells would be 1200 m, whereof 800 m will be in well 31/5-4 A, i.e. the horizontal part. Hole azimuth would be approximately 60 degrees north-east from spudd location. Top gas reservoir was expected at 1536,5 m TVD, and top oil reservoir (4C sand unit) at 1536,5 m TVD. The horizontal target depth at TD was expected at 1576,5 m TVD. The Fensfjord formation was expected at 1666 m TVD. A penetration hole was drilled through the oil zone into the Fensfjord formation. This hole was plugged back, and the 31/5-4 A well was sidetracked and drilled horizontally as planned.

## Operations:

Appraisal well 31/5-4 A was spudded 10 October 1990 by the semi-submersible rig Transocean 8, and completed as well 31/5-4 AR 18 July 1991 at a depth of 2603 m RKB in the Sognefjord formation of Late Jurassic age. The cement plug in the 13 3/8" shoe was drilled out to kickoff point at 1569 m RKB. The 12 1/4" hole was directional drilled further to 1728.5 m RKB. Due to low angle at that point, the hole was plugged back to 1575 m RKB. Sidetracked the well (31/5-4 AR) from 1604 m RKB and drilled the 12 1/4" hole to 1803 m RKB. The average build rate in this hole section was 4.6° / 30 m and the angle at TD was 90.74°. The 8 1/2" horizontal hole was drilled to TD at 2603 m RKB. An attempt to run pressure gauges inside the 6 5/8" screen failed as the toolstring was dropped accidentally in the pipe and were damaged. GOC was encountered at 1567.3 and OWC at 1580.3 m TVD. The well was suspended with oil and gas shows.

## Testing:

No DST tests were performed in this well.

# Geological Tops.

## Well:31/5-4 A 31/5-4 AR.

	Depth m (RKB).
Nordland Group	339,5
Hordaland Group	525,0
Rogaland Group	1205,0
Balder Fm	1205,0
Sele Fm	1292,0
Lista Fm	1393,0
Shetland Group	1449,0
Cromer Knoll Group	1470,0
Viking Group	1551,0
Draupne Fm	1551,0
Sognefjord Fm	1621,0
T.D.	2603,0