Final Well Report

Well: 30/9-18

Licence 104

NORSK HYDRO A.S

FINAL WELL REPORT

WELL 30/9-18

OCTOBER 1995

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PREFACE

License PL 104 was awarded to the Statoil/Norsk Hydro/DNO(*)/Norsk Agip/ Saga Petroleum/Tenneco Oil Co.(**) group in 1985 following the 9`th licensing round. Norsk Hydro is the operator.

The license area is located in block 30/9 on the Norwegian shelf of the North Sea.

The licensees' percentage share of the block is as follows;

Den Norske Stats Oljeselskap a.s. (Statoil)	50%
Norsk Hydro a.s.	30%
Saga Petroleum a.s.	10% *
Norsk Agip a.s.	5%
Conoco Norway a.s.	5% **

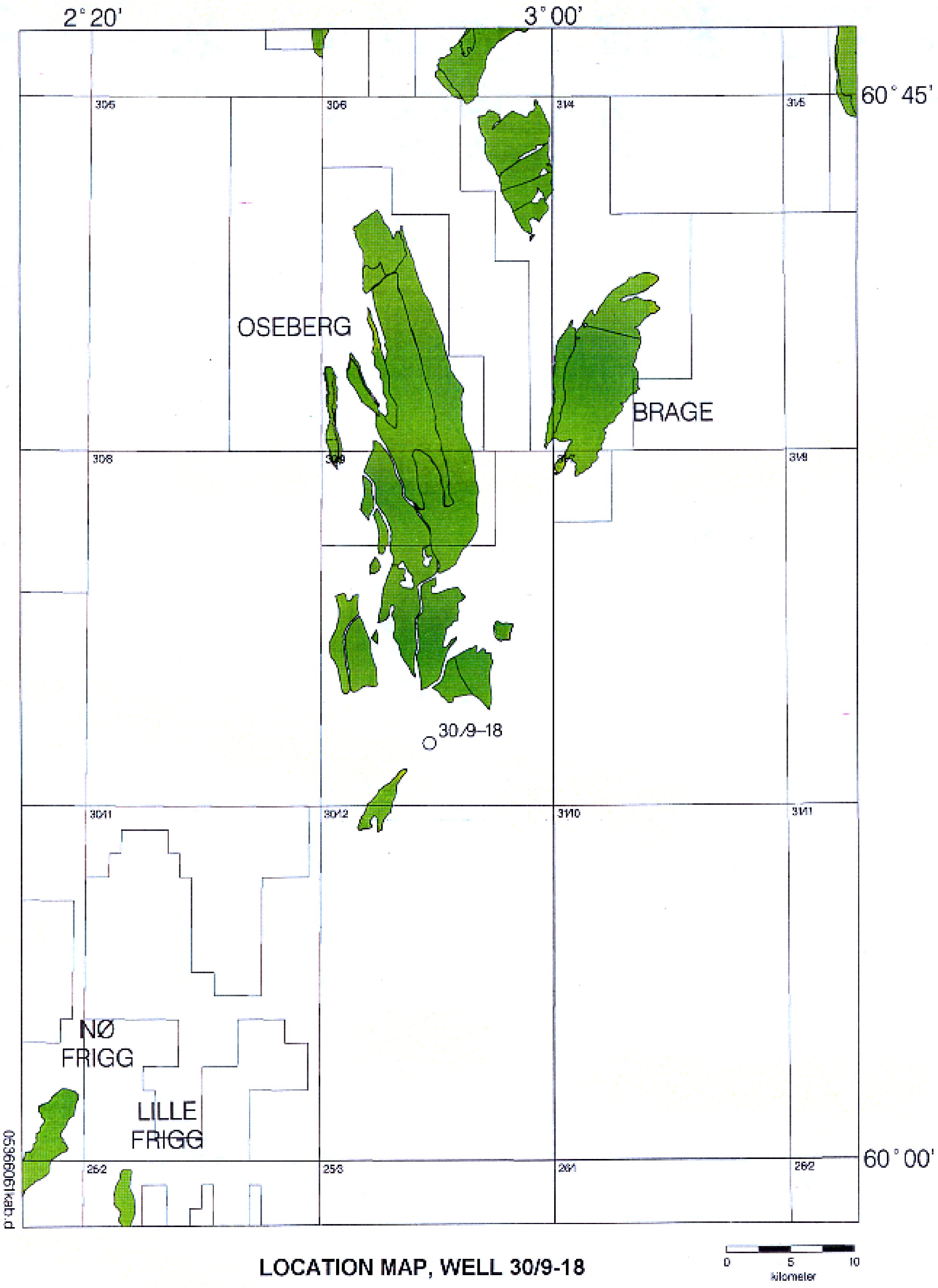
The well was drilled by Norsk Hydro a.s., on behalf of the group, during the first quarter of 1995.

All depths in this report are in mMD unless otherwise stated.

*DNO`s license share was taken over by Saga Petroleum a.s. in 1993.

**Tenneco Oil Company`s license share was taken over by Conoco Norway Inc. in 1989.

LOCATION MAP



LOCATION MAP, WELL 30/9-18

SUMMARY OF WELL DATA

LOCATION:	60° 17' 38.69"N 02° 49' 22.59"E 6 684 332.9mN 490 211.4mE ED 50, UTM Zone 31, CM 3°E
OPERATOR:	Norsk Hydro a.s.
RIG:	Tresure Saga
CONTRACTOR:	Wilrig
KB ELEVATION (to MSL):	26m
WATER DEPTH (MSL):	106m
START OF OPERATIONS:	14.03.95
WELL SPUDDED:	14.03.95
REACHED TD:	06.04.95
COMPLETED:	11.04.1995
STATUS:	Permanently abandoned.
FORMATION AT TD:	Drake Formation
TD DRILLER (mRKB):	2994 m
TD LOGGER (mRKB):	2992 m
DRILLING DEPTHS:	36" to 193 m 24" to 557 m 12 1/4" to 1550 m 8 1/2" to 2559 m 6" to 2994 m
CASING DEPTHS:	30" to 193 m 18 5/8" to 547 m 9 5/8" to 1538 m 7" liner: 1383 - 2557 m

SECTION A

GEOLOGY

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1 OBJECTIVES

The objectives of the well were to:

- Prove commercial oil resources (> 20 x 10^6 Sm^3 STOOIP), to in combination with the K-structure discovery, clarify the Oseberg Syd development strategy.
- Establish the extent of the high-permeability Tarbert reservoir found in well 30/9-16.
- Test the hydrocarbon potential of the Lower Brent Gp, Cook Fm and the Statfjord Fm, which locally are hydrocarbon bearing or have residual hydrocarbons in the J- and K-wells.

The well location were chosen in order to satisfy the following criteria:

- Prove in the order of 20 x 10^6 Sm^3 STOOIP in the Heather and Tarbert Fms in the X-prospect.
- Find Heather and/or Tarbert reservoir with good production parameters.
- Chose a location where the K-East prospect can be reached with a side-track and conclusively tested.
- Good seismic data quality at reservoir level.
- Avoid faults in the reservoir section

All these criteria have been satisfied for the chosen well location.

2 RESULTS

Well 30/9-18 was spudded on 14th March 1995 and reached total depth at 2994m on 6th April 1995 in the Drake Formation. The well was plugged back and permanently abandoned, and the well was completed on 11th April 1995.

The well penetrated the Brent Group reservoir zones. The reservoir zones were water bearing. Very weak oil shows are reported in the Heather/Tarbert intervals during drilling.

Tarbert Formation contained 127m gross sand. The NORE unit was 17 m thick, of which only the Lower Ness contributed net sand.

Formation tops in the Tertiary and Jurassic sections came in slightly higher than prognosed. However, they were within the prognosed uncertainty range.

Formation pressures from the Lower Heather and Tarbert Fms are in communication. The Ness Fm is in a separate pressure regime.

3 BIOSTRATIGRAPHY

The biostratigraphical evaluation of Well 30/9-18 was carried out by Stratlab a.s.

The analyses were based on studies of lithology, micropaleontology, palynology, and nannofossils, which were made on ditch cutting samples and sidewall cores covering the interval 1400 - 2990m (TD) RKB .

Table 3.1 on the next page shows a summarised chronostratigraphic and lithostratigraphic subdivision of the well. Further details may be found in the report "Well 30/9-18, biostratigraphy interval 1400 - 2990m (TD)".

HYDRO

WELL: 30/9-18

NB! NOT TO SCALE

DEPTH RKB

ELEVATION KB: 26 m

ALL DEPTHS IN METERS (mRKB)

CHRONOSTRATIGRAPHY

SYSTEM	SERIES/ STAGE	DEPTH m
QUAT.		
TERTIARY		
	Early Oligocene	1400 m = FSA 1670 m
	Late Eocene	1680 m 1730 m
	Middle Eocene	1740 m 2000 m
	Early Eocene	2010 m 2035 m
	Early Eocene - Late Paleocene	2055 m 2140 m
	Late Paleocene	2145 m 2320 m
	Early Paleocene	2330 m
	∿∿∿	2340 m
CRETACEOUS	Late Maastrichtian	2350 m
	E. Maastrichtian-L.Campanian	2360 m 2430 m
	Santonian - Coniacian	2440 m 2490 m
	Coniacian-Late Cenomanian	2500 m 2545 m
	Early Cenomanian?-Late Albian	2550 m 2555 m
	Late Albian	2559 m 2570 m
	Middle - Early Albian	2580 m 2585 m
	Early Albian - Aptian	2590 m
	Barremian-Hauterivian	2590,5 m 2595 m
	∿∿∿	2596 m
JURASSIC	Early Kimmeridgian	2614 m
	Late Oxfordian	2620 m
	∿∿∿	2626,5 m
	Early Bathonian - Late Bajocian	2730 m
	Bajocian	2740 m 2950,5 m
	∿∿∿	2954 m
	Late Toarcian	2990 m = LSA

LITHOSTRATIGRAPHY

GROUP	FORMATION/ MEMBER
	132 m
NORDLAND	643 m
	Utsira 815 m
HORDALAND	2052 m
ROGALAND	Balder 2106 m
	Sele 2204 m
	Lista 2257 m
	Våle 2331 m
SHETLAND	2541 m
CROMER KNOLL	2595 m
VIKING	Draupne 2597 m
	Heather 2623 m
	L. Heather Sst 2646 m
BRENT	Upper Tarbert 2705 m
	Middle Tarbert 2725 m
	Lower Tarbert 2750 m
	Ness 2937 m
	Lower Ness Sst 2945 m
	ORE 2954 m
DUNLIN	Drake TD – 2994 m

∿∿ = Unconformity
FSA – First sample analysed
LSA = Last sample analysed

Fig 3.1: Chrono and lithostratigraphy

4 LITHOSTRATIGRAPHY

This summary is compiled predominantly from ditch cuttings descriptions. Sidewall cores were available from 2570 m down to 2965 m. No conventional cores were cut in this well. Wireline and MWD logs were used to aid lithological interpretation and the placement of formation boundaries.

The well was drilled with returns to seabed from the seafloor at 132 m to 557 m, before setting 18 5/8" casing at 547 m. Lithology interpretation through this interval is based on MWD logs and drilling parameters. The first drill cuttings sample was taken from 557 m.

All depths stated below are measured depth in meters RKB (KB is 26m).

4.1 QUATERNARY AND TERTIARY

NORDLAND GROUP (132 - 815 m)

123 - 557 m

This interval was drilled with returns to seabed. Based upon MWD data and drilling data, it consists of mainly clay with some sandstone.

557 - 643 m

This interval consists of claystone interbedded with sandstone.

CLAYSTONE:	medium dark grey, soft, amorph, silty - sandy, non - slightly calcareous, rare micromicaceous.
SANDSTONE:	loose grains, clear - milky Quartz, very fine - coarse, generally medium, subrounded - rounded, poor sorted.

Utsira Formation (643 m - 815 m)

The Utsira Formation consists of sandstone with occasional claystone beds.

SANDSTONE:	clear Quartz, loose, medium - coarse, traces very coarse, subrounded - rounded, moderately sorted, traces Mica, traces shell fragments, traces lithic fragments.
CLAYSTONE:	olive grey, soft, amorphous, non-slightly calcareous, silty.

HORDALAND GROUP (815 - 2052m)

815 - 1522 m

This interval consists of interbedded claystone and sandstone.

CLAYSTONE:	olive grey, soft-firm, amorphous, occasionally blocky, non-slightly calcareous, silty-very silty, becoming less silty downwards, trace Glauconite, trace micromicaceous, trace micropyritic.
SANDSTONE:	very light grey, clear - locally milky Quartz, generally loose, fine - coarse, subangular - subrounded, moderately sorted, trace Kaolinite matrix, trace - abundant Glauconite.
AGE:	Early Oligocene

1522 - 2030 m

This interval comprises claystone with dolomite and limestone stringers.

CLAYSTONE :	olive grey - dark brown, becoming dark greenish grey from 1675m, soft - firm - moderately hard, blocky, non calcareous, slightly silty, trace micromicaceous, rare micropyrite, trace carbonaceous.
DOLOMITE:	pale yellow brown - dark yellow brown, blocky, hard - very hard, micro - cryptocrystalline, locally succrosic.
LIMESTONE:	pink grey - pale yellow brown, soft, cryptocrystalline, argillaceous.
AGE:	Early Oligocene - Early Eocene.

2030 - 2052 m

This lowermost section of the Hordaland Group comprises a very characteristic brownish Claystone (informally called "red brown claystone") interbedded with greenish Claystone.

CLAYSTONE :	moderately brown - dusky brown, firm - moderately hard, blocky, non calcareous, slightly silty, trace micromicaceous.
AGE:	Early Eocene

ROGALAND GROUP (2052 - 2331m)

Balder Formation (2052- 2106m)

The Balder Formation consists of claystone with minor tuff and stringers of limestone.

CLAYSTONE:	dark greenish grey - olive grey, also moderate brown - dusky brown, medium grey - medium light grey, firm - moderately hard, blocky, non calcareous, trace micromicaceous, rare micropyritic.
TUFF:	light grey - light blue grey, speckled, firm -moderately hard, blocky.
LIMESTONE:	white - very light grey, soft - hard, blocky - angular, microcrystalline - cryptocrystalline.
AGE:	Early Eocene - Late Paleocene.

Sele Formation (2106- 2204m)

The Sele Formation consists of claystone with stringers of limestone.

CLAYSTONE:	olive grey - olive black, green grey - dark green grey, firm - moderately hard, blocky, non calcareous, non - slightly silty, micromicaceous, trace micropyritic.
LIMESTONE:	pale - dark yellow orange, off white - very light grey, firm - hard, blocky - angular, cryptocrystalline - crystalline.
AGE:	Early Eocene - Late Paleocene.

Lista Formation (2204 - 2257m)

The Lista Formation comprises various coloured claystone with local sand and limestone stringers.

CLAYSTONE:	olive grey - olive black, greenish grey - dark green grey, minor brown grey - dusky yellow brown, becoming generally olive grey, firm - locally moderately hard, blocky, non calcareous, slightly silty - silty, locally micropyritic, trace micromicaceous, trace carbonaceous.
LIMESTONE:	light olive grey - very light grey, firm, locally hard, blocky, very argillaceous, crypto - microcrystalline.
SANDSTONE:	medium grey, clear Quartz, very fine - fine, subangular - subrounded, moderately - well sorted, moderately hard - hard, calcareous cemented, trace Glauconite, no visible porosity.

AGE:	Late Paleocene.

Våle Formation (2257 - 2331 m)

The Våle Formation comprises claystone with stringers of limestone.

CLAYSTONE:	olive grey - light brown grey, amorphous, soft, non calcareous, silty, trace carbonaceous.
LIMESTONE:	light olive grey - medium grey, locally off white - very light grey, firm, locally hard, blocky, argillaceous, crypto-microcrystalline.
AGE:	Late - Early Paleocene.

4.2 CRETACEOUS

SHETLAND GROUP (2331- 2541m)

2331 - 2541 m

The Shetland Group consists mainly of limestone with local interbeds of calcareous claystone.

LIMESTONE:	white - very light grey, firm - moderately hard, blocky, crypto - microcrystalline, rare Glauconite.
CLAYSTONE:	medium grey - olive grey - dark grey, soft - firm, moderate - very calcareous grading Marl, slightly silty - silty, trace micromicaceous, trace carbonaceous, rare micropyrite.
AGE:	Late Maastrichtian - Late Cenomanian.

CROMER KNOLL GROUP (2541 - 2595 m)

2541 - 2595 m

The Cromer Knoll Group comprises Limestones interbedded with Claystones.

LIMESTONE:	varicoloured, light grey - light green grey, moderate yellow brown, olive brown, locally pale red, soft - firm, locally hard, subblocky - amorphous, generally argillaceous, generally cryptocrystalline, locally crystalline.
CLAYSTONE:	alternating moderate brown - grey brown and medium dark grey - dark grey, soft - firm, amorphous - subblocky, slightly silty - silty, calcareous - very calcareous, trace carbonaceous.
AGE:	Coniacian - Hauterivian.

4.3 JURASSIC

VIKING GROUP (2595 - 2646m)

Draupne Formation (2595- 2597m)

The Draupne Formation consists of carbonaceous claystone.

CLAYSTONE:	dusky yellow - brown black, soft, amorphous, non - slightly calcareous, silty - very silty, micromicaceous, carbonaceous - very carbonaceous.
AGE:	Early Kimmeridgian

Heather Formation (2597 - 2646 m)

The Heather Formation consists of interbedded Siltstone with Sandstone and Limestone Stringers

CLAYSTONE:	dusky yellow brown - brown black, soft, amorphous, non - slightly calcareous, silty - very silty grading Siltstone, locally Sandstone laminae, micromicaceous, trace micropyrite, carbonaceous
SANDSTONE:	light grey - medium light grey, clear quartz, very fine to fine, subangular - subrounded, moderately sorted, argillaceous matrix, local calcite cement, trace Micromica, poor - fair visible porosity.
AGE:	Early Kimmeridgian - Late Bajocian.

Lower Heather Sandstone (2623 - 2646m)

SANDSTONE:	light grey - medium light grey, clear Quartz, very fine - fine, subangular - subrounded, moderate sorted, argillaceous matrix, calcite cemented, trace micromicaceous, trace micropyrite, fair visible porosity.
LIMESTONE:	white - very light grey, firm, locally moderately hard, blocky - subblocky, microcrystalline - cryptocrystalline.
AGE:	Late Oxfordian ?.

BRENT GROUP (2646 - 2954m)

Tarbert Formation (2646 - 2750 m)

The Tarbert Formation consists of Sandstone interbedded with Siltstone and Coal.

SANDSTONE:	light olive grey - light grey, clear Quartz, minor milky white, very fine - fine, locally grading silt, and fine - coarse, occasionally very coarse, trace pebbly, subangular - subrounded, minor rounded, moderately sorted, friable - loose, locally calcite cement, trace Mica, trace Pyrite, poor - fair visible porosity.
SILTSTONE:	very light grey - medium grey, firm, blocky, moderately to very calcareous, sandy - very sandy grading Sandstone, very argillaceous, micromicaceous, trace micropyrite, trace carbonaceous.
COAL:	brown black, firm - moderately hard, brittle, occasionally silty, occasional micropyrite.
AGE:	Early Bathonian - Bajocian.

Ness Formation (2750 - 2945 m)

The Ness Formation consists of interbedded and interlaminated Sandstone Claystone with Coal seams. There is minor Dolomite at base.

SANDSTONE:	light grey - light brown, clear Quartz, very fine - fine, and medium - coarse, trace very coarse - pebbly, subangular - subrounded, friable, moderately sorted, trace Mica, trace Pyrite, poor - fair visible porosity.
CLAYSTONE:	olive grey - brown grey, becoming brown black at base, firm, non calcareous, silty - very silty grading to Siltstone, locally sandy laminae, locally very micromicaceous, rare micropyrite, locally carbonaceous.
COAL:	black - brown black, firm - hard, brittle - fissile, resinous waxy texture, occasional earthy dull texture.
DOLOMITE:	brown grey, pale brown - dusky yellow brown, very hard, angular - blocky, sucrosic, cryptocrystalline.
AGE:	Bajocian.

Lower Ness Sandstone (2937 - 2945m)

SANDSTONE: very light grey, clear Quartz, very fine - fine, moderately sorted, firm - moderately hard, locally calcite cement, poor visible porosity.

AGE: Bajocian.

ORE Formation (2945 - 2954m)

The Ore Formation is predominately Claystone with minor Sandstone.

CLAYSTONE: brown grey, soft - firm, blocky, non calcareous, silty, carbonaceous, micromicaceous.

SANDSTONE: very light grey, clear quartz, fine - medium, subangular - subrounded, moderately sorted, local calcite cement, argillaceous matrix, poor visible porosity.

AGE. Bajocian.

DUNLIN GROUP (2954- 2994 TD m)

Drake Formation (2954 - 2994 TD m)

The Drake Formation consists of Claystone with traces of very fine sand and a Dolomite stringer.

CLAYSTONE: brown black - olive black, soft - firm, blocky, non calcareous, silty, locally very silty, trace sandy, micromicaceous, trace carbonaceous.

DOLOMITE: brown grey - brown black, dusky yellow brown, firm - moderately hard, blocky, argillaceous, sucrosic, cryptocrystalline.

AGE: Late Toarcian.

5 HYDROCARBON SHOWS

The evaluation of hydrocarbon shows at the wellsite was carried out in a conventional manner. A standard (Exlog) hydrocarbon total gas detector system (50 units = 1%) together with a gas chromatograph for automatic and continuous gas analysis, recorded as ppm by volume of C1 through nC4, were operational below 557 m and down to the TD of the well.

Hydrocarbon shows on ditch cuttings, cores and sidewall cores were evaluated according to procedures described in Norsk Hydro's "Wellsite Geologist's Manual".

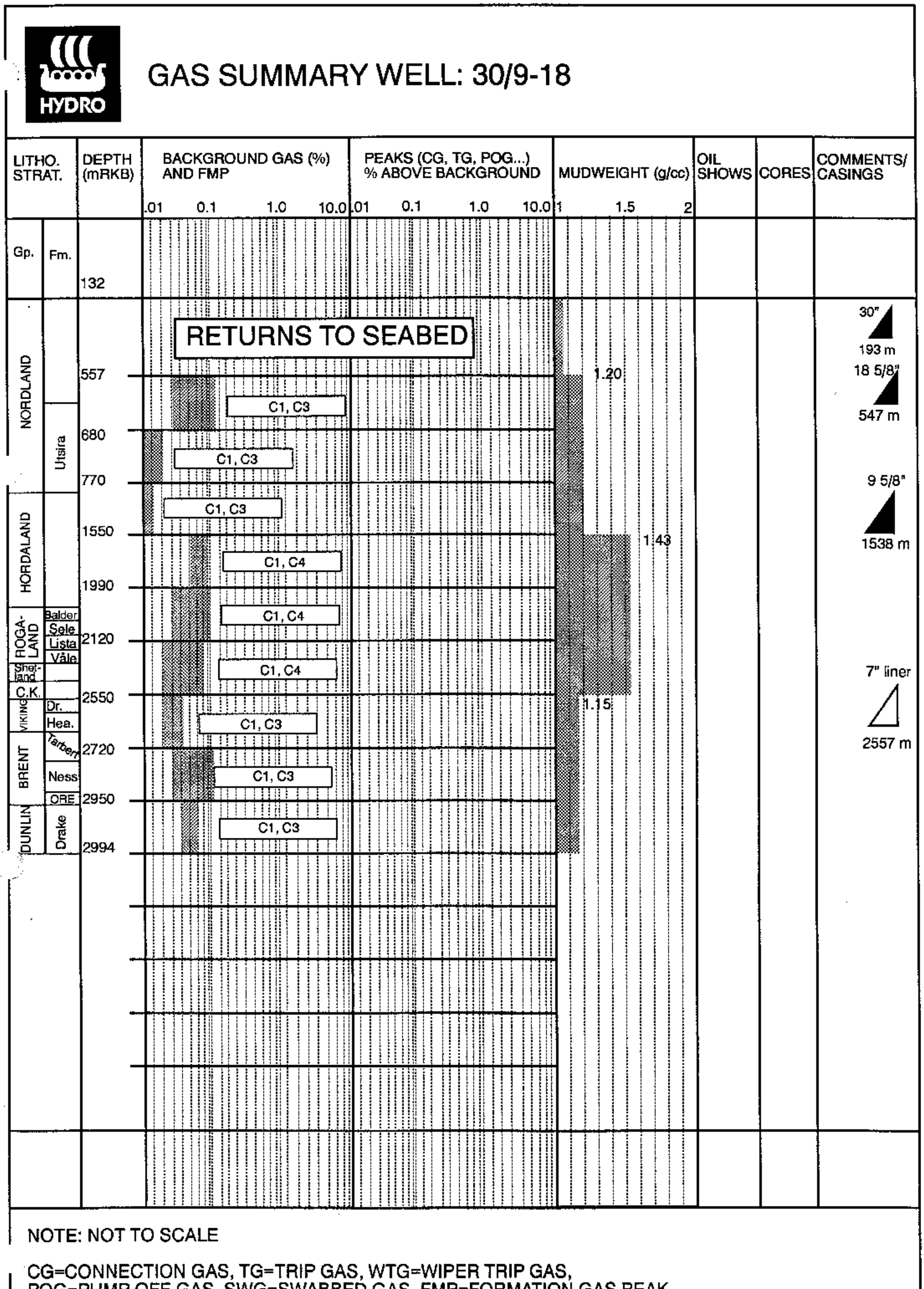
5.1 Gas Record

132 - 557m:

This interval was drilled with returns to sea bed.

557 - 2994 m:

The gas record for the well is presented in the Figure 5.1 on the next page.



NOTE: NOT TO SCALE

CG=CONNECTION GAS, TG=TRIP GAS, WTG=WIPER TRIP GAS,
POG=PUMP OFF GAS, SWG=SWABBED GAS, FMP=FORMATION GAS PEAK

Fig 5.1: Gas summary

5.2 Oil stain and fluorescence

No oil or gas shows were observed in this well. A patchy, pale yellow to dull yellow direct fluorescence was observed on siltstone and very fine sandstone of Heather and Tarbert formations, from 2650m to 2750m, but no cut fluorescence were observed. Locally, only few cuttings gave very weak pale yellow cut fluorescence. A summary of the observed shows is given in Table 5.1 below.

INTERVAL (mRKB)	SOURCE	LITHOLOGY	SHOWS DESCRIPTION
2650 - 2750 Heather / Upper Tarbert	Cuttings	Siltstone / Sandstone	Patchy pale yellow-dull yellow, trace moderate bright yellow direct fluorescence, no cut, locally very weak pale yellow crush cut, no fluorescence residual, no visible residual.

Table 5.1. Shows summary

6 CORING

6.1 Conventional cores

No cores were cut in this well.

6.2 Sidewall cores

Sidewall cores were taken from 2570m to 2965m. Details of recovery are given in Table 6.1 below.

Descriptions of the sidewall cores can be found in Appendix II, and gross lithology is reported on the Completion Log.

Run	Requested	Misfired	Lost	Empty	Recovered	Rec.%
3A	45	3	4	1	37	82%
TOTAL	45	3	4	1	37	82%

Table 6.1 : Sidewall cores

7 LOGGING

7.1 Wireline logs

The following table is a summary of wireline logs run in the well and shows log type, date run, logged intervals and run number for each log.

Logs	**Date**	**Logged interval (mRKB)**	**Run**
BGT/DLL/LSS/LDL/MSFL/GR/ AMS/SP	23.03.95	1523 - 525 (GR to 132m)	1A
BGT/DLL/LSS/LDL/MSFL/GR/ AMS/SP	29.03.95	2550.5 - 1538	2B
DLL/LSS/MSFL/GR/SP/AMS	06.04.95	2990.5 - 2558.5	3C
LDL/CNL/FMS/GR/AMS	06.04.95	2981 - 2558.5	3C/A
RFT-HP/GR/AMS	07.04.95	2624 - 2873.5	3A
VSP	07.04.95	2990 - 290	3A
CST/GR	08.04.95	2965 - 2570	3A

Table 7.1 : Wireline logs

7.2 MWD logs

A MWD service (Baker/Hughes/Inteq) yielding gamma ray, resistivity and survey measurements (RGD tool) was run in the following section:

132 - 2556 m

A MWD yielding only GR and survey was run in the 6" hole section: 2559 - 2991m.

7.3 Bottom hole temperatures from wireline logs

The table below gives a summary of the bottom hole temperatures measured from wireline logs.

Log suite	Run	Depth (mRKB)	Temp °C	Time since circ.	Circ. time
BGT/DLL/LSS/LDL/MSFL/ GR/AMS/SP	1A	1533	36.5	6 hrs 25 min	3 hrs
BGT/DLL/LSS/LDL/MSFL/ GR/AMS/SP	2B	2560.5	75	22 hrs 5 min	1 hr
DLL/MSFL/LSS/GR/SP	3C	2990.5	92.5	8 hrs 5 min	1 hr 45 min
LDL/CNL/FMS/GR/AMS	3C/A	2991.5	101	13 hrs 55 min	1 hr 45 min

Table 7.2 : Bottom hole temperatures from logs

8 PETROPHYSICAL RESULTS

8.1 Summary

The main target, the Tarbert Fm, proved to be water bearing, showing low residual hydrocarbon saturations. Both the Heather Fm, Ness Fm and the ORE Fms were also found to be water bearing. The reservoir properties were found to be generally good to fair.

The petrophysical analysis of well 30/9-18 was performed by incorporating petrophysical parameters and procedures established in the Oseberg Syd Field Study (Ref. /1/). No cores were obtained from well 30/9-18, thus well 30/9-16 was used as a guide for parameter selections (Ref. /2/). Formation tops and reservoir quality have been defined. RFT formation pressures have been analysed giving three distinct and separate water gradients, one covering the Lower Heather / Tarbert Fm and two separate gradients covering the Ness Fm. The three water gradients indicates that there are possibly no pressure communication between the three zones. No tests or RFT fluid samples were obtained from the well.

The Lower Heather Sst contains 7.8 m of Net Sand with a porosity of 19.4%, and a clay volume of 26.5%. As for the Upper Tarbert Fm, it contained 43.3 m of Net Sand, with a porosity of 19.3%, and with a clay volume of 21.3%. The Middle Tarbert Fm contained 5.6 m of Net Sand with an average porosity of 20.7%, and with a clay volume of 14.7%. As for the Lower Tarbert Fm, it contained 10.7m of Net Sand, with a porosity of 15.3%, and a clay volume of 27%. The Ness Fm was divided into two, the top part being called the Ness Fm, while the lower section was called the Lower Ness Sst. The Ness Fm contains 47.5 m of Net Sand, with an average porosity of 22.5%, and with a clay volume of 6%. As for the ORE Fms, they contain 6.8 m of Net Sand, with an average porosity of 26.7%, and a clay volume of 1%. The Drake Fm contained no Net Sand. All the formations contained water.

8.2 Input Data

Log Data

Openhole wireline logs, along with MWD logs used in the petrophysical evaluation were loaded from tape at a sampling increment of 0.1524 m

Database preparation

All logs were checked that they were on depth with previous runs using the GR as a base reference, and subsequent runs were spliced accordingly. Hole conditions in the 12 1/4" section, 550 m to 1550 m, are good. The 8 1/2" section, 1550 m to 2559 m, has good hole conditions with very minor washouts in the shaly sections. The 6" section, 2559 m to 2994 m, has very good hole conditions.

Whole core data

No cores were cut in well 30/9-18.

8.3 Analytical procedure

Environmental corrections

Measured depth borehole corrections were applied using Schlumbergers GeoFrame corrections, which is a part of Norsk Hydro's log database software, to all tools except the neutron. The neutron was corrected using the Tigress software, which is Norsk Hydro's project database software. Environmental corrections performed through the reservoir section used the borehole and mud data as listed in the headers on the log prints.

The invasion corrections were performed on the LLD/LLS/MSFL tool combination to generate R_t and R_{xo}. R_t and R_{xo} determined from the invasion corrections were used for S_w and S_{xo} calculations. The corrected data was transferred to the Tigress project data base, where the final petrophysical interpretation was performed.

Clay volume

Clay volume was determined by using a non-linear gamma ray method and the density / neutron method.

Gamma Ray

$V_{cly} = I_{cly}(GFCT - 1.0) / (GFCT - I_{cly})$
where I_{cly} = linear V_{cly}, and
GFCT is a variable set to 2.0 in this analysis

Density / Neutron

$V_{cly} = A/B$
A =
B =

Gamma ray parameters used in clay volume calculations were determined by histograms and crossplots generated in clay intervals to determine resistivity of the clay (R_{cly}), neutron clay porosity ($_{Ncly}$) and clay density ($_{cly}$).

Varying amounts of coal and carbonaceous materials have been identified with density/neutron/acoustic cutoffs. Limestone intervals have been determined by manual observations of log responses and through the use of a series of density/neutron/acoustic cutoffs. The log derived intervals containing coal, limestone and highly carbonaceous intervals, matches well with observed cuttings descriptions from the field.

Effective Porosity

Effective porosity was calculated from density/neutron crossplot porosity in all zones, except in the Heather Fm where the density method was used.

Water Saturation

Water saturation was calculated using the Poupon-Leveaux (Indonesian) Equation:

where

S_w = water saturation
n = saturation exponent
R_t = true formation resistivity
R_{cly} = clay resistivity
V_{cly} = clay volume
a = constant
R_w = formation water resistivity
= effective porosity
m = cementation exponent
d = $1-(V_{cly}/2)$

Water resistivity, R_w, was taken from the Oseberg Syd Field Study (Ref./1/). Mud filtrate resistivity R_{mf} was obtained from the header data on the log prints.

Cementation exponent, 'm', was taken from the Oseberg Syd Field study.

Saturation exponent, 'n', and the Archies empirically derived constant, 'a', were set to industry standards.

Fluid densities ($_{fl}$) were estimated from R_{mf}.

Reservoir Summation

The following cutoffs were used to determine Net Sand and Net Pay:

		Net Sand %	Net Pay %	
	>	10.0	10.0	Brent Gp
	>	15.0	15.0	Heather Fm
S_w	<	100.0	60.0	
V_{cly}	>	40.0	40.0	

The effective porosity, $_e$, cutoff for the Brent Group and the Heather Fm was set to the same values that were used in well 30/9-16, where core data were available.

The water saturation, S_w, cutoff of 60%, and the clay volume, V_{cly}, cutoff of 40% are approximations.

8.4 Results

Reservoir intervals are characterised by varying amounts of mica, coal and carbonaceous materials, and to a lesser extent limestone stringers.

Low residual hydrocarbon saturations of 5-10 % are observed through the reservoir zones. Shows were observed and described on the cuttings over a section from approximately 2640 m to 2780 m, indicating that some hydrocarbon saturations should be calculated. Some of the hydrocarbon saturations calculated below this interval, if not actual, might be caused by the fact that the DLL has a tendency to read to high in a water zone, thus causing hydrocarbon saturations to be calculated in water filled zones. Hydrocarbon saturations and porosities caused by shoulder effects were manually removed through the reservoir sections.

Net sand summaries, and formation averages are presented in Table.8.1.

8.5 RFT formation pressures

Operations

One RFT run was performed covering the Heather, Tarbert and Ness Fms. Formation pressures from the Lower Heather Fm are in communication with formation pressures in the Tarbert Fm, giving a water gradient of 1.02 g/cc. As for formation pressures in the Ness Fm, they fall on to separate pressure regimes with a distinct pressure difference of less than one bar, where the deepest one has the lowest absolute pressure, compared to the top one. Pressure date from well 30/9-18 can be observed in Appendix II and on th Completion log.

Database preparation

All the pressure data were manually entered and quality controlled using the drawdown and buildup profiles. Pressure points were eliminated if they were obviously affected by supercharging or were dry tests. Plots of hydrostatic pressures were checked as an additional quality control step. Formation pressure points were kept in the analysis when doubt arose to whether they were valid or not. Data from the HP gauge was used in the analysis.

Interpretation

Data quality is fair to good through the Lower Heather Fm, and good in the Tarbert and Ness Fms. Adequate formation pressure measurements are available to identify three separate pressure regimes. One covers the Lower Heather and the Tarbert Fms, while the two remaining covers the Ness Fm. The pressure difference between the Lower Heather / Tarbert pressure regime and the Upper Ness regime is 1.2 bar. As for the difference between the Upper Ness and the Lower Ness pressure regimes, it is approximately 0.5 bar. This difference could be an effect of pressure gauge stabilisation, but could also be real. The Lower Ness pressure regime is 0.5 bar lower than the Upper Ness regime.The pressure gradients obtained indicates water with a density of 1.02 g/cc in all three pressure regimes.

8.6 References

1 Petrophysical Field Evaluation Status Report, PL079 Outside & PL104, Block 30/9, vols. 1, 2A & 2B. Norsk Hydro Vækerø, June 1993.

2 Discovery Evaluation Report Well 39/9-16 PL104/PL171, Norsk Hydro Vækerø, February 1995.

PETROPHYSICAL RESULTS

FORMATION	TOP mRKB	BASE mRKB	NET RESERVOIR GROSS m	NET m	N/G	PHIE %	SW %	NET PAY NET m	N/G	PHIE %	SW %
DRAUPNE Fm	2595	2597	2	0,0	0,00	-	-	-	-	-	-
HEATHER Fm	2597	2623	26	0,0	0,00	-	-	-	-	-	-
L.HEATHER sst	2623	2646	23	7,8	0,34	19,4	93	-	-	-	-
U.TARBERT Fm	2646	2704	58	43,4	0,75	19,3	93	-	-	-	-
M.TARBERT Fm	2704	2725	21	5,6	0,27	20,7	96	-	-	-	-
L.TARBERT Fm	2725	2750	25	10,7	0,43	15,3	99	-	-	-	-
NESS Fm	2750	2937	187	47,6	0,25	22,5	99	-	-	-	-
ORE Fms	2937	2954	17	6,9	0,40	26,7	88	-	-	-	-
DRAKE Fm	2954	2994	40	0,0	0,00	-	-	-	-	-	-

CUTOFF	MIN.	MAX.	DETERMINE	
VCL (%)	0,0	40,0	NET SAND/PAY	"ALL FORMATIONS"
PHIE (%)	10,0	100,0	NET SAND/PAY	"BRENT GROUP"
PHIE (%)	15,0	100,0	NET SAND/PAY	"HEATHER Fm"
SW (%)	0,0	60,0	NET PAY	"ALL FORMATIONS"

Table 8.1: Petrophysical summary

9 GEOPHYSICAL RESULTS

Prognosed and actual time/depth values in well 30/9-18 are listed in Table 9.1, and a time/depth plot is provided in Fig. 9.1

Well 30/9-18 largely confirmed the seismic interpretation as all stratigraphic levels below Top Shetland Gp. were encountered within the prognosed uncertainty range.

The Top Shetland Gp. was encountered 7m shallower than prognosed, largely confirming the velocity field down to the Top Shetland Gp. level.

The Base Cretaceous level was encountered 23 m shallower than expected, reflecting the uncertainty in the seismic interpretation due to interfering seismic events within the Cretaceous.

The Top Ness Fm. was encountered 4 m deeper than prognosed, whereas the Top Tarbert Fm was encountered 24 m shallower than prognosed. These deviations reflect mainly the uncertainty in the assessment of the Tarbert Fm. thickness.

The Base Brent Gp. came in 45m deeper than prognosed. Interference between seismic events in the lower part of the Brent Gp. and a general poorer data quality compared to the Top Ness Fm. reflector explains the differences observed.

HORIZON	TIME (ms TWT)			DEPTH (m TVD MSL)		
	Prognosis	Actual	Deviation	Prognosis	Actual	Deviation
Seabed	143.2	143.2	0	106	106	0
Top Utsira Fm	663	664.4	+ 1.4	632	617	- 15
Base Utsira Fm	836	836.8	+ 0.8	802	789	- 13
Top Balder Fm	1992	1992.1	+ 0.1	2049	2026	-23
Top Shetland Gp	2208	2207.3	- 0.8	2312	2305	- 7
Base Cretaceous	2367	2364.2	- 2.8	2589	2569	-20
Top Tarbert Fm		2395.8			2620	
Top Ness Fm	2453	2456.6	+ 3.6	2720	2723.5	+ 3.5
Base Brent Gp	2552	2583.8	+ 31.8	2882	2927.5	+45.5

Figure 9.1 Geophysical summary.

GEOPHYSICAL RESULTS

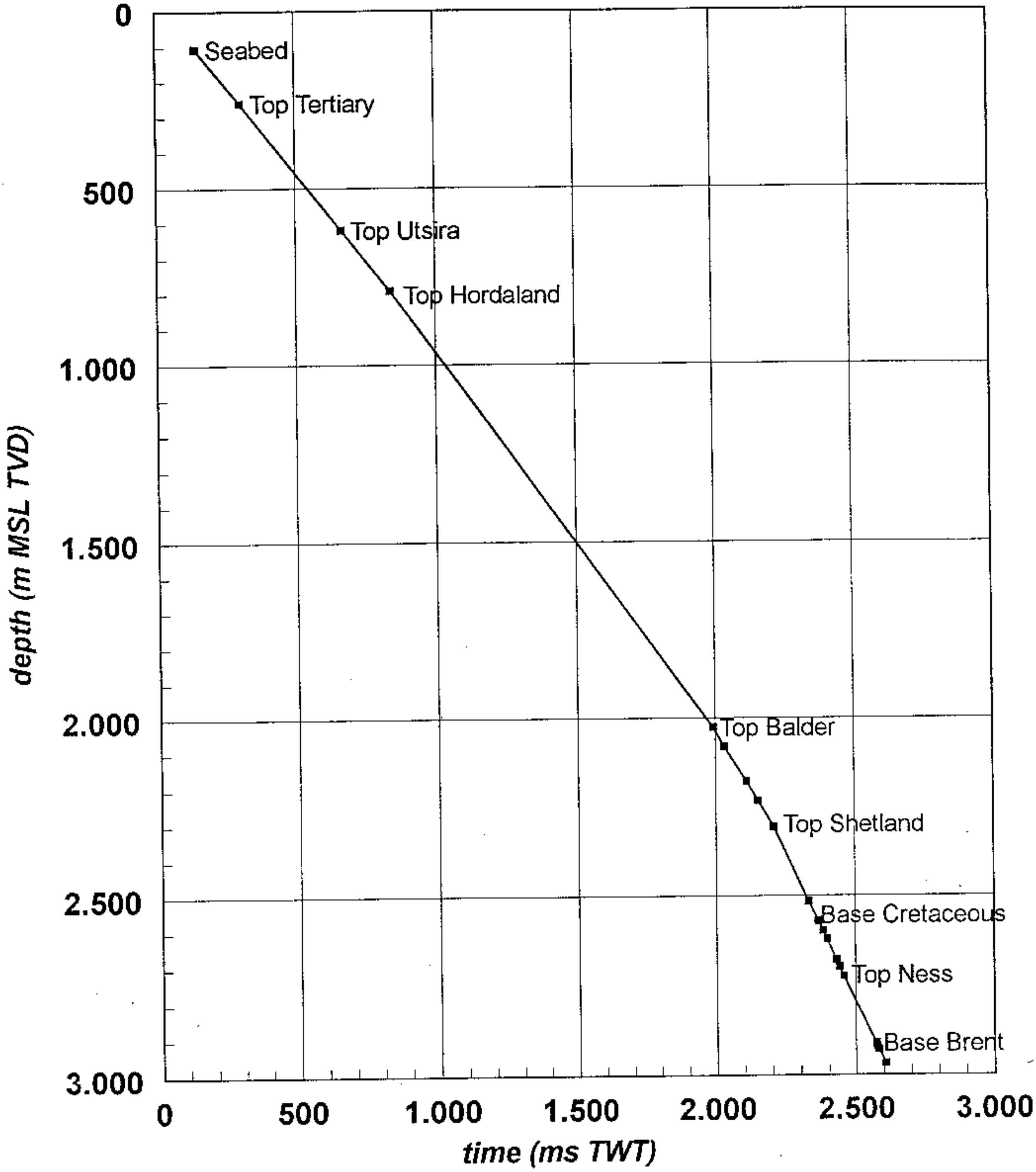


Fig. 9.1: Time vs. depth plot

10 POST SITE SURVEY REPORT

WELL DATA:

1 **Distance from rig floor to sea level:** 26 m

2 **Water depth (MSL):** 106 m

3a **Setting depth for conductor (m RKB):** 193 m

3b **Leak Off / Formation Integrity Test (g/cc):**

4a **Setting depth for casing on which BOP mounted:** 547 m

4b **Leak Off / Formation Integrity Test (g/cc):** 1.57

5 **Depth (m RKB & two way time to formation/section/layer tops:**

Top Pliocene: 286 m/ 318 ms
Top Utsira Fm.: 643 m/ 664 ms
Base Utsira Fm.: 815 m/ 837 ms

6 **Depth interval (m RKB & TWT) and age of sand bodies shallower than 1000 m under the seabed. Note which layers if any contain gas:**

The logs in the upper part of Pleistocene are poor and sand layers are not resolved (36" hole).

Pleistocene layers: 250-252m/278-280 ms, 282-286m/314-318ms

Pliocene layers: 449-450m/482-483 ms, 471-475 m/503-506 ms, 495-496 m/ 525-526 ms, 503-504 m/533-534 ms, 592-603 m/616-628 ms, 626-629m/648-652ms, 631-635 m/653-657 ms

Miocene layers: 643-733 m/664-755ms, 735-756m/757-778ms, 757-776m/ 779-798ms, 786-804m/807-826ms, 808-815m/830-837ms, 836-839m/856-859ms, 907-914m/918-925ms, 946-965m/ 954-974ms, 1081-1087m/1087-1092ms

7 **By what means is the presence of gas proven:**

While starting the cementing the 18 5/8" casing gas was observed streaming out from the ringroom. The cement was circulated out with sea water and the gas stream increased. The gas stream was stopped by circulating 1.30 sg mud and the casing was cemented with gas-block cement. The BOP was set and no further gas observations were made.

8 **Composition and origin of gas:** N/A

9 **Describe all measurements taken in gas bearing layers:**
MWD (gamma and resistivity). The logs give no indications of the gas level.

SEISMIC DATA:

10 **Given depth (m RKB & TWT) of unconformities at the well location:**

Top Pliocene:	286 m/ 318 ms
Top Utsira Fm.:	643 m/ 664 ms
Base Utsira Fm.:	815 m/ 837 ms

11 **Given depth and extent of sand layers (communication, continuity, truncation etc.):**

250-252 m and 282-287 m: Pleistocene sand layers are expected to have low continuity.
449-504 m: The thin layers in this interval are local with low continuity.
592-635 m: The layers are regional but disappears towards east and are absent in the wells in the eastern part of Block 30/9.
643-815 m: The Utsira sands are regionally distributed.
936-1087 m: The Early/Middle Miocene sands are commonly observed in Block 30/9, but due clay diapirs, the layers are discontinuous with great lateral variations in thickness.

12 **Given depth and extent of any gas blanking ("gass-skygging"), seismic anomalies etc.:**

Minor segments of seismic amplitude anomalies were mapped at one level in the vicinity of the spud location:
- 175 m (190 ms), 170 m north of the spud location

13 **Note any indication of gas originating from deeper levels. Give description in cases where gas comes from deeper layers:**

14 **How does the interpretation of the site survey correspond to the well data with respect to:**

- **shallow gas:** While starting the cementing the 18 5/8" casing gas was observed streaming out from the ringroom. Gas was not predicted in well 30/9-18.

- **sand bodies:** The Pleistocene sand levels correspond to the interpretation. The predicted sands in the upper Pliocene are not observed in the logs. The lower Pliocene sands are observed 10-15 m shallower than predicted. The Utsira Fm. is observed 15 m shallower than predicted.
The depths to the Miocene sand layers observed below the Utsira Fm. (836-1087 m) were not prognosed.

- **unconformities:** Base Pleistocene was predicted at 289 m and is observed as the base of a sand layer at 286 m. The Top Utsira Fm. was observed at 643 m and predicted at 658 m. The Base Utsira Fm. was observed at 815 m and predicted at 828 m (914 ms).

- **correlation to nearby wells:** the seismic correlation to tie wells 30/9-9 and 30/9-16 is good, but the interval velocity in the Pliocene sequence is 8% higher in 30/9-16 compared to 30/9-9 and 30/9-18. The velocities from 30/9-16 were used in the depth conversion giving the deviation of 15m for the Top Utsira Fm.

11 STANDARD AND SPECIAL STUDIES

- "VSP innsamlingsrapport, brønn 30/9-18", Norsk Hydro
- "Well 30/9-18: Biostratigraphy interval 1400 - 2990m (TD)", Stratlab

APPENDIX I

SIDEWALL CORE DESCRIPTIONS

NORSK HYDRO

SIDE WALL CORE DESCRIPTION

Well : 30/9-18

Rig : Treasure Saga

Run no: 3A | Date: 08.04.95 | Logging Co: Schlumberger | Page No.: 1 of 5

Shot : 45 | Misfired : 3 | Lost : 4 | Empty : 1 | Recovered: 37 | Geologist : SSG/JRK

No.	Depth m RKB	Rec cm	Lithology and Show Description	Fluorescence					
				Direct			Cut		
				Tr	M	G	Tr	M	
1	2965	1.5	**CLYST:** brn blk, frm - mod hd, blky, non calc, mod slty, mod - v micromic, tr carb, tr micropyr.						
2	2959.5	1.5	**CLYST:** a/a, tr vf sdy.						
3	2954	2.5	**CLYST:** a/a						
4	2950.5	1.5	**CLYST:** dusky yel brn - brn blk, else a/a.						
5	2949	2	**CLYST:** brn blk - brn gy, lam, blky, non calc, hom, v carb (brn blk), sl micromic.						
6	2945.5	2.0	**CLYST:** brn blk, tr Coal, else a/a.						
7	2933	1.5	**SLST:** olv gy - m gy, frm, blky, non calc, in pt vf sdy, mod micromic, rr micropyr.						
8	2925	2.5	**CLYST:** brn gy - lt olv gy, frm, blky, non calc, carb lam, tr Coal, sl micromic.						
9	2920	1.5	**CLYST:** lt gy - lt olv gy, frm, blky, non calc, in pt v slty grd SLST, in pt v micromic.						
10	2911		**Lost**						

Tr:trace M:medium G:good

Comments :

NORSK HYDRO	SIDE WALL CORE DESCRIPTION				Well : 30/9-18 Rig : Treasure Saga
Run no: 3A	Date: 08.04.95	Logging Co: Schlumberger			Page No.: 2 of 5
Shot : 45	Misfired : 3	Lost : 4	Empty : 1	Recovered: 37	Geologist : SSG/JRK

No.	Depth m RKB	Rec cm	Lithology and Show Description	Fluorescence					
				Direct			Cut		
				Tr	M	G	Tr	M	
11	2899.5	2.0	**CLYST:** olv gy, frm, blky, non calc, rr micromic, tr pel (m, rnd, sph, mod hd, non calc).						
12	2876.5	1.5	**CLYST:** a/a, in pt v slty - vf sdy, v micromic.						
13	2841.5	2.5	**CLYST:** olv gy, blky, frm, non calc, rr micromic, sl slty.						
14	2828	2.0	**CLYST:** a/a.						
15	2815.5	2.0	**Clyst** lam w/ **Sst**. **CLYST:** brn gy - brn blk, frm, blky, non calc, v micromic, slty. **SST:** v lt gy, clr Qtz, pred vf - f w/ crs - v crs g, pr srtd, arg mtx, tr Mic. **No shows.**						
16	2806.5		**Lost**						
17	2796	2.0	**Clyst** lam w/ **Sst:** as no. 15 (2815.5m).						
18	2774	1.5	**Sst** w/ **Clyst** lam. **SST:** lt gy - lt brn, clr Qtz, vf - f, subang - subrnd, fri, mod srtd, pr vis por. **No shows.** **CLYST:** brn gy - brn blk, frm, blky, non calc, slty, v micromic.						
19	2763	1.0	**Sst** w/ **Clyst** lam: as no. 18 (2763m).						
20	2759.5	1.5	**Clyst** w/ **Sst** lam. **CLYST:** v slty grd Slst, v micromic, else a/a. **SST:** pred vf, else a/a.						

Tr:trace M:medium G:good

Comments :

NORSK HYDRO

SIDE WALL CORE DESCRIPTION

Well : 30/9-18

Rig : Treasure Saga

Run no: 3A	Date: 08.04.95	Logging Co: Schlumberger		Page No.: 3 of 5
Shot : 45	Misfired : 3	Lost : 4	Empty : 1	Recovered: 37

Geologist : SSG/JRK

No.	Depth m RKB	Rec cm	Lithology and Show Description	Fluorescence					
				Direct			Cut		
				Tr	M	G	Tr	M	
21	2751.5	1.5	**Clyst lam w/ Sst.** **CLYST:** brn gy - brn blk, frm, non calc, v slty grd Slst, v micromic. **SST:** lt gy - lt brn, clr Qtz, vf - f, subang - subrnd, fri, mod srtd, pr vis por. **No shows.**						
22	2748		**Misfire.**						
23	2724		**Misfire.**						
24	2718		**Misfire.**						
25	2692		**Lost.**						
26	2686	2.0	**SST:** lt gy, clr Qtz,vf - f, subang - subrnd, mod srtd, v arg, micropyr, micromic, fr vis por. **No shows.**						
27	2681.5	2.0	**SST:** as no. 26 (2686m).						
28	2664.5	1.5	**SST:** as no. 26 (2686m).						
29	2653.5	0.5	**SST:** v lt gy - lt gy, clr - smky Qtz,f - crs, occ v crs - pbly g (2mm), subang - subrnd - rnd, pr srtd, frm, v arg, kao mtx, calc cmt, tr micropyr, pr vis por. **No shows.**						
30	2650	1.5	**SST:** lt gy - m lt gy, clr Qtz, vf - f, subang - subrnd, mod srtd, arg mtx, calc cmt, tr micromic, fr vis por. **No shows.**						

Tr:trace M:medium G:good

Comments :

NORSK HYDRO

SIDE WALL CORE DESCRIPTION

Well : 30/9-18

Rig : Treasure Saga

Run no: 3A
Date: 08.04.95
Logging Co: Schlumberger
Page No.: 4 of 5

Shot : 45
Misfired : 3
Lost : 4
Empty : 1
Recovered: 37
Geologist : SSG/JRK

No.	Depth m RKB	Rec cm	Lithology and Show Description	Fluorescence					
				Direct			Cut		
				Tr	M	G	Tr	M	
31	2645	1.5	**SST:** lt gy - m lt gy, clr Qtz, vf - f, subang - subrnd, mod srtd, arg mtx, calc cmt, tr micromic, fr vis por. **No shows**.						
32	2641.5	1.5	**SST:** as no. 31 (2645m).						
33	2634	1.5	**SST:** tr micropyr, else as no. 31 (2645m).						
34	2626.5	2.0	**SST:** abdt micropyr, else as no. 31 (2645m).						
35	2622		**Empty**.						
36	2620	1.5	**Clyst** w/ lam of **Sst.** **CLYST:** brn gy - brn blk, frm, blky, non calc, v slty, v micromic. **SST:** lt gy - m lt gy, clr Qtz, vf - f, subang - subrnd, mod srtd, arg mtx, calc cmt, tr micromic, fr vis por. **No shows.**						
37	2614	2.0	**Clyst** w/ lam of **Sst**: as no. 36 (2620m).						
38	2611		**Lost**						
39	2607.5	2.0	**Clyst** w/ lam of **Sst**: as no. 36 (2620m).						
40	2602	2.0	**Clyst** w/ lam of **Sst**: as no. 36 (2620m).						

Tr:trace M:medium G:good

Comments :

NORSK HYDRO	**SIDE WALL CORE DESCRIPTION**		Well : 30/9-18
			Rig : Treasure Saga
Run no: 3A	Date: 08.04.95	Logging Co: Schlumberger	Page No.: 5 of 5

Shot : 45	Misfired : 3	Lost : 4	Empty : 1	Recovered: 37	Geologist : SSG/JRK

No.	Depth m RKB	Rec cm	Lithology and Show Description	Fluorescence					
				Direct			Cut		
				Tr	M	G	Tr	M	
41	2596	2.0	**CLYST:** brn blk, frm, blky, non calc, sl slty, v micromic, tr vf sdy.						
42	2590.5	1.5	**MRL:** gy rd, sft - frm, blky, hom.						
43	2585	2.0	**CLYST:** olv blk, frm, blky, non calc, rr micromic, plas, wxy ap.						
44	2580	2.5	**CLYST:** olv gy, frm, blky, mod micromic, wxy ap, v calc grd Mrl.						
45	2570	2.0	**CLYST:** m dk gy - dk gy, frm, blky, v calc grd Mrl, mod micromic.						

Tr:trace M:medium G:good

Comments :

APPENDIX II

WELL SUMMARY

GEOLOGICAL WELL SUMMARY

RFT RESULTS

WELL SUMMARY:

Coord: 60°17'38.69"N
02°49'22.59"E
UTM:6 684332.9mN
490211.4mE
Zone: ED 50, Zone 31, CM 3°
Line: NH8502R, Line 239, Crossline 1033
Rig: Treasure Saga
Waterdepth: 106 m
Stopped in: Drake Fm.

On location: 14.03.95
Spudded: 14.03.95
At T.D.: 06.04.95
Completed: 11.04.95
T.D. Driller: 2994 m
T.D. Logger: 2992 m
Wireline Logging: Schlumberger
Mudlogging: Baker, Hughes Inteq

WELL:

30/9-18

COUNTRY

Norway

OPERATOR Norsk Hydro LICENCE 104

OWNED BY: Norsk Hydro, Statoil, Saga, Conoco, Agip

TARGETS

Primary: Tarbert Fm
Secondary: Lower Brent, Cook and Statfjord

RESULTS

The reservoir zones were water bearing

CASING

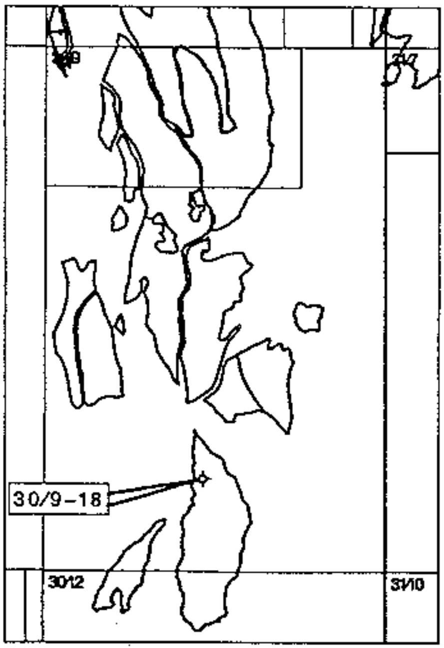
30":	193 m
18 5/8:	547 m
9 5/8":	1538 m
7" :	2557 m

CORES

None

GAS RECORD

557 - 680 m	0,04-0,15% C1-C3
680 - 770 m	0,01-0,03% C1-C3
770 - 1550 m	0,0 -0,02% C1-C3
1550 - 1990 m	0,06-0,09% C1-C4
1990 - 2120 m	0,04-0,11% C1-C4
2120 - 2550 m	0,03-0,07% C1-C4
2550 - 2720 m	0,03-0,05% C1-C3
2720 - 2950 m	0,04- 0,12%C1-C3
2950 - 2994 m	0,05- 0,07%C1-C3



LOGS

BGT/DLL/LSS/LDL/MSFL/	1A	1523 - 525 m
GR/AMS/SP	2B	2550,5 - 1538 m
DLL/MSFL/LSS/GR/SP/AMS	3C	2990,5 - 2558,5 m
LDL/CNL/FMS/GR/AMS	3C/A	2981 - 2558,5 m
RFT-HP/GR/AMS	3A	2873,5 - 2624 m
VSP	3A	2990 - 290 m
CST/GR	3A	2965 - 2570 m

OIL SHOWS

No shows

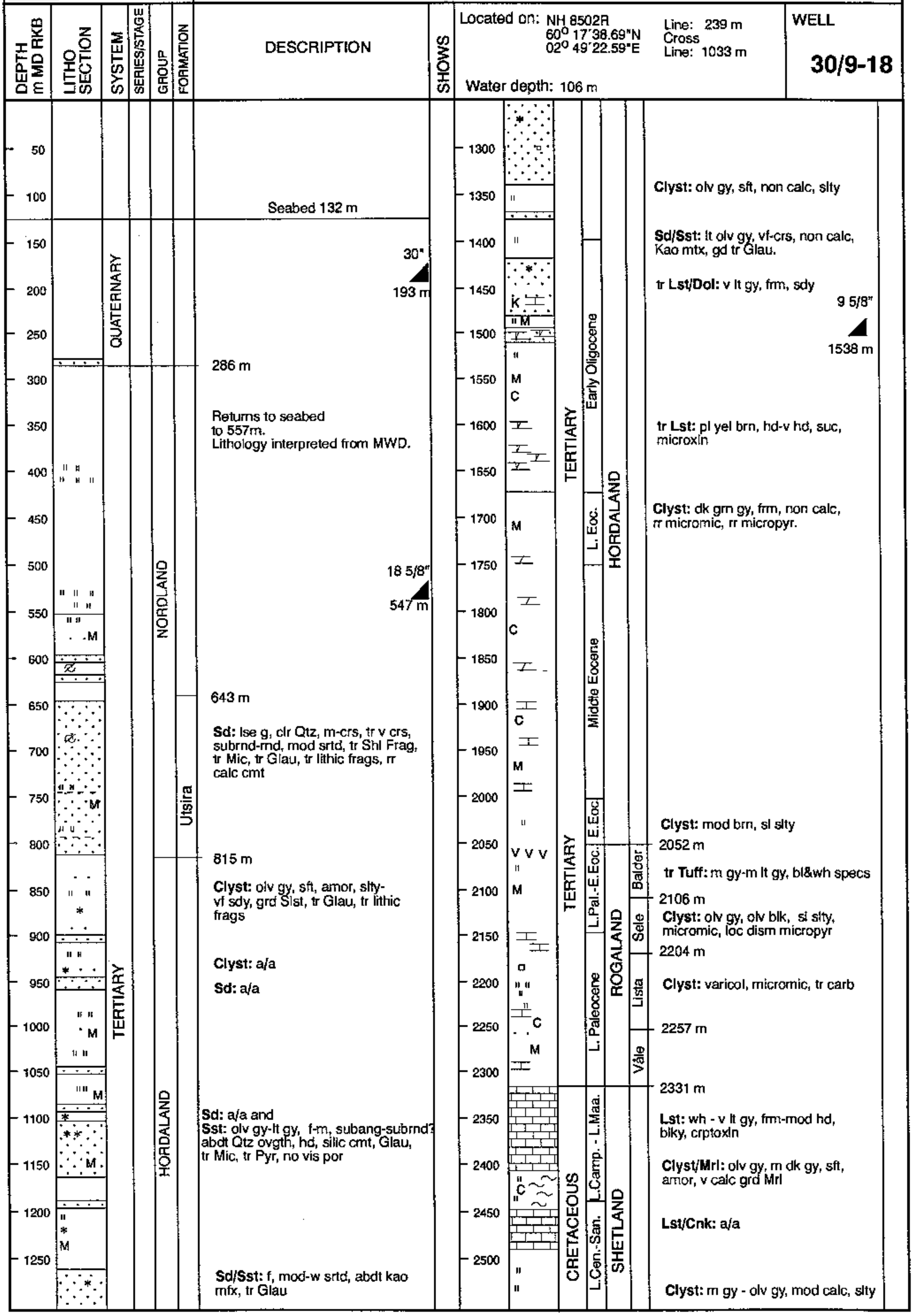
GEOLOGICAL WELL SUMMARY

Located on: NH 8502R
60° 17′38.69"N
02° 49′22.59"E

Line: 239 m
Cross
Line: 1033 m

Water depth: 106 m

WELL
30/9-18



Seabed 132 m

286 m

Returns to seabed to 557m.
Lithology interpreted from MWD.

643 m

Sd: lse g, clr Qtz, m-crs, tr v crs, subrnd-rnd, mod srtd, tr Shl Frag, tr Mic, tr Glau, tr lithic frags, rr calc cmt

815 m

Clyst: olv gy, sft, amor, slty-vf sdy, grd Slst, tr Glau, tr lithic frags

Clyst: a/a

Sd: a/a

Sd: a/a and
Sst: olv gy-lt gy, f-m, subang-subrnd? abdt Qtz ovgth, hd, silic cmt, Glau, tr Mic, tr Pyr, no vis por

Sd/Sst: f, mod-w srtd, abdt kao mtx, tr Glau

Clyst: olv gy, sft, non calc, slty

Sd/Sst: lt olv gy, vf-crs, non calc, Kao mtx, gd tr Glau.

tr **Lst/Dol:** v lt gy, frm, sdy

tr **Lst:** pl yel brn, hd-v hd, suc, microxln

Clyst: dk grn gy, frm, non calc, rr micromic, rr micropyr.

Clyst: mod brn, sl slty

2052 m

tr **Tuff:** m gy-m lt gy, bl&wh specs

2106 m

Clyst: olv gy, olv blk, sl slty, micromic, loc dism micropyr

2204 m

Clyst: varicol, micromic, tr carb

2257 m

2331 m

Lst: wh - v lt gy, frm-mod hd, blky, crptoxln

Clyst/Mrl: olv gy, m dk gy, sft, amor, v calc grd Mrl

Lst/Cnk: a/a

Clyst: m gy - olv gy, mod calc, slty

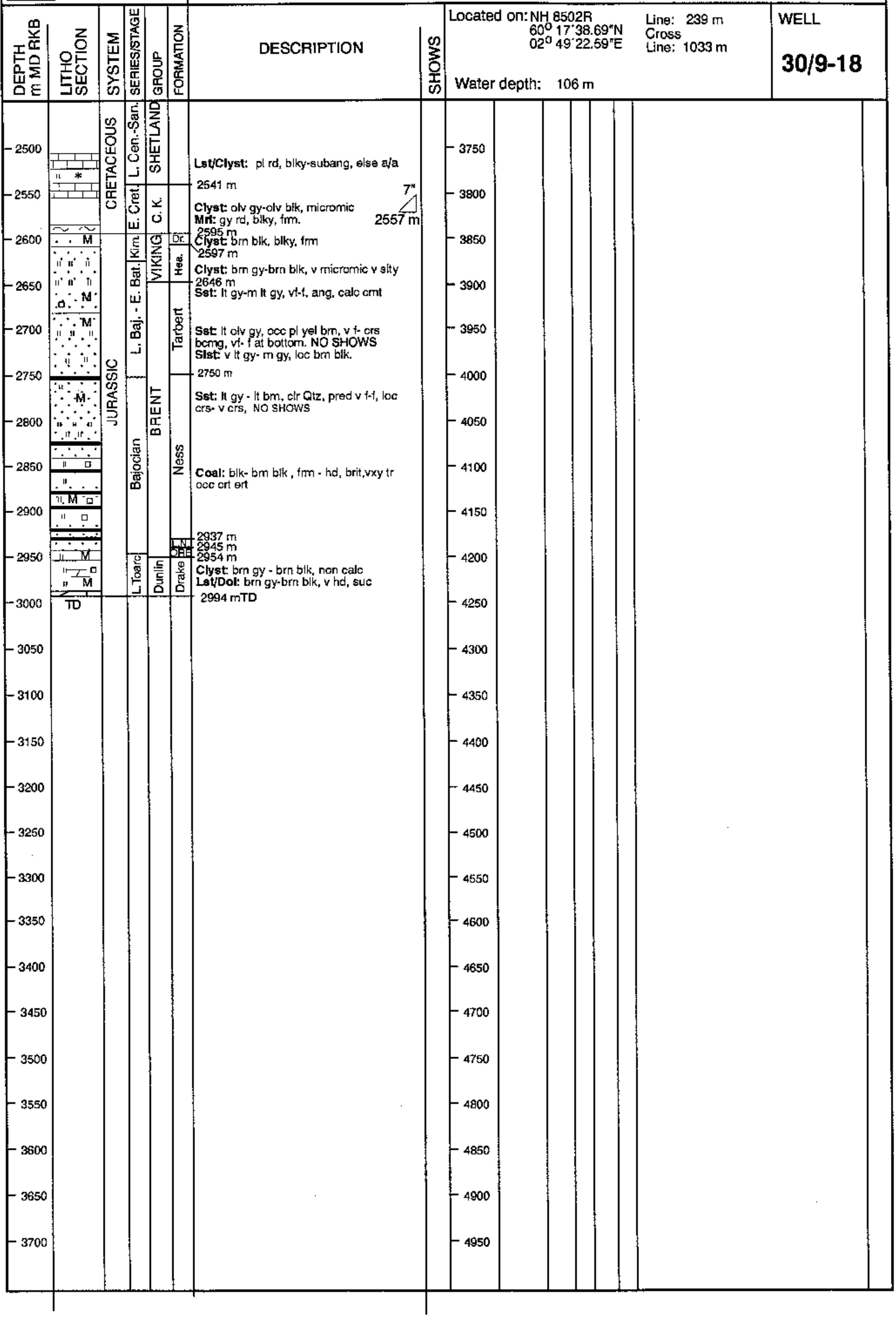
GEOLOGICAL WELL SUMMARY

Located on: NH 8502R
60° 17'38.69"N
02° 49'22.59"E

Line: 239 m
Cross Line: 1033 m

Water depth: 106 m

WELL
30/9-18



Lst/Clyst: pl rd, blky-subang, else a/a

2541 m

Clyst: olv gy-olv blk, micromic
Mrl: gy rd, blky, frm.

2595 m

Clyst: brn blk, blky, frm

2597 m

Clyst: brn gy-brn blk, v micromic v slty

2646 m

Sst: lt gy-m lt gy, vf-f, ang, calc cmt

Sst: lt olv gy, occ pl yel brn, v f- crs bcmg, vf- f at bottom. NO SHOWS
Slst: v lt gy- m gy, loc brn blk.

2750 m

Sst: lt gy - lt brn, clr Qtz, pred v f-f, loc crs- v crs, NO SHOWS

Coal: blk- brn blk , frm - hd, brit,vxy tr occ crt ert

2937 m
2945 m
2954 m

Clyst: brn gy - brn blk, non calc
Lst/Dol: brn gy-brn blk, v hd, suc

2994 mTD

FORMATION PRESSURE WORKSHEET

Well No.: 30/9 - 18
Rig : Treasure Saga
Date : 07.04.95
Pressure Units : Bar
RKB-MSL : 26 m
Witnessed by : S.S. Gahlla

Run No. 3A	Depth (MD)	Depth TVD (RKB)	Initial Hydrostatic Press		Formation Pressure		Final Hydrostatic Press		Time		Remarks
Test No			Strain	HP	Strain	HP	Strain	HP	Set	Retract	
1	2624	2624	299.3	299.3	271.69	271.71	299.3	299.4	12:17	12:19	42.70 mD/CP. V. good perm.
2	2627.5	2627.5	299.6	299.8	271.93	272.07	299.6	299.8	12:27	12:29	21.50 mD/CP. V. good perm.
3	2645.5	2645.5	301.6	301.8	273.64	273.81	301.6	301.8	12:37	12:41	21.96 mD/CP. V. good perm.
4	2657	2657	302.8	303.1	274.7	274.88	302.8	303.1	12:50	12:53	676.96 mD/CP. Excellent perm.
5	2662	2662	303.4	303.6	275.17	275.37	303.4	303.7	13:01	13:04	457.77 mD/CP. Excellent perm.
6	2689	2689	306.4	306.7	277.79	278.02	306.4	306.7	13:12	13:15	77.72 mD/CP. V. good perm.
7	2707	2707	308.4	308.7	279.54	279.77	308.4	308.7	13:22	13:25	132.82 mD/CP. V. good perm.
8	2767	2767	315.0	315.4	284.43	284.63	315.1	315.4	13:32	13:35	233.03 mD/CP. Excellent perm.
9	2772.5	2772.5	315.7	316.1	284.96	285.19	315.7	316.0	13:41	13:44	53.92 mD/CP. V. good perm.
10	2783	2783	316.8	317.2	285.98	286.20	316.8	317.2	13:48	13:51	1016.04 mD/CP. Excellent perm.
11	2793	2793	318.0	318.3	286.93	287.18	318.0	318.3	14:00	14:04	51.11 mD/CP. V. good perm.
12	2822	2822	321.2	321.6	289.43	289.70	321.2	321.6	14:15	14:19	120.68 mD/CP V. good perm.
13	2826	2826	321.6	322.0	289.80	290.09	321.7	322.1	14:26	14:30	55.27 mD/CP V. good perm.
14	2867	2867	326.3	326.7	293.95	294.24	326.3	326.7	14:36	14:40	8.58 mD/CP; Good perm.
15	2873.5	2873.5	327.0	327.4	294.56	294.83	327.0	327.3	14:47	14:50	24.05 mD/CP; V. good perm

SECTION B

OPERATIONS

Prepared by: David J. Tjörwold Drilling Engineer

Verified by: ________________ Senior Drilling Engineer

Approved by: Durund Myrseth Drilling Superintendent

Norsk Hydro

GENERAL INFORMATION ON WELL 30/9-18

Field : OSEBERG EAST Country: NORWAY
Licence : 104
UTM zone : 31 Central Meredian: 3' E Horiz. Datum: ED50

LOCATION coordinates:		Surface	Target
UTM	N [m]:	6684332.9	0.0
UTM	E [m]:	490211.4	0.0
Geographical	N :	60 27'38.69"	
Geographical	E :	02 49'22.59"	

Water depth : 107 m Reference point height: 26 m
Formation at TD : No formation data found

Operator :	NORSK HYDRO PRODUKSJON A/S	Share: 30.00 %
Partners :	DEN NORSKE STATS OLJESELSKAP A/S	Share: 50.00 %
	CONOCO PETROLEUM NORGE A/S	Share: 5.00 %
	DET NORSKE OLJESELSKAP A/S	Share: 5.00 %
	NORSK AGIP A/S	Share: 5.00 %
	SAGA PETROLEUM A/S	Share: 5.00 %

RIG NAME : TREASURE SAGA

Total depth (RKB) : 2993 m MD 2993 m TVD

TIME SUMMARY

Start time : 13-mar-1995 00:00
Spudding date : 14-mar-1995
Abandonment date: 08-apr-1995

Main operation		Hours	Days	%
MOBILIZATION	:	11.0	0.5	1.6
DRILLING	:	468.0	19.5	68.6
FORMATION EVALUATION LOGGING	:	56.0	2.3	8.2
FORMATION EVALUATION CORING	:	5.5	0.2	0.8
PLUG AND ABANDONMENT	:	66.0	2.8	9.7
DOWNTIME DRILLING	:	65.5	2.7	9.6
DOWNTIME FORM. EVAL. MWD	:	3.0	0.1	0.4
DOWNTIME FORM. EVAL. LOGGING	:	3.0	0.1	0.4
DOWNTIME PLUG AND ABANDONMENT	:	4.5	0.2	0.7
Sum	:	682.5	28.4	

Hole and casing record

Hole	Depth [m MD]	Casing	Depth [m MD]
36"	193	30"	193
24"	557	18 5/8"	547
12 1/4"	1550	9 5/8"	1538
8 1/2"	2559	7"	2557
6"	0		

Well status : PERMANENTLY ABANDONED

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SECTION B

1 POSITIONING AND ANCHORING OF THE RIG

The location of well 30/9-18 was defined as NH 85202R, line 239, crossline 1033.The spud tolerances was 50 m in all directions.

Planned position of the well:

	Geographical coord.	UTM coord.
Lat:	60°17' 38.69" N	6 684 332.9 mN
Long:	02°49' 22.59" E	490 211.4 mE

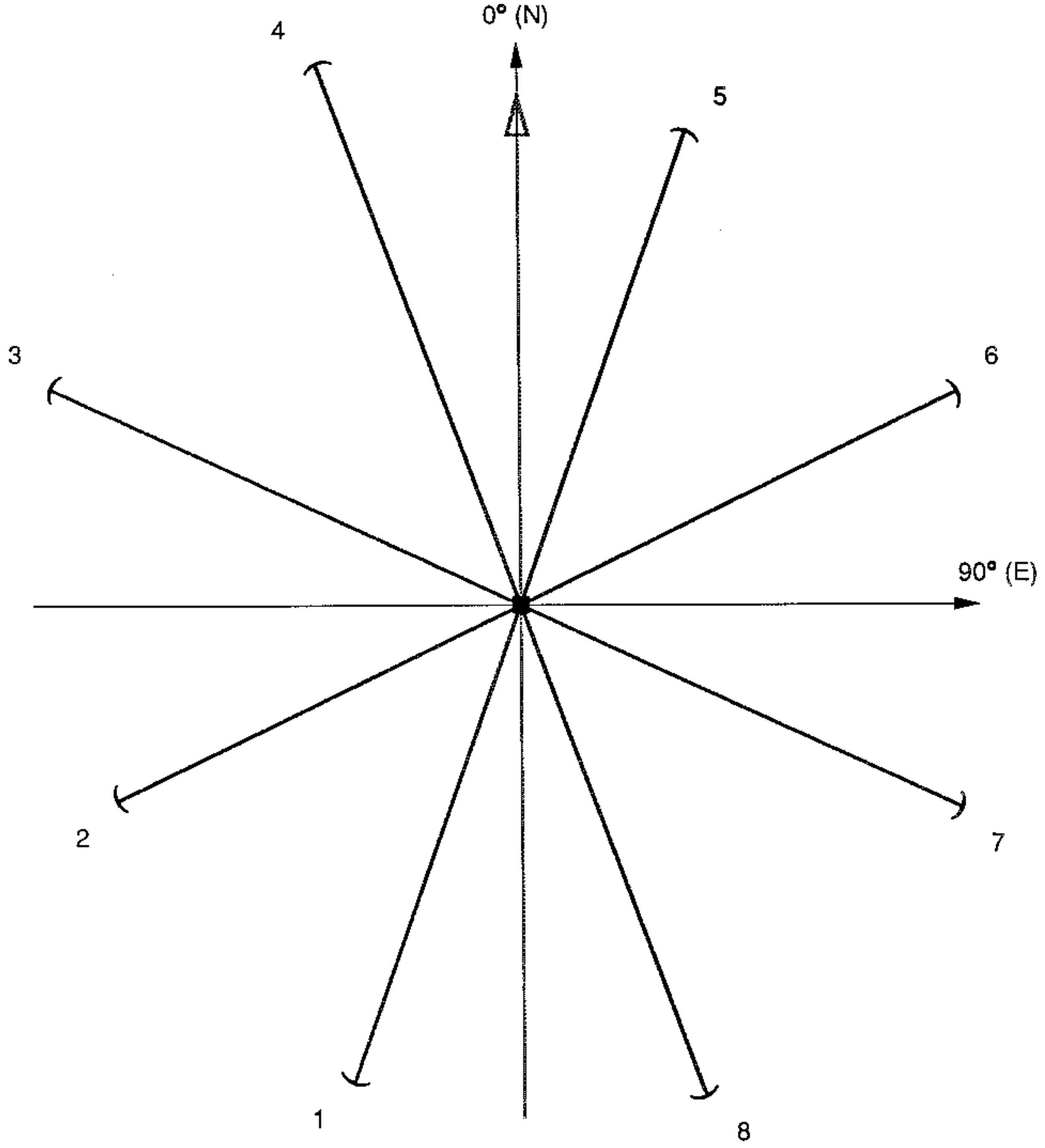
The equipment on board the rig for navigation and positioning was the differential global positioning system (DGPS).

Final position of the well:

Lat:	60°17' 38.69" N	6 684 332.9 mN
Long:	02°49' 22.59" E	490 211.4 mE
	Geographical coord.	UTM coord.

Co-ordinate reference: ED-1950 UTM ZONE 31 (CM 3° E)

The mooring line pattern is shown in Figure B-1.



RIG HEADING 0 DEG.

ANCHOR NO	DIRECTION (DEG.)	LENGTH (m)
1	202	1095
2	247	1063
3	292	1224
4	337	1248
5	22	1085
6	67	1153
7	112	1152
8	157	1134

Figure 1		Mooring Line Pattern TREASURE SAGA 30/9-18	HYDRO

2 OPERATION RESUME

2.1 Summary of operations

The rig "Treasure Saga" was pulled on the anchors from the 30/9-17 location. As the latter was abandoned due to problems encountered by unpredicted shallow gas.

36" hole section

Well 30/9-18 was spudded on the 14th of march 1995 at 10:30 hrs. The 36" hole was drilled from 132 m MD to TD at 193 m MD using a 36" hole opener and 17 1/2" bit.

The casing was ran and landed with the shoe at 193 m.

24" hole section

The 24" hole was drilled from 193 m MD to 557 m MD. (Shallow gas was predicted at 590 m MD) Ran and landed the 18 5/8" casing at 547 m MD. As the cement was displaced bubbles from the hole was observed indicating shallow gas. Displaced out the entire cement volume and filled the annulus with 1.3 sg mud. Mixed and pumped gasblock cement around.

Installed the BOP.

12 1/4" hole section

Drilled the shoetrack and 3 m of new formation prior to displacing the well to 1.2 sg mud. Performed a leak off test to 1.57 sg.

Drilled 12 1/4" hole from 560 m to 1550 m in two bit runs. Some tight hole was experienced on the trips. Increased the mudweight to 1.25 sg prior to open hole logging.

The following logs were run at TD
Run no 1 BGT/DLL/LSS/LDL/MSFL/GR/AMS/SP

Installed the 9 5/8" casing with the shoe at 1538 m MD. The cement volume was calculated to have the cement top in safe distance from the wellhead to ease any cutting and retrieving of the wellhead.

8 1/2" hole section

Drilled the shoetrack and 3 m of new formation. Performed a leak off test to 1.6 sg equivalent mudweight.

Displaced the hole to 1.43 sg mud. Drilled 8 1/2" hole from 1550 m to section TD at 2559 m MD in 3 bitruns.

The following logs were runat section TD:
Run no. 2: BGT/DLL/MSFL/LSS/LDL/GR/AMS/SP

Installed the 7" line from 2557 m to 1383 m MD.

6" section

Drilled the shoetrack and 3 m of new formation. Displaced the well to 1.15 sg mud. Performed the leak off test to 1.82 sg equivalent mudweight.

Drilled 6" hole from 2559 m to well TD at 2994 m in three bit trips. The average ROP was 5- 6 m/hrs.

The following logs were run:

Run no.3C	DLL/MSFL/LSS/GR/SP/AMS
run no 3C/A	LDL/CNL/FMS/GR/AMS
Run no 3A	RFT/HP/GR/AMS
run no: 4	VSP
run no:5	CST/GR

Comment:
As a rare occasion this well was planned with a 6" hole through the reservoir to prove any cost savings for reduced hole diameters.

A cost benefit study of drilling 6" hole versus the material saving has been carried out. This makes clear that the material cost savings was overrun by time dependant cost due to slow penetration rate in the 6" hole.

Permanent plug and abandonment

A cement plug was spotted from TD to 2417 m MD. The plug was load tested with a 6" bit.

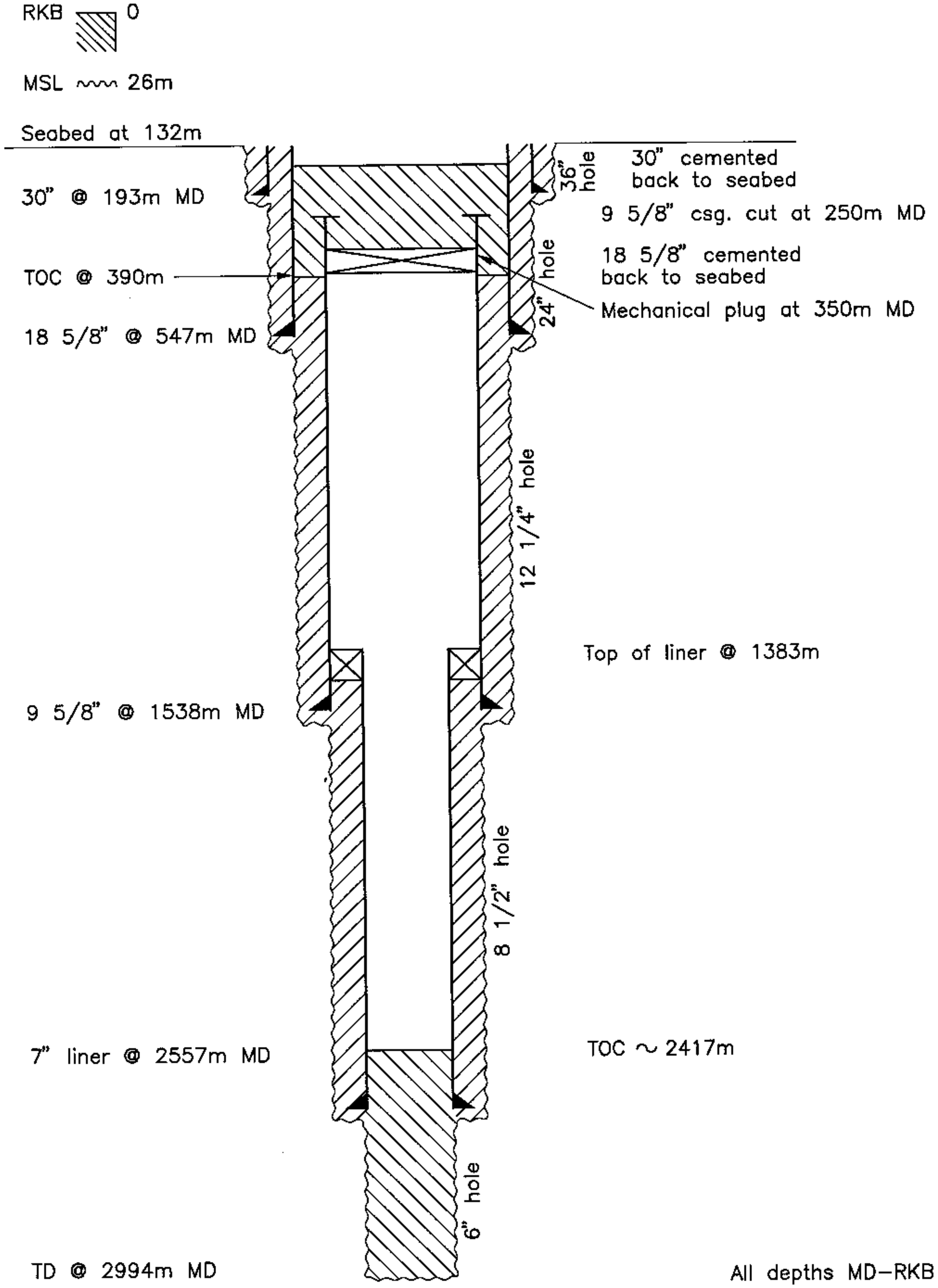
Installed and pressure tested a mechanical plug in the 9 5/8" casing at 350 m MD.

The 9 5/8" casing was cut at 250 m MD. Retrieved the 9 5/8" casing and spotted a cement plug from the mechanical plug to 145 m MD.

Cut and retrieved the 18 3/4" wellhead.

The well was finished on the 13 -april-1995 at 12:40 hrs.

The final well status is shown in Figure B-2.



All depths MD–RKB

Final
Well Report
30/9-18

Figure: B-2

Well Status
Permanent Abandonment

TBO0412A/D/09.95

2.2 Daily reports

OPERATION TIME ON WELL 30/9-18

Report no : 1 Date: 14-mar-1995 Section size: 36"
Midnight depth: 194 m MD Estimated PP: 1.03 sg Mudweight : sg

Main Oper.	Sub Operation	Description	Oper. Time
DRILL	TRIPOH	Ran in the hole with the spud assembly and tagged the seabed at 132.3 m.	1.50
DRILL	DRILL	Drilled 36" hole from 132.3 m to 154 m.	3.00
DNDRI	WIPER	Reamed boulders and moved the rig to correct the inclination of the well.	3.00
DRILL	DRILL	Drilled 36" hole to 193 m and 17 1/2" hole to 194 m.	6.00

Report no : 2 Date: 15-mar-1995 Section size: 36"
Midnight depth: 194 m MD Estimated PP: 1.03 sg Mudweight : 1.05 sg

Main Oper.	Sub Operation	Description	Oper. Time
DRILL	CIRC	Pumped and displaced a 20 m3 high viscous pill.	0.50
DRILL	CIRC	Displaced the hole with 50 m3 of 1.20 sg mud.	0.50
DRILL	WIPER	Performed a wipertrip to 142 m.	0.50
DRILL	CIRC	Displaced the hole with 50 m3 of 1.40 sg mud.	0.50
DRILL	TRIPOH	Pulled out of the hole. Ran in with the beacon. The beacon was tangeled around the drill string. Ran in and placed beacon #2 on the sea bed. Pulled out of the hole with the drill string and beacon #1.	2.50
DRILL	CSG	Rigged up to run 30" casing.	0.50
DNDRI	WAIT	Waiting on the weather to come down.	6.00
DRILL	CSG	Picked up 3 x 30" casing joints. Secured the PGB in the moon pool. Attempted to run the casing through the splach zone without success.	2.00
DNDRI	WAIT	Waited on the weather to come down.	6.00
DRILL	CSGRUNOH	Ran 30" casing to the sea bed at 132 m. Positioned the rig and stabbed into the hole. Landed the 30" casing with the shoe at 193 m.	5.00

Report no : 3 Date: 16-mar-1995 Section size: 36"
Midnight depth: 194 m MD Estimated PP: 1.03 sg Mudweight : 1.05 sg

Main Oper.	Sub Operation	Description	Oper. Time
DRILL	CSGRUNOH	Checked the level indicator with the ROV. The inclination of the PGB was 1.5 deg.	0.50
DRILL	CIRC	Circulated 25 m3 seawater prior to the cement job. Tested the surface lines to 100 bar.	0.50
DRILL	CMT	Cemented the 30" casing. Pumped 18.4 m3 1.56 sg lead slurry and 20.4 m3 1.90 sg tail slurry. Displaced the cement with 5.0 m3 seawater.	1.50
DRILL	CSG	Released the 30" casing running tool and pulled out to the PGB with the stinger. Washed the PGB. Pulled out of the hole and laid down the 30" casing running tool and the stinger.	1.50

Report no : 3 Date: 16-mar-1995 Section size: 24"
Midnight depth: 194 m MD Estimated PP: 1.03 sg Mudweight : 1.05 sg

Main Oper.	Sub Operation	Description	Oper. Time
DRILL	CSG	Made up the subsea plugs to the 18 3/4" casing running tool. Made up the 18 3/4" well head to the running tool and racked same in the derrick.	2.00
DRILL	CMT	Made up and racked the cement head in the derrick.	2.00
DRILL	TRIPCH	Broke out the 17 1/2" bit and the 36" hole opener.	1.00
DRILL	TRIPCH	Made up the 24" bottom hole assembly. Ran in the hole and tagged the top of the cement at 188 m.	2.00
DRILL	CMTDRIL	Drilled cement from 188 m to 193 m. Opened up from 17 1/2" to 24" hole from 193 m to 194 m.	2.00
DRILL	DRILL	Drilled 24" hole from 194 m to 557 m.	8.50
DRILL	CIRC	Pumped a 20 m3 high viscous pill around the hole. Displaced the hole with 130 m3 1.20 sg mud.	1.50
DRILL	WIPER	Performed a wipertrip to the 30" casing shoe at 193 m.	1.00

Report no : 4 Date: 17-mar-1995 Section size: 24"
Midnight depth: 557 m MD Estimated PP: 1.03 sg Mudweight : 1.05 sg

Main Oper.	Sub Operation	Description	Oper. Time
DRILL	CIRC	Displaced the hole with 130 m3 1.20 sg mud.	1.00
DRILL	TRIPOH	Pulled out of the hole from 557 m to the 30" casing shoe at 193 m.	0.50
DRILL	TRIPCH	Pulled out of the hole from 193 m.	1.00
DRILL	CSG	Rigged up to run 18 5/8" casing.	1.00
DRILL	CSGRUNCH	Ran 18 5/8" casing to 24 m.	1.00
DNDRI	EQUIP	Attempted to get 18 5/8" casing back-up tongue to function without success.	0.50
DRILL	CSGRUNCH	Ran 18 5/8" casing from 24 m to 193 m.	3.00
DRILL	CSGRUNOH	Ran 18 5/8" casing in open hole from 193 m to 416 m.	1.50
DRILL	CSGRUNOH	Ran 18 5/8" casing on 5" heavy weight drill pipe from 416 m to 547 m. Landed the casing with the shoe at 547 m. Made a 25 ton overpull test.	1.50
DRILL	CIRC	Circulated 75 m3 with seawater.	0.50
DRILL	CMT	Pressure tested the cement lines to 150 bar. Mixed and pumped 84,6 m3 1.44 sg cement slurry. Stopped due to gas flow from the well.	1.50
DNDRI	WELLCONTR	Displaced the cement out of the hole with 224 m3 seawater.	1.50
DNDRI	WELLCONTR	Pumped 160 m3 1.30 sg mud to kill the well. Observed the well static.	1.00
DNDRI	WELLCONTR	Observed the well. Pumped 2 m3 1.30 sg mud each hour.	8.50

Report no : 5 Date: 18-mar-1995 Section size: 24"
Midnight depth: 557 m MD Estimated PP: 1.03 sg Mudweight : 1.05 sg

Main Oper.	Sub Operation	Description	Oper. Time
DNDRI	WELLCONTR	Continued waiting for cement and cement chemicals. Pumped 20 m3 of 1.30 sg mud before the cement job.	8.00
DNDRI	WELLCONTR	Pressure tested the surface lines to 150 bar. When starting the cement job, there was problems with the mix liquid.	0.50
DNDRI	WELLCONTR	Displaced the cement out of the hole with 163 m3 1.30 sg mud.	2.00
DNDRI	WELLCONTR	Observed the well and pumped 1 m3 1.30 sg mud each 0.5 hour while premixing the cement chemicals.	3.50
DNDRI	WELLCONTR	Pressure tested the surface lines to 150 bar. Mixed and pumped 129 m3 1.56 sg lead slurry and 10 m3 1.90 sg tail slurry.	3.00
DRILL	CMT	Dropped the dart and displaced the cement with 63 m3 1.20 sg mud. Bumped the plug with 76 bar. Checked for back flow. There was no flow.	1.00
DRILL	CSG	Released the casing running tool. Pulled out of the hole and laid down the casing running tool.	1.00
DRILL	BOP	Made up and ran in the hole with the wellhead washing tool. Washed the wellhead and the PGB. Pulled out of the hole and laid down the washing tool.	3.00
DRILL	CMT	Made up the grouting string and ran in the hole. Attempted to stab into the grouting funnel.	2.00

Report no : 6 Date: 19-mar-1995 Section size: 36"
Midnight depth: 557 m MD Estimated PP: 1.03 sg Mudweight : 1.20 sg

Main Oper.	Sub Operation	Description	Oper. Time
DRILL	CMT	Stabbed into the grouting funnel. Tagged cement at 140 m, 9.5 m below the 18 3/4" wellhead.	0.50
DRILL	CMT	Connected the cement stand and pressure tested the surface lines to 100 bar.	0.50
DRILL	CMT	Mixed and pumped 8.2 m3 1.95 sg cement slurry. Displaced with 1.0 m3 seawater.	0.50
DRILL	CMT	Pulled out with the grouting string. Laid down 3 x 2 3/8" drill pipe.	0.50
DRILL	BOPHAND	Rigged up to run the BOP.	1.00
DRILL	BOP	Rigged up for running the BOP. Run the BOP on the riser to right abowe the guide posts.	10.50
DNDRI	WAIT	Waited on the weather to come down.	2.50
DRILL	BOP	Connected the kill, the choke and the booster line.	3.00
DNDRI	WAIT	Waited on the weather to come down.	2.00
DRILL	BOP	Landed and latched the BOP. Performed a overpull test to 50 ton.	0.50
DRILL	BOPHAND	Laid down the landing joint. Installed the diverter. Performed an overpull test to 25 ton. Rigged down the riser running equipment.	2.00
DRILL	BOPTEST	Made up the BOP test plug and ran in the hole.	0.50

Report no : 7 Date: 20-mar-1995 Section size: 24"
Midnight depth: 773 m MD Estimated PP: 1.03 sg Mudweight : 1.20 sg

Main Oper.	Sub Operation	Description	Oper. Time
DRILL	BOPTEST	Ran in the hole with the BOP test plug. Landed the test plug in the wellhead.	0.50
DRILL	BOPTEST	Pressure tested the wellhead connection to 35/400 bar for 5/10 minutes. Function tested the BOP from the blue and the yellow pod. Functioned the upper pipe ram from the acoustic system.	1.50
DRILL	BOPTEST	Pulled out and laid down the BOP test tool.	0.50
DRILL	WHINST	Set the nominal bore protector.	1.00
DRILL	CSG	Made up the 9 5/8" casing hanger running tool to a stand of drill pipe and racked in the derrick.	0.50
DRILL	TRIPCH	Made up the 17 1/2" drilling assembly and ran in the hole. Tagged the top of the cement at 534 m.	2.00
DRILL	CMTDRIL	Drilled the cement from 534 m to 547 m. Cleaned the rathole from 547 m to 557 m.	0.50
DRILL	CSGDRIL	Drilled the 17 1/2" hole from 557 m to 560 m.	0.50
DRILL	CSGDRIL	Swept the hole with 20 m3 gel mud. Reamed the rathole.	0.50
DNDRI	EQUIP	Changed from upper to lower slip joint packer.	0.50
DRILL	CIRC	Displaced the hole to 1.20 sg KCl mud.	1.00
DRILL	CSGDRIL	Pulled back into the 18 5/8" casing. Flushed the kill and the choke lines with 1.20 sg KCl mud. Performed a leak-off test to 1.57 sg equivalent mud weight.	1.00
DRILL	TRIPCH	Pulled out of the hole and laid down 4 x 9 1/2" drill collars, the bit and the bit sub.	2.00
DRILL	CMT	Made up and racked the cement head.	0.50
DRILL	TRIPCH	Made up the 12 1/4" bit, the bit sub and the pin-pin sub. Racked the same in the derrick.	1.00
DRILL	WHINST	Retrieved the nominal seat protector. Set the 16" wear bushing.	1.50
DRILL	TRIPCH	Laid down the 9 1/2" non magnetic drill collar. Made up the 12 1/4" drilling assembly and ran in the hole to 561 m.	3.00
DRILL	DRILL	Drilled the 12 1/4" hole from 561 m to 773 m.	6.00

Report no : 8 Date: 21-mar-1995 Section size: 12 1/4"
Midnight depth: 1342 m MD Estimated PP: 1.03 sg Mudweight : 1.20 sg

Main Oper.	Sub Operation	Description	Oper. Time
DRILL	DRILL	Drilled the 12 1/4" hole from 773 m to 1109 m.	9.00
DRILL	TRIPOH	Pulled out of the hole to the 18 5/8" casing shoe.	1.50
DRILL	TRIPCH	Flow checked in the 18 5/8" casing shoe. The well was static. Pulled out of the hole and broke out the bit.	1.00
DRILL	BHAHAND	Made up the new 12 1/4" bit. Changed out the worn stabilizer.	0.50
DRILL	TRIPCH	Ran in the hole to the 18 5/8" casing shoe.	1.00

Report no : 8 Date: 21-mar-1995 Section size: 12 1/4"
Midnight depth: 1342 m MD Estimated PP: 1.03 sg Mudweight : 1.20 sg

Main Oper.	Sub Operation	Description	Oper. Time
DRILL	REAM	Ran in the hole to 1109 m. Reamed several intervals.	3.00
DRILL	DRILL	Drilled the 12 1/4" hole from 1109 m to 1342 m.	8.00

Report no : 9 Date: 22-mar-1995 Section size: 12 1/4"
Midnight depth: 1550 m MD Estimated PP: 1.03 sg Mudweight : 1.25 sg

Main Oper.	Sub Operation	Description	Oper. Time
DRILL	DRILL	Continued drilling 12 1/4" hole from 1342 m to 1550 m.	12.50
DRILL	CIRC	Pumped a 25 m3 high viscous pill. Circulated the hole clean.	2.50
DNDRI	WIPER	Pulled out of the hole from 1550 m to 1127 m.	1.00
DNDRI	WIPER	Backreamed from 1127 m to 1100 m.	0.50
DNDRI	WIPER	Pulled out of the hole from 1100 m to the 18 5/8" casing shoe at 547 m.	1.00
DNDRI	WIPER	Ran in the hole from 547 m to 983 m.	0.50
DNDRI	WIPER	Reamed tight spots from 983 m to 1550 m. Hard reaming from 983 m to 988 m.	3.50
DRILL	CIRC	Pumped a 20 m3 high viscous pill. Increased the mud weight from 1.20 sg to 1.25 sg and circulated the hole clean.	2.00
DRILL	TRIPOH	Pulled out of the hole from 1550 m to 1350 m.	0.50

Report no : 10 Date: 23-mar-1995 Section size: 12 1/4"
Midnight depth: 1550 m MD Estimated PP: 1.03 sg Mudweight : 1.25 sg

Main Oper.	Sub Operation	Description	Oper. Time
DRILL	TRIPOH	Continued pulling out of the hole from 1350 m to the 18 5/8" casing shoe at 547 m.	1.50
DRILL	TRIPCH	Flowchecked for 15 minutes. The well was stable. Pulled out of the hole from 547 m to 324 m.	0.50
DRILL	BHAHAND	Pulled out of the hole with the BHA.	1.00
FLOG	LOGHAND	Rigged up the wireline equipment.	0.50
FLOG	LOGHAND	Made up the logging string: BGT/DLL/LSS/LDL/MSFL/GR/AMS/SP.	1.00
FLOG	LOG	Ran in the hole to 1533 m and logged with log #1. Pulled out of the hole with the wireline.	5.00
FLOG	LOGHAND	Laid down the logging tools. Rigged down the wireline equipment.	1.50
DRILL	WHINST	Made up the wear busing retrieving tool. Ran in the hole and retrieved the 16" wear bushing. Washed the wellhead. Pulled out of the hole and laid down the wear bushing. Serviced the wear bushing retrieving tool.	1.00

Report no : 10 Date: 23-mar-1995 Section size: 12 1/4"
Midnight depth: 1550 m MD Estimated PP: 1.03 sg Mudweight : 1.25 sg

Main Oper.	Sub Operation	Description	Oper. Time
DRILL	CSG	Made up the 9 5/8" casing hanger to a 9 5/8" casing pup joint. Made up the 13 3/8" dummy hanger to the 9 5/8" casing hanger. Rigged up to run 9 5/8" casing.	2.50
DRILL	CSG	Made up the sub sea plugs to the 9 5/8" casing running tool. Made up the 9 5/8" casing hanger to the running tool. Racked the same in the derrick. Held safety meeting with the involved personnel.	1.00
DRILL	CSGRUNCH	Ran 9 5/8" casing to the 18 5/8" casing shoe at 547 m.	4.00
DRILL	CSGRUNOH	Ran 9 5/8" casing from 547 m to 1406 m. Made up the 9 5/8" casing hanger to the casing string.	4.00
DNDRI	EQUIP	Broke out the 9 5/8" casing hanger to change out damaged joint below.	0.50

Report no : 11 Date: 24-mar-1995 Section size: 12 1/4"
Midnight depth: 1550 m MD Estimated PP: 1.03 sg Mudweight : 1.25 sg

Main Oper.	Sub Operation	Description	Oper. Time
DNDRI	EQUIP	Broke out the 9 5/8" casing hanger. Changed out the damaged casing joint. Made up the 9 5/8" casing hanger to the casing string.	2.00
DRILL	CSGRUNOH	Ran in the hole with the 9 5/8" casing on 5" heavy weight drill pipe. Landed the casing with the shoe at 1538 m.	1.00
DRILL	CIRC	Broke the circulation and circulated the bottoms up to the riser.	1.00
DRILL	CMT	Pumped 15 m3 1.40 sg Dual E spacer, 47.4 m3 1.56 sg lead slurry and 10.0 m3 1.90 sg tail slurry. Displaced with 53.4 m3 1.25 sg mud and bumped the plug. No flow when checking for back flow.	2.50
DRILL	CSG	Rigged up and tested the high pressure line to 378 bar. Pressure tested the 9 5/8" casing to 378 bar.	1.50
DRILL	CSG	Set and tested the seal assembly to 378 bar.	1.00
DRILL	CSG	Pulled out of the hole with the casing landing string.	0.50
DRILL	WHINST	Set the 9 5/8" wear bushing.	0.50
DRILL	BHAHAND	Laid down the cement head, the wash tool and the 12 1/4" drilling assembly.	4.00
DRILL	BHAHAND	Made up the 8 1/2" bottom hole assembly and ran in the hole to 420 m.	2.50
DRILL	SLIP	Slipped and cut 112' of drill line.	1.00
DRILL	TRIPCH	Ran in the hole from 420 m to 1500 m.	1.50
DRILL	OTHER	Held kick drill with drilling crew.	0.50
DRILL	CSGDRIL	Washed down from 1500 m and tagged top of the float at 1513 m. Drilled the float and cement to 1531 m.	4.50

Report no : 12 Date: 25-mar-1995 Section size: 8 1/2"
Midnight depth: 2070 m MD Estimated PP: 1.30 sg Mudweight : 1.43 sg

Main Oper.	Sub Operation	Description	Oper. Time
DRILL	CSGDRIL	Drilled the cement in 9 5/8" casing from 1531 m. Drilled through the shoe at 1538 m.	1.00
DRILL	CIRC	Washed and reamed from 1538 m to bottom at 1550 m. Drilled 8 1/2" hole from 1550 m to 1553 m. Circulated for 15 minutes and pulled into the 9 5/8" casing shoe.	0.50
DRILL	FMTEST	Performed a leak-off test to 1.60 sg equivalent mud weight.	1.00
DRILL	DRILL	Drilled 8 1/2" hole from 1553 m to 2070 m.	21.50

Report no : 13 Date: 26-mar-1995 Section size: 8 1/2"
Midnight depth: 2122 m MD Estimated PP: 1.21 sg Mudweight : 1.43 sg

Main Oper.	Sub Operation	Description	Oper. Time
DRILL	DRILL	Drilled the 8 1/2" hole from 2070 m to 2122 m.	11.00
DRILL	TRIPOH	Pulled out of the hole to the 9 5/8" casing shoe.	1.00
DRILL	TRIPCH	Pulled out of the hole from the 9 5/8" casing shoe to 258 m.	1.50
DRILL	BHAHAND	Pulled out of the hole with the 8 1/2" bottom hole assembly and laid down the bit. Dumped the memory from the MWD. Serviced the MWD.	1.50
DNDRI	EQUIP	Made up the new bit and ran in the hole until 5" drill pipe at the well head. Rotated for 10 minutes and pulled out of the hole.	2.00
DNDRI	EQUIP	Retrieved the 9 5/8" wear bushing. Redressed the wear bushing running tool.	2.00
DNDRI	EQUIP	Set the new wear bushing. Pulled out with the running tool and the stinger.	1.50
DRILL	BHAHAND	Ran in the hole with the 8 1/2" bottom hole assembly.	1.50
DRILL	TRIPCH	Ran in the hole to the 9 5/8" casing shoe.	1.50
DRILL	TRIPOH	Ran in the hole from the 9 5/8" casing shoe to 1640 m.	0.50

Report no : 14 Date: 27-mar-1995 Section size: 8 1/2"
Midnight depth: 2420 m MD Estimated PP: 1.13 sg Mudweight : 1.43 sg

Main Oper.	Sub Operation	Description	Oper. Time
DRILL	TRIPOH	Ran in the hole from 1640 m to TD at 2122 m.	1.00
DRILL	DRILL	Drilled the 8 1/2" hole from 2122 m to 2420 m.	23.00

Report no : 15 Date: 28-mar-1995 Section size: 8 1/2"
Midnight depth: 2508 m MD Estimated PP: 1.13 sg Mudweight : 1.43 sg

Main Oper.	Sub Operation	Description	Oper. Time
DRILL	TRIPOH	Pulled out of the hole to the 9 5/8" casing shoe.	1.50
DRILL	OTHER	Lubricated the rig.	0.50
DRILL	TRIPCH	Pulled out of the hole from the 9 5/8" casing shoe to 258 m.	1.00
DRILL	BHAHAND	Pulled out of the hole with the bottom hole assembly. Dumped the memory on the MWD.	1.50
DRILL	BHAHAND	Made up the new 8 1/2" rock bit and ran in the hole with the bottom hole assembly to 258 m.	1.00
DRILL	TRIPCH	Ran in the hole from 258 m to the casing shoe.	1.50
DRILL	TRIPOH	Ran in the hole to 2420 m.	1.50
DRILL	DRILL	Drilled 8 1/2" hole from 2420 m to 2501 m.	13.50
DNDRI	EQUIP	Experienced failure on the air system for the crown block saver.	0.50
DRILL	DRILL	Drilled 8 1/2" hole from 2501 m to 2508 m.	1.50

Report no : 16 Date: 29-mar-1995 Section size: 8 1/2"
Midnight depth: 2559 m MD Estimated PP: 1.12 sg Mudweight : 1.43 sg

Main Oper.	Sub Operation	Description	Oper. Time
DRILL	DRILL	Drilled the 8 1/2" hole from 2501 m to 2559 m.	12.00
DRILL	CIRC	Circulated the bottoms up	1.00
DRILL	WIPER	Made a wiper trip to 2370 m.	1.00
DRILL	CIRC	Circulated the hole clean.	0.50
DRILL	TRIPOH	Pulled out to the casing shoe.	1.00
DRILL	TRIPCH	Pulled out to 258 m.	1.50
DRILL	BHAHAND	Pulled out the bottom hole assembly.	1.00
FLOG	LOGHAND	Rigged up for electric logging. Made up the tool string.	2.00
FLOG	LOG	Ran BGT/DLL/MSFL/LSS/LDL/GR/AMS/SP.	4.00

Report no : 17 Date: 30-mar-1995 Section size: 8 1/2"
Midnight depth: 2559 m MD Estimated PP: 1.12 sg Mudweight : 1.43 sg

Main Oper.	Sub Operation	Description	Oper. Time
FLOG	LOG	Ran the BGT/DLL/MSFL/LSS/LDL/GR/AMS/SP.	1.50
FLOG	LOGHAND	Rigged down the tool string and the wireline equipment.	2.00
DRILL	CSG	Made up the cementing head and racked it in the derrick.	0.50
DRILL	CSG	Rigged up to run 7" liner.	0.50
DRILL	CSGRUNCH	Ran the 7" liner.	6.50
DRILL	CSGRUNCH	Made up the liner hanger assembly and continued to run the liner on 5" drill pipe. Was not able to pass the BOP with the hanger.	2.00
DRILL	CSGRUNCH	Pulled out and checked the hanger and slips.	0.50
DRILL	CSGRUNCH	Continued to run the liner to 1538 m. Passed the BOP without problems.	1.00

Report no : 17 Date: 30-mar-1995 Section size: 8 1/2"
Midnight depth: 2559 m MD Estimated PP: 1.12 sg Mudweight : 1.43 sg

Main Oper.	Sub Operation	Description	Oper. Time
DRILL	CSGRUNOH	Broke the circulation and continued to run in with the liner. Tagged bottom at 2559 m. Pulled back to 2557 m.	2.50
DRILL	CSGRUNOH	Established circulation. Dropped the setting ball and set the liner with 130 bar. Released the running tool and sheared out the ball seat with 185 bar.	1.00
DRILL	CMT	Circulated while rotating the liner.	2.00
DRILL	CMT	Pumped 10 m3 1.5 s.g. Dual E spacer. Pressure tested the cement line. Mixed and pumped 23 m3 1.9 s.g. cement slurry.	1.50
DRILL	CMT	Dropped the dart and displaced the cement with 34.87 m3 mud. Bumped the plug with 70 bar. Bled off the pressure and checked for backflow.	0.50
DRILL	CSG	Set the liner packer with 30 ton weight. Pulled out with stinger to 1375 m.	0.50
DRILL	CSG	Circulated out excess cement.	1.50

Report no : 18 Date: 31-mar-1995 Section size: 8 1/2"
Midnight depth: 2559 m MD Estimated PP: 1.12 sg Mudweight : 1.43 sg

Main Oper.	Sub Operation	Description	Oper. Time
DRILL	CSG	Circulated and conditioned the mud.	1.00
DRILL	CSG	Pulled out of the hole. Laid down the liner running tool.	2.00
DRILL	CSG	Laid down the cement head.	0.50
DRILL	BHAHAND	Laid down 15 x 6 1/2" drill collars and 6 1/2" jar.	2.00
DRILL	BOPTEST	Ran in and washed the BOP. Ran in with the BOP test tool.	1.00
DRILL	BOPTEST	Pressure tested middle pipe ram to 35 bar. Failed to test same ram to 337 bar.	1.00
DNDRI	EQUIP	Pulled out and changed the o-ring and seal element on the BOP test tool. Ran in with the test tool.	1.00
DRILL	BOPTEST	Pressure tested the BOP.	3.00
DRILL	EQTEST	Rigged up and attempted to pressure test the mud hose, negative test.	0.50
DNDRI	EQUIP	Troubleshoot on negative test on the mud hose.	1.00
DRILL	EQTEST	Pressure tested the mud hose and upper and lower safety valve to 337 bar.	1.50
DRILL	BOPTEST	Pulled out with the test plug.	0.50
DRILL	SLIP	Slipped the drill line.	0.50
DRILL	BHAHAND	Made up the 6" bottom hole assembly.	2.50
DRILL	TRIPCH	Picked up 3 1/2" drill pipe and ran in the hole to 1375 m.	5.50
DRILL	TRIPCH	Washed down from 1375 m to 1430 m.	0.50

Report no : 19 Date: 01-apr-1995 Section size: 6"
Midnight depth: 2564 m MD Estimated PP: 1.12 sg Mudweight : 1.15 sg

Main Oper.	Sub Operation	Description	Oper. Time
DRILL	CSG	Pressure tested the liner and liner lap to 337 bar.	1.00
DRILL	OTHER	Performed choke drill.	0.50
DRILL	CSG	Rigged down after casing test.	0.50
DRILL	TRIPCH	Picked up 3 1/2" drill pipe and ran in the hole to 2519 m.	5.00
DRILL	CSGDRIL	Drilled out the shoetrack from 2519 m to 2557 m. Cleaned out the rat hole to 2559 m.	11.50
DRILL	DRILL	Drilled 6" hole from 2559 m to 2562 m. Displaced the hole to 1.15 sg mud while drilling.	2.50
DRILL	CIRC	Continued to displace the hole to 1.15 sg mud.	1.00
DRILL	FMTEST	Performed a leakoff test to 1.82 sg equivalent mud weight.	1.00
DRILL	DRILL	Drilled 6" hole from 2562 m to 2564 m.	1.00

Report no : 20 Date: 02-apr-1995 Section size: 6"
Midnight depth: 2651 m MD Estimated PP: 1.10 sg Mudweight : 1.15 sg

Main Oper.	Sub Operation	Description	Oper. Time
DRILL	DRILL	Drilled 6" hole from 2564 m to 2651 m.	23.50
FCOR	CIRCSAMP	Circulated for samples.	0.50

Report no : 21 Date: 03-apr-1995 Section size: 6"
Midnight depth: 2723 m MD Estimated PP: 1.05 sg Mudweight : 1.15 sg

Main Oper.	Sub Operation	Description	Oper. Time
FCOR	CIRCSAMP	Circulated bottoms up for samples.	1.00
DRILL	DRILL	Drilled 6" hole from 2651 m to 2676 m.	3.00
FCOR	CIRCSAMP	Circulated bottoms up for samples.	2.50
DRILL	TRIPOH	Pulled out of the hole to the casing shoe.	1.00
DRILL	TRIPCH	Pulled out to 189 m.	2.50
DRILL	TRIPCH	Pulled out the bottom hole assembly.	1.00
DNFMW	EQUIP	Changed out the MWD tool probe.	1.00
DRILL	TRIPCH	Made up the bottom hole assembly.	1.00
DRILL	TRIPCH	Ran in the hole to the casing shoe.	2.50
DRILL	OTHER	Lubricated the rig.	0.50
DRILL	TRIPOH	Ran in the hole to 2676 m.	0.50
DRILL	DRILL	Drilled 6" hole to 2686 m.	1.50
FCOR	CIRCSAMP	Circulated bottoms up for samples.	1.50
DRILL	DRILL	Drilled 6" hole to 2723 m.	4.50

Report no : 22 Date: 04-apr-1995 Section size: 6"
Midnight depth: 2858 m MD Estimated PP: 1.05 sg Mudweight : 1.15 sg

Main Oper.	Sub Operation	Description	Oper. Time
DRILL	DRILL	Continued drilling 6" hole from 2723 to 2858 m.	24.00

Report no : 23 Date: 05-apr-1995 Section size: 6"
Midnight depth: 2947 m MD Estimated PP: 1.05 sg Mudweight : 1.15 sg

Main Oper.	Sub Operation	Description	Oper. Time
DRILL	DRILL	Drilled 6" hole from 2858 to 2947 m.	14.50
DRILL	CIRC	Circulated the bottoms up. Pumped a slug.	2.00
DRILL	TRIPOH	Pulled out of the hole to the 7" casing shoe.	1.00
DRILL	TRIPCH	Continued pulling out of the hole. Changed the bit.	3.00
DRILL	TRIPCH	Ran in the hole to 2545 m.	3.00
DRILL	OTHER	Lubricated the rig.	0.50

Report no : 24 Date: 06-apr-1995 Section size: 6"
Midnight depth: 2994 m MD Estimated PP: 1.05 sg Mudweight : 1.15 sg

Main Oper.	Sub Operation	Description	Oper. Time
DRILL	TRIPOH	Continued running in the hole from 2545 to 2947 m.	1.00
DRILL	DRILL	Drilled 6" hole from 2947 to 2994 m.	8.00
DRILL	CIRC	Circulated the bottoms up.	1.50
DRILL	TRIPOH	Pulled out of the hole to the casing shoe.	1.00
DRILL	TRIPCH	Continued pulling out of the hole.	3.50
FLOG	LOGHAND	Rigged up Schlumberger for wire line logging.	0.50
FLOG	LOGHAND	Made up the tool string for the first logging run.	1.50
FLOG	LOG	Ran log No. 3C: DLL/MSFL/LSS/GR/SP/AMS.	4.00
FLOG	LOGHAND	Laid down the logging tools from the first run.	1.00
FLOG	LOGHAND	Made up the tool string for the second logging run.	1.00
FLOG	LOG	Started running log No. 3C/A: LDL/CNL/FMS/GR/AMS.	1.00

Report no : 25 Date: 07-apr-1995 Section size: 6"
Midnight depth: 2994 m MD Estimated PP: 1.05 sg Mudweight : 1.15 sg

Main Oper.	Sub Operation	Description	Oper. Time
FLOG	LOG	Continued running log No. 3C/A: LDL/CNL/FMS/GR/AMS.	4.00
FLOG	LOG	Started pulling out of the hole. Became stuck with the logging tools inside the 7" liner at 2170m.	0.50
DNFLO	STUCK	Attempted to open and close the caliper. Pulled the string free.	1.50

Report no : 25 Date: 07-apr-1995 Section size: 6"
Midnight depth: 2994 m MD Estimated PP: 1.05 sg Mudweight : 1.15 sg

Main Oper.	Sub Operation	Description	Oper. Time
FLOG	LOG	Continued pulling out of the hole, but was not able to pass the liner lap	0.50
DNFLO	STUCK	Ran back into the open hole to 2580 m and shaked off junk. Started pulling out to the liner lap again	1.50
FLOG	LOG	Continued to pull out of the hole.	1.00
FLOG	LOGHAND	Laid down the logging tools	1.00
FLOG	LOGHAND	Picked up the logging tools for the third run.	1.00
FLOG	LOGFMT	Ran log # 3A: RFT-HP/GR/AMS	5.00
FLOG	LOGHAND	laid down the logging tools	0.50
FLOG	LOGHAND	Picked up the VSP tools.	0.50
FLOG	LOGVS	Ran VSP log.	6.50
DRILL	OTHER	Wire clamps on the heave compensator wire slipped. Rearranged and made up clamps.	0.50

Report no : 26 Date: 08-apr-1995 Section size: 6"
Midnight depth: 2350 m MD Estimated PP: sg Mudweight : 1.15 sg

Main Oper.	Sub Operation	Description	Oper. Time
FLOG	LOGVS	Continued running VSP log.	2.50
FLOG	LOGHAND	Laid down the VSP tools.	0.50
FLOG	LOGHAND	Picked up the logging tools.	0.50
DNFMW	OTHER	Started running in the hole with the CST/GR tools. The GR tool would not power. Pulled out from 800 m and changed the GR tool.	2.00
FLOG	LOGSWC	Ran the CST/GR log.	4.00
FLOG	LOGHAND	Laid down the CST/GR tools. Rigged down electric logging equipment.	1.50
PA	CMTTRIP	Ran in the hole with 56 stands of 3 1/2" and 5 " open ended DP.	4.00
PA	CMTPLUG	Circulated and conditioned the mud	1.00
PA	CMTPLUG	Pressure tested the surface lines to 200 bar. mixed and pumped first stage of TD cement plug.	0.50
PA	CMTPLUG	Displace the cement with 16.2 m3 1.15 sg mud.	0.50
PA	CMTTRIP	pulled out to 2724 m.	0.50
PA	CMTPLUG	Reverse circulated out excess cmt.	1.00
PA	CMTPLUG	Pressure tested surface lines to 200 bar, mixed and pumped second stage of TD cement plug. Displace cmt with 13.65 m3 mud.	0.50
PA	CMTTRIP	Pulled out to 2350 m	1.00
PA	CMTPLUG	Reverse circulated out excess cmt.	1.00
PA	CMTTRIP	Pulled out 5" DP.	3.00

Report no : 27 Date: 09-apr-1995 Section size: 0.0
Midnight depth: 350 m MD Estimated PP: sg Mudweight : 1.15 sg

Main Oper.	Sub Operation	Description	Oper. Time
PA	CMTTRIP	Continued pulling out and laying down 3 1/2" drill pipe.	1.50
PA	TRIPCH	Made up 6" bit and ran in the hole to 2300 m.	3.00
PA	SLIP	Slip and cut drilling line.	1.00
DRILL	OTHER	Lubricated the rig.	0.50
PA	TRIPCH	Continued running in the hole to 2370 m.	0.50
PA	CIRC	Circulated bottoms up.	1.00
DNPA	WAIT	Waited on cement.	2.50
PA	TRIPCH	Continued running in the hole to 2400 m.	0.50
PA	CIRC	Circulated bottoms up.	1.00
DNPA	WAIT	Waited on cement.	2.00
PA	CIRC	Ran in to 2417 m. Tagged and load tested the cement plug with 10 tons and circulated bottoms up.	1.00
PA	TRIPCH	Pulled out of the hole. Layed down 90 joints of 3 1/2" drill pipe and all 4 3/4" drill collars. Broke off the bit and pressure tested cement plug to 238 bar/10 min.	5.00
PA	MECHPLUG	Made up and ran in the hole with the 9 5/8" bridge plug. Set the plug at 350 m and pulled out of the hole.	1.00
PA	WHINST	Retrieved the 18 3/4" x 9 5/8" wear bushing and pressure tested bridge plug to 137 bar/10 min.	1.50
PA	WHINST	Ran in the hole and pulled free the 18 3/4" x 9 5/8" seal assembly. Flow checked and pulled out of the hole with the seal assembly.	1.50
PA	CSGRETR	Made up the 9 5/8" casing cutting and retrieving assembly.	0.50

Report no : 28 Date: 10-apr-1995 Section size: 0.0
Midnight depth: 180 m MD Estimated PP: sg Mudweight : 1.15 sg

Main Oper.	Sub Operation	Description	Oper. Time
PA	CUTTRIP	Continued making up the 9 5/8" casing cutting and - retrieving assembly. Ran in the hole and landed the spear in the 9 5/8" casing hanger.	2.00
PA	CUTCSG	Cut the 9 5/8" casing at 250 m.	0.50
PA	CIRC	Checked for pressure. Circulated one annulus volume. Opened up the annular preventer and flow checked.	1.00
PA	CUTTRIP	Pulled out of the hole with the running string, 9 5/8" casing and cutting - / retrieving assembly. Racked the cutting - and retrieving assembly in the derrick.	2.00
PA	CSGRETR	Laid down the 9 5/8" casing.	1.50
PA	CMTTRIP	Ran in the hole with 10 stands of 3 1/2" drill pipe and 5" drill pipe open ended to 350 m. Broke the circulation.	1.50

Report no : 28 Date: 10-apr-1995 Section size: 0.0
Midnight depth: 180 m MD Estimated PP: sg Mudweight : 1.15 sg

Main Oper.	Sub Operation	Description	Oper. Time
PA	CMTPLUG	Rigged up and tested the surface lines to 200 bar. Set cement plug from 350 to 180 m: pumped 8 m3 of sea water, mixed and pumped 15 m3 of 1.95 sg cement slurry and 0.2 m3 of sea water. Displaced the cement with 0.5 m3 of 1.15 sg mud.	1.00
PA	CMTTRIP	Pulled out of the hole to 145 m.	0.50
PA	CIRC	Displaced the hole with sea water.	0.50
PA	CMTTRIP	Pulled out of the hole and laid down 30 joints of 3 1/2" drill pipe. Pressure tested the cement plug to 115 bar / 10 min while laying down pipe.	1.50
PA	CUTTRIP	Laid down the 9 5/8" casing cutting and - retrieving assembly.	1.50
PA	CIRC	Ran in the hole with jet sub and washed the BOP. Pulled out of the hole.	1.00
PA	BOPHAND	Rigged up to pull the BOP.	2.00
PA	BOP	Pulled the riser and BOP.	4.00
PA	BOPHAND	Removed beacons and bulls eyes from the riser and the BOP. Positioned the BOP in the trolley and set the BOP on the stump. Laid down the last two riser joints and rigged down the riser running equipment.	3.00
PA	CUTTRIP	Started making up the 18 3/4" x 30" well head cutting and retrieving assembly.	0.50

Report no : 29 Date: 11-apr-1995 Section size: 0.0
Midnight depth: m MD Estimated PP: sg Mudweight : 1.15 sg

Main Oper.	Sub Operation	Description	Oper. Time
PA	CUTTRIP	Made up the 18 3/4" x 30" well head cutting and - retrieving assembly. Ran in the hole with the assembly and landed in the well head.	3.00
PA	CUTCSG	Cut the 18 3/4" x 30 " well heads at 137 m. Came free with 500 kN over pull.	4.50
PA	CUTTRIP	Pulled out of the hole. Laid down the well head cutting - and retrieving assembly.	1.50
PA	CSGRETR	Laid down the 18 3/4" x 30" well heads.	1.00

Report no : 30 Date: 13-apr-1995 Section size: 0.0
Midnight depth: m MD Estimated PP: sg Mudweight : 1.15 sg

Main Oper.	Sub Operation	Description	Oper. Time
MOB	MOORDEMOB	Deballasted the rig and pulled the anchors. Changed two anchors.	11.00

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Norsk Hydro
                          T I M E   D I S T R I B U T I O N

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 Well: 30/9-18                 Rig: TREASURE SAGA          Depth: 2993.0 m MD
 All sections

    Operations                    Hours    %       Hours    %          Acc. total
===============================================================================
MOBILIZATION
  MOORING; PULLING ANCHORS      :  11.0   1.61
     Sum.......................................11.0   1.61             11.0

DRILLING
  BHA HANDLING/TESTING          :  19.0   2.78
  EQUIPMENT TEST                :   2.0   0.29
  TRIPPING IN CASED HOLE        :  50.5   7.40
  TRIPPING IN OPEN HOLE         :  19.0   2.78
  DRILLING                      : 218.0  31.94
  OTHER                         :   3.5   0.51
  WELLHEAD EQUIPMENT INSTALLATIO:   4.0   0.59
  REAMING                       :   3.0   0.44
  CIRC. AND COND. MUD/HOLE      :  18.0   2.64
  WIPER TRIP                    :   2.5   0.37
  CASING HANDLING/TESTING       :  23.0   3.37
  RUNNING CASING IN CASED HOLE  :  18.0   2.64
  RUNNING CASING IN OPEN HOLE   :  17.0   2.49
  DRILLING OUT OF CASING        :  19.0   2.78
  PRIMARY CEMENTING             :  17.0   2.49
  FORMATION STRENGTH TESTING    :   2.0   0.29
  DRILLING OUT CEMENT PLUG      :   2.5   0.37
  BOP HANDLING                  :   3.0   0.44
  BOP RUNNING/RETRIEVING        :  17.0   2.49
  BOP TESTING                   :   8.5   1.25
  SLIP AND CUT DRILLING LINE    :   1.5   0.22
     Sum......................................468.0  68.57            479.0

FORMATION EVALUATION LOGGING
  LOGGING EQUIPMENT HANDLING/TES:  16.5   2.42
  LOGGING                       :  21.5   3.15
  FORMATION TESTER              :   5.0   0.73
  SIDEWALL CORING               :   4.0   0.59
  VERTICAL SEISMIC              :   9.0   1.32
     Sum.......................................56.0   8.21            535.0

FORMATION EVALUATION CORING
  CIRCULATING FOR SAMPLE        :   5.5   0.81
     Sum........................................5.5   0.81            540.5

PLUG AND ABANDONMENT
  TRIPPING IN CASED HOLE        :   9.0   1.32
  WELLHEAD EQUIPMENT INSTALLATIO:   3.0   0.44
  CIRC. AND COND. MUD/HOLE      :   5.5   0.81
  TRIPPING FOR CEMENT JOB       :  13.5   1.98
  BOP HANDLING                  :   5.0   0.73
  BOP RUNNING/RETRIEVING        :   4.0   0.59
  SET CEMENT PLUG               :   5.5   0.81
  SET MECHANICAL PLUG           :   1.0   0.15
  TRIPPING OF CASING CUTTING EQU:  10.5   1.54
  CUT CASING/WELLHEAD           :   5.0   0.73
  CASING RETRIEVING             :   3.0   0.44
  SLIP AND CUT DRILLING LINE    :   1.0   0.15
     Sum.......................................66.0   9.67            606.5
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TIME DISTRIBUTION

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 Well: 30/9-18                Rig: TREASURE SAGA          Depth: 2993.0 m MD
 All sections

    Operations                        Hours     %       Hours     %        Acc. total
================================================================================
DOWNTIME DRILLING
  EQUIPMENT FAILURE AND REPAIR  :  11.5   1.68
  WAITING                       :  16.5   2.42
  WELL CONTROL                  :  28.0   4.10
  WIPER TRIP                    :   9.5   1.39
     Sum.......................................65.5   9.60         672.0

DOWNTIME FORM. EVAL. MWD
  EQUIPMENT FAILURE AND REPAIR  :   1.0   0.15
  OTHER                         :   2.0   0.29
     Sum........................................3.0   0.44         675.0

DOWNTIME FORM. EVAL. LOGGING
  STICKING/GOING STUCK WITH EQUI:   3.0   0.44
     Sum........................................3.0   0.44         678.0

DOWNTIME PLUG AND ABANDONMENT
  WAITING                       :   4.5   0.66
     Sum........................................4.5   0.66         682.5

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  Reported time (100.0 %  of well total  682.5 hours) :              682.5
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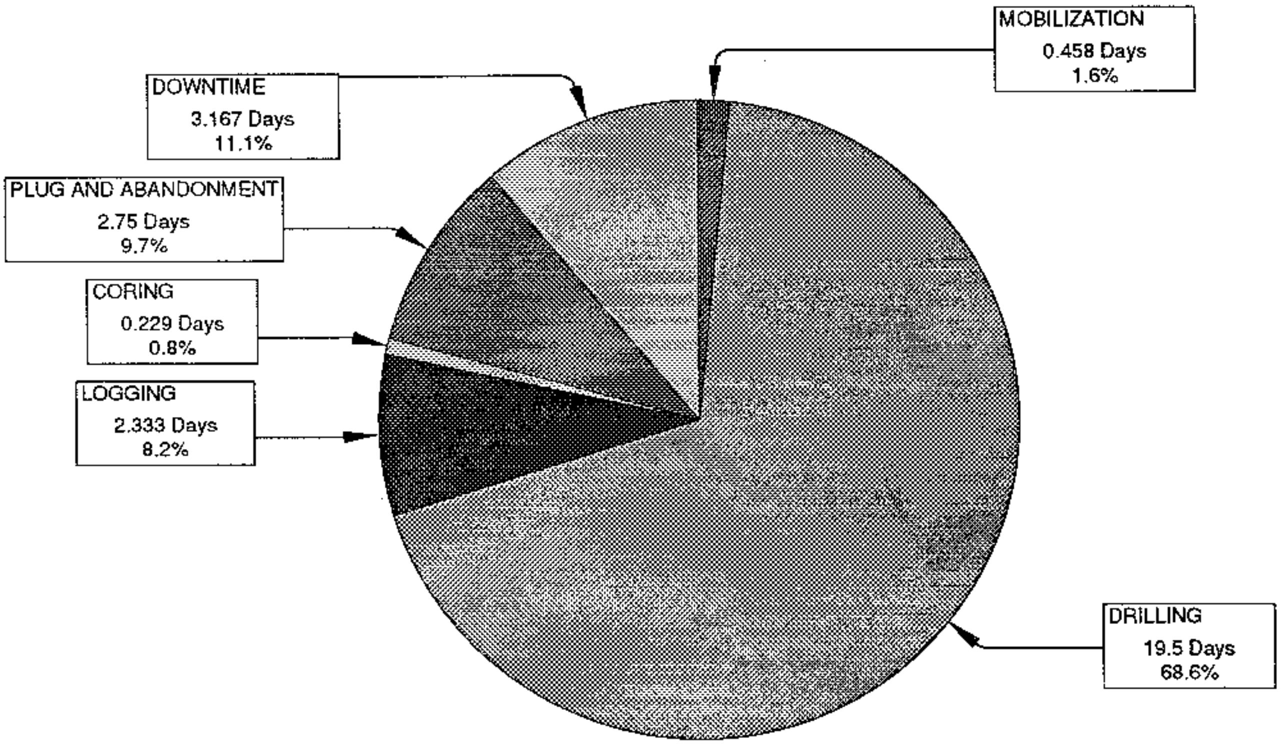


Figure 1		Time Distribution Well: 30/9-18	HYDRO

Norsk Hydro

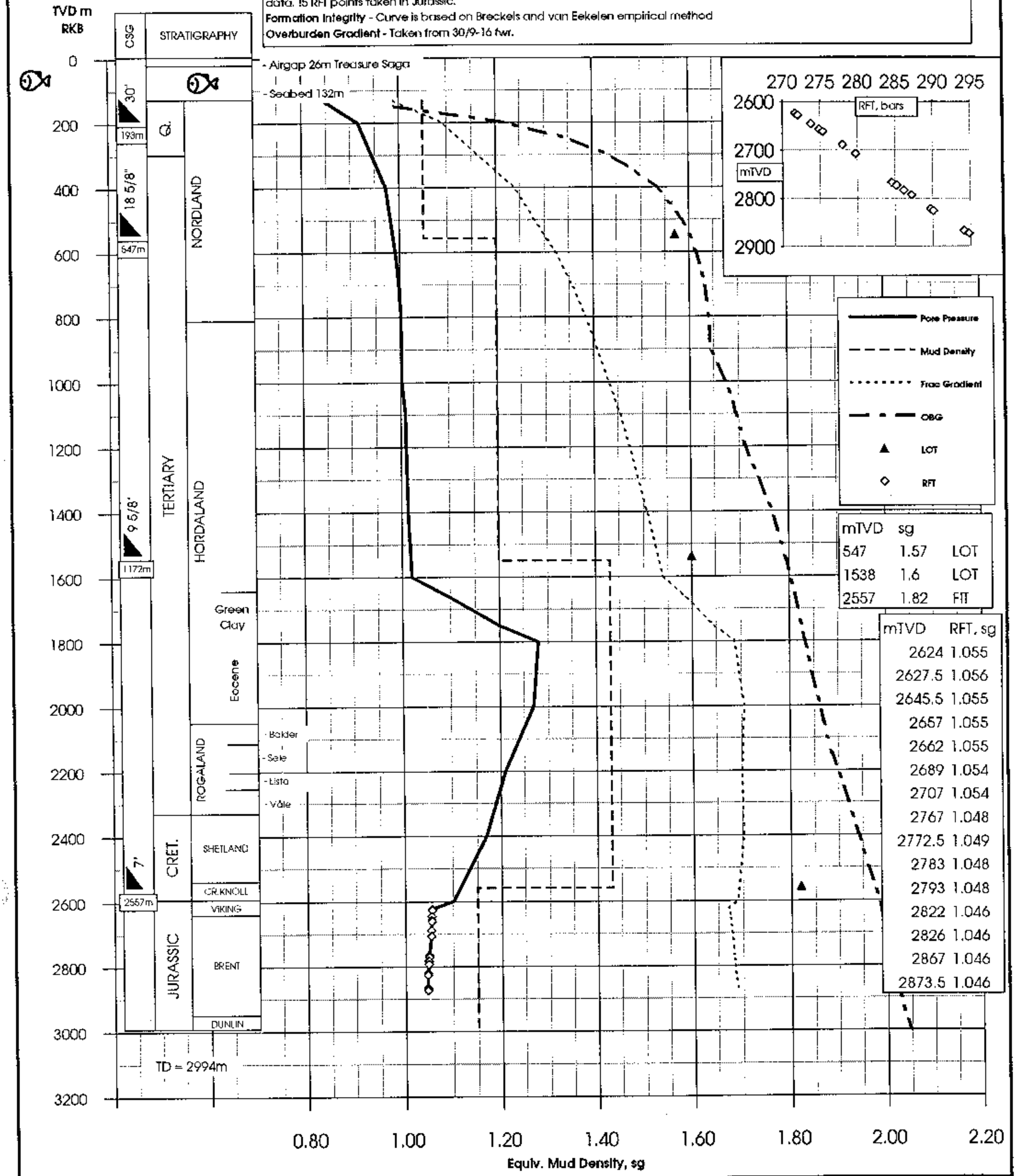
H O L E   D E V I A T I O N

Well : 30/9-18 Reference Point : RKB , 26.0 m above MSL
Waterdepth: 107.0 m Vertical to 131.9 m
UTM zone : 31 Central Meredian: 3' E Horizontal Datum: ED50
Template Centre Coordinates, UTM: North: 0.0 m, East: 0.0 m
Wellhead Coordinates, UTM: North: 6684332.9 m, East: 490211.4 m
Official surveys : Y Track :
Coordinates are measured from the wellhead centre.

Depth MD [m]	Inclination [Deg]	Direction [Deg]	Tool Type	#	Depth TVD [m]	Coordinates North [m]	East [m]	Vert. Sect. [m]	Dogleg D/30m	Build D/30m	Turn D/30m
132.0	0.00	0.00	MWD		132.0	0.00	0.00	0.0	0.00	0.00	0.00
136.0	0.80	151.80	MWD		136.0	-0.02	0.01	0.0	6.00	6.00	999.99
144.0	1.50	203.30	MWD		144.0	-0.17	-0.00	0.2	4.43	2.62	193.12
145.0	1.20	125.10	MWD		145.0	-0.19	0.00	0.2	51.56	-9.00	******
151.0	0.60	146.10	MWD		151.0	-0.25	0.07	0.3	3.38	-3.00	105.00
169.0	0.60	106.20	MWD		169.0	-0.35	0.21	0.4	0.68	0.00	-66.50
185.0	0.70	65.40	MWD		185.0	-0.34	0.38	0.5	0.87	0.19	-76.50
219.0	0.20	156.20	MWD		219.0	-0.31	0.60	0.7	0.64	-0.44	80.12
276.0	0.50	113.80	MWD		276.0	-0.50	0.86	1.0	0.20	0.16	-22.32
332.0	0.20	87.80	MWD		332.0	-0.59	1.18	1.3	0.18	-0.16	-13.93
416.0	0.50	126.80	MWD		416.0	-0.81	1.62	1.8	0.13	0.11	13.93
503.0	0.40	105.90	MWD		503.0	-1.12	2.22	2.5	0.07	-0.03	-7.21
551.0	0.40	107.90	MWD		551.0	-1.21	2.54	2.8	0.01	0.00	1.25
579.0	0.60	95.50	MWD		579.0	-1.26	2.78	3.1	0.24	0.21	-13.29
669.0	0.30	75.60	MWD		669.0	-1.24	3.48	3.7	0.11	-0.10	-6.63
752.0	0.30	259.90	MWD		752.0	-1.23	3.47	3.7	0.22	0.00	-63.51
839.0	0.30	258.10	MWD		839.0	-1.32	3.03	3.3	0.00	0.00	-0.62
926.0	0.00	166.40	MWD		926.0	-1.36	2.80	3.1	0.10	-0.10	-31.62
1012.0	0.20	89.30	MWD		1012.0	-1.36	2.95	3.3	0.07	0.07	-26.90
1098.0	0.50	299.10	MWD		1098.0	-1.18	2.78	3.0	0.24	0.10	-52.40
1174.0	0.40	261.80	MWD		1174.0	-1.05	2.22	2.5	0.12	-0.04	-14.72
1261.0	0.80	201.10	MWD		1261.0	-1.66	1.70	2.4	0.24	0.14	-20.93
1346.0	0.40	174.20	MWD		1346.0	-2.51	1.52	2.9	0.17	-0.14	-9.49
1433.0	0.40	116.90	MWD		1433.0	-2.95	1.82	3.5	0.13	0.00	-19.76
1521.0	0.20	252.80	MWD		1521.0	-3.14	1.95	3.7	0.19	-0.07	46.33
1542.0	0.50	187.30	MWD		1542.0	-3.24	1.90	3.8	0.65	0.43	-93.57
1605.0	0.50	203.10	MWD		1605.0	-3.76	1.76	4.2	0.07	0.00	7.52
1689.0	0.10	209.20	MWD		1689.0	-4.16	1.58	4.5	0.14	-0.14	2.18
1778.0	0.30	25.50	MWD		1778.0	-4.02	1.64	4.3	0.13	0.07	59.43
1863.0	0.50	37.50	MWD		1863.0	-3.53	1.96	4.0	0.08	0.07	4.24
1948.0	0.80	355.60	MWD		1948.0	-2.64	2.15	3.4	0.19	0.11	-14.79
2034.0	1.60	15.10	MWD		2033.9	-0.88	2.41	2.6	0.31	0.28	6.80
2113.0	1.30	2.40	MWD		2112.9	1.08	2.74	2.9	0.17	-0.11	-4.82
2186.0	1.20	11.30	MWD		2185.9	2.65	2.92	3.9	0.09	-0.04	3.66
2272.0	1.20	3.70	MWD		2271.9	4.44	3.16	5.4	0.06	0.00	-2.65
2359.0	1.70	6.50	MWD		2358.8	6.63	3.36	7.4	0.17	0.17	0.97
2410.0	1.60	14.40	MWD		2409.8	8.07	3.62	8.8	0.15	-0.06	4.65
2494.0	1.40	18.20	MWD		2493.8	10.18	4.24	11.0	0.08	-0.07	1.36
2550.0	1.20	7.10	MWD		2549.8	11.41	4.52	12.3	0.17	-0.11	-5.95
2639.0	1.90	231.50	MWD		2638.8	11.42	3.48	11.9	0.97	0.24	-45.71
2938.0	3.30	40.30	MWD		2937.6	14.90	5.17	15.8	0.52	0.14	16.94

3 PORE PRESSURE, FORMATION INTEGRITY, OVERBURDEN AND TEMPERATURE GRADIENTS

Pore Pressure - Interval of abnormal pore pressure in the Eocene is seen to varying extents on the Dxc, gas and MWD resistivity data. 15 RFT points taken in Jurassic.
Formation Integrity - Curve is based on Breckels and van Eekelen empirical method
Overburden Gradient - Taken from 30/9-16 fwr.



mTVD	sg	
547	1.57	LOT
1538	1.6	LOT
2557	1.82	FIT

mTVD	RFT, sg
2624	1.055
2627.5	1.056
2645.5	1.055
2657	1.055
2662	1.055
2689	1.054
2707	1.054
2767	1.048
2772.5	1.049
2783	1.048
2793	1.048
2822	1.046
2826	1.046
2867	1.046
2873.5	1.046

Final Well Report 30/9-18	**Fig: B-4**	**Final Pore Pressure, Mud Density, Fracture- and Overburden Gradients**

HYDRO

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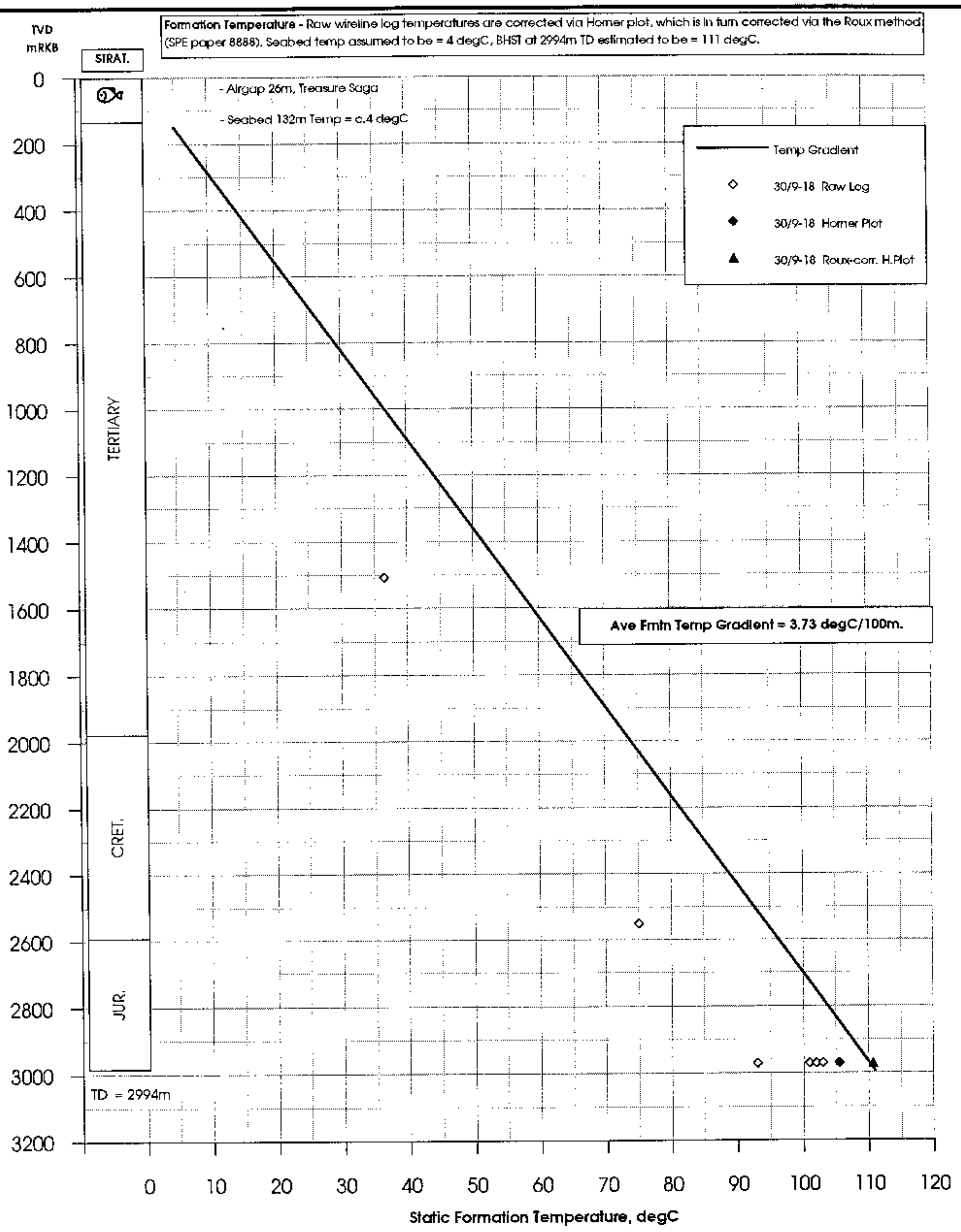


Formation Temperature - Raw wireline log temperatures are corrected via Horner plot, which is in turn corrected via the Roux method (SPE paper 8888). Seabed temp assumed to be = 4 degC, BHST at 2994m TD estimated to be = 111 degC.

- Airgap 26m, Treasure Saga

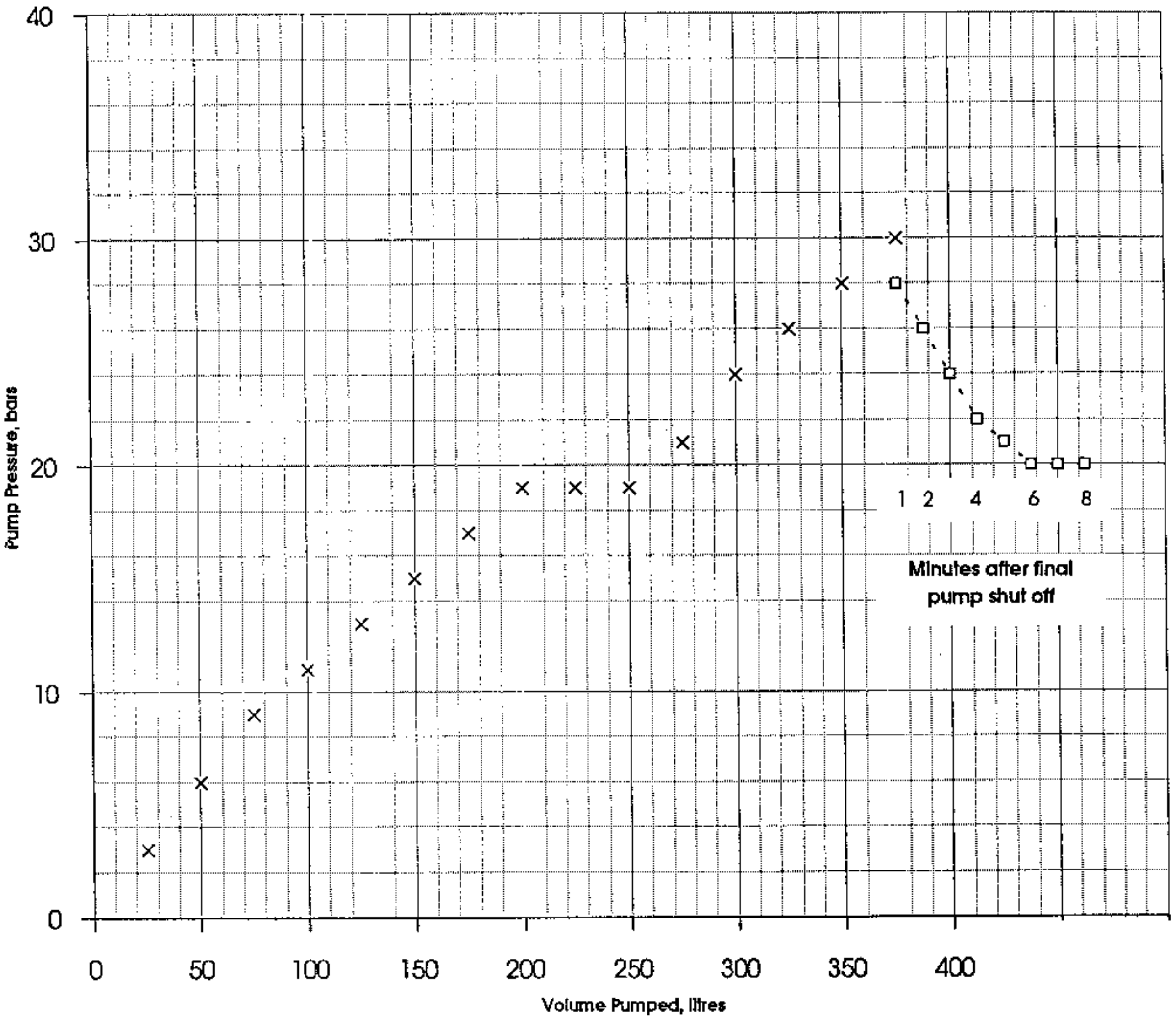
- Seabed 132m Temp = c.4 degC

Ave Fmtn Temp Gradient = 3.73 degC/100m.

TD = 2994m

Final Well Report 30/9-18	Fig.: B-5	**Formation Temperature Gradient**

Well 30/9-18		Test type - ELOT/LOT/FIT LOT		Test date 20.03.95	
Rig Treasure Saga	Airgap(m) 22	Water depth (m) 106	Csg OD (in) 18 5/8	Hole angle (deg) 0	
Csg Shoe (mMD/mTVD) 547	547	OH depth. (mMD/mTVD) 560	560	Lithology Claystone	
Mud Properties	Dens (sg) 1.2	API WL(ml/30min)	PV (cp)	YP (Pa)	Gels (Pa)
Pump Rate (l/min) 75		Vol pumped (l.) 375		Vol bled back (l.) 250	
Leakoff Pressure (bar) 20		Max pressure (bar) 30		Propagation press. (bar)	
Test result (sg EMD) 1.57		Comments			



Final Well Report 30/9-18	**Fig.: B-6a**	**Formation Strength Test Report**

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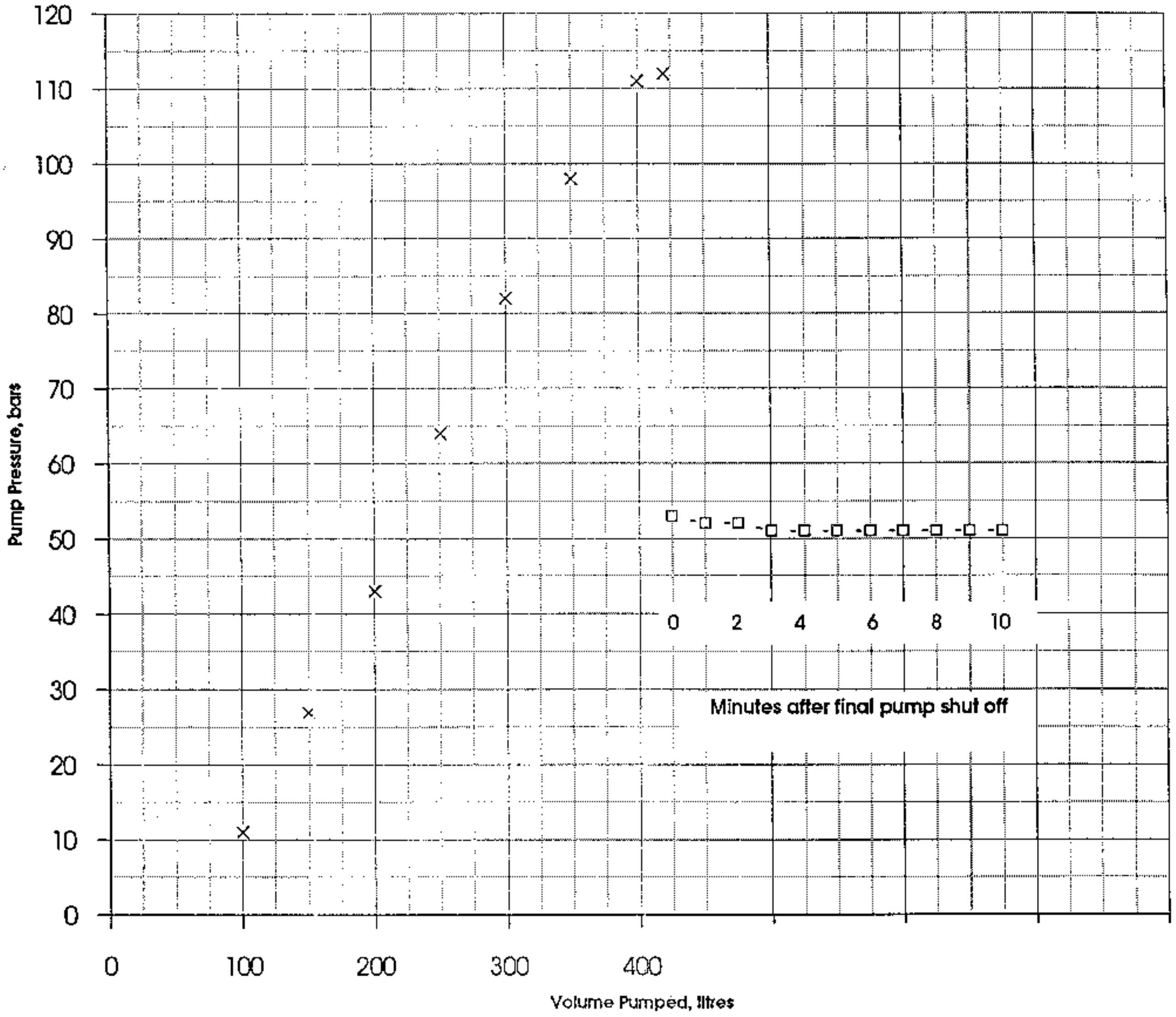
Well	30/9-18	Test type - ELOT/LOT/FIT	LOT	Test date	25.03.95					
Rig	Treasure Saga	Airgap(m)	22	Water depth (m)	106	Csg OD (in)	9 5/8	Hole angle (deg)	0	
Csg Shoe (mMD/mTVD)	1538	1538	OH depth. (mMD/mTVD)	1553	1553	Lithology	Claystone			
Mud Properties	Dens (sg)	1.26	API WL(ml/30min)	2.8	PV (cp)	22	YP (Pa)	14	Gels (Pa)	3/5
Pump Rate (l/min)	100	Vol pumped (l.)	420	Vol bled back (l.)	260					
Leakoff Pressure (bar)	51	Max pressure (bar)	112	Propagation press. (bar)						
Test result (sg EMD)	1.6	Comments								



Final Well Report 30/9-18

Fig.: B-6b

Formation Strength Test Report

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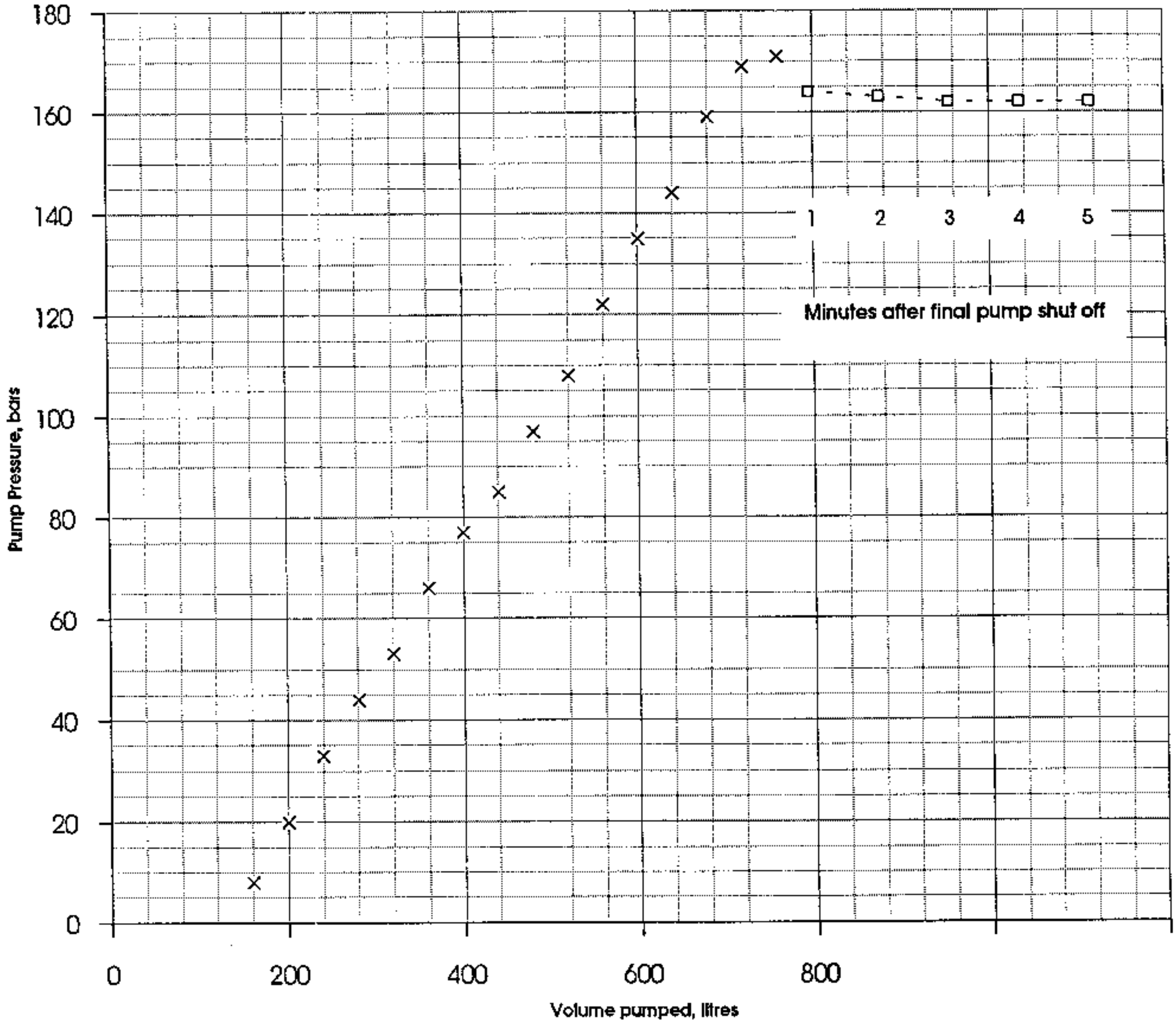
Well 30/9-18		Test type - ELOT/LOT/FIT LOT		Test date 01.04.95	
Rig Treasure Saga	Airgap(m) 22	Water depth (m) 106	Csg OD (in) 7	Hole angle (deg) 0	
Csg Shoe (mMD/mTVD) 2557	2557	OH depth, (mMD/mTVD) 2662	2662	Lithology Limest/Clayst	
Mud Properties	Dens (sg) 1.15	API WL(ml/30min) 2.1	PV (cp) 9	YP (Pa) 8.5	Gels (Pa) 1.5/4
Pump Rate (l/min) 50		Vol pumped (l.) 760		Vol bled back (l.) 675	
Leakoff Pressure (bar) 170		Max pressure (bar) 171		Propagation press. (bar) 162	
Test result (sg EMD) 1.82		Comments			



Final Well **Report** **30/9-18**	**Fig.:** **B-6c**	**Formation Strength** **Test Report**

HYDRO

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4 MATERIAL REPORT

Norsk Hydro

MAIN CONSUMPTION OF CASING/TUBING ON WELL 30/9-18

Size	Casing string	Grade	Weight [kg/m]	Weight [lb/ft]	Threads type	Length [m]	No. of joints	Cost of str. in hole	Total cost of string
30"	CONDUCTOR	B	460.86	309.70	SL-60	62.5	5		
18 5/8"	SURFACE	X-56	130.00	87.36	E60MT	416.5	35		
9 5/8"	INTERMEDIATE	L-80	69.94	47.00	NK 3 SB	1406.0	119		
7"	PRODUCTION	L-80	38.69	26.00	NK 3 SB	1174.0	100		

TOTAL CONSUMPTION OF CEMENT ADDITIVES ON WELL 30/9-18

Section	Cement/ Additive	Unit	Total Amount Used	Cost [kNOK]
36"	API CLASS G	MT	60.0	
	CaCl2C	1	1300.0	
	ECONO	1	500.0	
	NF-3	1	20.0	
24"	API CLASS G	MT	153.0	
	CFR-3L	1	2435.0	
	ECONO	1	2500.0	
	GASCON	1	10550.0	
	HAL361	1	15635.0	
	NF-3	1	115.0	
	SCR-L	1	200.0	
12 1/4"	API CLASS G	MT	49.0	
	CFR-3L	1	940.0	
	GASCON	1	4200.0	
	HAL361	1	6450.0	
	SCR-L	1	790.0	
8 1/2"	API CLASS G	MT	30.0	
	CFR-3L	1	250.0	
	GASCON	1	1100.0	
	HAL361	1	1456.0	
	SCR-L	1	800.0	
6"	CFR-3L	1	200.0	
	GASCON	1	900.0	
	HAL361	1	964.0	
	SCR-L	1	400.0	

Norsk Hydro

CEMENT/ADDITIVE CONSUMPTION PER JOB ON WELL 30/9-18

Date	CsgSize	Jobtype	Cement/ Additive	Description	Unit	Amount Planned Used	Amount Actual Used	Difference Amount	Difference %	Difference Cost [kNOK]
16-mar-1995	30"	CASING CEMENTING	API CLASS G	API CLASS G	MT		47			
			CaCl2C	CaCl2 / ACCELERATOR: CALCIUM C	l		1300			
			ECONO	EXTENDER: ECONOLITE	l		500			
			NF-3	NF-3	l		20			
17-mar-1995	18 5/8"	CASING CEMENTING	API CLASS G	API CLASS G	MT		54			
			ECONO	EXTENDER: ECONOLITE	l		2500			
18-mar-1995	18 5/8"	CASING CEMENTING	API CLASS G	API CLASS G	MT		85			
			CFR-3L	DISPERSANT: CFR-3 LIQUID	l		2435			
			GASCON	EDP-C469-91	l		10550			
			HAL361	FLUID LOSS ADDITIVE: HALAD-361	l		15635			
			NF-3	NF-3	l		115			
			SCR-L	RETARDER: SCR-100L	l		200			
19-mar-1995	30"	GROUT	API CLASS G	API CLASS G	MT		13			
24-mar-1995	9 5/8"	CASING CEMENTING	API CLASS G	API CLASS G	MT		49			
			CFR-3L	DISPERSANT: CFR-3 LIQUID	l		940			
			GASCON	EDP-C469-91	l		4200			
			HAL361	FLUID LOSS ADDITIVE: HALAD-361	l		6450			
			SCR-L	RETARDER: SCR-100L	l		790			
30-mar-1995	7"	LINER CEMENTING	API CLASS G	API CLASS G	MT		30			
			CFR-3L	DISPERSANT: CFR-3 LIQUID	l		250			
			GASCON	EDP-C469-91	l		1100			
			HAL361	FLUID LOSS ADDITIVE: HALAD-361	l		1456			
			SCR-L	RETARDER: SCR-100L	l		800			
08-apr-1995	UNDEFIN	PLUG IN OPEN HOL	CFR-3L	DISPERSANT: CFR-3 LIQUID	l		200			
			GASCON	EDP-C469-91	l		900			
			HAL361	FLUID LOSS ADDITIVE: HALAD-361	l		964			
			SCR-L	RETARDER: SCR-100L	l		400			
10-apr-1995	18 5/8"	PLUG IN CASED HO	API CLASS G	API CLASS G	MT		14			

Norsk Hydro

BITRECORD FOR WELL 30/9-18

Bit No	Bit RR	Bit Type	Size (in)	Manufacturer	Tradename	Serial no.	IADC code	Nozzles diameter (../32in)						Flow area (in2)	BHA no.	Depth out (m MD)	Bit meter (m)	Rot. hours (hrs)	ROP (m/hr)	Rotation min/max (rpm)	Total bit revol.	Weight min/max (kN)	Flow min/max (l/min)	Pump min/max (bar)	Bit grading: Cutting structur I	O	DC	L	B	Gauge 1/16 (in)	Remarks oth	Remarks pul
1	1	ISRT	17.500	HTC	MAX-PT11H	U93BJ	435			18	18	18	20	1.052	1	194	62	6.90	8.9	12/91	30138	0/60	420/3920	12/110	1	1	WT	A	E	I	NO	TD
1	2	HO		SEC	CUSTOM	RSHO-049				20	20	20	20	1.227	1	194	62	6.90	8.9	12/91	30138	0/60	420/3920	12/110	1	1	WT	A	E	I	NO	
2	2	MITO	24.000	HTC	ATX-G1	S56BV	115G			18	20	20	20	1.169	2	557	364	5.70	63.9	66/165	53581	10/190	3420/3880	104/155	2	2	WT	A	E	I	NO	TD
2	3	BITS	9.438	.		.									2	557	364		0.0	66/165		10/190	3420/3880	104/155								SIH
3	1	MITO	17.500	SEC	SS44GJ4	618507	135M			18	22	22	22	1.362	3	560	3	0.25	12.0	60/80	930	10/120	2800/2800	68/72	3	3	WT	A	E	I	NO	TD
4		ISRT	12.250	SEC	SS82FLJ4	649931	437M			16	18	18	18	0.942	4	1109	549	9.60	57.2	107/164	82238	30/210	2690/2840	91/115	2	4	BT	A	E	I	NO	TQ
5		ISRT	12.250	HTC	ATM-GT00	A38CB	417			15	18	18	18	0.918	5	1550	441	17.30	25.5	72/170	153610	15/230	2640/2860	107/137	3	7	BT	M	E	2	JD	TD
6		PDC	8.500	DB	TD 13 MRQ	7940532	M615		11	11	12	12	12	0.517	6	2122	572	26.00	22.0	50/217	253668	10/170	1660/2340	122/275	8	8	RO	C	X	I	NO	PR
7		PDC	8.500	LYNG	LA 325 B	1590	M615		11	11	11	11	11	0.464	7	2420	298	19.80	15.1	94/185	199608	40/200	2050/2160	200/270	2	3	WT	A	X	I	NO	PR
8		ISRT	8.500	HTC	ATM-P11H	R13BS	437				14	15	15	0.495	8	2559	139	25.80	5.4	80/180		100/150	2100/2100	265/280	1	1	WT	A	E	I	NO	TD
9		ISRT	6.000	HTC	ATJ-22	Y11WD	517				10	10	10	0.230	9	2676	117	25.10	4.7	70/100	136293	30/90	800/800	120/140	2	2	WT	A	E	I	ER	HR
10		ISRT	6.000	HTC	ATJ-22	U80WF	517				10	10	10	0.230	10	2947	271	40.10	6.8	90/102	232722	50/140	873/910	140/174	2	2	WT	A	E	1	ER	HR
11		PDC	6.000	LYNG	LA 250 B	1385	M646				9	9	12	0.235	11	2994	47	7.30	6.4	97/185	53785	70/120	885/885	156/166	1	1	CT	A	X	I	NO	TD
12		MITO	6.000	HTC	J4	U81WH	216				32	32	32	2.356	12	0	****		0.0	/		/	/	/								

Norsk Hydro

BOTTOM HOLE ASSEMBLIES USED ON WELL 30/9-18

BHA no. 1: No./Element/OD(in)/Length(m) Depth In: 132 m MD Out: 194 m MD

1	MAX-PT11H	17.500	0.41	8	NON MAG. COLLAR	9.594	9.03
2	CUSTOM		1.82	9	DRILL COLLAR STEEL	9.594	36.78
3	BIT SUB	9.438	0.80	10	X-OVER	9.469	0.78
4	PIN SUB	9.562	1.23	11	DRILL COLLAR STEEL	8.000	44.52
5	MWD	8.250	11.89	12	X-OVER	8.125	0.92
6	X-OVER	9.688	1.23	13	HWDP	5.000	
7	BIT SUB	9.406	1.18				

Reason Pulled: TOTAL DEPTH/CASING DEPTH Sum:

BHA no. 2: No./Element/OD(in)/Length(m) Depth In: 193 m MD Out: 557 m MD

1	ATX-G1	24.000	0.42	9	DRILL COLLAR STEEL	9.594	36.78
2	BIT SUB	9.438	0.80	10	X-OVER	9.469	0.78
3	PIN SUB	9.562	1.23	11	DRILL COLLAR STEEL	8.000	44.72
4	MWD	8.250	11.89	12	JAR	7.750	9.59
5	X-OVER	9.688	1.23	13	DRILL COLLAR STEEL	8.000	26.88
6	BIT SUB	9.406	1.18	14	X-OVER	8.125	0.92
7	NON MAG. COLLAR	9.594	9.03	15	HWDP	5.000	
8	STEEL STAB	23.750	2.20				

Reason Pulled: TOTAL DEPTH/CASING DEPTH Sum:

BHA no. 3: No./Element/OD(in)/Length(m) Depth In: 557 m MD Out: 560 m MD

1	SS44GJ4	17.500	0.42	6	JAR	7.750	9.59
2	BIT SUB	9.438	0.80	7	DRILL COLLAR STEEL	8.000	26.88
3	DRILL COLLAR STEEL	9.500	36.78	8	X-OVER	8.125	0.92
4	X-OVER	8.000	0.78	9	HWDP	5.000	181.26
5	DRILL COLLAR STEEL	8.000	44.72	10	DRILL PIPE	5.000	

Reason Pulled: TOTAL DEPTH/CASING DEPTH Sum:

BHA no. 4: No./Element/OD(in)/Length(m) Depth In: 560 m MD Out: 1109 m MD

1	SS82FLJ4	12.250	0.30	7	STEEL STAB	12.188	1.36
2	BIT SUB	7.969	1.21	8	DRILL COLLAR STEEL	8.000	107.92
3	PIN-PIN SUB	8.250	0.59	9	JAR	7.750	9.59
4	MWD	8.562	11.89	10	DRILL COLLAR STEEL	8.000	26.61
5	SAVER SUB	8.938	1.03	11	X-OVER	8.125	0.92
6	DRILL COLLAR STEEL	8.000	8.50	12	HWDP	5.000	323.56

Reason Pulled: TORQUE Sum: 493.48

BHA no. 5: No./Element/OD(in)/Length(m) Depth In: 1109 m MD Out: 1550 m MD

1	ATM-GT00	12.250	0.30	7	STEEL STAB	12.250	2.09
2	BIT SUB	7.969	1.21	8	DRILL COLLAR STEEL	8.000	107.92
3	PIN-PIN SUB	8.250	0.59	9	JAR	7.750	9.59
4	MWD	8.562	11.89	10	DRILL COLLAR STEEL	8.000	26.61
5	SAVER SUB	8.938	1.03	11	X-OVER	8.125	0.92
6	DRILL COLLAR STEEL	8.000	8.50	12	HWDP	5.000	323.56

Reason Pulled: TOTAL DEPTH/CASING DEPTH Sum: 494.21

BOTTOM HOLE ASSEMBLIES USED ON WELL 30/9-18

BHA no. 6: No./Element/OD(in)/Length(m) Depth In: 1550 m MD Out: 2122 m MD

1 TD 13 MRQ	8.500	0.37	7 NON MAG. COLLAR	6.500	9.37
2 BIT SUB	6.312	1.16	8 DRILL COLLAR STEEL	6.500	113.30
3 PIN-PIN SUB	6.812	0.61	9 JAR	6.312	9.80
4 MWD	6.688	12.04	10 DRILL COLLAR STEEL	6.500	28.19
5 SAVER SUB	6.688	0.41	11 HWDP	5.000	81.00
6 NON MAG. STAB	8.500	1.85			

Reason Pulled: PENETRATION RATE Sum: 258.10

BHA no. 7: Depth In: 2122 m MD Out: 2420 m MD; same elements as in BHA no. 6
Except Bit, here LYNG, LA 325 B (Length 0.29 m)
Reason Pulled: PENETRATION RATE

BHA no. 8: Depth In: 2420 m MD Out: 2559 m MD; same elements as in BHA no. 6
Except Bit, here HTC, ATM-P11H (Length 0.25 m)
Reason Pulled: TOTAL DEPTH/CASING DEPTH

BHA no. 9: No./Element/OD(in)/Length(m) Depth In: 2559 m MD Out: 2676 m MD

1 ATJ-22	6.000	0.19	6 STEEL STAB	6.000	1.64
2 BIT SUB	6.000	1.22	7 DRILL COLLAR STEEL	4.750	138.22
3 X-OVER	4.750	0.78	8 JAR	4.750	9.09
4 MWD	4.750	9.48	9 DRILL COLLAR STEEL	4.750	27.85
5 X-OVER	4.750	0.78			

Reason Pulled: HOURS Sum: 189.25

BHA no. 10: No./Element/OD(in)/Length(m) Depth In: 2676 m MD Out: 2947 m MD

1 ATJ-22	6.000	0.19	6 STEEL STAB	6.000	1.64
2 BIT SUB	6.000	1.22	7 DRILL COLLAR STEEL	4.750	165.89
3 X-OVER	4.750	0.78	8 JAR	4.750	9.09
4 MWD	4.750	9.48	9 DRILL COLLAR STEEL	4.750	27.85
5 X-OVER	4.750	0.78			

Reason Pulled: HOURS Sum: 216.92

BHA no. 11: Depth In: 2947 m MD Out: 2994 m MD; same elements as in BHA no. 10
Except Bit, here LYNG, LA 250 B (Length 0.27 m)
Reason Pulled: TOTAL DEPTH/CASING DEPTH

BHA no. 12: No./Element/OD(in)/Length(m) Depth In: 2350 m MD Out: 0 m MD

1 J4	6.000	0.18	4 DRILL COLLAR STEEL	4.750	165.89
2 BIT SUB	5.130	1.22	5 JAR	4.630	9.09
3 STEEL STAB	4.750	1.64	6 DRILL COLLAR STEEL	4.750	27.85

Reason Pulled: Sum: 205.87

Norsk Hydro

DAILY MUD PROPERTIES : RHEOLOGY PARAMETERS FOR WELL 30/9-18

Hole section: 36"

WATER BASED SYSTEM

Date	Depth [m]		Mud Type	Funnel Visc [sec]	Dens [sg]	Mudtmp Out [DegC]	Fann Readings								Rheo Test [DegC]	PV [mPas]	YP [Pa]	Gel0 [Pa]	Gel10 [Pa]
	MD	TVD					600	300	200	100	60	30	6	3					
15-mar-1995 23:59	194	194	SPUD MUD	100.0	1.05	0.0									0.0	0.0	0.0	0.0	0.0

Hole section: 24"

WATER BASED SYSTEM

Date	Depth [m]		Mud Type	Funnel Visc [sec]	Dens [sg]	Mudtmp Out [DegC]	Fann Readings								Rheo Test [DegC]	PV [mPas]	YP [Pa]	Gel0 [Pa]	Gel10 [Pa]
	MD	TVD					600	300	200	100	60	30	6	3					
16-mar-1995 23:59	557	557	SPUD MUD	100.0	1.05	0.0									0.0	0.0	0.0	0.0	0.0
17-mar-1995 23:59	557	557	SPUD MUD	100.0	1.05	0.0									0.0	0.0	0.0	0.0	0.0
18-mar-1995 23:59	557	557	SPUD MUD	100.0	1.05	0.0									0.0	0.0	0.0	0.0	0.0
19-mar-1995 23:59	557	557	SPUD MUD	100.0	1.20	0.0									0.0	0.0	0.0	0.0	0.0

Hole section: 12 1/4"

WATER BASED SYSTEM

Date	Depth [m]		Mud Type	Funnel Visc [sec]	Dens [sg]	Mudtmp Out [DegC]	Fann Readings								Rheo Test [DegC]	PV [mPas]	YP [Pa]	Gel0 [Pa]	Gel10 [Pa]
	MD	TVD					600	300	200	100	60	30	6	3					
20-mar-1995 23:59	773	773	KCL/POLYME	57.0	1.20	0.0	64	42	30	18			5	4	50.0	22.0	10.0	2.0	2.5
21-mar-1995 23:59	1342	1342	KCL/POLYME	69.0	1.20	0.0	55	38	30	21			6	5	50.0	17.0	10.5	3.0	4.0
22-mar-1995 23:59	1550	1550	KCL/POLYME	71.0	1.25	0.0	70	48	30	21			6	5	50.0	22.0	13.0	3.0	4.0
23-mar-1995 23:59	1550	1550	KCL/POLYME	71.0	1.25	0.0	60	41	33	24			7	6	50.0	19.0	11.0	3.0	4.0

See also the report 'DAILY MUD PROPERTIES : OTHER PARAMETERS'

DAILY MUD PROPERTIES : RHEOLOGY PARAMETERS FOR WELL 30/9-18

Hole section: 8 1/2"

WATER BASED SYSTEM

Date	Depth [m]		Mud Type	Funnel Visc [sec]	Dens [sg]	Mudtmp Out [DegC]	Fann Readings								Rheo Test [DegC]	PV [mPas]	YP [Pa]	Gel0 [Pa]	Gel10 [Pa]
	MD	TVD					600	300	200	100	60	30	6	3					
24-mar-1995 23:59	1550	1550	KCL/POLYME	71.0	1.25	0.0	72	50	40	29			8	6	50.0	22.0	14.0	3.0	5.0
25-mar-1995 23:59	2070	2070	KCL/POLYME	66.0	1.43	0.0	79	53	43	30			9	7	50.0	26.0	13.5	4.0	9.0
26-mar-1995 23:59	2122	2122	KCL/POLYME	67.0	1.43	0.0	88	58	46	32			8	6	50.0	30.0	14.0	3.6	6.5
27-mar-1995 23:59	2420	2420	KCL/POLYME	67.0	1.43	0.0	81	54	43	30			7	5	50.0	27.0	13.5	3.6	7.5
28-mar-1995 23:59	2420	2420	KCL/POLYME	69.0	1.43	0.0									50.0	28.0	15.0	3.5	7.5
29-mar-1995 23:59	2459	2459	KCL/POLYME	67.0	1.43	0.0									50.0	27.0	12.5	3.0	5.5
30-mar-1995 22:00	2559	2559	KCL/POLYME	69.0	1.43	0.0									50.0	29.0	13.0	3.0	5.0

Hole section: 6"

WATER BASED SYSTEM

Date	Depth [m]		Mud Type	Funnel Visc [sec]	Dens [sg]	Mudtmp Out [DegC]	Fann Readings								Rheo Test [DegC]	PV [mPas]	YP [Pa]	Gel0 [Pa]	Gel10 [Pa]
	MD	TVD					600	300	200	100	60	30	6	3					
31-mar-1995 23:59	2559	2559	KCL/POLYME	69.0	1.43	0.0									50.0	29.0	13.0	3.0	5.0
01-apr-1995 23:59	2564	2564	KCL/POLYME	46.0	1.15	0.0	35	26	19	11			3	2	50.0	9.0	8.5	1.5	4.0
02-apr-1995 23:59	2651	2651	KCL/POLYME	68.0	1.15	0.0	46	32	25	18			5	3	50.0	149.0	9.0	2.0	3.5
03-apr-1995 23:59	2723	2723	KCL/POLYME	68.0	1.15	0.0	45	31	24	17			5	3	50.0	14.0	8.5	2.5	4.0
04-apr-1995 23:00	2858	2858	KCL/POLYME	73.0	1.15	0.0	58	40	33	23			7	5	50.0	18.0	11.0	3.0	4.0
05-apr-1995 20:00	2947	2947	KCL/POLYME	73.0	1.15	0.0	59	41	33	23			7	5	50.0	18.0	11.5	3.0	4.0
06-apr-1995 23:59	2994	2994	KCL/POLYME	73.0	1.15	0.0	58	40	32	22			7	5	50.0	18.0	11.0	3.0	4.0
07-apr-1995 23:59	2994	2994	KCL/POLYME	73.0	1.15	0.0	58	40	32	22			7	5	50.0	18.0	11.0	3.0	4.0
08-apr-1995 21:00	2350	2350	KCL/POLYME	72.0	1.15	0.0	57	39	31	21			6	4	50.0	18.0	10.5	3.0	4.0
09-apr-1995 20:00	350	350	KCL/POLYME	74.0	1.15	0.0	60	41	32	22			7	5	50.0	19.0	11.0	4.0	6.0

See also the report 'DAILY MUD PROPERTIES : OTHER PARAMETERS'

Norsk Hydro

DAILY MUD PROPERTIES : OTHER PARAMETERS FOR WELL 30/9-18

Hole section: 36"

WATER BASED SYSTEM

Date	Depth [m]		Mud Type	Dens	Filtrate		Filt.cake		HPHT	pH	Alcalinity			Inhib Chem	K+	CL-	Ca++	Mg++	Tot hard	Percentage			CEC	ASG	LGS
	MD	TVD		[sg]	API [ml]	HPHT [ml]	API [mm]	HPHT [mm]	Press/Temp [psi/DegC]		Pm [ml]	Pf [ml]	Mf [ml]	[Kg/m3]	[mg/l]	[mg/l]	[mg/l]	[mg/l]	[mg]	Solid [%]	Oil [%]	Sand [%]	[Kg/m3]	[sg]	[Kg/m3]
15-mar-1995 23:59	194	194	SPUD MUD	1.05	0.0	0.0	0	0	0/0	0.0	0.0	0.0	0.0	0	0	0	0	0	0	0.0	0.0	0.0	0	0.0	0

Hole section: 24"

WATER BASED SYSTEM

Date	Depth [m]		Mud Type	Dens	Filtrate		Filt.cake		HPHT	pH	Alcalinity			Inhib Chem	K+	CL-	Ca++	Mg++	Tot hard	Percentage			CEC	ASG	LGS
	MD	TVD		[sg]	API [ml]	HPHT [ml]	API [mm]	HPHT [mm]	Press/Temp [psi/DegC]		Pm [ml]	Pf [ml]	Mf [ml]	[Kg/m3]	[mg/l]	[mg/l]	[mg/l]	[mg/l]	[mg]	Solid [%]	Oil [%]	Sand [%]	[Kg/m3]	[sg]	[Kg/m3]
16-mar-1995 23:59	557	557	SPUD MUD	1.05	0.0	0.0	0	0	0/0	0.0	0.0	0.0	0.0	0	0	0	0	0	0	0.0	0.0	0.0	0	0.0	0
17-mar-1995 23:59	557	557	SPUD MUD	1.05	0.0	0.0	0	0	0/0	0.0	0.0	0.0	0.0	0	0	0	0	0	0	0.0	0.0	0.0	0	0.0	0
18-mar-1995 23:59	557	557	SPUD MUD	1.05	0.0	0.0	0	0	0/0	0.0	0.0	0.0	0.0	0	0	0	0	0	0	0.0	0.0	0.0	0	0.0	0
19-mar-1995 23:59	557	557	SPUD MUD	1.20	0.0	0.0	0	0	0/0	0.0	0.0	0.0	0.0	0	0	0	0	0	0	0.0	0.0	0.0	0	0.0	0

Hole section: 12 1/4"

WATER BASED SYSTEM

Date	Depth [m]		Mud Type	Dens	Filtrate		Filt.cake		HPHT	pH	Alcalinity			Inhib Chem	K+	CL-	Ca++	Mg++	Tot hard	Percentage			CEC	ASG	LGS
	MD	TVD		[sg]	API [ml]	HPHT [ml]	API [mm]	HPHT [mm]	Press/Temp [psi/DegC]		Pm [ml]	Pf [ml]	Mf [ml]	[Kg/m3]	[mg/l]	[mg/l]	[mg/l]	[mg/l]	[mg]	Solid [%]	Oil [%]	Sand [%]	[Kg/m3]	[sg]	[Kg/m3]
20-mar-1995 23:59	773	773	KCL/POLYME	1.20	4.2	0.0	1	0	0/0	9.6	0.0	0.1	0.5	100	52300	47000	240	0	440	10.0	0.0	1.0	8	0.0	90
21-mar-1995 23:59	1342	1342	KCL/POLYME	1.20	3.1	0.0	1	0	0/0	8.5	0.0	0.1	0.5	112	58576	57000	200	0	400	10.0	0.0	1.5	15	0.0	66
22-mar-1995 23:59	1550	1550	KCL/POLYME	1.25	3.1	0.0	1	0	0/0	8.3	0.0	0.0	0.6	100	52300	54000	200	0	400	12.0	0.0	2.0	20	0.0	99
23-mar-1995 23:59	1550	1550	KCL/POLYME	1.25	2.9	0.0	1	0	0/0	8.3	0.0	0.0	0.6	100	52300	56000	200	0	400	12.0	0.0	2.0	20	0.0	94

Hole section: 8 1/2"

WATER BASED SYSTEM

Date	Depth [m]		Mud Type	Dens	Filtrate		Filt.cake		HPHT	pH	Alcalinity			Inhib Chem	K+	CL-	Ca++	Mg++	Tot hard	Percentage			CEC	ASG	LGS
	MD	TVD		[sg]	API [ml]	HPHT [ml]	API [mm]	HPHT [mm]	Press/Temp [psi/DegC]		Pm [ml]	Pf [ml]	Mf [ml]	[Kg/m3]	[mg/l]	[mg/l]	[mg/l]	[mg/l]	[mg]	Solid [%]	Oil [%]	Sand [%]	[Kg/m3]	[sg]	[Kg/m3]
24-mar-1995 23:59	1550	1550	KCL/POLYME	1.25	2.8	0.0	1	0	0/0	8.7	0.0	0.1	0.7	105	54915	56000	320	0	550	12.0	0.0	2.0	22	0.0	94
25-mar-1995 23:59	2070	2070	KCL/POLYME	1.43	2.7	0.0	1	0	0/0	8.0	0.1	0.0	1.9	107	55916	66500	440	0	480	18.0	0.0	0.8	42	0.0	98
26-mar-1995 23:59	2122	2122	KCL/POLYME	1.43	2.0	0.0	1	0	0/0	8.7	0.0	0.1	2.0	110	57530	74000	360	0	480	18.0	0.0	0.3	56	0.0	80
27-mar-1995 23:59	2420	2420	KCL/POLYME	1.43	2.3	0.0	1	0	0/0	8.3	0.0	0.0	1.5	120	62760	75000	240	0	440	18.5	0.0	0.4	57	0.0	105
28-mar-1995 23:59	2420	2420	KCL/POLYME	1.43	2.0	0.0	1	0	0/0	8.3	0.0	0.1	1.5	105	62760	78000	240	0	440	18.5	0.0	0.4	56	0.0	97
29-mar-1995 23:59	2459	2459	KCL/POLYME	1.43	1.7	0.0	1	12	0/0	8.3	0.0	0.1	1.6	120	0	80500	240	0	320	18.5	0.0	0.4	49	0.0	91
30-mar-1995 22:00	2559	2559	KCL/POLYME	1.43	1.7	0.0	1	12	0/0	8.3	0.0	0.1	1.6	120	0	81000	240	0	320	18.5	0.0	0.4	49	0.0	90

Hole section: 6"

WATER BASED SYSTEM

Date	Depth [m]		Mud Type	Dens	Filtrate		Filt.cake		HPHT	pH	Alcalinity			Inhib Chem	K+	CL-	Ca++	Mg++	Tot hard	Percentage			CEC	ASG	LGS
	MD	TVD		[sg]	API [ml]	HPHT [ml]	API [mm]	HPHT [mm]	Press/Temp [psi/DegC]		Pm [ml]	Pf [ml]	Mf [ml]	[Kg/m3]	[mg/l]	[mg/l]	[mg/l]	[mg/l]	[mg]	Solid [%]	Oil [%]	Sand [%]	[Kg/m3]	[sg]	[Kg/m3]
31-mar-1995 23:59	2559	2559	KCL/POLYME	1.43	2.5	12.0	1	2	0/0	9.7	0.0	0.1	2.9	120	0	81000	580	0	700	18.5	0.0	0.4	49	0.0	90
01-apr-1995 23:59	2564	2564	KCL/POLYME	1.15	2.1	14.5	1	4	0/0	8.7	0.0	0.1	0.2	88	0	53000	100	0	200	7.0	0.0	0.0	6	0.0	1
02-apr-1995 23:59	2651	2651	KCL/POLYME	1.15	2.3	12.0	1	2	0/0	8.3	0.0	0.0	1.2	87	0	52500	120	0	220	7.0	0.0	0.3	8	0.0	2

See also the report 'DAILY MUD PROPERTIES : RHEOLOGY PARAMETERS'

DAILY MUD PROPERTIES : OTHER PARAMETERS FOR WELL 30/9-18

Hole section: 6"

WATER BASED SYSTEM

Date	Depth [m]		Mud Type	Dens	Filtrate		Filt.cake		HPHT Press/Temp	pH	Alcalinity			Inhib Chem	K+	CL-	Ca++	Mg++	Tot hard	Percentage			CEC	ASG	LGS
	MD	TVD		[sg]	API [ml]	HPHT [ml]	API [mm]	HPHT [mm]	[psi/DegC]		Pm [ml]	Pf [ml]	Mf [ml]	[Kg/m3]	[mg/l]	[mg/l]	[mg/l]	[mg/l]	[mg]	Solid [%]	Oil [%]	Sand [%]	[Kg/m3]	[sg]	[Kg/m3]
03-apr-1995 23:59	2723	2723	KCL/POLYME	1.15	2.2	12.0	1	2	35/110	8.1	0.0	0.0	0.9	86	0	53000	200	0	300	7.0	0.0	0.3	10	0.0	1
04-apr-1995 23:00	2858	2858	KCL/POLYME	1.15	2.0	11.8	1	2	35/110	8.5	0.0	0.0	1.2	84	0	53500	120	0	210	7.5	0.0	0.5	14	0.0	1
05-apr-1995 20:00	2947	2947	KCL/POLYME	1.15	2.0	11.8	1	2	35/110	8.5	0.0	0.0	0.0	87	0	54000	200	0	260	7.5	0.0	0.5	15	0.0	0
06-apr-1995 23:59	2994	2994	KCL/POLYME	1.15	2.0	12.0	1	2	35/110	8.2	0.0	0.0	0.0	85	0	54000	200	0	260	7.5	0.0	0.5	15	0.0	0
07-apr-1995 23:59	2994	2994	KCL/POLYME	1.15	2.0	12.0	1	2	35/110	8.2	0.0	0.0	0.0	85	0	54000	200	0	260	7.5	0.0	0.5	15	0.0	0
08-apr-1995 21:00	2350	2350	KCL/POLYME	1.15	2.1	11.8	1	2	35/110	8.2	0.0	0.0	0.0	85	0	54000	200	0	280	7.5	0.0	0.5	15	0.0	0
09-apr-1995 20:00	350	350	KCL/POLYME	1.15	2.2	12.0	1	2	35/110	9.3	0.0	0.0	0.0	85	0	54000	240	0	280	7.5	0.0	0.5	14	0.0	0

See also the report 'DAILY MUD PROPERTIES : RHEOLOGY PARAMETERS'

5 FINAL COST REPORTS

NORSK HYDRO
DRIFT/BORESEKTOR *Drilling*

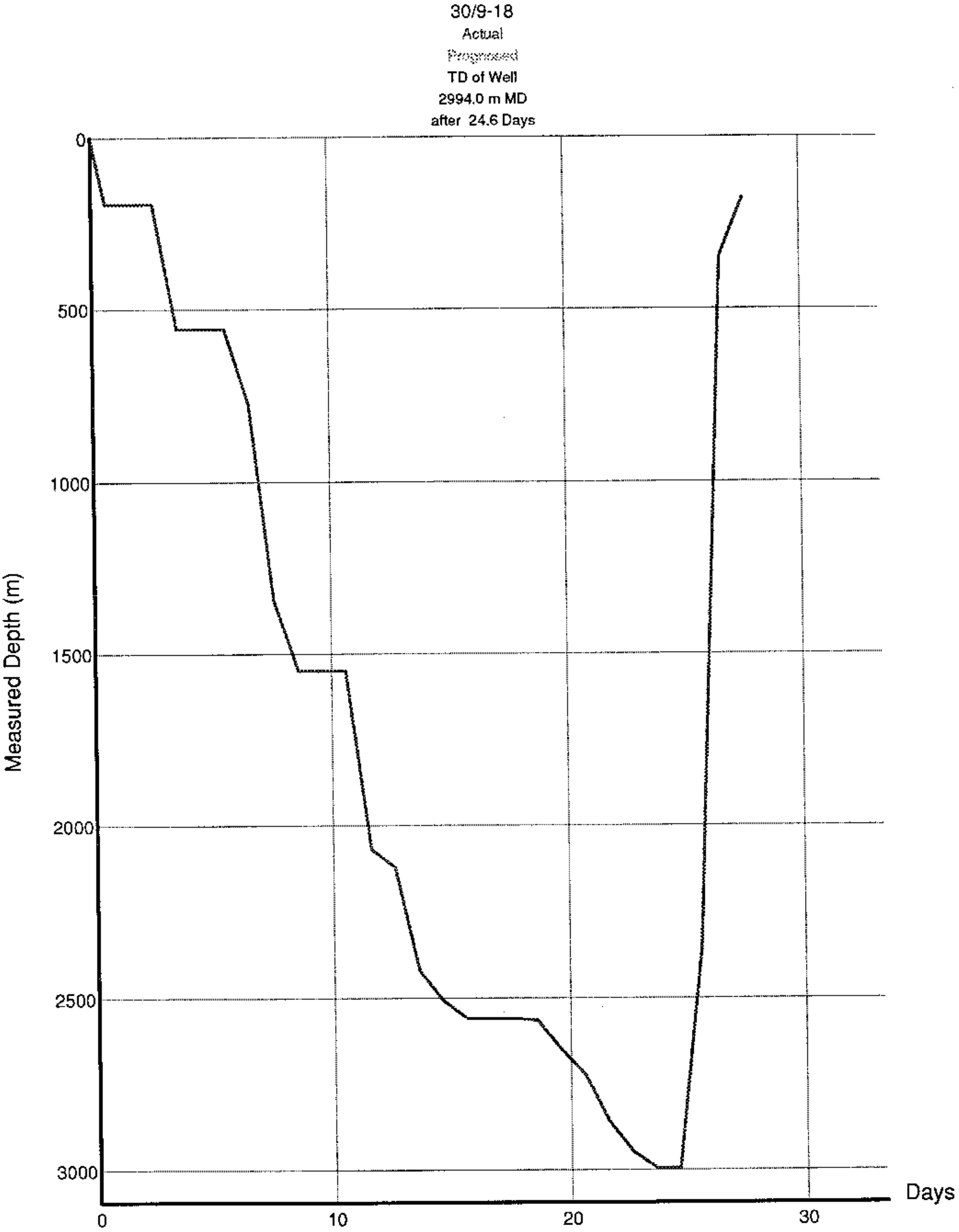
WELL : 30/9-18
LICENS : 104
RIG : TREASURE SAGA
RIG RATE : USD 6.200 + NOK 275.000
DEPTH IN METER : 3368 m 2994 m
EXCHANGE RATE USD 1= : NOK 6,50 NOK 6,50
DAYS : 30,9 28,437
DATE OF REPORT : 00.00.00 31.07.95

ESTIMATED COSTS	(IN 1.000 NOK)	APPR.AFE 190-06	ACC. ACTUAL	ESTIM. FIN.COSTS
0	**EMPLOYEE RELATED COSTS**	**1.700**	**1.369**	**1.369**
1	**RIG COSTS**	**9.743**	**8.838**	**8.838**
2	**RIG SUPPORT COSTS**	**2.044**	**1.564**	**1.564**
3A	*Fuel/lub.*	773	581	581
3C	*Bits*	961	1.005	1.005
3D	*Casing/casing equipment*	2.052	1.874	1.874
3F	*Wellhead*	1.473	1.457	1.457
[illegible]	*Cement/cement additives*	1.255	2.922	2.922
3G	*Mud/mud chemicals*	1.949	1.989	1.989
3	**CONSUMABLES COSTS, SUB TOTAL**	**8.463**	**9.828**	**9.828**
4B	*Fix. wing transportation*	0	0	0
4C	*Other transportation*	62	57	57
4D	*Standby vessel*	834	731	731
4F	*Helicopter transportation*	927	667	667
4G	*Supply vessels*	1.932	2.657	2.657
4	**TRANSPORTATION COSTS, SUB TOTAL**	**3.755**	**4.112**	**4.112**
5A	*Coring*	50	110	110
5B	*Drilling*	341	220	220
5C	*Cutting of casing/Fishing equipm.*	320	226	226
5F	*MWD-services*	989	1.049	1.049
5G	*Casing operations*	453	287	287
5H	*Mud logging*	757	717	717
[illegible]	*Cement/press.test*	309	274	274
5J	*Electrical logging*	746	846	846
5K	*VSP*	0	0	0
5L	*Prod. testing*	164	138	138
5M	*Diving/ROV*	478	377	377
5N	*Misc. rental & op.costs*	742	509	509
5	**SERVICE COSTS, SUB TOTAL**	**5.349**	**4.753**	**4.753**
6A	*Site survey*	0	0	0
6B	*Rig positioning*	300	300	300
6C	*Drilling site clean up*	200	0	200
6	**SURVEY COSTS, SUB TOTAL**	**500**	**300**	**500**
7	**WAREHOUSE COSTS**	**773**	**394**	**394**
8	**LAB.COSTS**			
TOTAL OPERATION COSTS		**32.327**	**31.158**	**31.358**

6 EQUIPMENT FAILURES AND PROBLEMS

Rpt. No.	Equipment	Failures/Problems	Lost time (hrs)
4	18 5/8" casing toong	Imptoper tolreances to fit the actual casing size	0.5
7	slip joint packer	changed to upper packer	0.5
8/9	Pup joint below hanger	The casing slips squeezed the pup joint due to stuck casing	2.5
13	Wear bushing	Damaged wear bushing made marks on the drillpipe.	5.5
21	MWD	changed out probe after malfunctioning at surface	1

7 DRILLING PROGRESS CURVE



Ref. Point: RKB 26.0 m above MSL

Figure 1

MD Drilling Curve

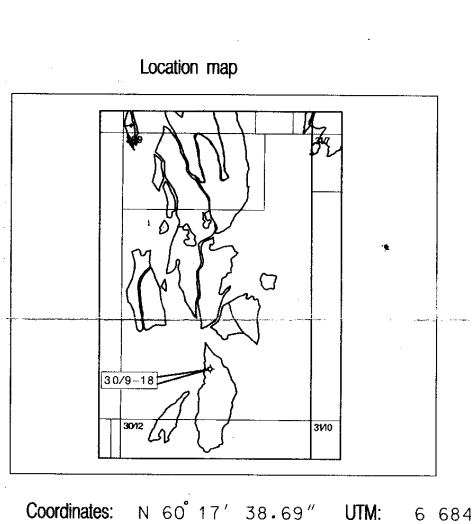
HYDRO

Completion log

Scale: 1:500

Well: 30/9-18

Location map



Coordinates: N 60° 17' 38.69" E 02° 49' 22.59"
UTM: 6 684 332.9 mN, 490 211.4 mE
ED 50. Zone 31. CM 3°E
Elevation K B: 26 m
Water Depth: 106 m MSL
Total Depth (Driller): 2994 m
Total Depth (Logger): 2992 m
Formation at Total Depth: Drake

Country: NORWAY
Licence: PL 104
Owners: NORSK HYDRO A.S. STATOIL, CONOCO, SAGA, AGIP
Field: OSEBERG SOUTH

Date Spudded: 14.03.95
Reached Total Depth: 06.04.95
Completed: 11.04.95
Well Status: P & A. Dry.

Rig: Treasure Saga
Contractor: Wilrig
Mudlogging Company: Baker Hughes Inteq
Geologists: Ree, Knape, Swanberg, Gahlla, Kelman

Prepared by: K.Aasgaard
Controlled by: R.Ree
Date: 01.08.95 1995

Casing Records:

30"	at	193 m
18 5/8"	at	547 m
9 5/8"	at	1538 m
7" liner	at	2557 m (Top at 1383 m)

Comments:

Logs Run

BGT/DLL/LSS/MSFL/GR		LDL/GR		FMS		VSP		RFT		CST	
1A	1523 - 525 m	1A	1523 - 525 m	3A	2990 - 2558.5 m	3A	2990 - 290 m	3A	2624 - 2873.5 m	3A	2965 - 2570 m
2B	2550.5 - 1538 m	2B	2550.5 - 1538 m								
3C	2990.5 - 2558.5 m	LDL/CNL/GR									
		3C/A	2981 - 2558.5 m								

Legend

- CONGLOMERATE
- SAND / SANDSTONE
- SILT/SILTSTONE
- CLAY
- CLAYSTONE
- SHALE
- LIMESTONE
- DOLOMITE
- DOLOMITIC LIMESTONE
- CALCAREOUS DOLOMITE
- CHALK
- MARL / MARLSTONE
- COAL / LIGNITE
- GLAUCONITE
- ANHYDRITE
- SALT
- GYPSUM
- TUFF
- IGNEOUS EXTR / INTR
- SANDY VERY / SANDY / SANDY SLIGHTLY
- SILTY VERY / SILTY / SILTY SLIGHTLY
- ARGILLACEOUS
- DOLOMITE STRINGER
- LIMESTONE STRINGER
- C Carbonaceous mat.
- △ Chert
- • Glauconite
- M Mica
- □ Pyrite
- Macrofossils
- Macrofossils frag.
- Microfossils

Hydrocarbon Shows
- Oil stain
- Fluorescence
- Visible cut
- Fluorescence cut
- Gas shows

Casing Shoe

Deviation

Two way time from velocity survey (depth m K.B.) e.g: 1732m 1.740 mSec

Core interval

Side Wall Core → (No recovery) →

Perforated Interval

Cement Plug Interval

DST ① Trough casing ② Open hole ②Re-run

← ① RFT / FIT

30/9-18
30/9-18

FORMATION PRESSURE WORKSHEET

Well No.: 30/9 - 18 | Rig : Treasure Saga | Date : 07.04.95
Pressure Units : Bar | RKB-MSL : 26 m | Witnessed by : S.S. Gahlla

Run No. 3A	Depth (MD)	Depth TVD (RKB)	Initial Hydrostatic Press		Formation Pressure		Final Hydrostatic Press		Time		Remarks
Test No			Strain	HP	Strain	HP	Strain	HP	Set	Retract	
1	2624	2624	299.3	299.3	271.69	271.71	299.3	299.4	12:17	12:19	42.70 mD/CP. V. good perm.
2	2627.5	2627.5	299.6	299.8	271.93	272.07	299.6	299.8	12:27	12:29	21.50 mD/CP. V. good perm.
3	2645.5	2645.5	301.6	301.8	273.64	273.81	301.6	301.8	12:37	12:41	21.96 mD/CP. V. good perm.
4	2657	2657	302.8	303.1	274.7	274.88	302.8	303.1	12:50	12:53	676.96 mD/CP. Excellent perm.
5	2662	2662	303.4	303.6	275.17	275.37	303.4	303.7	13:01	13:04	457.77 mD/CP. Excellent perm.
6	2689	2689	306.4	306.7	277.79	278.02	306.4	306.7	13:12	13:15	77.72 mD/CP. V. good perm.
7	2707	2707	308.4	308.7	279.54	279.77	308.4	308.7	13:22	13:25	132.82 mD/CP. V. good perm.
8	2767	2767	315.0	315.4	284.43	284.63	315.1	315.4	13:32	13:35	233.03 mD/CP. Excellent perm.
9	2772.5	2772.5	315.7	316.1	284.96	285.19	315.7	316.0	13:41	13:44	53.92 mD/CP. V. good perm.
10	2783	2783	316.8	317.2	285.98	286.20	316.8	317.2	13:48	13:51	1016.04 mD/CP. Excellent perm.
11	2793	2793	318.0	318.3	286.93	287.18	318.0	318.3	14:00	14:04	51.11 mD/CP. V. good perm.
12	2822	2822	321.2	321.6	289.43	289.70	321.2	321.6	14:15	14:19	120.68 mD/CP V. good perm.
13	2826	2826	321.6	322.0	289.80	290.09	321.7	322.1	14:26	14:30	55.27 mD/CP V. good perm.
14	2867	2867	326.3	326.7	293.95	294.24	326.3	326.7	14:36	14:40	8.58 mD/CP; Good perm.
15	2873.5	2873.5	327.0	327.4	294.56	294.83	327.0	327.3	14:47	14:50	24.05 mD/CP; V. good perm

Page : 1 of : 1

FORMATION	TOP mRKB	BASE mRKB	NET RESERVOIR GROSS m	NET m	N/G	PHIE %	SW %	NET PAY NET m	N/G	PHIE %	SW %
DRAUPNE Fm	2595	2597	2	0,0	0,00	-	-	-	-	-	-
HEATHER Fm	2597	2623	26	0,0	0,00	-	-	-	-	-	-
L.HEATHER sst	2623	2646	23	7,8	0,34	19,4	93	-	-	-	-
U.TARBERT Fm	2646	2704	58	43,4	0,75	19,3	93	-	-	-	-
M.TARBERT Fm	2704	2725	21	5,6	0,27	20,7	96	-	-	-	-
L.TARBERT Fm	2725	2750	25	10,7	0,43	15,3	99	-	-	-	-
NESS Fm	2750	2937	187	47,6	0,25	22,5	99	-	-	-	-
ORE Fms	2937	2954	17	6,9	0,40	26,7	88	-	-	-	-
DRAKE Fm	2954	2994	40	0,0	0,00	-	-	-	-	-	-

CUTOFF	MIN.	MAX.	DETERMINE	
VCL (%)	0,0	40,0	NET SAND/PAY	"ALL FORMATIONS"
PHIE (%)	10,0	100,0	NET SAND/PAY	"BRENT GROUP"
PHIE (%)	15,0	100,0	NET SAND/PAY	"HEATHER Fm"
SW (%)	0,0	60,0	NET PAY	"ALL FORMATIONS"

INTEF PRETATION RESULTS

DRILLING RESULTS

30/ 9-18

LEGEND:

- ——→ Correlation of seismic event with log event (Seismic pick in site survey report)
- ←- - - Revised seismic pick (Based on log results)

COORDINATES:
Geographic:
60° 17' 38.69" N – 2° 49' 22.59" E
UTM:
66 332.9 mN – 490 211.4 mE
ED50 Zone 31 (CM 3° E).

RIG: TREASURE SAGA
RKB 26 m
SPUD DATE: 14.3 .95
COMPLETION DATE: 11.4.95

LEGEND:

- ☐ – Clay/claystone
- ⁘ – Silt/Siltstone
- ▒ – Sand/sandstone
- ▦ – Limestone
- ▨ – Cement plug

Seismic

Seismic source: 4x10 cu.in airgun
Sample rate: 0.5 ms
Streamer: 375 m/60 ch/6.25 m/6.25 m

Line: NH9356-320

Well location
309-18

Prognosis

Reflectors	TWT (ms)	Int vel	Depth (m RKB)	Anomaly
	141		132	
R3	168		156	
R3b	190		175	
		1775		
R5	318		289	
		1910		
IP1	357		326	
IP2	482		462	
		2210		
IP3	617		608	
R6	663		658	
		1965		
R7	836		828	
		2160		
R10	1000		1005	

Correlation

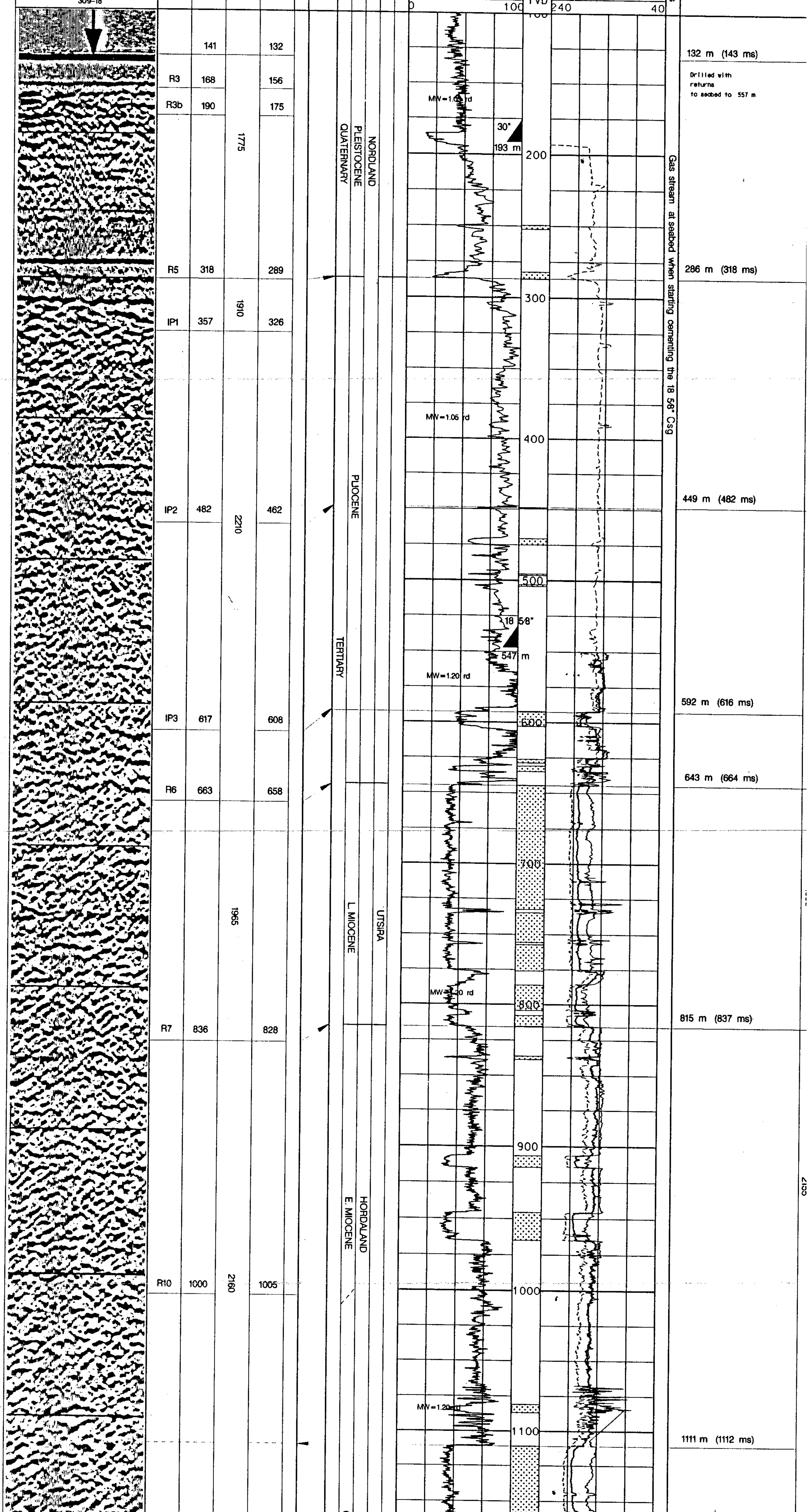
Stratigraphy: System, Series, Group, Formation, Informal Unit

Gamma

Sonic Resistivity

Shallow Gas

Results



132 m (143 ms)

Drilled with returns to seabed to 557 m

286 m (318 ms)

449 m (482 ms)

592 m (616 ms)

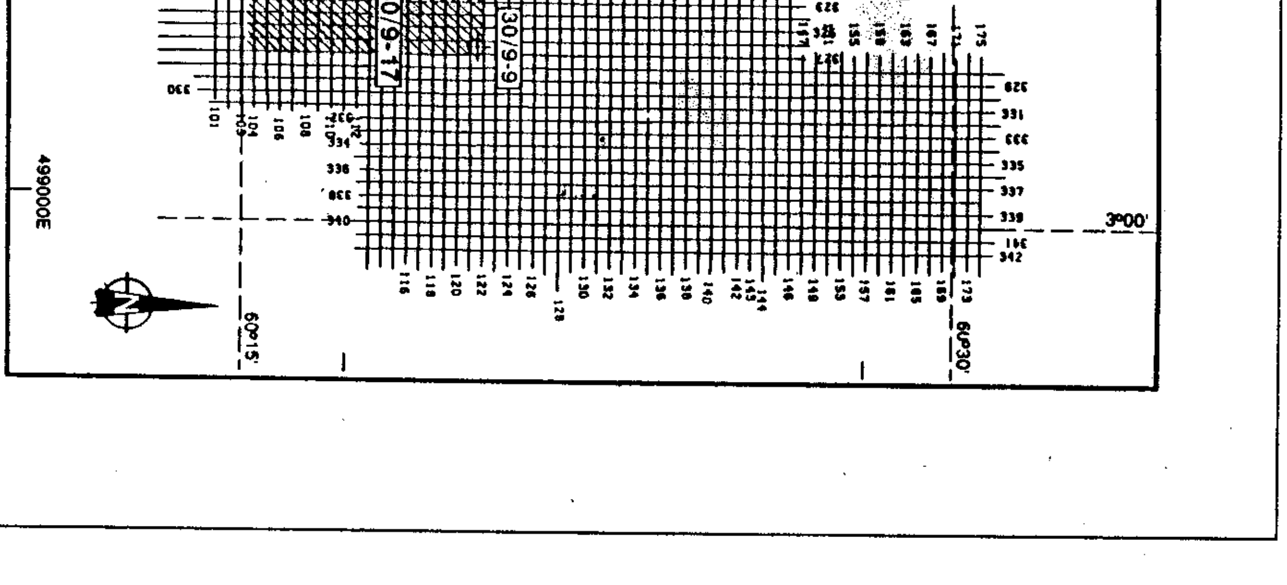
643 m (664 ms)

815 m (837 ms)

1111 m (1112 ms)

NOTES:

The given stratigraphy is based on seismic correlation to other wells as no datings or cuttings are available from the investigated interval in well 309-18.



HYDRO

Marine Surveys Section

Exploration and Production Division

Drawing title:

Post site survey for well 309-18

Comparison for predicted lithology, stratigraphy, shallowgas and obtained drilling results

Interpreted by	Drawn by	Checked by	Date	File no.	Rev.
KB	KB	KB	18.08.1995		0

Scale 1:2000

marineun\oseberg\log\30918.etr Sep 8, 1995 10 45 26