STATOIL

FINAL WELL REPORT

PL 124, WELL 6507/8-7

UPN
LET OPR BEV HAR
Harstad, July 2004

ConocoPhillips petoro Eni GROUP Eni Norge

Final well report
PL 124
Well 6507/8-7
Kappa

04Y94*19254

STATOIL

Title:
Final well report **PL 124** **Well 6507/8-7** **Kappa**

Document no.:	Contract no./project no.:	Filing no.:
04Y94*19254	**PL 124**	

Classification:	Distribution:
Open	**Open**

Distribution date:	Rev. date:	Rev. no.:	Copy no.:
	2004-07-25	**0**	

Author(s)/Source(s):
John Martin Østby, Sveinung Tysse, Anne Brit Sommervoll

Subjects:
General information, Exemptions and non-conformances, Health, safety, environment and quality, Geology and formation data report, Drilling operation report

Remarks:

Valid from:	Updated:
Responsible publisher:	Authority to approve deviations:

Responsible:	Name:	Date/Signature:
Well project manager	Viggo Larsen	23.09.2004 Viggo Larsen
Recommended:	Name:	Date/Signature:
OPR BEV, Manager well evaluation	Rolf Nylend	23.8.2004 Rolf Nylend
Recommended:	Name:	Date/Signature:
OPR BOR, Manager exploration drilling	Harald Mortensen	23.08.2004 H. Mortensen
Approved:	Name:	Date/Signature:
LET HNO, Area Manager	Roger Inge Johansen	26.08.2004 Roger Johansen

Table of contents

List of Figures and Tables

1 Introduction

1.1 Well data record

Well name	:	6507/8-7	
Type of well	:	Exploration	
Prospect	:	Kappa	
Country	:	Norway	
Area	:	Haltenbanken	
License	:	PL 124	
Licensees	:	Statoil ASA (Operator)	35.00 %
		Petoro AS	27.09 %
		Norske ConocoPhillips AS	27.91 %
		Eni Norge AS	10.00 %
Drilling unit	:	Deepsea Bergen	
Type	:	Semi-submersible	
Water depth	:	333 m MSL	
Air gap	:	23 m	
On license	:	04.01.2004	
Rig release	:	31.01.2004	
Formation at TD	:	Tilje Formation	
Geographic co-ordinates	:	65^{o} 17' 42.45" N 07^{o} 21' 41.57" E	
Datum/Spheroid	:	ED-1950 / Int. 1924	
UTM	:	UTM Zone 32, CM 09^{o} E 7 242 521 m N 423 592 m E	
Seismic location	:	Seismic survey ST00M01 Inline 402, Cross-line 972.	

All depths in this report refer to RKB (Rotary table) unless otherwise stated.

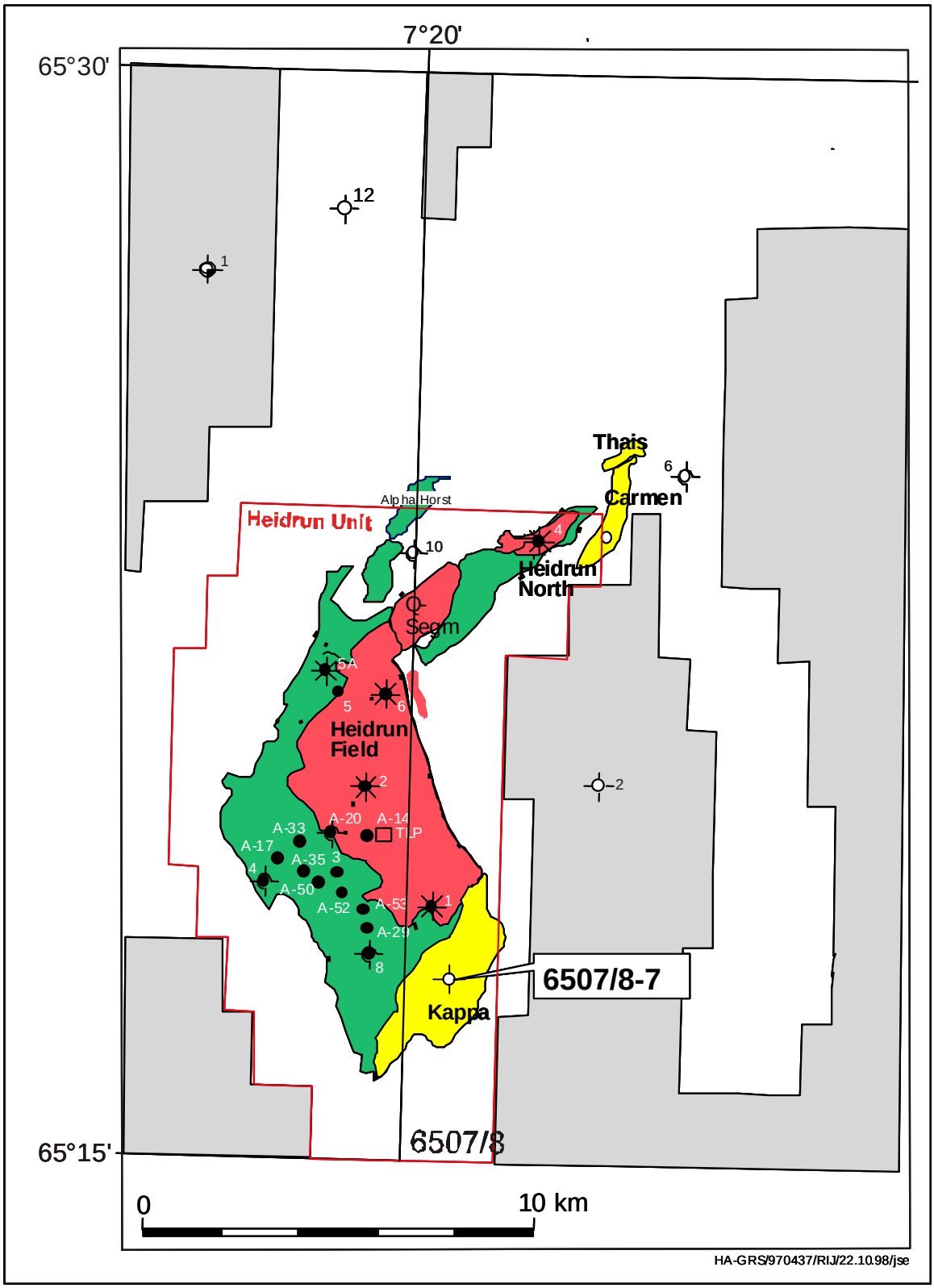


Fig. 1.1 Location map

1.2 Well objectives

The primary objective for the well 6507/8-7 was to prove hydrocarbons in the Middle and Lower Jurassic sandstones of the Fangst and Båt Groups.

The secondary objective was to prove hydrocarbons in the Cretaceous Lysing Formation of the Cromer Knoll Group.

1.3 Result of the wells

Well 6507/8-7 was spudded in a water depth of 333 m MSL and drilled to a total depth of 2975 m, which is 17m into the Tilje Formation. No shallow gas was observed by the ROV at the wellhead.

The Lysing Formation does not exist at this location. The top of Cromer Knoll Group consists of interbedded limestone/marl and claystone dated to the Lange Formation.

The Viking and the Fangst Groups were both slightly thicker than expected. No sandbeds were penetrated in the Viking Group. No hydrocarbons were proven in the penetrated sandbeds of the Fangst and Båt Groups.

1.4 Drilling summary

1.4.1 Casing

Table 1.1 Casing

Casing	Shoe depth [m MD / m TVD RKB]	LOT / FIT [Equivalent mud weight]
30"	403 / 403	NA
20”	545 / 545	LOT: 1.23 g/cm³
13 3/8”	1500 / 1500	XLOT: 1.62 g/cm³
9 7/8”	2736 / 2735,5	XLOT: 1.65g/cm³

1.4.2 Drilling fluids

Table 1.2 Drilling fluids

Section	Section TD [m MD RKB]	Maximum mud weight [g/cm³]	Mud type
36 “	408	1.03	Seawater / high visc. sweeps
26 ”	550	1.03	Seawater / high visc. sweeps (Made w/SW and CMC EHV)
17 ½ ”	1510	1.16	Seawater / Polymer
12 ¼ “	2737	1.42	Glydril (water based KCl/Pac/glycol)
8 ½ “	2975	1.20	Glydril (water based KCl/Pac/glycol)

1.5 Data acquisition summary

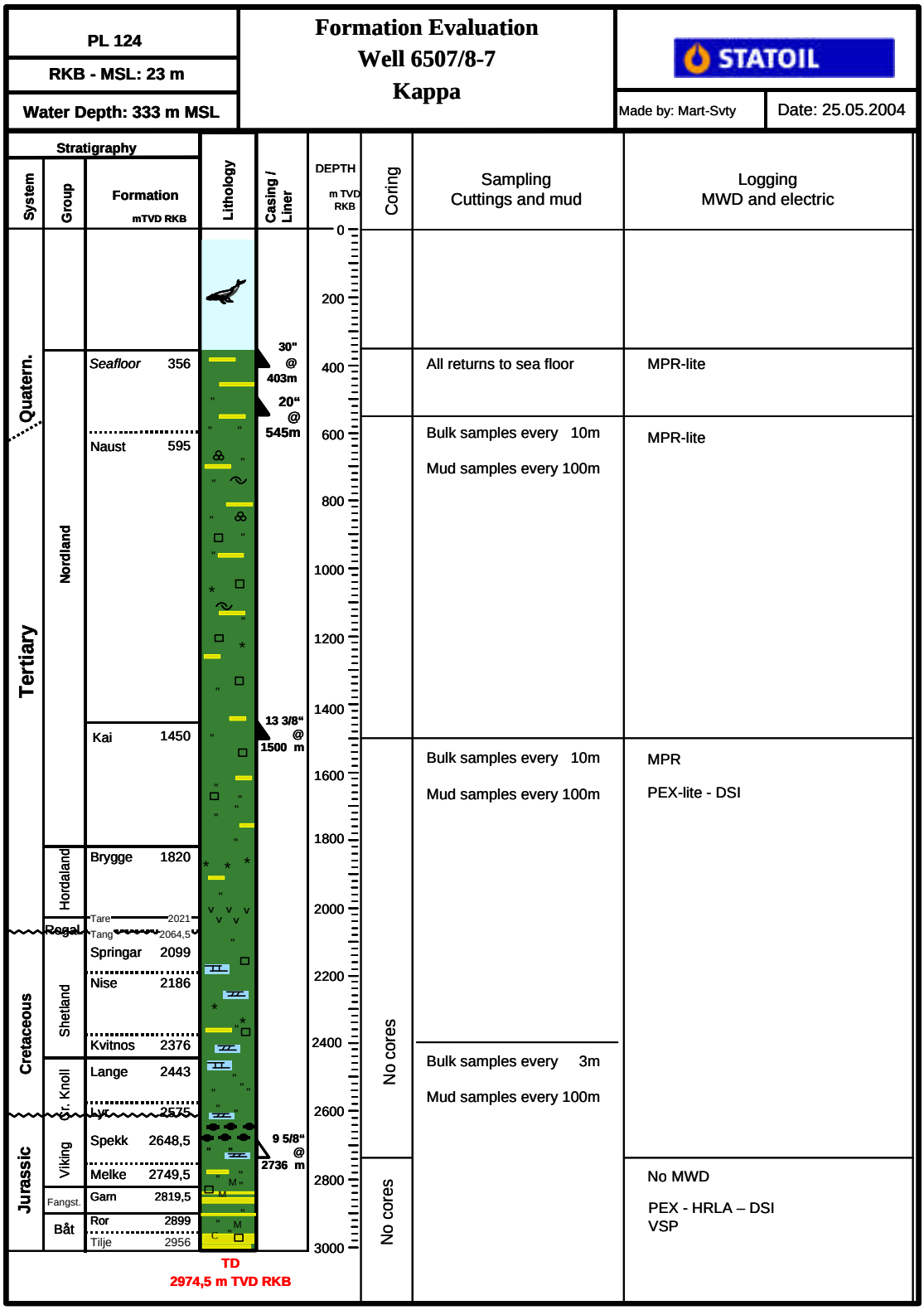


Figure 1.2.

2 Exemptions and non-conformances

2.1 Exemptions and non-conformances from NPD's regulations

None

2.2 Exemptions and non-conformances from Statoil's regulations

Two exemptions from the Statoil regulations (WR0436) were relevant for this operation:

- Pressure testing of BOP connector to casing test pressure (Synergi no. 249256)

The BOP connector should, according to WR0436, be tested to MWDP (Maximum well design pressure) after initial installation. However, latest practice has been to test the connector to casing test pressure, which in this case (20" casing) was 70 bar. After installing the 13 3/8" casing, the connector was tested to MWDP.

- Drilling 8 ½" reservoir section without MWD (Synergi no. 250999)

Due to bad weather the boat with the BHA was returned ashore 22.01.2004. The next boat had still not arrived due to weather conditions and two other rigs were given higher priority. The 8 ½" reservoir section was drilled without the MWD in stead of waiting for the equipment.

Consequence:
Drill max 188 m without a survey and max 203 m since previous survey.
(The section was logged with wireline logs at TD.)
If having to wait on the boat to arrive with the MWD, the economical consequence was 1 842 000 NOK/day.

Action:
The action is to drop a single shot at TD.

3 Health, safety, environment and quality (HSE&Q)

3.1 Incident reports

A total number of 147 incident reports were registered in Synergi during the Kappa well.

3.2 Comments to the cards/reports

Of the above mentioned cards/reports, there were:

- 0 LTA's
- 0 red incidents
- 0 yellow incidents
- 0 spills to sea
- 1 first aid incident
- 0 falling objects and 3 potential falling objects detected

  - The First Aid incident was a person that got dust/spoon from a grinding machine in his eye. (He was using eye protection glasses)

In general Statoil is very satisfied with the HSE work both on the rig and within Odfjell Drilling AS

3.3 Synergi reports – Non-conformances

The following transcript shows the quality related non-conformances reported in Synergi that were considered as serious.

Synergi No.	Date	Title
249085	07.01.2004	Anderdrift survey tool failure
249786	13.01.2004	Mistet boreparameter data mellom 1280 - 1342 mMD RKB.
251540	28.01.2004	BHI mudlogging quality

3.4 Experience summary

Table 3.1 Experience summary

Section	Experience (subject and description)	Immediate solution	Solution recommended for future
36”			
	Synergi 249085 (Closed) - 07.01.2004 - Non Conformance - Anderdrift survey tool failure Experienced problems with readings of survey data from Anderdrift tool. Tool worked OK on surface but failed after drilling 33 m.	Continued drilling and dropped single shot at TD (contingency solution).	Strip tool and investigate. According to Andergauge, no failure was detected during investigation.
26”			
	Pressure needed to perform LOT Predicted LOT: 1,25 g/cm^3 EMW MW: 1,15 g/cm^3 Expected surface pressure: 5-7 bar The expected surface pressure needed to reach the frac pressure was very low, only 5-7 bar. Such a low pressure is nearly impossible to pump at a decent rate. One had to stage pump at 10 lpm, which is far too low to give any reliable data for the LOT performance.	The solution was to stage pump at 10 lpm, not to frac unintentionally and loose circulation.	Thorough discussions on value of LOT at shallow depths since very low pressure is needed.
17 1/2”			
	Add KCl in the Kai Fm. By adding KCl to the mudsystem prior to entering the Kai Fm in the Heidrun area, the hole stability seems to improve.		
	Added KCl to the SW/polymer mud in the Kai Formation to prevent hole instability.		Add KCl through the Kai Formation in the Heidrun Area.
12 1/4”			
	Hole stability problems in Brygge, Tare and Tang Formations.	Cased off with 9 5/8” liner	Continue research on how to combat hole instability in these formations.
8 1/2”			
	Ice plug in cement line from cement unit to drillfloor. When testing line from cement unit to drillfloor during P&A (cmt. plug #1) it was discovered that ice had plugged the line.	Pumped cement through test line.	Odfjell to follow winter procedures and empty lines for fresh water after operations.
P & A			
	The casing was cut and the wear bushing retrieved (shearpin set to 30 ton). The 13 3/8" casing was recovered with wear bushing (2 joints + 1 pup).		

3.5 Time distribution

Table 3.2 Time distribution

Total time, planned	**31.5 days**
Total time	**27.0 days**
Total down time	**18.0 hrs**
Waiting on weather (WOW)	**0.0 hrs**

Table 3.3 Operations factor

Ops. Factor: $= \frac{Total\_time - Down\_time - WOW}{Total\_time - WOW} * 100$	**97.2%**

Fig. 3.1 D-time distribution

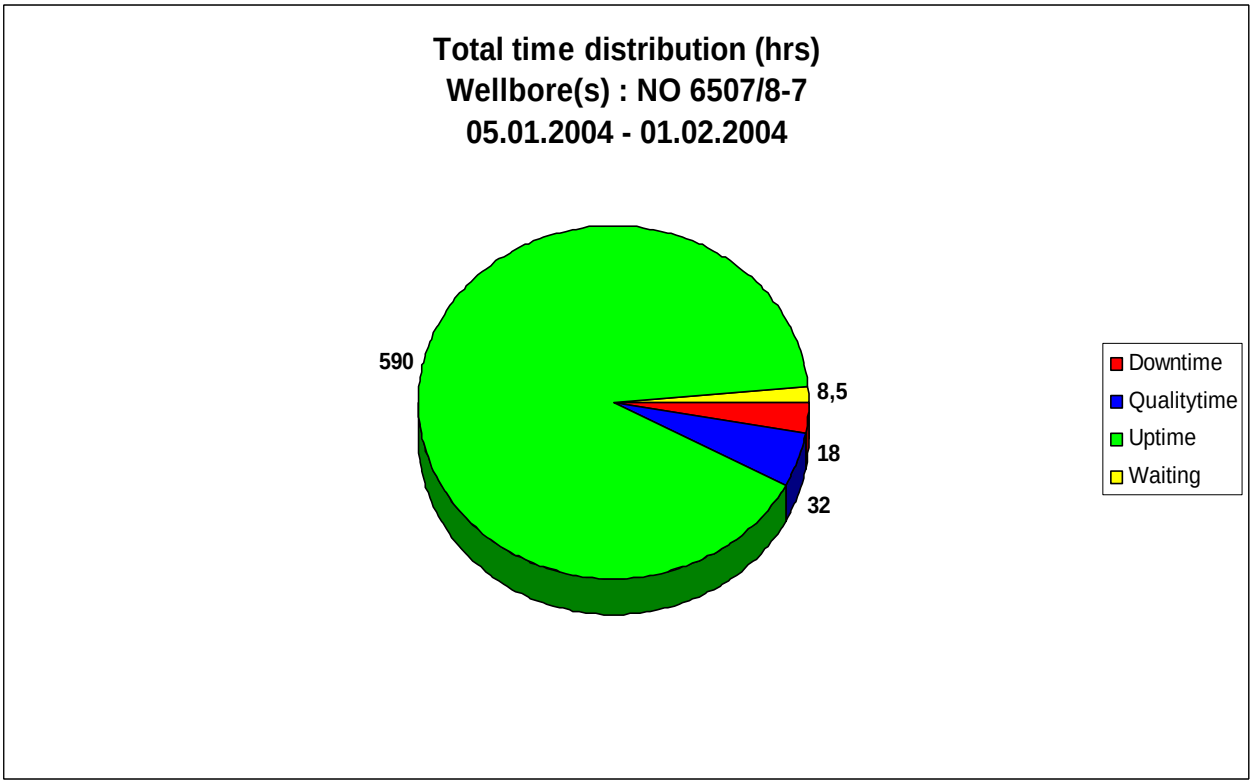


Fig. 3.2 D-time distribution by main activities

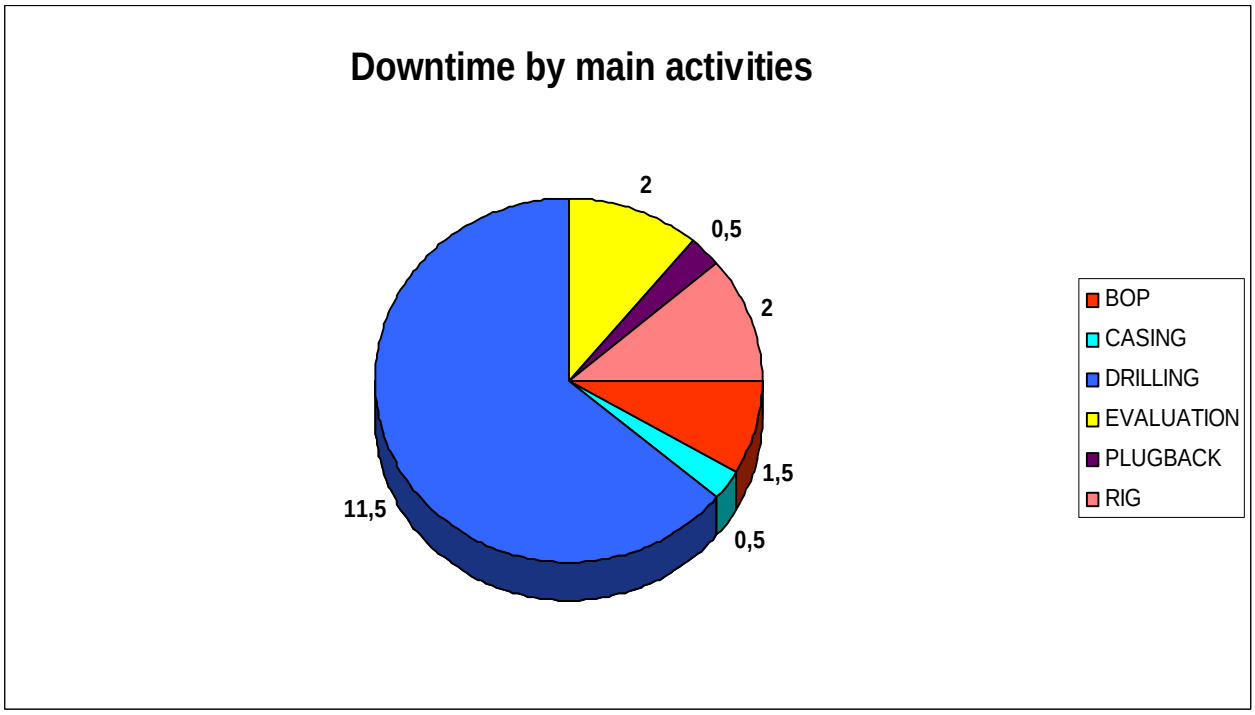


Fig. 3.3 D-time distribution pr Company in hours

Company	Description	D-time
BHI	Unit shut down Threads on MWD.	4.5 hrs.
Odfjell Drilling	MU torque. Manipulator arm. BX elevator. Frozen cmt line. Casing tong. Slipped drilling line.	4.5 hrs. 2.0 hrs
Schlumberger	VSP telemetry	2.0 hrs.
Statoil	Saver sub. Cup testing	5.0 hrs.
Total		**18.0 hrs.**

4 Geology and formation data report

4.1 Geological setting and results

The structural framework of Grinna Graben was established during the late Jurassic rift phase. The seismic data show that the sediments below the Base Cretaceous unconformity are faulted and deformed within the Grinna Graben. This indicates that the Grinna Graben was mainly formed after the Jurassic, but before the infill of the Upper Cretaceous sediments.

The well 6507/8-7 is the first well drilled in the southern part of the Grinna Graben and penetrates rocks of Quaternary, Tertiary, Cretaceous and Jurassic age. The TD of the well is in rocks of Jurassic age in the Tilje Formation (Fig. 4.1 and 4.2).

4.2 Shallow gas results

An amplitude anomaly located 60m NNE and 75m SSW of the well location in an assumed sandy layer at 578m was mapped by the site survey. Since shallow gas had been encountered in some wells in the area, the well was classified as class 1 which means there is a slight possibility for shallow gas. Therefore the 20” casing was set and cemented before drilling through the classified layer. Neither distinct sand layers nor any shallow gas were observed in this well.

4.3 Stratigraphy

The stratigraphical division is based on the biostratigraphic report, MWD log curves and on correlation with nearby wells. The stratigraphy of the entire well is shown in Figures 4.2, 4.3 and 4.4.

PL124
Kappa profile

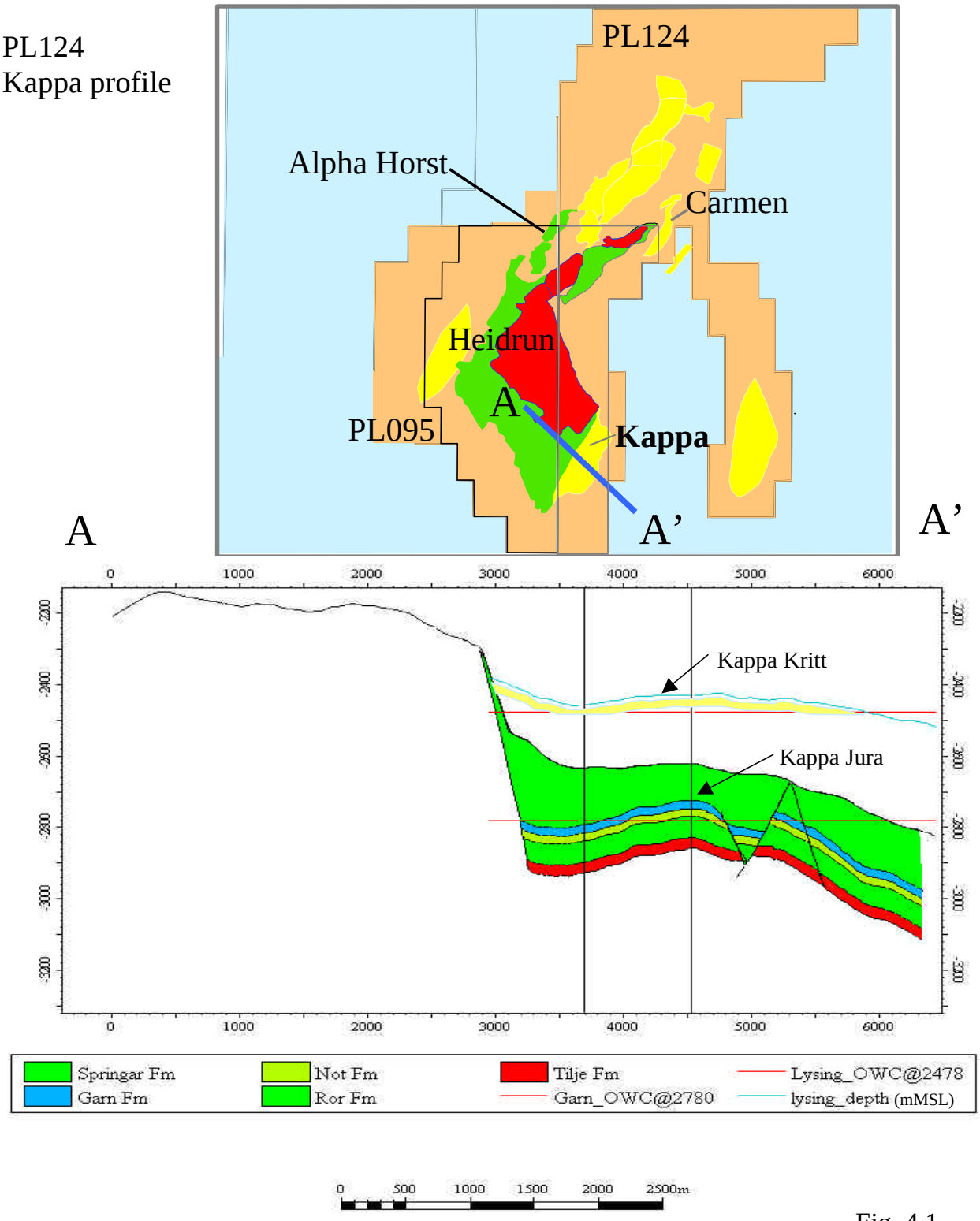


Fig. 4.1

PL 124

RKB - MSL: 23 m

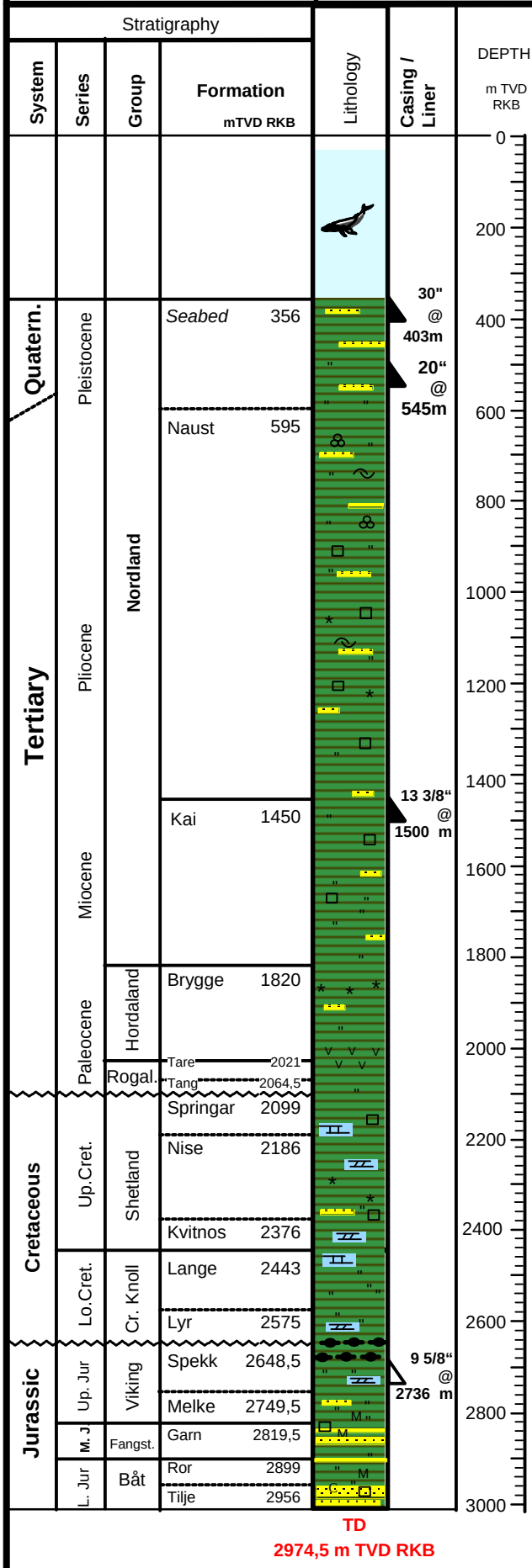
Water Depth: 333 m MSL

Well stratigraphy
Well 6507/8-7
Kappa

STATOIL

Made by: Mart

Date: 25.05.2004



TD

2974,5 m TVD RKB

NORDLAND GROUP

NAUST FORMATION:

Clay: light grey to medium grey, light green grey I.P., soft, amorphous, sticky, non to slightly calcareous, silty to sandy , micaceous, black mafic minerals, common disseminated glauconite, occasionally shell fragments and microfossils

Sand: clear to translucent quartz, fine to medium, occasionally coarse to very coarse, subangular to rounded, loose, poor sorted, very well silica cemented and hard I.P.

Trace: lithic fragments, mica, microfossils

KAI FORMATION:

Clay/claystone: olive grey to medium grey, soft to firm, amorphous to subblocky, slightly sticky, non to slightly calcareous, silty to sandy , micropyritic, trace mafic minerals, glauconite

Sandstone: clear to translucent quartz, very fine to fine, occasionally medium to coarse, subangular to subrounded, loose, trace silica cemented

Trace: pyrite, lithic fragments

HORDALAND GROUP

BRYGGE FORMATION:

Claystone: *upper part:* green grey dark green grey, *lower part:* brownish grey to brownish black, green grey to medium dark grey, *general*: firm to moderate hard, subblocky to blocky, non calcareous, glauconitic, pyritic

Tuffaceous claystone: light to medium green grey, medium dark grey, black and white specks,firm to moderate hard, subblocky to blocky, micromicaceou, micropyritic, occasionally glauconitic, non calcareous

Sand: clear quartz, very fine, friable

Trace: mica, pyrite, glauconite

ROGALAND GROUP

TARE FORMATION:

Tuffaceous claystone: as above

Limestone: white, pale yellow orange to yellow grey, angular to blocky, firm to moderate hard, cryptocrystallineargillaceous I.P.

TANG FORMATION:

Claystone: greenish grey to dark greenish grey, medium dark grey to dark grey, firm to occasionally hard, subblocky to blocky., non calcareous, slightly glauconitic and micropyritic

Limestone: white to yellow grey, greyish orange, soft to firm, occasionally moderate hard, crypto- to microcrystalline, slightly argillaceous

SHETLAND GROUP

Claystone: greenish grey to dark greenish grey, medium dark grey to dark grey, rarely moderate brown, firm to moderate hard I.P., subblocky to blocky, non calcareous

Limestone: as above

Trace: siltstone, sandstone, pyrite, glauconite

CROMER KNOLL GROUP

Claystone: green grey to dark greenish grey, medium dark grey to dark grey, olive grey, subblocky to blocky, firm to moderate hard, non calcareous.

Limestone: light grey to yellow grey, firm, microcrystalline, silty to occasionally very fine sand, argillaceous I.P.

VIKING GROUP

Claystone: dusky yellow brown, dark grey to grey black, olive black, firm to moderate hard, blocky to fissile, carbonaceous,silty, non to moderate calcareous

Limestone: white, moderate hard to hard, micro- to cryptocrystalline, also light greenish grey, yellow grey, firm, occasionally silty to sandy, slightly argillaceous

Sandstone: clear to translucent quartz, very fine, subrounded to rounded, well sorted, loose to friable, trace weak calcareous cement

FANGST / BÅT GROUP

Sandstone: clear to translucent, occasionally white to pink quartz, very fine to very coarse, medium to coarse I.P., subangular to rounded, moderate sorted, friable to hard, poor to well cemented I.P., silica cemented, argillaceous

Claystone: medium grey to medium dark grey, olive grey, olive black soft to, firm, amorphous to blocky, non calcareous, silty, sandy

Trace: mica, pyrite, glauconite

Fig. 4.2

PL 124

RKB - MSL: 23 m

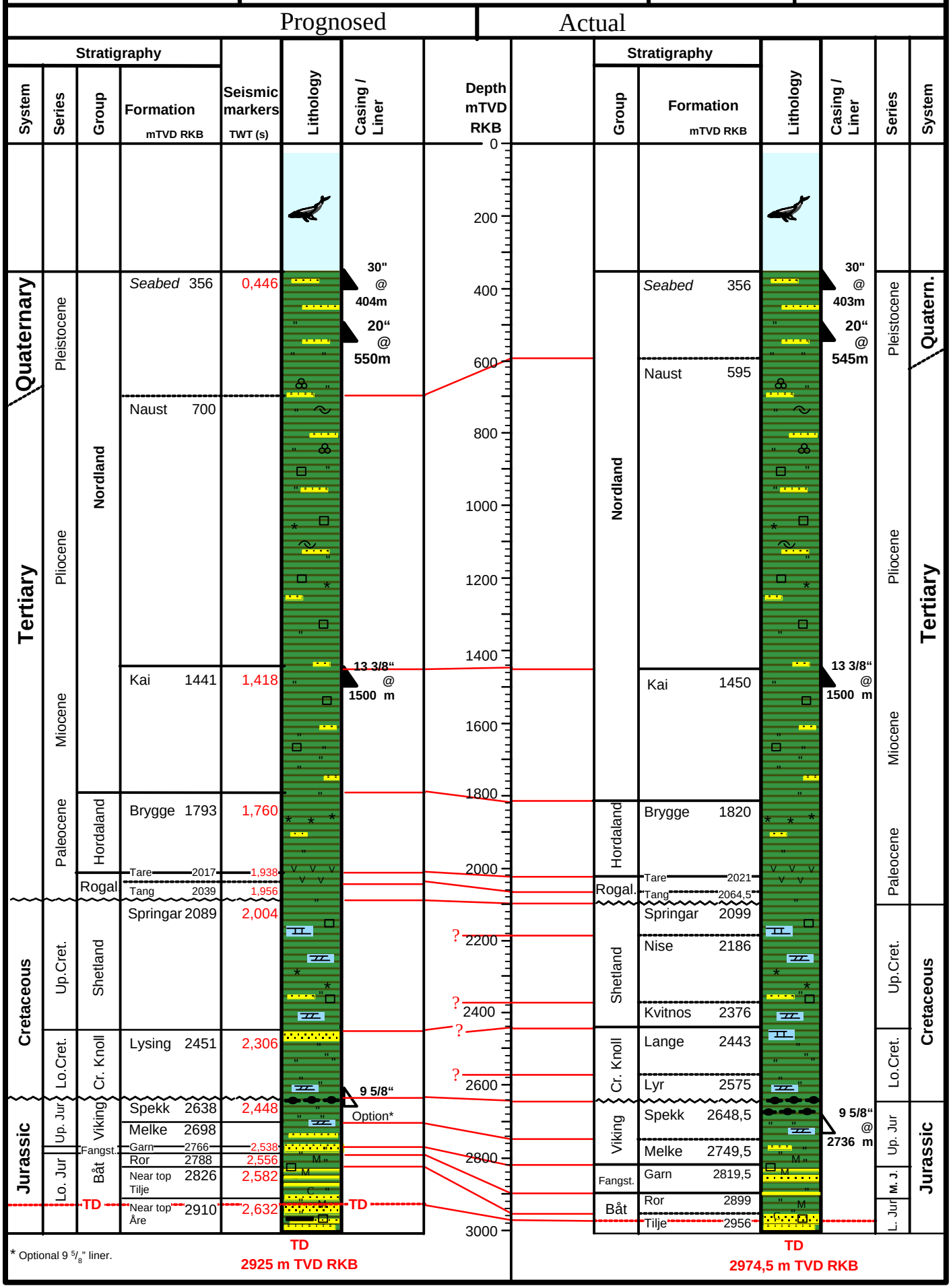
Water Depth: 333 m MSL

Well 6507/8-7 Kappa
Prognosis vs. Actual

STATOIL

Made by: MART

Date: 24.07.2004



* Optional 9 5/8" liner.

Fig. 4.3

PL 124

RKB - MSL: 23 m

Water Depth: 333 m MSL

Well 6507/8-7 Kappa
Reservoir section
Prognosis vs. Actual

STATOIL

Made by: MART

Date: 24.07.2004

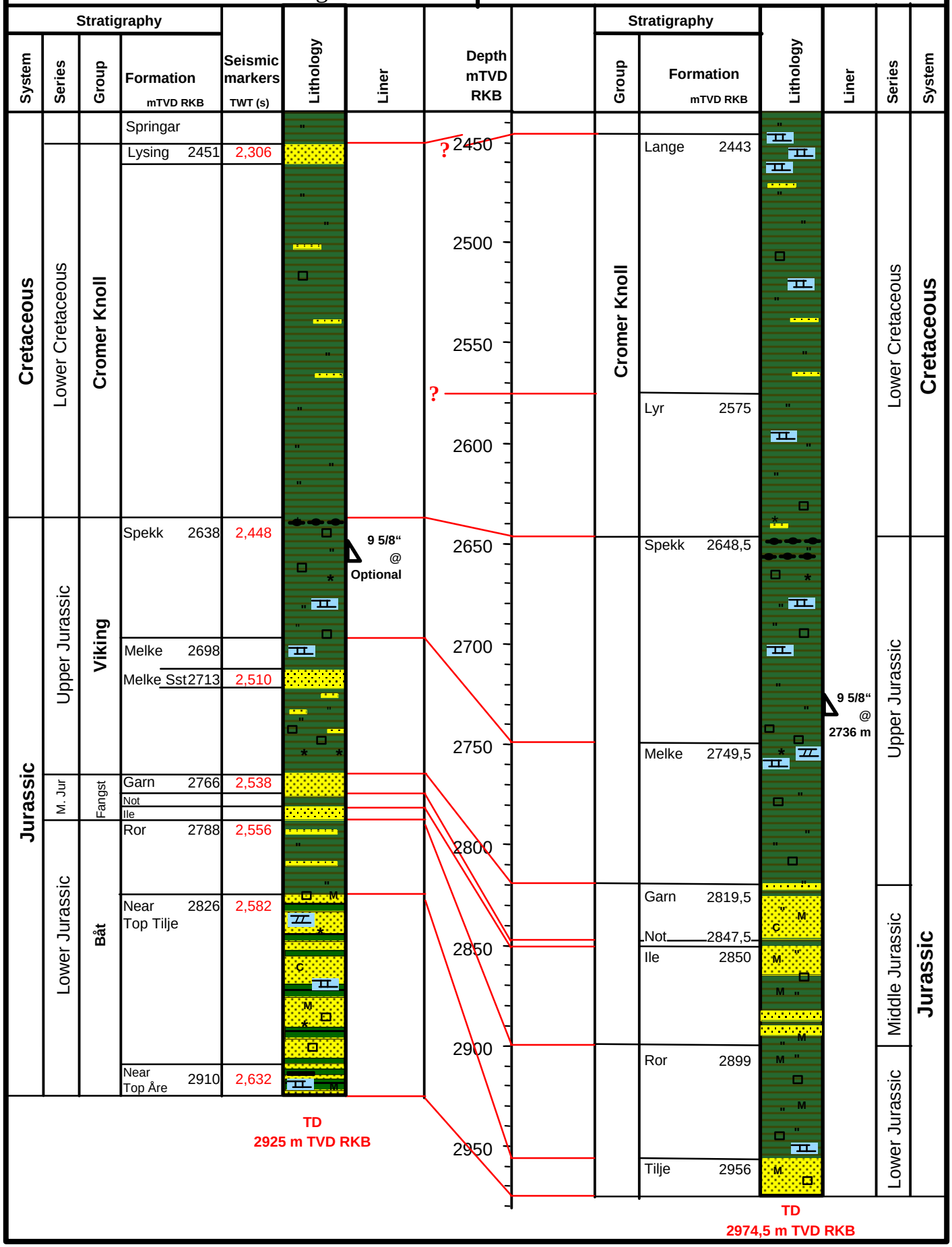


Fig. 4.4

4.3.1 Table of chronostratigraphy

Table 4.1 Chronostratigraphy

Stratigraphic succession		mMD	
	Studied interval 1500 – 2975 mMD	From	To
Tertiary	Upper Miocene	1500	1740
	Middle Miocene	1750	1810
	Upper Oligocene	1820	1860
	Lower Oligocene	1870	1910
	---------- Hiatus ----------		
	Middle Eocene	1920	1960
	Lower Eocene	1970	2040
	Upper Paleocene	2050	2100
---------- Base Tertiary unconformity ---------			
Cretaceous	Maastrichtian	2110	
	Lower Maastrichtian	2120	2130
	Upper Campanian	2140	2150
	Middle Campanian	2160	2230
	Lower Campanian	2240	2300
	Upper Santonian	2320	2360
	Lower Santonian	2370	2400
	Upper Coniacian	2403	2430
	Middle Coniacian	2433	2442
	---------- Hiatus ----------		
	Upper Cenomanian	2448	2460
	Middle Cenomanian	2463	
	Lower Cenomanian	2466	2472
	Upper Albian	2475	2499
	Middle Albian	2502	2538
	Lower Albian	2541	2562
	Upper Aptian	2565	2592
	Upper Barremian	2598	2613
	Lower Barremian	2616	2634
	Lower Valenginian	2637	
	Upper Ryazanian	2643	
	Lower Ryazanian	2649	
---------- Base Cretaceous unconformity ---------			
Jurassic	Upper - Middle Volgian	2652	2679
	Middle Volgian	2682	2685
	Upper Kimmeridgian	2688	2691
	Lower Kimmeridgian	2694	2748
	Middle Oxfordian	2751	2760
	Upper Callovian	2763	2778
	Lower Bathonian	2781	2787
	Upper Bajocian	2790	2714
	Lower Bajocian	2817	2832
	Upper Aalenian	2874	2880
	Lower Aalenian	2883	2898
	Upper Toarcian	2904	2919
	Lower Toarcian	2922	2964
	Upper Pliensbachian	2973	2975
	TD	2975	

4.3.2 Table of lithostratigraphy

Table 4.2 Lithostratigraphy

Table of lithostratigraphy					
Period	**Group / Formation**	**Observed depth**			**TWT**
		mMD	**m TVD**	**m MSL**	**sec.**
QUATERNARY	NORDLAND GROUP. (Sea Floor)	356.0	356.0	333.0	
TERTIARY	Naust Formation	595.0	595.0	572.0	
	Kai Formation	1450.0	1450.0	1427.0	1.421
	HORDALAND GROUP	1820.0	1820.0	1797.0	1.726
	Brygge Formation	1820.0	1820.0	1797.0	1.726
	ROGALAND GROUP	2021.0	2021.0	1998.0	1.920
	Tare Formation	2021.0	2021.0	1998.0	1.920
	Tang Formation	2064.5	2064.5	2041.5	1.960
CRETACEOUS	SHETLAND GROUP	2099.0	2099.0	2076.0	1.992
	Springar Formation	2099.0	2099.0	2076.0	1.992
	Nise Formation	2186.0	2186.0	2163.0	2.074
	Kvitnos Formation	2376.0	2376.0	2353.0	2.230
	CROMER KNOLL GP.	2443.0	2443.0	2420.0	2.285
	Lange Formation	2443.0	2443.0	2420.0	2.285
	Lyr Formation	2575.0	2575.0	2552.0	2.388
JURASSIC	VIKING GROUP	2648.5	2648.5	2625.5	2.439
	Spekk Formation	2648.5	2648.5	2625.5	2.439
	Melke Formation	2750.0	2749.5	2726.5	2.519
	FANGST GROUP	2820.0	2819.5	2796.5	2.561
	Garn Formation	2820.0	2819.5	2796.5	2.561
	Not Formation	2848.0	2847.5	2824.5	2.588
	Ile Formation	2850.5	2850	2827	2.588
	BÅT GROUP	2899.5	2899	2876	2.611
	Ror Formation	2899.5	2899	2876	2.611
	Tilje Formation	2956.5	2956	2933	2.652
	TD	2975.0	2974.5	2951.5	-

4.4 Lithostratigraphic description

NORDLAND GROUP **356 - 1820 mMD, 356 – 1820 mTVD (333 – 1797 mTVD MSL)**

The Nordland Group comprises the Quaternary, the Naust Formation and the Kai Formation.
The basal Quaternary, whole section of the Naust Formation and top of the Kai Formation were penetrated in the 17 ½" section and the bottom part of the Kai Formation was penetrated in the 12 ¼" hole section.

Quaternary **356 – 595 mMD, 356 – 595 mTVD (333 – 572 mTVD MSL)**

System: Tertiary

Basal Quaternary sediments consisted of soft clays interbedded with minor sand units, commonly composed of lithic fragments and quartz. Seismic indicated a potentially gas bearing sand unit at 585m, however the deepest sand unit of any size was logged by the MWD at around 550m and no gas was recorded. All sand/sandy units proved to be water wet according to the MWD log.

The claystone was olive grey to medium dark grey, also olive grey to medium grey, amorphous, soft, sticky, silty to sandy, calcareous to very calcareous, traces of mafic minerals and mica were noted, also traces of glauconite were seen.
The sand in the samples consisted of clear to translucent, fine to medium occasionally coarse quartz grains. They are subangular to subrounded and poorly sorted.

Naust Formation **595 – 1450 mMD, 595 – 1450 mTVD (572 – 1427 mTVD MSL)**

System: Tertiary

The Naust Formation consists of a monotonous sequence of clay with thin detrital sands. The Gamma ray changes little if at all into the top of the formation, the pick was made on a rightwards step in the resistivity curve. From cuttings also little change can be noticed, a lightening of the clay and a gradual increase in microfossil content of the samples are the only indicators of a formation change.

The clay is light to moderate grey, with a faint green/olive grey tint, soft, sticky, amorphous, silty to sandy and non to occasionally slightly calcareous. Traces of mica, dark coloured mafic minerals and variable amounts of glauconite nodules are seen. Common microfossils of primarily shell fragments and foraminifera are seen together with minor ostracodes and dinoflagelates.

The sands in the samples are mixed colourless and pale orange, yellow and green stain and transparent, loose quartz. The grains are predominantly fine to medium, occasionally coarse to very coarse,

subangular to rounded, poorly sorted. Variable amounts of varicoloured, fine to very coarse, angular to rounded lithic fragments and quartz shards occur.

Kai Formation **1450 – 1820 mMD, 1450 – 1820 mTVD (1427 – 1797 mTVD MSL)**

System: Tertiary
Series: Upper – Middle Miocene
Depositional environment: Marine, inner, mid to outer shelf

The top of the Kai Formation is picked on a leftward step in the resistivity, from where the resistivity curve starts to develop some character. KCl polymer was added to the mud system from 1440m, which causes the gamma trace to gradually increase and thereby mask any change in the gamma ray across the formation top.

The formation comprise claystone which is olive grey to medium grey, also brownish grey towards the base, soft to firm, slightly sticky, amorphous to subblocky, silty to occasionally very fine sandy, micromicaceous, commonly micropyritic and glauconitic and non to very calcareous.

Trace amounts of sand and limestone occur. The sand appears as loose grains, consisting of clear to translucent quartz grains which are very fine to fine, occasionally medium to coarse and subangular to subrounded. The limestone is yellowish grey, light greenish grey to light olive grey, soft, crypto- to microcrystalline, argillaceous and occasionally micropyritic.

HORDALAND GROUP **1820 – 2021 mMD, 1820 – 2021 mTVD (1797 – 1998 mTVD MSL)**

The top of the Hordaland Group is picked at the break of a slightly decreasing gamma ray trend and a slight decreasing trend in resistivity, before the resistivity subtly increases again. The Hordaland Group comprises the Brygge Formation.

Brygge Formation **1820 – 2021 mMD, 1820 – 2021 mTVD (1797 – 1998 mTVD MSL)**

System: Tertiary
Series: Upper Oligocene – Lower Eocene
Depositional environment: Marine, mid to outer shelf to upper bathyal

The formation consists of claystone, which is tuffaceous from 2010m. It appears as brown grey to brown black, green grey to dark green grey, medium dark grey, black and with white tuff specks from 2010m. The claystone is firm to occasionally moderately hard, subblocky to blocky, silty to occasionally very fine sandy in the upper part, slightly micromicaceous, occasionally microglauconitic, micropyritic and non to slightly calcareous.

Trace amounts of limestone occur, and it is white, pale yellow orange, grey to yellow grey, firm to moderately hard, cryptocrystalline and slightly argillaceous.

ROGALAND GROUP **2021 – 2099 mMD, 2021 – 2099 mTVD (1998 – 2076 mTVD MSL)**

The Rogaland Group consists of the Tare- and Tang formations.

Tare Formation **2021 – 2064.5 mMD, 2021 – 2064.5 mTVD (1998 – 2041.5 mTVD MSL)**

System: Tertiary
Series: Lower Eocene – Upper Paleocene
Depositional environment: Marine, outer shelf

The top of the Tare Formation is picked on the gamma ray close to a top before a typical decreasing trend. This coincides with an increasing trend on the resistivity and decreasing sonic velocity.

The formation consists of claystone that is tuffaceous with black and white tuff specks. It is green grey, medium dark grey, firm to occasionally moderately hard, subblocky to blocky, slightly micromicaceous, microglauconitic in parts, micropyritic and non calcareous.

Trace amounts occur of limestone that are predominantly white, firm to moderately hard, cryptocrystalline and slightly argillaceous.

Tang Formation **2064.5 – 2099 mMD, 2064.5 – 2099 mTVD (2041.5 – 2076 mTVD MSL)**

System: Tertiary
Series: Upper Paleocene
Depositional environment: Marine, outer shelf to upper bathyal

The top of the Tang Formation is picked just below a characteristic high peak on the gamma ray log that coincides with low resistivity- and sonic- values.

The formation comprises claystone, which is slightly tuffaceous only in the upper part. The claystone is light green grey to green grey, medium dark grey, occasionally brown grey, firm to occasionally moderately hard, subblocky to blocky, microglauconitic in parts, micropyritic and non calcareous.

Traces of limestone occur which is white to occasionally yellow grey, firm to moderately hard, cryptocrystalline and slightly argillaceous.

SHETLAND GROUP **2099 – 2443 mMD, 2099 – 2443 mTVD (2076 – 2420 mTVD MSL)**

The Shetland Group comprises the Springar, Nise and Kvitnos Formations.

Springar Formation **2099 – 2186 mMD, 2099 – 2186 mTVD (2076 – 2163 mTVD MSL)**

System: Cretaceous
Series: Upper Cretaceous
Stage: Maastrichtian – Middle Campanian
Depositional environment: Marine, outer shelf to upper bathyal

An increase in the resistivity curves and a distinct increase of the sonic velocity recognize the transition from the overlying Tang Formation into the Springar Formation.

The Springar Formation comprises claystone with some limestone stringers.
The claystone is light green grey to green grey to dark green grey, medium dark grey to dark grey, occasionally moderate brown in upper part, firm to occasionally moderately hard, subblocky to blocky, occasionally slightly microglauconitic, occasionally micropyritic and non calcareous.

The limestone is white to yellowish grey, greyish orange, soft to firm, crypto- to microcrystalline and slightly argillaceous to argillaceous.

Traces of pyrite and glauconite are also observed.

Nise Formation **2186 – 2376 mMD, 2186 – 2376 mTVD (2163 – 2353 mTVD MSL)**

System: Cretaceous
Series: Upper Cretaceous
Stage: Middle Campanian – Lower Santonian
Depositional environment: Marine, outer shelf to upper bathyal

The top Nise Formation is recognized by a slightly increase in the resistivity log that coincide with a distinct change in the pattern of sonic velocity curve.

The Nise Formation comprises claystone with minor limestone stringers almost as described for the Springar Formation.

The claystone is light green grey to green grey to dark green grey, medium dark grey to dark grey, firm to occasionally moderately hard, subblocky to blocky, occasionally slightly microglauconitic, occasionally micropyritic and non calcareous.

The limestone is white to yellowish grey, greyish orange, soft to firm, crypto- to microcrystalline, slightly argillaceous to argillaceous and occasionally slightly carbonaceous.

Traces of pyrite and glauconite are also observed. Small traces of very fine to fine, loose sand grains occur.

Kvitnos Formation **2376 – 2443 mMD, 2376 – 2443 mTVD (2353 – 2420 mTVD MSL)**

System: Cretaceous
Series: Upper Cretaceous
Stage: Lower Santonian to Middle Coniacian
Depositional environment: Marine, outer shelf to upper bathyal

The top Kvitnos Formation is recognized by a slightly increasing trend of the resistivity log and a minor shift to a lower, almost constant level of the sonic velocity curve.

The Kvitnos Formation comprises claystone with minor limestone stringers and small traces of loose sand.

The claystone is green grey to medium dark grey, occasionally dark grey, firm to occasionally moderately hard, subblocky to blocky, occasionally slightly microglauconitic, occasionally micropyritic and non calcareous.

The limestone is white to yellow white, greyish orange, soft to firm, occasionally moderate hard, crypto- to microcrystalline and occasionally slightly carbonaceous.

Traces of pyrite and glauconite are also observed. Small traces of loose, very fine to fine, occasionally medium to coarse sand grains occur.

CROMER KNOLL GROUP **2443 – 2648.5 mMD, 2443 – 2648.5 mTVD (2420 – 2625.5 mTVD MSL)**

The Cromer Knoll Group comprises the Lange- and Lyr Formations

Lange Formation **2443 – 2575 mMD, 2443 – 2575 mTVD (2420 – 2552 mTVD MSL)**

System: Cretaceous
Series: Lower Cretaceous
Stage: Upper Cenomanian to Upper Aptian
Depositional environment: Marine, outer to mid shelf

The Lange Formation is defined by a marked drop in the gamma ray that coincides with increasing resistivity and sonic velocity, representing the higher content of carbonates.

The lithology of the Lange Formation is characterized by a upper part, above 2478m, consisting of primarily limestone/marl, and a lower part with basically claystone.

The limestone/marl is light olive grey to greenish grey, yellowish grey, greyish brown to moderately brown, medium dark grey to dark grey, firm to occasionally moderately hard, occasionally micro-glauconitic, silty to very fine sandy in parts, rarely micropyritic and micromicaceous.

Small amounts of claystone are present as thin layers within the limestone/marl. This claystone is medium dark grey to greenish grey, firm to occasionally moderately hard, subblocky to blocky, occasionally slightly microglauconitic, occasionally micropyritic and non calcareous

The dominating claystone in the lower part is medium dark grey to dark grey, occasionally olive grey, greyish brown to moderate brown, soft to firm, subblocky to blocky, slightly silty to silty, occasionally microglauconitic, micromicaceous in parts and none to very calcareous.

Traces of limestone occur and are described as light grey to yellow grey, firm, microcrystalline, silty to sandy and partly argillaceous.

Lyr Formation **2575 – 2648.5 mMD, 2575 – 2648.5 mTVD (2552 – 2625.5 mTVD MSL)**

System: Cretaceous
Series: Lower Cretaceous
Stage: Upper Aptian to Upper Ryazanian
Depositional environment: Marine, inner, mid to outer shelf

The Lyr Formation is picked at a start of a gradually decreasing trend on the gamma ray curve, increasing resistivity and sonic trends.

The formation consists of claystone with frequent limestone stringer/ thin limestone layers.
The claystone is medium dark grey to dark grey, olive grey, greyish brown to moderately brown and grey black towards the base. It is occasionally sticky, firm to occasionally moderately hard, subblocky to blocky, slightly silty, occasionally micromicaceous and micropyritic and slightly calcareous to very calcareous.

The limestone is white to light grey, occasionally yellow grey, firm to moderately hard, occasionally micropyritic, occasionally silty/sandy and occasionally slightly argillaceous.

VIKING GROUP **2648.5 – 2820 mMD, 2648.5 – 2819.5 mTVD (2625.5 – 2796.5 mTVD MSL)**

The Viking Group comprises the Spekk and the Melke Formations.

Spekk Formation **2648.5 – 2750 mMD, 2648.5 – 2749.5 mTVD (2625.5 – 2726.5 mTVD MSL)**

System: Jurassic
Series: Upper Jurassic
Stage: Lower Ryazanian – Lower Kimmeridgian
Depositional environment: Marine, inner shelf

The Spekk Formation is picked at the start of a characteristic ‘hot’ increase on the gamma ray log, whilst both the resistivity and sonic cuts back.

The Spekk Formation is dominated by claystone with traces of limestone stringers.
The claystone is in the upper part greyish black to dark grey, firm to moderately hard, blocky to slightly fissile, micromicaceous, micropyritic and occasional calcareous. In the lower part the claystone is olive black to brownish black, firm to moderately hard, subblocky to fissile, with a metallic lustre, carbonaceous, in parts silty or sandy, micropyritic, micromicaceous and non calcareous.

The limestone is greenish grey to yellowish grey, occasionally sandy/silty and slightly argillaceous.

Melke Formation **2750 – 2820 mMD, 2749.5 – 2819.5 mTVD (2726.5 – 2796.5 mTVD MSL)**

System: Jurassic
Series: Middle Jurassic
Stage: Middle Oxfordian to Lower Bajocian
Depositional environment: marginal marine to marine inner shelf, deepening to marine, inner shelf

A significant drop of the gamma ray log value defines the transition from the Spekk Formation to the Melke Formation.

The Melke Formation is dominated by a claystone with some minor limestone- and sandstone- stringers. The claystone is grey to greyish black, blocky, soft to moderately hard, micropyritic, micromicaceous and occasionally silty/sandy.

The limestone is yellow grey to medium grey, soft to firm, blocky, micritic and slightly argillaceous to argillaceous.

The sandstone is medium grey, consisting of clear to translucent quarts grains. The grains are very fine to occasionally fine, well sorted, subangular to subrounded, loose or occasionally friable with traces of weak calcareous cementation.

FANGST GROUP **2820 – 2899.5 mMD, 2819.5 – 2899 mTVD (2796.5 – 2876 mTVD MSL)**

The Fangst Group consists of the Garn-, Not- and Ile Formations.

Garn Formation **2820 - 2848 mMD, 2819.5 – 2847.5 mTVD (2796.5 – 2824.5 mTVD MSL)**

System: Jurassic
Series: Middle Jurassic
Stage: Lower Bajocian - Upper Aalenian
Depositional environment: Fluviodeltaic to marginal marine to marine inner shelf

The Garn Formation is picked on a sharp decrease on both gamma ray and resistivity.

The Garn Formation consists mainly of sandstone with some claystone beds toward the base.
The sandstone consists of clear to translucent quarts grains. They are fine to coarse, well to moderately sorted, subangular to rounded, loose to occasionally friable with excellent visible porosity and with traces of pyrite, mica and claystone.

The claystone is medium grey to medium dark grey and olive grey. It is soft to firm, amorphous to subblocky, silty to very silty, sandy in parts and moderate calcareous.

Not Formation **2848 – 2850.5 mMD, 2847.5 – 2850 mTVD (2824.5 – 2827 mTVD MSL)**

System: Jurassic
Series: Middle Jurassic
Stage: Upper Aalenian
Depositional environment: Fluviodeltaic to marginal marine

The Not Formation is defined by the increasing gamma ray, resistivity that coincide also with an increase in the sonic velocity. In this well the formation borders are represented as a gamma ray spike.

The Not Formation consists of claystone as described for the Garn Formation.

Ile Formation **2850.5 – 2899.5 mMD, 2850 – 2899 mTVD (2827 – 2876 mTVD MSL)**

System: Jurassic
Series: Middle Jurassic
Stage: Lower Aalenian
Depositional environment: Fluviodeltaic to marginal marine

The drop of the gamma ray, indicating sandstone, defines the transition from the Not Formation to the Ile Formation.

The Ile Formation consists of sandstone with some minor claystone beds and some limestone stringers. The sandstone consists of clear to translucent quarts grains. They are very fine to very coarse, poor to moderately sorted, subangular to rounded, appears loose to friable and occasionally friable to hard. The sandstone is occasionally slightly silica cement and with light grey matrix, with good visible porosity, traces of pyrite, mica and claystone. Increasing amounts of claystone appears in the lower parts.

The claystone is medium grey to dark grey, soft to firm, amorphous to subblocky, silty to very silty, sandy in parts and slightly to moderately calcareous.

The limestone is yellow grey to light grey, soft, micritic, argillaceous and sandy in parts

BÅT GROUP **2899.5 - 2975 mMD, 2899 – 2974.5 mTVD (2876 – 2951.5 mTVD MSL)**

The Båt Group comprises the Ror and Tilje Formations

Ror Formation **2899.5 – 2956.5 mMD, 2899 – 2956 mTVD (2876 – 2933 mTVD MSL)**

System: Jurassic
Series: Lower Jurassic
Stage: Upper – Lower Toarcian
Depositional environment: Fluviodeltaic to marginal marine

The Ror Formation is picked at a slight change in the resistivity log response pattern that coincides with a smoother sonic log curve.

The formation consists mainly of claystone with few minor sandstone stringers in the upper part. The claystone is medium dark grey to olive black, soft, amorphous, silty to very silty, in parts sandy, non calcareous, occasionally grading to very argillaceous sandstone with traces of limestone and pyrite.

The sandstone is pinkish grey to yellow grey and consists of clear, translucent to transparent quarts grains. They are fine to coarse, subangular to subrounded, moderately sorted, generally loose and in parts calcite cemented. Light grey to argillaceous matrix occurs. The sandstone has poor visible porosity.

Tilje Formation **2956.5 - 2975 mMD, 2956 – 2974.5 mTVD (2933 – 2951.5 mTVD MSL)**

System: Jurassic
Series: Lower Jurassic
Stage: Lower Toarcian - Upper Pliensbachian
Depositional environment: Fluviodeltaic to marginal marine

The Tilje Formation is defined by the decrease in resistivity representing waterwet sandstone.

The sandstone consists of clear, transparent, occasionally translucent quarts grains. They are very fine to coarse, moderately sorted, subangular to subrounded with traces of limestone and pyrite.

TD: 2975 mMD, 2974.5 mTVD, (2951.5 mTVD MSL)

4.5 Hydrocarbon indications

All cuttings were returned to seabed while drilling down to 550m MD. There were no indications of gas saturations from the MWD resistivity log or by monitoring the wellhead using short-range sonar/visual CCD on the ROV.

No shows are recorded in the drilled cuttings, and gas readings were generally very low. The low gas-values are probably the result of poor positioning of the gas-trap in the shaker-box. Improved cleaning of the shaker-box when drilling at approximately 2650m improved the respond of the gas chromatograph. This is easily seen the Table 4.3 and in Figure 4.5 – in the column for "Normalized total gas"

Gas ratio analysis (Fig 4.5) suggests that gas compositions are equivalent to oil just below the top Nise Formation and at the top Spekk Formation, but neither presence of sand nor any shows-descriptions confirm this. The poor quality of the gas recordings makes this interpretation doubtful. The electric logs confirm that no hydrocarbons are present in this well.

Table 4.3 Gas peaks

mMD	mTVD	Peak %	Type	Background %	Chromatographic analysis (ppm)						
					C_1	C_2	C_3	i-C_4	n-C_4	i-C_5	n-C_5
702,0	701,8	1,10	Formation gas	0,6	5699						
718,0	717,8	3,10	Formation gas	0,5	29385	20	7				
976,0	975,8	3,30	Formation gas	0,5	31960	8					
1010,0	1009,8	2,80	Formation gas	0,6	26682	7					
1030,0	1029,8	3,80	Formation gas	0,6	36695	8					
1308,0	1307,8	2,50	Formation gas	0,8	23530	22	7				
1453,0	1452,8	5,20	Connection gas	0,7	57165	62	22	4			
1822,0	1821,8	0,45	Formation gas	0,08	2456		3				
2226,0	2225,8	0,20	Formation gas	0,01	951						
2648,0	2647,8	1,50	Formation gas	0,1	12642	224	36	9	10	4	2
2662,0	2661,8	2,24	Formation gas	0,4	16391	408	67	20	20	9	4
2688,0	2687,8	2,02	Formation gas	1,5	16266	393	73	21	23	11	7
2716,0	2715,8	1,46	Formation gas	0,9	11337	379	71	14	16	9	5
2730,0	2729,8	1,45	Formation gas	0,4	10405	437	92	13	17	7	5
2737,0	2736,8	0,78	Formation gas	0,4	7756	348	82	11	15	6	4
2748,0	2747,8	1,11	Formation gas	0,5	9180	401	101	12	16	6	4
2759,0	2758,8	1,23	Formation gas	1	10087	449	116	13	17	6	4
2799,0	2798,8	0,33	Formation gas	0,15	3156	185	64	9	11	3	
2809,0	2808,8	0,20	Formation gas	0,1	1685	125	50	6	9	0	
2818,0	2817,8	0,22	Formation gas	0,1	1886	155	69	8	16	3	3
2827,0	2826,8	0,16	Formation gas	0,1	1377	94	37	4	8	0	
2868,0	2867,8	0,16	Formation gas	0,1	1557	53	16	0	3	0	
2892,0	2891,8	0,22	Formation gas	0,05	1625	62	17	0	3	0	
2927,0	2926,8	0,53	Formation gas	0,3	3814	291	122	14	20	4	3
2952,0	2951,8	0,38	Formation gas	0,15	2588	227	99	10	15	3	

Gas Interpretation Plots

Well no: 6507/8-7 **Licence:** PL 124

Hole diameter: 12 1/4 - 8 1/2 " **Depth interval:** 1510 - 2975 mMD

Formation	mMD
Hordaland Gp	1820
Rogaland Gp	2021
Shetland Gp	2099
Cromer Knoll Gp	2443
Viking Gp (Spekk Fm	2648,5

Formation	mMD
Melke Fm	2750
Fangst Gp (Garn Fm	2820
Not Fm	2848
Båt Gp (Ror Fm)	2899,5
Tilje Fm	2956,5

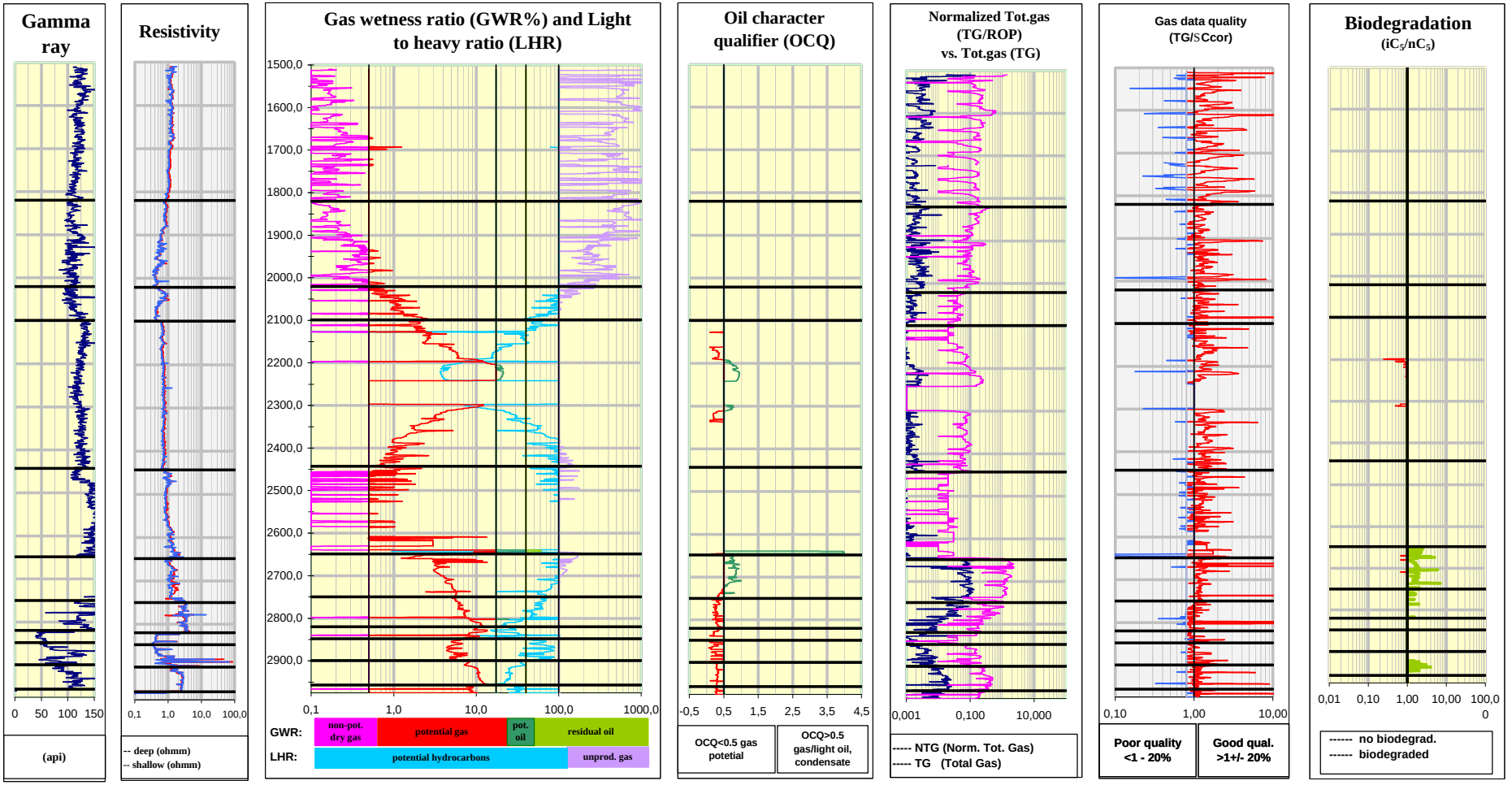


Fig. 4.5

4.6 Geophysical results

Refer to Figures 4.2 and 4.3.

The observed formation tops in the Tertiary and Cretaceous sections were encountered well within the uncertainties of the prognosis. The prognosed Lysing Formation at top Cromer Knoll Group was not present. The top Cromer Knoll Group consisted of limestone/marl related to the Lange Formation. The Spekk-, Garn-, Ile- and Ror Formations were thicker than prognosed.

4.7 Data acquisition

4.7.1 Cuttings and mud samples

A standard mud-logging unit was used for the well (details in Final Well Report, Baker Hughes Inteq)

Cuttings were sampled from 550 mMD to 2975 mMD (TD). The samples were collected in 5 ltr buckets and later split to smaller units by ResLab.

Mud samples were sampled every 100 m from 550 mMD to 2975 mMD (Ref. Figure 1.2).

4.7.2 Biostratigraphy at wellsite

Equipment for well-site biostratigraphy was utilized when drilling this well after setting of the 13 3/8" casing. The main purpose was to identify the Lysing Formation. The service was kept running until TD of the well due to very good help in formation correlation as the drilling proceeded. Particularly when drilling the 8 ½" section without any MWD included in the drill string, the immediate biostratigraphy analyses were very helpful for identifying the formations.

4.7.3 Conventional coring

No cores were cut due to a dry well.

4.7.4 MWD/LWD

Baker Hughes Inteq performed the MWD-logging.
Table 4.4 MWD logging

Run no.	Depth interval mMD	Hole section	Collar diam.	Tool type	Comments
1	408 – 550	26”	8 ¼”	MPR	MPR-lite service. The tool worked OK, only minor gaps in the log.
2	550 - 1510	17 ½”	8 ¼”	MPR	MPR-lite service. The tool worked OK, only minor gaps in the log.
3	1510 – 2737	12 ¼”	8 ¼”	MPR/DCP	Ordinary MPR set-up. The tool worked OK. The tool set-up had the sensors 1.5m further up in the BHA compared to the plan. The reason was that the available tool had different threads compared to planned one and therefore a different near-bit stabilizer had to be used in the BHA.
4	2737 – 2975	8 ½”			No MWD service. The original well design did not include the 8 ½” hole and therefore a new MWD tool had to be mobilized. No tool available at rig site in due time because bad weather prevented the tools to be offloaded.

4.7.5 Wireline logging

Schlumberger performed the wireline logging operation. The composite logs are presented in Figures 4.6 and 4.7. The open hole wireline logging was performed in the 12 ¼” and 8 ½” sections.

One log run was performed in the 12 ¼” section, see Table 4.5. TD of the 12 ¼” section is 2736 m, but it was impossible to get the tool string below 2718 m.

Table 4.5 Wireline logging in 12 ¼” section.

Wireline logging program			
#	TOOL COMBINATION	RUN	INTERVAL m MD RKB
1	PEXlite - DSI	1A	2718.0 – 1500.0 m

Two log runs were run in the 8 ½” reservoir section, see Table 4.6. The first log run was done without any problems.

PL 124

RKB - Sea 23 m

Water depth 333 m MSL

Composite plot
Well 6507/8-7

STATOIL

Made by: Svty

Date:21.07.2004

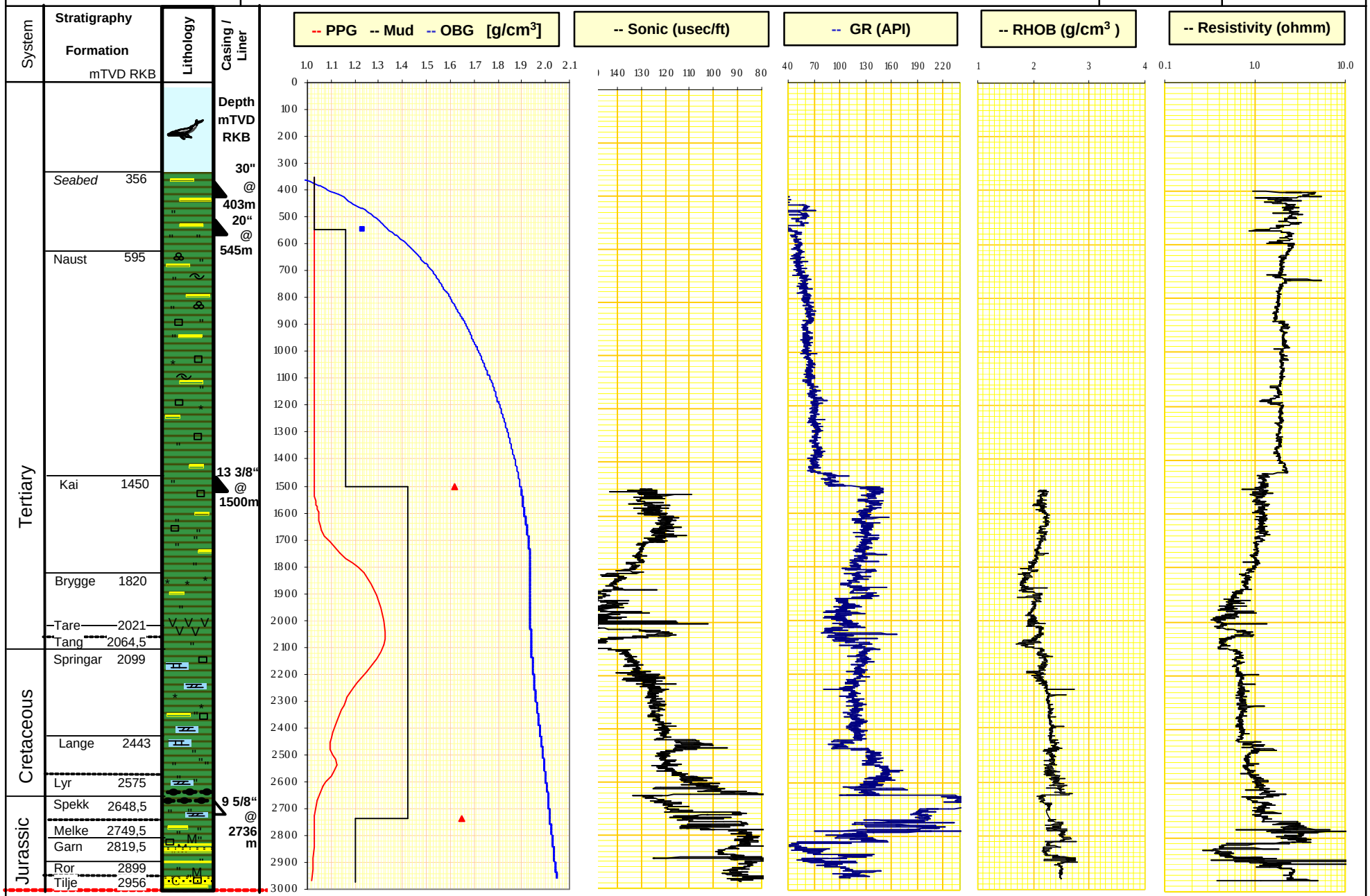


Fig 4.6

PL 124

RKB - Sea 23 m

Water depth 333 m MSL

Composite plot
Well 6507/8-7

STATOIL

Made by: Svty

Date: 21.07.2004

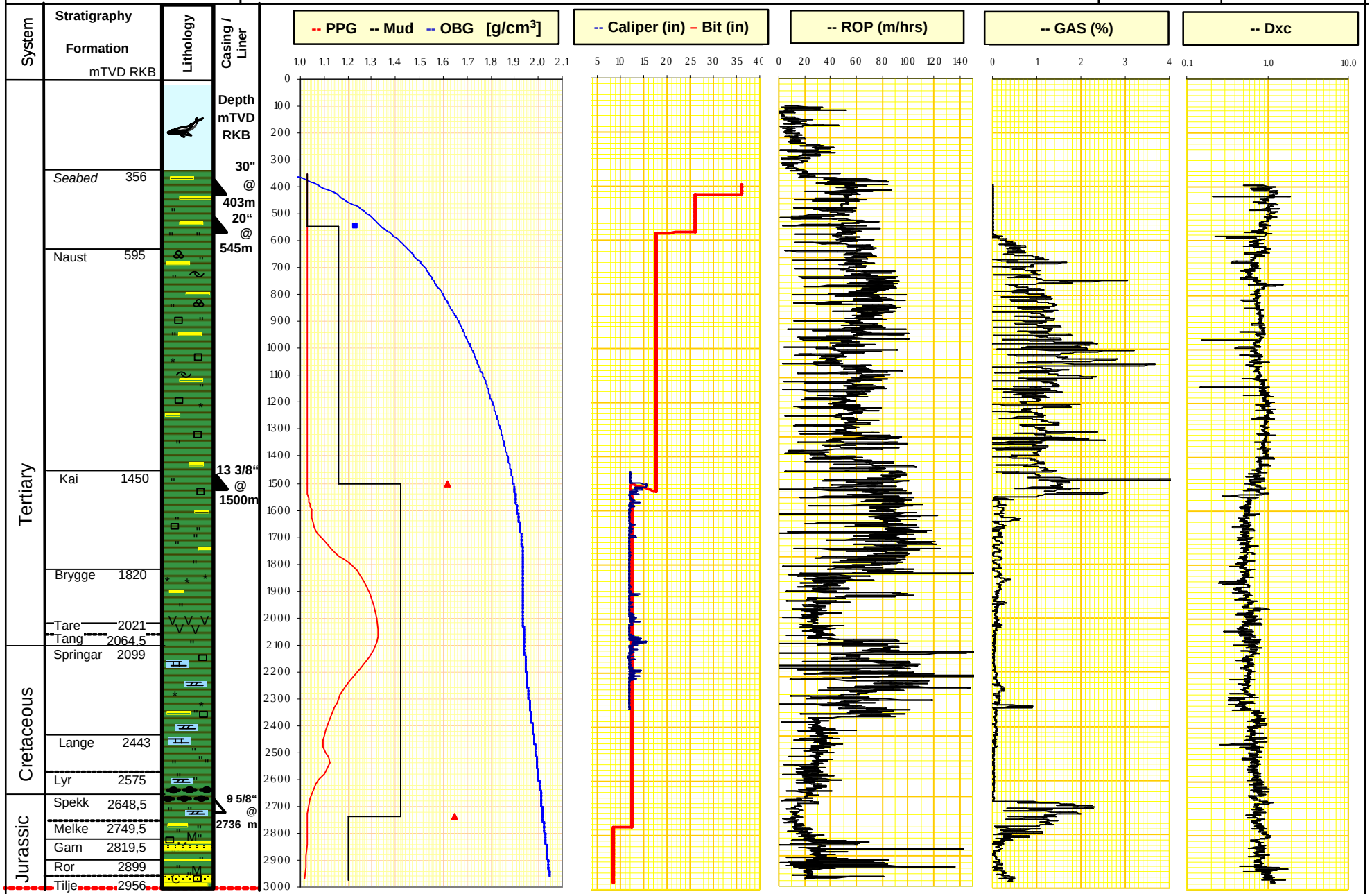


Fig 4. 7

The second log run was a zero offset VSP. A tool communication problem was experienced during the check shots and the telemetry head had to be changed before the logging was resumed successfully. 68 levels with level spacing of 15 m and check shots from 1953 m to 1400 m with 100 m spacing were logged with a single level CSI tool.

Table 4.6 Wireline logging in 8 ½" section.

Wireline logging program			
#	TOOL COMBINATION	RUN	INTERVAL m MD RKB
1	PEX-HRLA-DSI	2B	2738 – 2979 m
2	VSP-GR	2B	2975 – 1400 m

4.7.6 Data quality

Electric logging
The wireline logging operation and the data quality of the wireline logs were good. There is no overlapping of the calliper, neutron and the density logs between 2704 m and 2734 m since the logs did not reach TD in the 12 ¼" section.

MWD-services:
The MWD logging performance was satisfactory in this well and the data quality was generally good. Unfortunately the Baker Hughes Inteq run short of 8 ½" tools and the tool utilized in the 12 ¼" section had different threads than planned. Therefore a different near-bit stabilizer had to be run and this caused an unfavourable distance between the bit and the different MWD-sensors, hence additional penetration into prognosed reservoir sections before confirmation of any potential hydrocarbons.

Mud-logging services:
Unfortunately the gas-trap had been mounted in the shaker-box so that the mud hardly passed the trap as soon as cuttings piled up around the trap. This lead to low gas-readings and unusual compositions recorded by the gas chromatograph. The readings improved as soon as regularly cleaning of the box took place. Unfortunately, this situation was not discovered before drilling into the Spekk Formation and therefore the quality of the gas-data above this formation is uncertain. (See comments about the gas-data in Chapter 4.5.)

4.8 Formation pressure

The pore pressure plot shows a normal hydrostatic trend down to approximately 1600 m where a rapid increase starts (see Figure 4.8). The highest pore pressure is in the Brygge-, Tare- and Tang Formations with a maximum gradient of 1.32 g/cm^3 at 2090 m. Below this depth the pore pressure decreases down to approximately1.11 g/cm^3 at 2450 m and thereafter increases slightly to the highest formation pressure gradient in the Lange Formation, 1.13 g/cm^3, at approximately 2540 m. Below this depth the pore pressure gradient decreases to 1.03 g/cm^3 in the reservoir and to 1.02 g/cm^3 at TD of the well.

PL 124

RKB - MSL: 23 m

Water Depth: 333 m MSL

Composite pressure plot
Well 6507/8-7
Kappa

STATOIL

Made by: Mart-Svty

Date: 02.07.2004

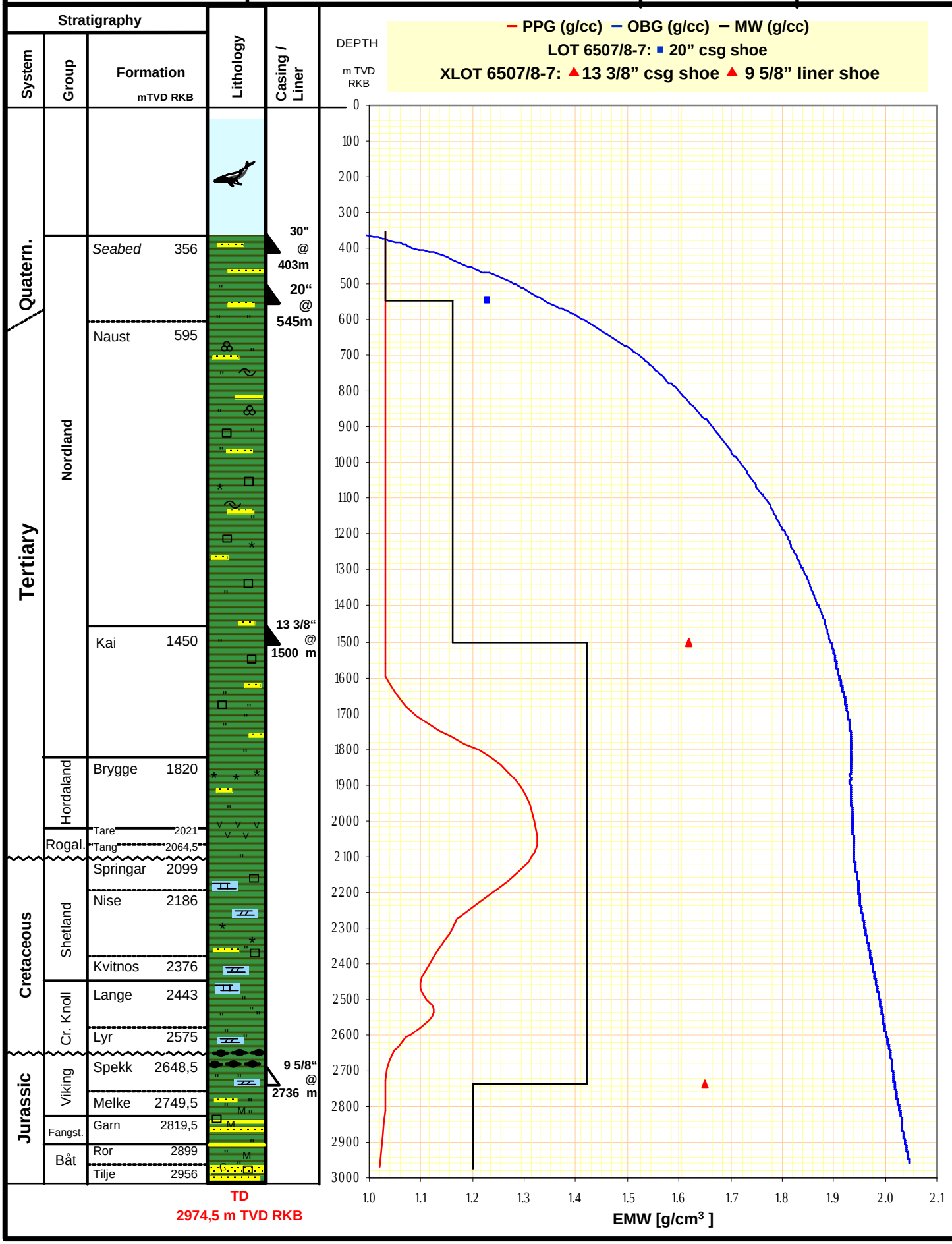


Fig. 4.8

The sonic log from wireline and the resistivity from the MWD spliced together with the wireline resistivity from 2736 m and down to TD together with the D-exponent, are used to calculate the pore pressure.

The evaluated pore pressure from the resistivity log and the drilling D-exponent is slightly higher than the predicted pressure from the sonic log. The sonic log gives the lowest pore pressure gradient and the best prediction compared to the prognosed pore pressure profile in the Brygge, Tare and Tang Formations.

The predicted pore pressure in the Lange Formation is lower than the prognosed. This can be due to some differences in the deposition of the sediments in Cretaceous and/or trapping of water in the Lange Formation with a higher pressure than a normal water gradient.

The overburden gradient is calculated using the density log from wireline Run 1A and Run 1B from 1500 down to TD. Density data from the well 6507/8-4 are used in the interpretation above the 13 3/8" casing shoe, see Figure 4.8.

4.8.1 Reservoir pressure summary

There are no pressure measurements in the reservoir. The pressure is expected to be hydrostatic in the reservoir zone since the reservoir was dry.

4.9 Reservoir fluid sampling

No samples were collected.

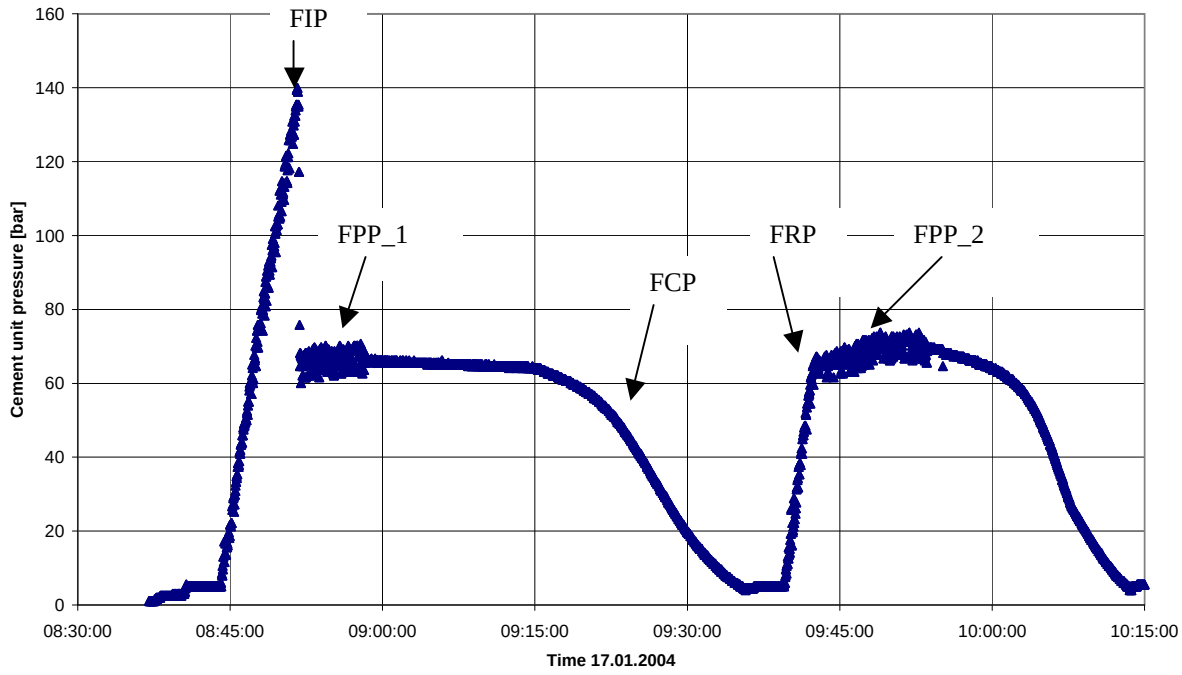
4.10 Leak off test

One leak off test (LOT) was performed below the 20" casing and two successful extended leak off tests (XLOT) with two cycles were performed below the 13 3/8" and 9 5/8" casing respectively.

The LOT below a shallow 20" casing shoe (545 m) is often difficult to evaluate, in this case one of the reason is the leak of pressure (LOP) that is only 7 bars above the static mud-weight of 1.15 g/cm^3. The LOT value is interpreted to be between 1.20 to 1.23 g/cm^3.

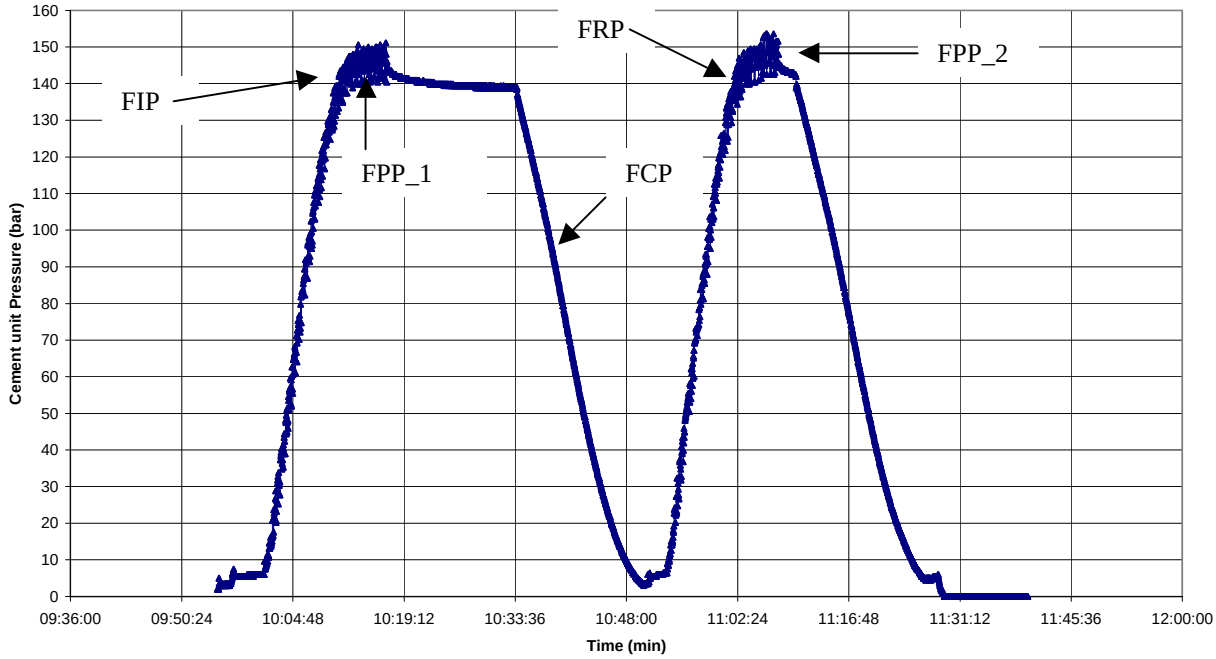
The first XLOT test, performed below 13 3/8" casing shoe, was good and used a mud weight of 1.18 g/cm^3. (See Figure 4.9.) The XLOT value is 1.62 g/cm^3 at 1500 m and is the same as the reopening pressure of the fracture. The formation initiation pressure (FIP) is measured to be 312 bar (2.13 g/cm^3 EMW), the formation propagation pressure (FPP_1) in the first cycle was measured to 240 bar (1.64 g/cm^3 EMW), the closing pressure (FCP) is measured to 230 bar (1.57 g/cm^3 EMW) and the fracture was reopened (FRP) at 238 bar (1.62 g/cm^3 EMW). The propagation pressure (FPP_2) in the second cycle is measured to 244 bar (1.67 g/cm^3 EMW), the closure pressure in the second cycle is the same as in the first XLOT cycle.

Figure 4.9 Extended leak of test at 13 3/8" casing shoe. Pressure at y-axes without mud weight.



The second XLOT, below the 9 5/8" liner shoe, was also a good test using mud weight of 1.20 g/cm^3. (See Figure 4.10.) The XLOT value is 1.65 g/cm^3 at 2736 m and is the same as the reopening pressure of the fracture. The formation initiation pressure (FIP) is measured to be 461 bar (2.92 g/cm^3 EMW), the formation propagation pressure (FPP_1) in the first cycle is measured to 467 bar (2.94 g/cm^3 EMW), the closing pressure (FCP) is measured to 417 bar (1.55 g/cm^3 EMW) and the fracture was reopened (FRP) at 444 bar (1.65 g/cm^3 EMW). The propagation pressure (FPP_2) in the second cycle is measured to 460 bar (1.75 g/cm^3 EMW), the closure pressure in the second cycle is almost the same as in the first XLOT cycle.

Figure 4.10 Extended leak of test at 9 5/8" casing shoe. Pressure at y-axes without mud weight.



Both XLOT values are plotted in Figure 4.8.

4.11 Formation temperature

The evaluated temperature is calculated by using an in-house (Hermansrud, 1999) equation that takes into consideration the time since circulation and the measured temperature from the logging tool.

Temperature measurements are available from all the three loggings run. The first logging run is in the 12 ¼" section that follows the gradient of 3.8 ^{o}C/100 m.
In the reservoir and down to TD, the temperature increases with a higher gradient approximately 5.5 ^{o}C/100m. This is expected for the area.

See Figure 4.11 for the temperature profile.

Table 4.7 Measured and evaluated temperatures

Tool combination	Depth of measurement m TVD RT	Recorded max temperature ^{0}C	Time since last circulation hrs	Evaluated temperature ^{0}C
PEXlite-DSI	2717	72	13.5	92.5
PEX-HRLA-DSI	2980	89	16.3	107
VSP	2980	94	25.3	107

4.12 Experiences / recommendations

Unstable formation was recorded while drilling the 12 ¼" hole in the Spekk Formation. Therefore a 9 5/8" contingency-liner was mobilized. The palynologist onboard the rig reported that the samples contained the organic sapropelic matter and this could be the reason for the instability. This is suggested to be further investigated.

PL 124

RKB - MSL: 23 m

Water Depth: 333 m MSL

Temperature gradient
Well 6507/8-7
Kappa

STATOIL

Made by: Mart-Svty

Date: 23.07.2004

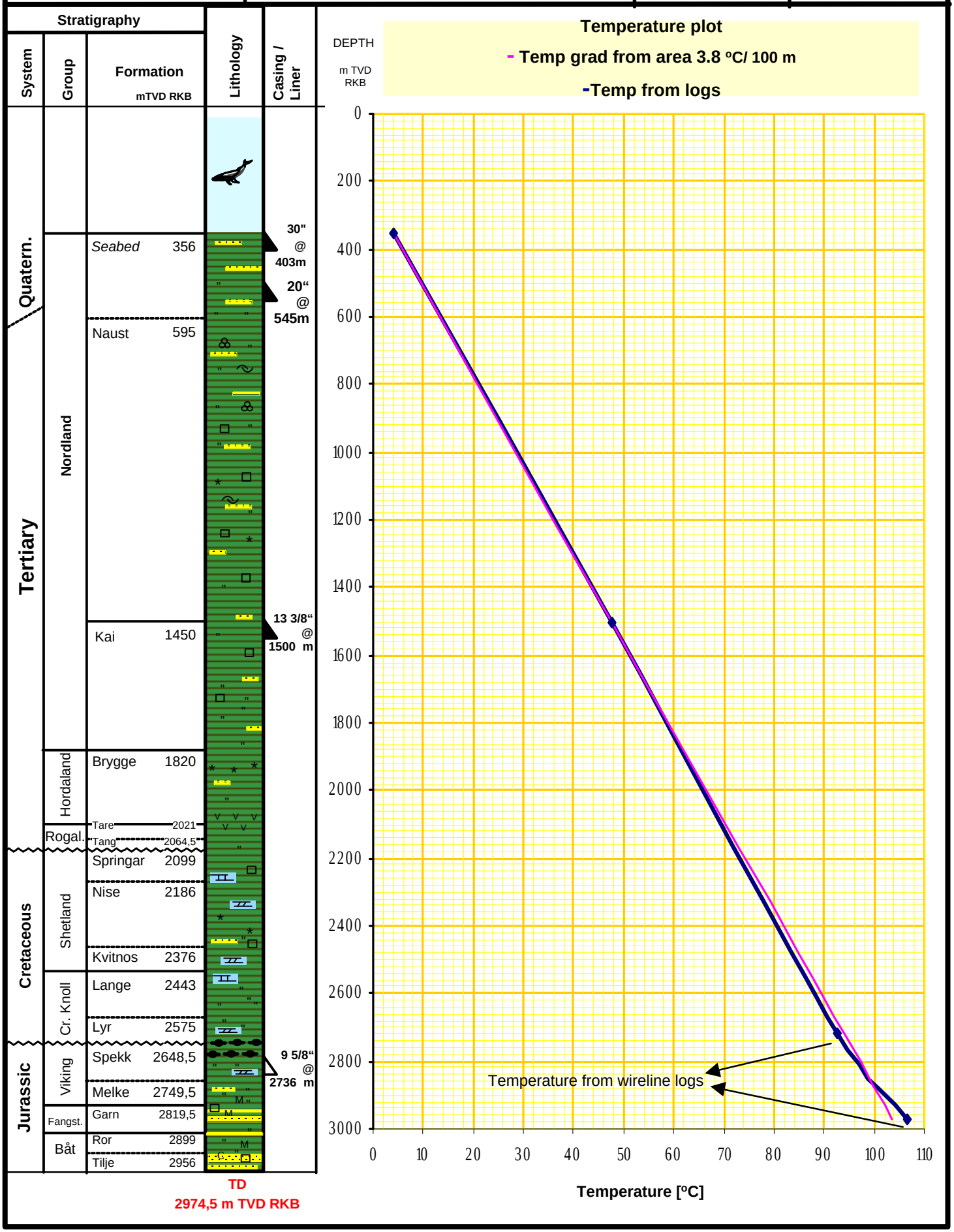


Fig.4.11

5 Drilling operations report

5.1 Rig move and positioning

5.1.1 Summary

The semi-submersible rig Deepsea Bergen was moved from the well 6507/8-F-1H at the Heidrun Field to the Kappa location 6507/8-7. The transit time was 4.5 hours.

At location anchors were run and marker buoys deployed using three anchor handlers due to winter conditions. Meanwhile, service and maintenance on rig equipment were carried out, as well as preparing the spud equipment.

5.1.2 Experiences/Recommendations

Efficient anchor handling
Used 3 anchor-handling boats and the anchor-handling and positioning of the rig went very well. This is important during winter operations not to risk to WOW.

5.2 Drilling top hole section

5.2.1 Summary

The 36" hole was drilled from seabed at 356 m to section TD at 409 m (depth of 17 ½" bit). Low weight on bit was used to ensure vertical hole. The top-hole section was drilled using seawater and high viscosity pills as drilling fluid. Encountered boulders from 15 m below seabed, causing problems when falling in. Experienced up to 30 mt overpull on several occasions when trying to work string free. When at 388 m, no progress was made, and also the Anderdrift did not supply survey data. A single-shot was dropped before pulling out, giving a survey reading of 0.5 deg inclination. The hole-opening assembly was considered functional upon inspection, and was run back in. When applying more weight (6-8 mt), the ROP increased up to 3 m/hr on average down to 406 m. More problems with overpull and with the Anderdrift tool were seen before reaching section TD at 409 m. Over the last meters, more weight was put on and inclination increased to 2.1° at TD.

The hole was displaced to 1.35 g/cm³ mud prior to pulling out. No overpull was experienced when pulling out of hole. Found that two rollers from the 26" X 36" HO were missing.

The top hole was drilled with high flow, 4000-4500 LPM, rotational speed of 60 - 120 RPM and low WOB, 0-3 mt in the first half before increasing to 6-8 mt. The average ROP was 4.6 m/hrs (20.5 hrs total drilling time).

4 joints of 30” conductor were run to 403 m, and cemented in place with 3 metres stick up on 30” WH. Held conductor in position while waiting on cement, due to an unintentional deepening of the hole while drilling. The cement slurry used for the conductor was X-LITE, 1.52 g/cm³ on surface and predicted to 1.54 g/cm³ down hole due to compression, with 300% OH excess.
When pulling out of the hole, 3.5 hrs was lost due to problems with loosening the saver-sub from the top-drive.

Drilled out the 30” conductor shoe and cleaned the rat hole in 2.5 hours.

5.2.2 Experiences/Recommendations

Cone on 26" Holeopener
After drilling 36" hole, 2 of the 26" HO cones were found missing. The pin (bolt) were still there so the cones have as a minimum been split in two parts and fallen off. The 17 1/2" bit had normal wear. The pins for the cones were not damaged so it looks like the failure occurred at a late stage.
Odfjell is looking into the steel quality and design of the cones.

Four joints of 30” conductor
Continued focus on optimising length of conductor.

ROP and weight on bit
Drilled 33 m from seabed at 355 m to 388 m with acceptable ROP. Drilled first 12 m in one hour, thereafter approx 2,0 m/hr. Experienced very slow ROP at 388 m, WOB 0 - 3 ton. Had problems with reading survey from Anderdrift tool, varied from 1,5 - 2,5 degrees.

Decided to drop single shot and POOH and check assembly. On surface tool was OK, and it was decided to RIH with the same assembly using higher weight on bit. Single shot showed 0,5 degrees.

To be able to put on more weight use of 9 1/2" DC is recommended.

The problem with the Anderdrift survey tool is followed up through the Synergi system and is described in another experience report.

5.3 Drilling 26” section

5.3.1 Summary

A short 26” section was drilled from the 30” conductor and to section TD at 550 m in one bit run. A packed rotary assembly with a milled tooth bit, IADC-code 115, was used. The
26” section was drilled with an average on bottom ROP of 14.6 m/hr, including the 2.5 hrs used on drilling out the 30” conductor.

Due to the high inclination at the 30” shoe (2.1^{O}) and the use of a packed assembly, the hole angle was kept steady throughout the section, thus giving a slightly off-centre hole.

Seawater and high viscosity pills were used as drilling fluid. When at section TD, a short wipertrip was performed and 1.5 m fill was found when back on bottom. Circulated hole clean and displaced to 1.35 g/cm³ mud before pulling out of hole. No overpull was seen.

Drilled section with about 4500 LPM, 80 rpm, 5 – 10 ton WOB.

The 20" casing was run and set at 545 m and cemented in place using a single plug system. Had full returns during the cement job and bumped the cement plug with 97% pump efficiency.

Ran and installed the riser and the BOP, and pressure tested the 20" casing to 70 bar.

Displaced hole to 1.15 g/cm³ mud while drilling out shoetrack. The 20" casing shoe and rat hole was drilled out and cleaned, before performing a leak off test (LOT) to 1.23 g/cm³ EMW. The LOT was however difficult to interpret due to the relatively small pressure difference (4.5 bar).

5.3.2 Experiences/Recommendations

Ref. Chapter 3.3

5.4 Drilling 17 1/2" section

5.4.1 Summary

The 17 1/2" section was drilled out of the 20" casing and to section TD at 1510 m in one bit run. A pendulum rotary assembly with a milled tooth bit, IADC-code 115, was used. The first directional survey at the 20" shoe showed an inclination of 2.6 ^{O}. Towards the bottom of the section interval, the angle dropped back to vertical.

The 17 1/2" section was drilled with an average on bottom ROP of 29 m/hr, included the 3.0 hrs used on drilling out the 20" casing. The ROP was limited due to shaker capacity.
A 1.15 g/cm³ SW/ polymer mud was used as drilling fluid. Prior to entering the Kai Formation, KCl was added to the system to stabilise the clay. At section TD the hole was circulated clean while rotating and reciprocating the string prior to pulling out of hole. The hole was slick with no tight spots, max overpull 10 ton.

Drilled the section with about 4500 LPM, 130 – 150 RPM, 5 – 25 ton WOB. These parameters resulted in a higher ROP compared to offset wells.

The 13 3/8" casing was run and set at 1500 m. Restriction was seen towards the bottom, and the casing was circulated down from 1425 m. The casing was successfully cemented, using a two-plug system. Had full returns during the cement job and bumped the plug with 97% pump efficiency.

The 13 3/8" casing shoe and rat hole was drilled out and cleaned in 4.5 hours. Below the 13 3/8" casing shoe an Extended Leak-off test (XLOT) was performed to 1.62 g/cm³ EMW.

5.5 Drilling 12 1/4" section

5.5.1 Summary

The 12 1/4" section was drilled from the 13 3/8" casing shoe at 1500 m and vertically to the section TD at 2737 m in one bit run. After performing the XLOT as described above, the well was displaced to 1.42 g/cm³ KCl/Pac/Glycol mud.
This section was planned drilled to well TD in a dry hole case or if hole stability allowed. However, due to signs of unstable formations when performing a wipertrip from 2670 m and upwards, it was decided to set a 9 5/8" liner and drill the reservoir section with a 8 ½" bit. Experienced several tight spots, and had up to 15 mT overpull. String packed off, and 2 m^3 was lost to the formation, before coming loose after working pipe up and down and circulating out cuttings. Used booster-pump to help lifting all the cuttings out of the riser.

Drilled further to section TD at 2737 m, before performing a new wipertrip to 2650 m and back to TD. Hole in good condition, saw only 5 mT overpull.

The rate of penetration was limited to 35 m/hr in the interval 2000 – 2120 m and below 2400 m due to MWD sampling rate in the interval . The section was drilled using a packed rotary assembly and a PDC bit, IADC-code M323. Parameters used were 3400 LPM / 60-150 RPM / 2-14 mT WOB. No bit balling was observed.

Performed one electric wireline run (Schlumberger PEXlite-DSI) from WL-TD at 2718 m up to 1500 m.

Ran and installed a 9 5/8" liner. Liner stood up at 2687 m, had to be washed down the remaining 50 m to TD. Dropped ball, set hanger at 1410 m and sheared ball seat at 230 bar. Mixed and pumped cement, displaced same according to plan. Bumped plug. Observed total losses of 16 m^3 mud during cement job. Pressure tested liner to 250 bar and set TSP packer. Disconnected liner running tool and pulled out of hole.

Ran in hole with the 8 ½" drilling assembly and drilled out plugs, float, shoetrack and liner shoe plus 3 m new formation in only 2.5 hours. Performed XLOT to 1.65 g/m^3 EMW.

5.6 Drilling 8 1/2" section

5.6.1 Summary

The 8 ½" section was drilled from the 9 5/8" liner shoe at 2736 m and vertically to TD at 2975 m in one bit run. After performing an XLOT, continued drilling towards TD. Had drilling break at 2775 m, where ROP increased from 15 m/hr to 25 m/hr. Flowchecked the well – negative. Observed 1.23 % gas when circulating bottoms up. Continued drilling to well TD at 2975 m.

Due to bad weather, no boats could be unloaded, meaning that most of the 8 ½" drilling equipment were unavailable. Only 8 ½" drill bits could be flown out to the rig. Thus, the section was drilled without MWD-tools, and therefore with limited ROP. Also, frequent stops were made during drilling of the reservoir, to circulate up cuttings samples.

The section was drilled using a packed rotary assembly and a PDC bit, IADC-code M223. Typical parameters were 2500 LPM / 65-170 RPM / 1-8 mT WOB, giving an average rate of penetration of 16.8 m/hr for this section.

Pulled out of the hole with the drilling assembly, and rigged up for wireline logging.
Performed two logging runs, the first consisting of DSI-HRLA-PEX, the second of VSP-GR. Lost 2 hours due to telemetry problems, otherwise the operation was successful.
Pulled out of hole with the logging tools, rigged down wireline equipment and prepared for plug- and abandonment operation.

5.7 Permanent P&A

5.7.1 Summary

Ran in hole with cement stinger (349 m of 3 ½" DP and 5 ½" DP to surface) to plug back the water filled Garn, Ror and Tilje sands. Washed down the last 50 m to TD, circulated bottoms up and prepared to pump cement. Cement line was frozen, lost ½ hr to rectify this. Mixed and pumped 13 m^3 cement and set cement plug # 1 from TD at 2975 m up to 2680 m, i.e. 56 m into 9 5/8" liner. Pulled above top of cement, circulated string clean, before pulling cement stinger to surface. Washed BOP and riser.
Ran in hole with 5 ½" open ended DP to 1510 m, installed a Cement Support Tool (CST), and pumped 12 m^3 1.92 g/cm^3 cement slurry. Cement plug # 2 covered the liner lap, from 1510 m and up to 1300 m. Pulled above cement, circulated string clean and pulled out of hole.

Ran in hole with casing cutting assembly, landed marine swivel in wellhead and cut 13 3/8" casing at 535 m. Flowchecked before pulling out of hole. Landed in wearbushing with 13 mT and recovered same after some difficulties latching on. Retrieved 13 3/8"casing hanger, pup joint and 2 casing joints. Apparently, the cutting operation caused the 13 3/8" casing to back off at two different levels in addition to the cut itself. A 13 3/8" casing spear was used to retrieve the 2 remaining stumps, the first with 5 joints, the last with 7 joints. There had been no abnormal indications during the cutting operation.

Placed cement plug #3 from below casing cut at 535 m on top of a CST at 610 m, and up to 470 m (17 m^3 1.75 g/cm^3 cement slurry).
Waited on cement, pressure tested plug # 3 to 74 bar and tagged same. Mixed and pumped 19.6 m^3 1.75 g/cm^3 cement slurry and placed same as Plug # 4 from 470 m and up to 365 m. Washed and pulled BOP.
RIH with MOST cutting assembly, landed same in wellhead. Cut 20" and 30" casing at 364 m, 8 m below seabed. Pulled Wellhead and PGB to surface.

Performed seabed survey with ROV, deballasted rig and pulled all 8 anchors.

The rig was transferred to Heidrun operations well 6507/7-C-4 AHT4, January 31st, 2004 at 23:59 hours.

5.8 Figures and tables

5.8.1 Well Schematic

Well: 6507/8-7
Field: Kappa
Rig: Deepsea Bergen

WELL SCHEMATIC

All depths referes to RKB
RKB-MSL Deepsea Bergen: 23 m
January 2004

HOLE		CASING				LOT FIT	TOC		CSG. SHOE			M.W.	LWD LOGS	SURV CSG/OH
SIZE	TVD MD	SIZE	TYPE / RAD. MARKERS	CENTRALIZERS	TEST PRESS [BAR]		TVD	MD	TVD	MD	RKB	(SG)		
Sea Bed	356,0						356,0	356,0						
36"	409 409	**30"**	4 jnts. 30", 309.72 lb/ft , ID 28" , X-52 incl 30" WH housing & shoe joint PGB	None	**N/A**		Seabed	Seabed	403	403		1.03 - 1.35 WBM	None	OH: DIR
26"	550 550	**20"**	18 3/4" WH housing 20" casing 133 lb/ft, ID 18.75 , X-56	Type: ST A4 1 ctr/jt on each of the 3 bottom jnts	70	LOT 1,23 s.g.	Seabed	Seabed	545	545		1.03 - 1.35 WBM	Ref. fig. 5.1 in chap. 5	OH: DIR
17 1/2"	1 510 1 510	**13 3/8"**	13 3/8" casing 72 lb/ft, P-110, New Vam	Type: NW-ST A4 1 ctr/jt on each of the 5 bottom jnts	250	XLOT 1,62 s.g.	1300 1410	1300 1410	1 500	1 500		1.15 WBM	Ref. fig. 5.1 in chap. 5	OH: DIR
12 1/4"	2 736 2 736	**9 5/8"**	9 5/8" liner 53.5 lb/ft, P-110, New Vam	Type: NW-ST A4 1 ctr/jt on each of the 4 bottom jnts		XLOT 1,65 s.g.	2000	2000	2736	2736		1.42 WBM	Ref. fig. 5.1 in chap. 5	OH DIR
8 1/2"	2 975 2 975								2 975	2 975		1,20 WBM	Ref. fig. 5.1 in chap. 5	None

5.8.2 W*ell Schematic – Permanent P & A*

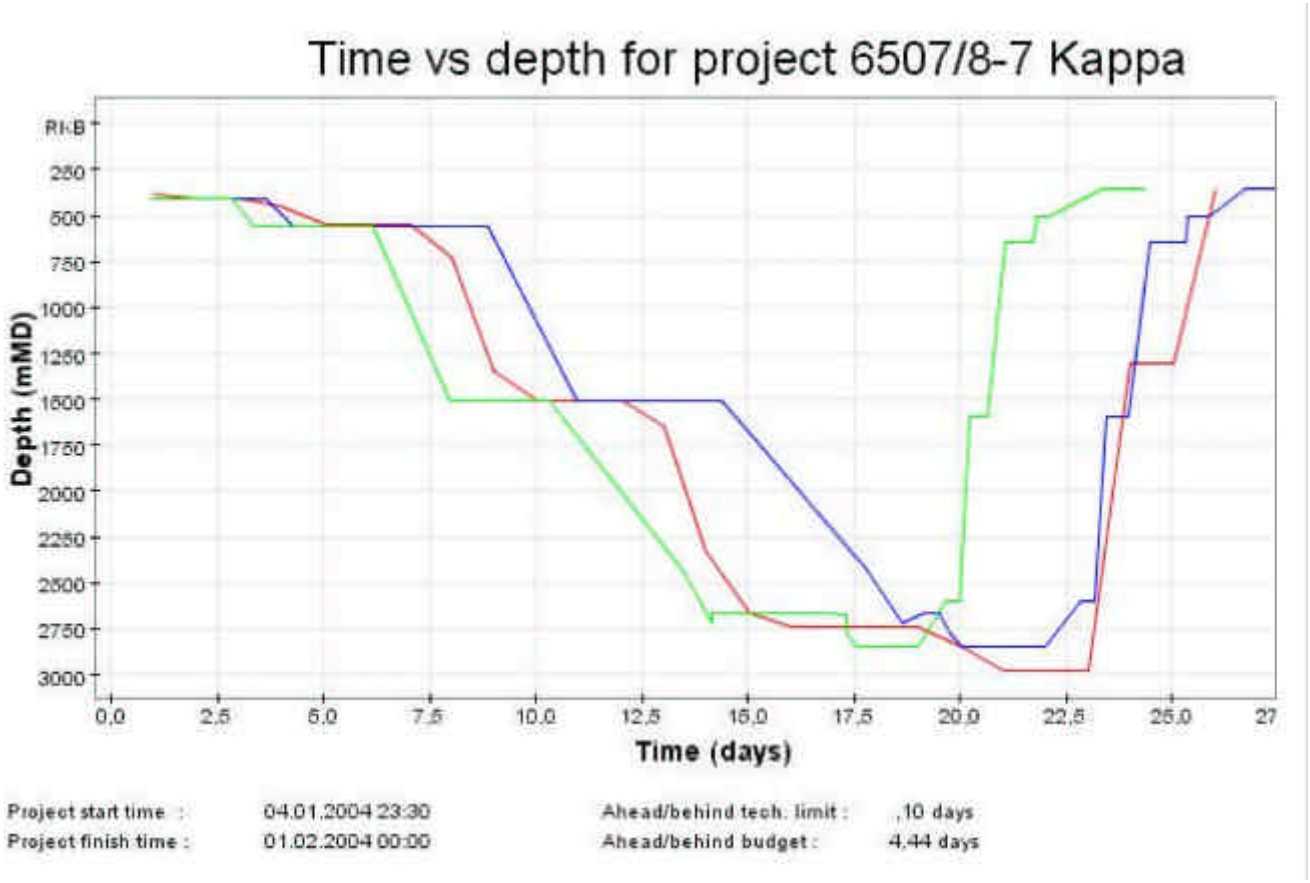
Well: 6507/8-7
Field: Kappa
Rig: Deepsea Bergen

WELL SCHEMATIC - PERMANENT P&A

All depths referes to RKB
RKB-MSL Deepsea Bergen: 23 m
January 2004

HOLE		CASING				LOT FIT	TOC		CSG. SHOE			M.W.	TESTS	CUT
SIZE	TVD MD	SIZE	TYPE / RAD. MARKERS	PERMEABLE HC BEARING ZONES	CASINGTEST PRESS [BAR]	(s.g.)	TVD	MD	TVD	MD	RKB	(SG)		
Sea Bed	356,0						356,0	356,0						
36"	409 409	**30"**	4 jnts. 30", 309.72 lb/ft , ID 28" , X-52 incl 30" WH housing & shoe joint PGB		**N/A**		365	356	403	403				364 (20/30")
26"	550 550	**20"**	18 3/4" WH housing 20" casing 133 lb/ft, ID 18.75 , X-56		70	1.23	470	470	545	545	Cmt. # 4 Cmt. #3		70 bar	535 (13 3/8")
17 1/2"	1 510 1 510	**13 3/8"**	13 3/8" casing 72 lb/ft, P-110, New Vam		250	1.62	1300 1410 1500	1300 1410 1500	610 1 500	610 1 500	CST 1.20 sg. WBM Cmt. # 2	1.20 SG WBM		
12 1/4"	2 737 2 737	**9 5/8"**	9 5/8" liner 53.5 lb/ft, P-110, New Vam	None	250	1,65	2000 2680	2000 2680	2736	2736	CST 1.20 sg. WBM Cmt. # 1	1.20 SG WBM	70 bar above XLOT	
8 1/2"	2 975 2 975			None					2 975	2 975				

5.8.3 Time/depth curve



P10 (days) Budget time (days) Actual time (days)

5.8.4 Timeplanner

Project planner

6507/8-7 Kappa

T.O124A.AP.20700

		Start time	End time	Budget time hrs	Acc Budget days	Tech limit hrs	Acc tech days	Planned depth mMD	Actual time hrs	Acc actual days	Actual depth mMD	% comp	Description	Companies
		04.01.04 23:30	**05.01.04 18:00**	**48.0**	**2.0**	**40.0**	**1.7**		**18.5**	**0.8**			**MOVE [NO 6507/8-7]**	
1	Sun	04.01.04 23:30	05.01.04 03:30	8.0	0.3	5.0	0.2	0.0	4.0	0.2	0.0	100	1 Move rig from Heidrun F-template to Kappa	ODS
2	Mon	05.01.04 03:30	05.01.04 18:00	40.0	2.0	35.0	1.7	0.0	14.5	0.8	367.0	100	2 Set anchors and ballast rig to drilling draft. Finalize rig positioning	ODS,Ocean
		05.01.04 17:00	**08.01.04 18:00**	**100.5**	**4.2**	**73.0**	**3.0**		**73.0**	**3.0**			**36" [NO 6507/8-7]**	
3	Mon	05.01.04 17:00	05.01.04 18:00	2.0	2.1	1.0	1.7	0.0	1.0	0.8	367.0	100	3 Continue RIH while PU 5 1/2" HWDP. Pos rig and placed ROV buoys on seabed	ODS
4	Mon	05.01.04 17:59	05.01.04 18:00	6.0	2.3	0.0	1.7	0.0	0.0	0.8		100	4 Pick up drill pipe/drill collars	ODS
5	Mon	05.01.04 17:59	05.01.04 18:00	6.0	2.6	4.0	1.9	0.0	0.0	0.8		100	5 MU cement stand and 30" cond housing. R/B same. MU 36" BHA	ODS
6	Mon	05.01.04 18:00	07.01.04 02:30	27.0	3.7	22.0	2.8	404.0	32.5	2.2	408.0	100	6 Drill 36" hole to 404 m. Circulate hole clean.	BHI,MI,ODS,Ocean
7	Wed	07.01.04 02:30	07.01.04 08:30	8.0	4.0	6.0	3.0	404.0	6.0	2.4	408.0	100	7 Displace to 1.35 sg mud. POOH. R/B DC and HWDP. L/D BHA	BHI,MI,ODS
8	Wed	07.01.04 08:30	07.01.04 17:30	14.0	4.6	12.0	3.5	404.0	9.0	2.8	403.0	100	8 Rig up and run 30" conductor, PGB and cement stinger	DQ,ODS,ODS,Ocean
9	Wed	07.01.04 17:30	07.01.04 23:30	9.0	5.0	7.0	3.8	404.0	6.0	3.0	403.0	100	9 Pump and displace X-ELITE cement.	Hall,ODS,Ocean
10	Wed	07.01.04 23:30	08.01.04 06:00	9.0	5.4	7.0	4.1	404.0	6.5	3.3	352.0	100	10 Retrieve running tool and lading string.	DQ,ODS,Ocean
11	Thu	08.01.04 06:00	08.01.04 15:30	14.0	6.0	10.0	4.5	404.0	9.5	3.7	400.0	100	12 MU and RIH with 26" BHA	BHI,BHI,ODS,Ocean
12	Thu	08.01.04 15:29	08.01.04 15:30	0.0	6.0	0.0	4.5	404.0	0.0	3.7	0.0	100	11 Optional: Planned rig maintenance	ODS
13	Thu	08.01.04 15:30	08.01.04 18:00	5.5	6.2	4.0	4.7	404.0	2.5	3.8	408.0	100	13 Drill out cement and 30" shoe	BHI,BHI,MI,ODS
		08.01.04 18:00	**12.01.04 11:00**	**126.5**	**5.3**	**80.0**	**3.3**		**89.0**	**3.7**			**26" [NO 6507/8-7]**	
14	Thu	08.01.04 18:00	09.01.04 11:30	16.0	6.9	12.0	5.2	556.0	17.5	4.5	550.0	100	14: Drill 26"hole to section TD	BHI,BHI,MI,ODS,Weir
15	Fri	09.01.04 11:30	09.01.04 20:30	8.0	7.2	4.0	5.4	556.0	9.0	4.9	550.0	100	15: Circulate well clean, displace to 1.35 sg mud. Wash PGB. POOH.	BHI,BHI,MI,ODS
16	Fri	09.01.04 20:30	10.01.04 07:00	13.0	7.7	9.0	5.8	556.0	10.5	5.4	545.0	100	16: R/U and run 20" casing and 18 3/4" WH housing.	DQ,ODS,ODS,Ocean
17	Sat	10.01.04 07:00	10.01.04 11:30	11.5	8.2	5.0	6.0	556.0	4.5	5.5	545.0	100	17: Circulate. Pump and displace cement.	Hall,ODS,Ocean
18	Sat	10.01.04 11:29	10.01.04 11:30	8.0	8.5	1.0	6.0	556.0	0.0	5.5	545.0	100	18: L/D RT, cement stand and 26" BHA.	BHI,BHI,BHI,DQ,ODS
19	Sat	10.01.04 11:30	10.01.04 16:00	5.0	8.8	3.0	6.1	556.0	4.5	5.7	545.0	100	19: Release RT and wash WH area. POOH.	DQ,ODS,Ocean
20	Sat	10.01.04 15:59	10.01.04 16:00	0.0	8.8	0.0	6.1	556.0	0.0	5.7	525.0	100	19a: Optional: Planned rig maintenance	ODS
21	Sat	10.01.04 16:00	11.01.04 18:30	40.0	10.4	35.0	7.6	556.0	26.5	6.8	351.0	100	20: Prepare to run BOP. Run BOP/riser. Press. Test BOP, WH conn. and casing.	ODS,Ocean
22	Sun	11.01.04 18:30	11.01.04 20:00	4.0	10.6	1.5	7.6	556.0	1.5	6.9	0.0	100	21: M/U cement stand and hang off tool	Hall,ODS
23	Sun	11.01.04 20:00	12.01.04 02:30	10.0	11.0	4.0	7.8	556.0	6.5	7.2	530.0	100	22: M/U 17 1/2" BHA and RIH	ODS
24	Mon	12.01.04 02:30	12.01.04 09:30	6.0	11.3	3.0	7.9	556.0	7.0	7.5	553.0	100	23: Drill out shoe track and drill 3 m new formation while disp. to 1.15 g/cm³ mud	MI,ODS
25	Mon	12.01.04 09:30	12.01.04 11:00	5.0	11.5	2.5	8.0	556.0	1.5	7.5	550.0	100	24: Pull in to casing shoe, circulate and perform LOT	MI,ODS
		12.01.04 11:00	**17.01.04 10:30**	**128.0**	**5.3**	**97.0**	**4.0**		**119.5**	**5.0**			**17 1/2" [NO 6507/8-7]**	
26	Mon	12.01.04 11:00	14.01.04 05:30	50.0	13.5	43.0	9.8	1510.0	42.5	9.3	1510.0	100	25: Drill 17 1/2" hole to 1510 m.	BHI,BHI,BHI,MI,ODS,Weir
27	Wed	14.01.04 05:30	14.01.04 22:30	13.0	14.1	8.0	10.2	1510.0	17.0	10.0	1510.0	100	26: Circulate hole clean, flowcheck and POOH. Pull WB	MI,ODS
28	Wed	14.01.04 22:30	15.01.04 17:00	24.0	15.1	20.0	11.0	1510.0	18.5	10.8	1500.0	100	27: RU and run 13 3/8" casing.	Hall,ODS,ODS
29	Thu	15.01.04 16:59	15.01.04 17:00	8.0	15.4	6.0	11.3	1510.0	0.0	10.8	1500.0	100	28: Release RT, POOH and wash well head area. LD RT and cement head.	Hall,ODS,Weath
30	Thu	15.01.04 17:00	16.01.04 13:30	6.5	15.7	5.0	11.5	1510.0	20.5	11.6	1500.0	100	29: Circulate, pump and displace cement.	BHI,BHI,Hall,ODS
31	Fri	16.01.04 13:30	17.01.04 01:30	13.5	16.3	10.0	11.9	1510.0	12.0	12.1	1469.0	100	30: MU and RIH with 12 1/4" BHA (picked up xxx joints while RIH)	BHI,BHI,ODS,Weir
32	Sat	17.01.04 01:29	17.01.04 01:30	6.5	16.5	0.0	11.9	1510.0	0.0	12.1		100	31: LD 17 1/2" BHA.	BHI,BHI,Hall,ODS

Project planner

6507/8-7 Kappa

T.O124A.AP.20700

		Start time	End time	Budget time hrs	Acc Budget days	Tech limit hrs	Acc tech days	Planned depth mMD	Actual time hrs	Acc actual days	Actual depth mMD	% comp	Description	Companies
		12.01.04 11:00	**17.01.04 10:30**	**128.0**	**5.3**	**97.0**	**4.0**		**119.5**	**5.0**			**17 1/2" [NO 6507/8-7]**	
33	Sat	17.01.04 01:30	17.01.04 08:30	4.0	16.7	3.0	12.0	1513.0	7.0	12.4	1513.0	100	32: Drill out shoe track and 3 m new formation.	BHI,BHI,MI,ODS,Weir
34	Sat	17.01.04 08:30	17.01.04 10:30	2.5	16.8	2.0	12.1	1513.0	2.0	12.5	1500.0	100	33: Circulate and perform XLOT	BHI,Hall,MI,ODS
		17.01.04 10:30	**24.01.04 12:00**	**127.0**	**5.3**	**171.0**	**7.1**		**169.5**	**7.1**			**12 1/4" [NO 6507/8-7]**	
35	Sat	17.01.04 10:30	17.01.04 15:30	4.0	17.0	2.0	12.2	1513.0	5.0	12.7	1513.0	100	34: Displace the well to 1,42 sg. WBM.	BHI,MI,ODS
36	Sat	17.01.04 15:30	19.01.04 18:30	82.0	20.4	75.0	15.3	2423.0	51.0	14.8	2670.0	100	35: Drill 12 1/4" hole to check for hydrocarbons (2423 - 2670 m)	BHI,BHI,BHI,MI,ODS,Weir
37	Mon	19.01.04 18:30	20.01.04 00:00	0.0	20.4	0.0	15.3	2423.0	5.5	15.1	2125.0	100	36: Circulate hole clean and POOH.	MI,ODS
38	Tue	20.01.04 00:00	20.01.04 23:00	20.0	21.2	17.0	16.0	2721.0	23.0	16.0	2737.0	100	37: Continue drill 12 1/4" hole to 2737 m, perform wiper trip to 13 3/8" shoe	BHI,BHI,BHI,MI,ODS,Weir
39	Tue	20.01.04 23:00	21.01.04 09:30	12.0	21.7	0.0	16.0	2670.0	10.5	16.5	2737.0	100	38: Circulate hole clean and POOH.	BHI,MI,ODS
40	Wed	21.01.04 09:30	21.01.04 19:00	7.0	22.0	14.0	16.6	2670.0	9.5	16.9	2737.0	100	39: Perform open hole logging (1 run)	ODS,Schlum
41	Wed	21.01.04 19:00	21.01.04 20:30	2.0	22.1	10.0	17.0	2670.0	1.5	16.9	0.0	100	40: PU&MU cement stand. Rack same.	BHI,MI,ODS,Weath
42	Wed	21.01.04 20:30	21.01.04 22:00	0.0	22.1	3.0	17.1	2670.0	1.5	17.0	0.0	100	41: MU to liner hanger assy. Continue run on DP	ODS,Weath
43	Wed	21.01.04 22:00	23.01.04 02:00	0.0	22.1	15.0	17.8	2670.0	28.0	18.1	2737.0	100	42: RU & run 9 5/8" liner	ODS,ODS,Weath
44	Fri	23.01.04 02:00	23.01.04 05:00	0.0	22.1	5.0	18.0	2670.0	3.0	18.3	2736.0	100	43: Circulate. Set hanger	ODS,Weath
45	Fri	23.01.04 05:00	23.01.04 08:30	0.0	22.1	12.0	18.5	2670.0	3.5	18.4	2736.0	100	44: Circulate & cement liner	Hall,MI,ODS,Weath
46	Fri	23.01.04 08:30	23.01.04 19:00	0.0	22.1	2.0	18.5	2670.0	10.5	18.9	2736.0	100	45: Set & pressure test packer. Function test BOP. POOH. LD RT.	DQ,Hall,ODS
47	Fri	23.01.04 09:29	23.01.04 09:30	0.0	22.1	5.0	18.8	2670.0	0.0	18.9		100	48: Drill out shoe track and 3 m new formation	BHI,BHI,BHI,MI,ODS
48	Fri	23.01.04 19:00	24.01.04 06:00	0.0	22.1	3.0	18.9	2670.0	11.0	19.3	2740.0	100	46: MU & RIH with 8 1/2" BHA.	BHI,BHI,BHI,MI,ODS
49	Sat	24.01.04 06:00	24.01.04 10:00	0.0	22.1	3.0	19.0	2673.0	4.0	19.5	2740.0	100	47: Circulate hole clean. Displace the well to 1,20 sg. WBM (New mud system)	BHI,BHI,BHI,Hall,MI,ODS
50	Sat	24.01.04 10:00	24.01.04 12:00	0.0	22.1	5.0	19.2	2673.0	2.0	19.6	2740.0	100	49: Perform XLOT.	BHI,MI,ODS
		24.01.04 12:00	**26.01.04 20:00**	**46.0**	**1.9**	**29.0**	**1.2**		**56.0**	**2.3**			**8 1/2" [NO 6507/8-7]**	
51	Sat	24.01.04 12:00	24.01.04 23:00	6.0	22.3	0.0	19.2	2770.0	11.0	20.0	2827.0	100	50: Drill 8 1/2" hole to check for HC (approx. 2740 - 2800 m).	BHI,BHI,BHI,MI,ODS
52	Sat	24.01.04 23:00	25.01.04 09:00	7.0	22.6	5.0	19.4	2850.0	10.0	20.4	2975.0	100	51: Continue drill 8 1/2" hole to TD +/- 2975 m.	BHI,BHI,MI,ODS,Weir
53	Sun	25.01.04 09:00	25.01.04 21:30	10.0	23.0	9.0	19.8	2850.0	12.5	21.0	2975.0	100	52: Circulate hole clean and POOH.	MI,ODS
54	Sun	25.01.04 21:30	26.01.04 20:00	23.0	24.0	15.0	20.4	2850.0	22.5	21.9	2979.0	100	53: Perform open hole logging (2 runs)	ODS,Schlum
		26.01.04 20:00	**31.01.04 11:30**	**149.0**	**6.2**	**141.0**	**5.9**		**111.5**	**4.6**			**PERM P&A [NO 6507/8-7]**	
55	Mon	26.01.04 20:00	27.01.04 06:00	14.0	24.6	11.0	20.9	2850.0	10.0	22.3	2975.0	100	54: P/U cement stinger and RIH to TD.	ODS
56	Tue	27.01.04 06:00	27.01.04 19:00	20.0	25.4	16.0	21.5	2600.0	13.0	22.9	2975.0	100	55: Plug back reservoir section with 1 cement plug #1.	BHI,Hall,ODS
57	Tue	27.01.04 19:00	28.01.04 06:00	8.0	25.8	8.0	21.9	2600.0	11.0	23.3	1510.0	100	56: POOH to 1500 m and circulate bottoms up while WOC to set up	BHI,MI,ODS
58	Wed	28.01.04 06:00	28.01.04 14:00	7.0	26.0	5.0	22.1	1600.0	8.0	23.6	1510.0	100	58: Install CST (cement support tool) and set cmt. plug from 1500 to 1300 m.	BHI,Hall,ODS
59	Wed	28.01.04 13:59	28.01.04 14:00	12.0	26.5	10.0	22.5	1600.0	0.0	23.6	1510.0	100	57: Pressure test transtition zone cment plug to 70 bar above 9 5/8" LOT.	BHI,Hall,ODS
60	Wed	28.01.04 14:00	28.01.04 19:00	12.0	27.0	10.0	22.9	650.0	5.0	23.9	535.0	100	59: RIH cutting assy. Cut 13 3/8" csg. @ 535 m. POOH w/cutting assembly.	ODS,ODS,Weath
61	Wed	28.01.04 19:00	29.01.04 05:00	4.0	27.2	4.0	23.1	650.0	10.0	24.3	378.0	100	60: Retrieve wearbushing.	DQ,ODS
62	Thu	29.01.04 05:00	29.01.04 14:30	10.0	27.6	8.0	23.4	650.0	9.5	24.7	610.0	100	61: RIH with 13 3/8" spear and retrieve 13 3/8" csg.	BHI,ODS,ODS
63	Thu	29.01.04 14:30	29.01.04 18:30	6.0	27.9	4.0	23.6	650.0	4.0	24.8	610.0	100	62: RIH with open ended DP to 600 m. Install CST. Set cmt. Plug from 600 m to 470 m. POOH	Hall,MI,ODS
64	Thu	29.01.04 18:30	30.01.04 04:00	2.0	28.0	2.0	23.7	500.0	9.5	25.2	400.0	100	63: WOC. Pressure test cment plug to 70 bar above 20" LOT.	Hall,ODS

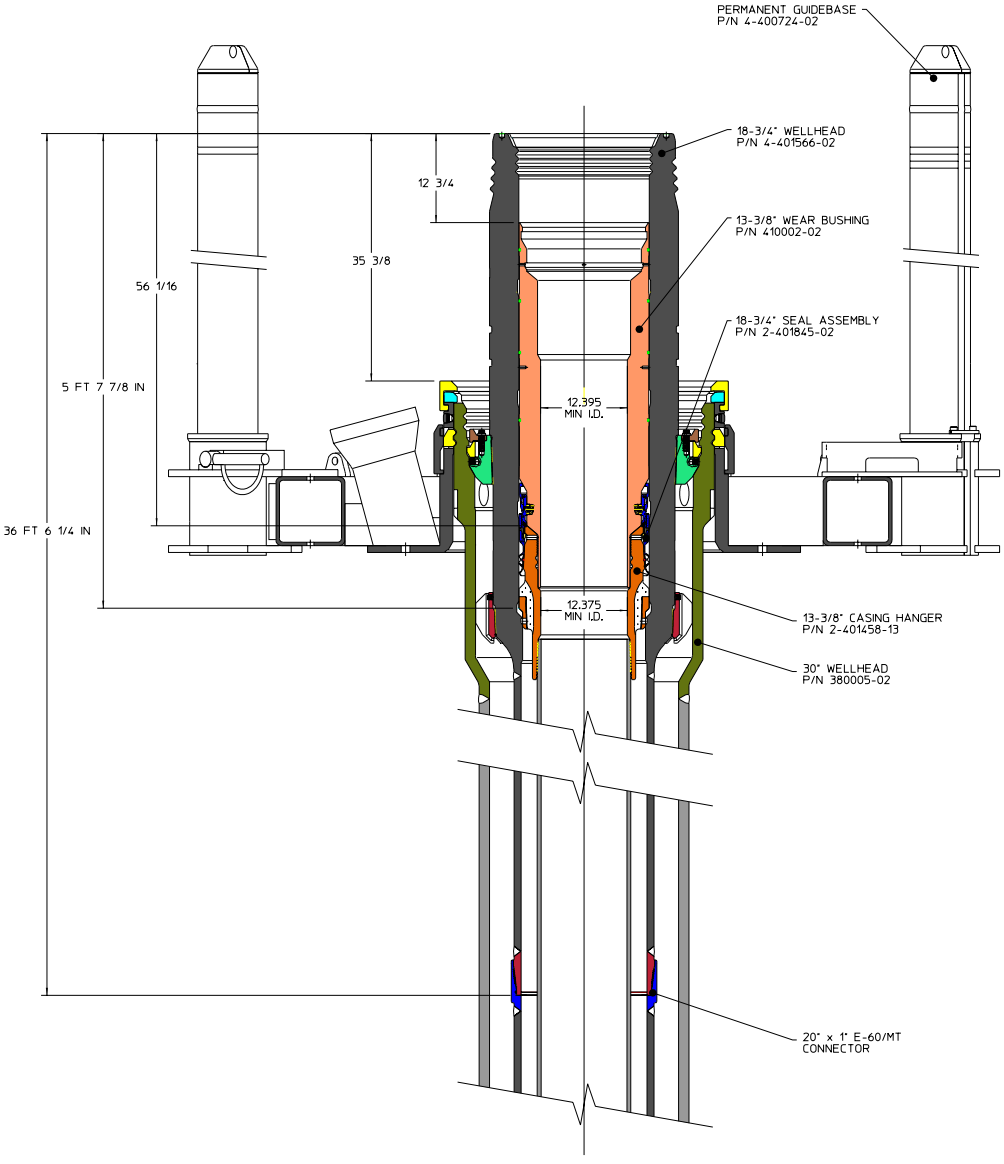
Project planner

6507/8-7 Kappa

T.O124A.AP.20700

		Start time	End time	Budget time hrs	Acc Budget days	Tech limit hrs	Acc tech days	Planned depth mMD	Actual time hrs	Acc actual days	Actual depth mMD	% comp	Description	Companies
		26.01.04 20:00	**31.01.04 11:30**	**149.0**	**6.2**	**141.0**	**5.9**		**111.5**	**4.6**			**PERM P&A [NO 6507/8-7]**	
65	Fri	30.01.04 04:00	30.01.04 07:00	3.0	28.1	2.0	23.8	500.0	**3.0**	**25.4**	470.0	100	64:Displace the well to seawater	BHI,MI,ODS
66	Fri	30.01.04 07:00	30.01.04 08:30	9.0	28.5	5.0	24.0	500.0	**1.5**	**25.4**	370.0	100	65: Set surface cement plug from 470 to 370 m	Hall,MI,ODS
67	Fri	30.01.04 08:30	31.01.04 00:00	20.0	29.3	30.0	25.2	356.0	**15.5**	**26.1**	353.0	100	66: Flush BOP. Pull riser and BOP.	ODS
68	Sat	31.01.04 00:00	31.01.04 08:00	20.0	30.1	24.0	26.2	356.0	**8.0**	**26.4**	364.0	100	67: RIH with MOST and motor cutting assy. Cut WH. POOH w/PGB & WH	DQ,ODS,Weath
69	Sat	31.01.04 08:00	31.01.04 11:30	2.0	30.2	2.0	26.3	0.0	**3.5**	**26.5**	0.0	100	68:L/D WH and cutting assembly. Inspection of seabed with ROV.	ODS,Ocean,Weath
		31.01.04 11:30	**01.02.04 00:00**	**30.0**	**1.3**	**20.0**	**0.8**		**12.5**	**0.5**			**MOVE [NO 6507/8-7]**	
70	Sat	31.01.04 11:30	01.02.04 00:00	30.0	31.5	20.0	27.1	0.0	**12.5**	**27.1**	0.0	100	69: Pull anchors & deballast rig, meanwhile L/D WH/PGB and cutting assy - 6 hrs	ODS
				31.5	**days**	**27.1**	**days**		**27.1**	**days**				

5.8.5 Wellhead system



CAD

REVISIONS				
REV.	DATE	CHKD.	APP.	REL.
A				

DWN. BY: TS
CHKD. BY: MMC
APP. BY: AFB
REL. BY: JFC
REL. DATE: 03-DEC-03
REF. LAYOUT:

ALL DIMENSIONS IN INCHES

SWS. STACK-UP, WELLHEAD, TYPE SS-15, 30" X 20" X 13.38" CASING PROGRAM F/STATOIL DEEP SEA BERGEN WELL 6507/8-7S
KAPPA
SALES DRAWING

DRIL-QUIP (EUROPE) LTD.

DWG SIZE	PART NUMBER	LAST REV
A1	4-SD-30375CP	A

5.8.6 Drilling fluids data

Well: 6507/8-7
Field: KAPPA
Rig: DEEPSEA BERGEN

DRILLING FLUIDS DATA

All depths referes to RKB
RKB-MSL Deepsea Bergen: 23 m

HOLE SIZE	HOLE TVD MD	CASING SIZE	CASING TVD MD	MUD TYPE	MW [g/cm³]	LGS [kg/m³]	10 sec. [Pa]	10 min. [Pa]	Fann 3 rpm [lb/sqft]	MBT [kg/m3]	PV [cP]	FV [sec]	API FL [ml]	YP [Pa]	pH	KCl [kg/m3]	Glycol [%]	Ca ++ [mg/l]	Sulphate [mg/l]	Total Volume Old Volume New Volume Usage [m³]
36"	408	**30"**	403	SW/ Bentonite sweeps	1,03 - 1,35							150 - 157			8 - 9					319 0 319 319
				Pre made HiVis with CMC and Bentonite. In addition, 50m³ of 1.35sg displacement mud with Bentonite and 3 kg/m³ CMC was mixed up before start of section. Pumped a total of 209 m³ HiVis sweeps and 110 m³ of 1.35sg. Bentonite mud.															
26"	550	**20"**	545	SW/ Bentonite sweeps	1,03 - 1,35							158			8 - 9					245 0 245 245
				Made up 70m³ 1.60sg kill mud and 79 m³ HiVis Bentonite pills with funnel viscosity higher than 150 s/qt before section start. Due to lack of drill water, HiVis pills were made up with CMC EHV and seawater during drilling. Used a total of 113 m³ HiVis Sweeps. Cut back kill mud to 1.35sg displacement mud at TD, adding 3 kg/m³ CMC EHV to provide extra fluid loss. Over displaced hole with 50% 1.35sg mud before pulling out.															
17 1/2"	1 510	**13 3/8"**	1 500	SW/ Polymer	1,15 - 1,17	24 - 114	2 - 4	4 - 15	3	10 - 30	14 - 15	na	4,5 - 10,5	12 - 16	8,7 - 9,1	25 - 35 (in Kai formation)	na	na	na	964 0 964 964
				Made up 214m³ 1,15sg SW/CMC mud while running 20" casing. Pre treated initial volume with 1kg/m³ Citric Acid and 1 kg/m³ Sodium Bicarbonate to avoid cement contamination. The well was displaced to 1.15sg mud while drilling out of the shoe. During drilling, un-weighted premix was added to the system to control mud weight and properties. Premixed 10mt KCl-powder in reserve pit, which was added to active mud system prior to drilling into the Kai formation at 1440m. This achieved a KCl-concentration of 35 kg/m³. Pumped 20 m³ weighted HiVis at TD. This led to approximately 50% increase in cuttings on shakers, when the HiVis mud came in return. When circulating to get the casing down, fully dispersed clay was experienced in the mud system. Mud weight out, was in the range between 1.2 and 1.25sg. Drill water was used to adjust mud weight to ± 1.16sg. The cement was displaced with 1.16sg mud. Drilled out cement and 3 m new formation without any need for treatment.															
12 1/4"	2 740	**9.625"**	2 736	Glydril (99%KCL/ Pac/Glycol)	1,42	7 - 61	4 - 7,5	4 - 7,5	4,5 - 9	7 - 17	18 - 22	na	2,4 - 3	9 - 18	8 - 9	115 - 139	3 - 3,5	160 - 480	30 - 85	726 0 726 270
				Mixed 360m³ new Glydril 99%KCl mud with low sulphate content for start of section. The KCl content of the initial mix was +/- 132kg/m³. Test in pit showed a sulphate content of 15mg/ltr. The well was displaced to 1.42sg Glydril 99% KCl, by pumping 15m³ drill water, 20m³ 1,42sg HiVis Glydril, followed by the 1,42sg Glydril mud. When clean mud in return, the circulation was stopped to clean out the surface pits and lines with fresh water. Test of active mud after displacement showed a sulphate content of 85mg/ltr. When drilling started, the KCl content dropped below 120 kg/m³, and KCl powder and concentrated premixes where added. This increased the content to 139 kg/m³. Cuttings looked dry and firm at all times through the section. This is again proved by a very low MBT throughout the section. A total of 456 m³ Glydril mud was carried over to the 8 ½" interval.															
8 1/2"	2 975	**NA**	NA	Glydril (99%KCL/ Pac/Glycol)	1,20	47 - 51	5 - 7	5 - 7	5 - 8	12 - 14	12 - 20	na	2,1 - 3	9 - 17	8 - 9	88 - 92	1,8	320 - 480	70	728 456 272 59
				Mixed 309m³ new 1.20sg Glydril 99% KCl mud. A blend of 1.42sg mud, brine and water was used for this purpose. The KCl content in the initial mix was +-110 kg/m³, and a test done on a sample taken from a pit, showed a concentration of 50mg/ltr Sulphate (in the 1.20sg mud). The sulphate content of the 1.42sg mud rose from 45mg/ltr to 170mg/ltr when drilling out the cement. Displaced the 1.42sg Glydril mud to the new 1,20sg mud. Tests of active mud after the displacement showed a sulphate content of 70mg/ltr. The mud properties were maintained mainly by adding fresh pre-mix. Adjustments of the rheology, was done by direct additions of XC-polymers. A total of 497 m³ Glydril mud was brought forward to the P&A interval.															

5.8.7 Cementing data

CEMENT DATA

Well: 6507/8-7
Field: Kappa
Rig: Deepsea Bergen

All depths referes to RKB
RKB-MSL Deepsea Bergen: 23 m

HOLE		CASING SHOE		TOC	VOLUME/ EXCESS	CEMENT SLURRY DESIGN										SPACER	DISPLACEMENT
SIZE	TVD MD	SIZE	TVD MD	TVD MD		Components	Lead [ltr/100kg]	Tail [ltr/100kg]	Density [g/cm^3]	Yield [ltr/100kg]	Stat. / Circ. Temp [°C]	Thickening time [hrs to 30 Bc]	API Free Water [%]	API Fluid loss [cc/30min]	24 hrs C. S. [psi]		Fluids and Rates
36"	409	**30"**	403	356	37 m^3 270%	X-lite cmt CaCl2 liquid NF-6 Sea water		4,50 0,10 55,83	1,52	107,40 Code DWLSP	6-8	02:59	n/a	n/a	690	30 m3 Sea water	Sea water 1200 lpm
26"	550	**20"**	545	356	Lead: 37 m^3 Tail: 15 m^3 100% (Lead)	Norcem "G" + 0,1 % EZ-FLO Econolite CaCl2 liquid NF-6 Sea water	3,20 - 0,10 95,07	- 4,35 0,10 39,56	L: 1,56 T: 1,95	L: 129,42 Code STL10 T: 75,06 Code STT10	12 / 12	L: 7:30 T: 5:32	n/a	n/a	L: +/- 100 T: 450	40 m3 Sea water	Sea water 2500 lpm
17 1/2"	1510	**13 3/8"**	1500	1300	18 m^3 20 %	Norcem "G" + 0,1 % EZ-FLO HR-4L Halad-613L NF-6 Freshwater		0,70 0,50 0,10 42,68	1,92	75,06 Code MPT05	47 / 36	03:35	0,06	n/a	1400	20 m3 1,56 SG Tuned Spacer	WBM 2500 - 3000 lpm
12 1/4"	2 737	**9 5/8"**	2 736	2 000	27 m^3 20 %	Norcem "G" + 0,1 % EZ-FLO Gascon 469 Halad-613L HR-5L CFR-5LE+ NF-6 Fresh water		3,50 11,00 0,50 1,70 0,10 29,83	1,90	77,75 Code GTT90	91 / 62	05:25	0	20	2500	15 m3 1,65 SG Tuned Spacer	WBM 1000 - 2000 lpm
8 1/2"	2 975	**OH Plug**	2 975	2 637	13 m^3 20 %	Norcem "G" + 0,1 % EZ-FLO Gascon 469 Halad-613L HR-5L CFR-3L NF-6 Fresh water		3,50 18,00 0,10 3,00 0,10 22,39	1,90	78,18 Code GTT90	94 / 77	05:20	0	24	2200	8 m3 1,55 SG Tuned Spacer	WBM 3000 lpm
		Plug #2 across 9 5/8" linerlap	1 500	1 300	12 m^3	Norcem "G" + 0,1 % EZ-FLO Halad-613L HR-4L NF-6 Fresh water		0,50 1,00 0,10 42,60	1,92	75,08 Code MPT14	50 / 41	03:58	1,1	n/a	1800	6 m3 1,55 SG Tuned Spacer	WBM 1500 lpm
		Plug #3 across 13 3/8" csg cut	600	470	17 m^3	Norcem "G" + 43 % X-LITE CaCl2 NF-6 Seawater		4,50 0,10 48,62	1,75	89,06 Code DWLSP	10 / 9	04:12 (70 bc)	n/a	n/a	+/- 1500	8 m3 1,55 SG Tuned Spacer	WBM 1500 lpm
		Plug #4 surface	470	365	19,6 m^3	Norcem "G" + 43 % X-LITE NF-6 Seawater		0,10 51,30	1,79	87,25 Code STTNT	8 / 8	> 4 hrs	n/a	n/a	+/- 1000	Seawater	Seawater 1500 lpm

5.8.8 Bottom hole assemblies

BHA report

Wellbore: NO 6507/8-7

BHA seq: 1 **BHA category:** Drilling **BHA description:**
BHA no: 1

String component	OD in	ID in	Length m	Acc length m
BIT, TRI CONE	17.500		0.42	0.42
FLOAT SUB	9.438	3.000	0.91	1.33
HOLE OPENER	9.500	3.000	1.62	2.95
HOLE OPENER	9.500	3.000	2.25	5.20
ANDERDRIFT	9.500	2.813	3.17	8.37
X-OVER	9.438	2.813	0.87	9.24
8" DRILL COLLAR	8.000	2.688	104.96	114.20
X-OVER	8.000	3.000	0.85	115.05
HW DRILL PIPE	5.500	3.625	80.00	195.05
DP 5 1/2"	5.500	4.778		195.05

BHA seq: 2 **BHA category:** Drilling **BHA description:**
BHA no: 2

String component	OD in	ID in	Length m	Acc length m
BIT, TRI CONE	17.500		0.42	0.42
FLOAT SUB	9.438	3.000	0.91	1.33
HOLE OPENER	9.500	3.000	1.62	2.95
HOLE OPENER	9.500	3.000	2.25	5.20
ANDERDRIFT	9.500	2.813	3.17	8.37
X-OVER	9.438	2.813	0.87	9.24
8" DRILL COLLAR	8.000	2.688	104.96	114.20
X-OVER	8.000	3.000	0.85	115.05
HW DRILL PIPE	5.500	3.625	80.00	195.05
DP 5 1/2"	5.500	4.778		195.05

BHA seq: 3 **BHA category:** Drilling **BHA description:**
BHA no: 3

String component	OD in	ID in	Length m	Acc length m
BIT, TRI CONE	26.000	2.000	0.63	0.63
STAB. NB W/FLOAT	9.500	3.000	2.21	2.84
PONY COLLAR	9.500	3.000	2.41	5.25
STAB STRING	9.500	3.000	2.28	7.53
X-OVER	9.500	3.000	0.68	8.21
MPR SUB	8.250	2.813	5.24	13.45
MWD DCP	8.250	2.813	11.28	24.73
SAVER SUB	8.250	2.813	0.82	25.55
STAB STRING	8.250	2.813	2.22	27.77
DRILL COLLAR	8.000	2.813	79.22	106.99
JAR	7.750	2.813	9.66	116.65
DRILL COLLAR	8.000	2.813	17.37	134.02
X-OVER	8.000	3.000	0.85	134.87
HW DRILL PIPE	5.500	3.875	80.00	214.87
DRILL PIPE	5.500	4.778		214.87

BHA seq: 4 **BHA category:** Drilling **BHA description:** 17.5" Pendulum.
BHA no: 4

String component	OD in	ID in	Length m	Acc length m
BIT, TRI CONE	17.500	2.000	0.43	0.43
BIT SUB W/FLOAT	9.500	3.000	0.87	1.30
X-OVER	9.500	3.000	0.68	1.98
MPR SUB	8.250	2.812	5.24	7.22
MWD DCP	8.250	2.813	11.28	18.50
SAVER SUB	8.250	2.813	0.82	19.32
STAB STRING	17.500	3.000	2.22	21.54
NON MAG. COLLAR,	8.000	2.875	8.12	29.66

BHA report

Wellbore: NO 6507/8-7

BHA seq: 4 **BHA category:** Drilling **BHA description:** 17.5" Pendulum.
BHA no: 4

String component	OD in	ID in	Length m	Acc length m
STRING STAB	17.500	2.875	1.94	31.60
8" DRILL COLLAR	8.000	2.813	79.22	110.82
JAR	7.750	2.813	9.66	120.48
DRILL COLLAR	8.000	2.813	17.37	137.85
X-OVER	8.000	3.000	0.85	138.70
HW DRILL PIPE	5.500	3.875	80.00	218.70
DRILL PIPE	5.500	4.778		218.70

BHA seq: 5 **BHA category:** Drilling **BHA description:**
BHA no: 5

String component	OD in	ID in	Length m	Acc length m
BIT, PDC	8.500		0.27	0.27
BIT SUB W/FLOAT	6.500	2.313	0.64	0.91
DRILL COL, NM	6.500	2.875	8.54	9.45
DRILL COLLAR	6.500	2.875	9.36	18.81
STAB STRING	8.250	2.750	1.60	20.41
DRILL COLLAR	6.500	2.750	64.99	85.40
X-OVER	6.750	3.000	0.95	86.35
HW DRILL PIPE	5.500	3.875	52.96	139.31

BHA seq: 6 **BHA category:** Drilling **BHA description:**
BHA no:

String component	OD in	ID in	Length m	Acc length m
BIT, PDC	8.500		0.27	0.27
BIT SUB W/FLOAT	6.500	2.313	0.64	0.91
DRILL COL, NM	6.500	2.875	8.54	9.45
DRILL COLLAR	6.500	2.875	9.36	18.81
STAB STRING	8.250	2.750	1.60	20.41

BHA seq: 7 **BHA category:** **BHA description:**
BHA no:

String component	OD in	ID in	Length m	Acc length m
DIVERTING SUB	3.500	2.563	1.98	1.98
DP 3 1/2"	3.500	2.563	347.85	349.83
X-OVER	4.750	2.375	1.00	350.83

BHA seq: 8 **BHA category:** **BHA description:**
BHA no:

String component	OD in	ID in	Length m	Acc length m
13 3/8" CSG CUTTER	12.000	12.000	3.12	3.12
X-OVER	8.000	3.000	1.01	4.13
DP 5 1/2"	5.500	3.500	174.20	178.33
DP PUP JOINT	5.500	3.500	4.70	183.03
X-OVER	8.000	3.000	1.01	184.04
MARINE SWIVEL	14.250	2.250	7.49	191.53
ANNULAR SWIVEL	8.750	2.750	5.67	197.20
X-OVER	7.250	3.500	1.02	198.22
DP 5 1/2"	5.500	3.500		198.22

BHA seq: 9 **BHA category:** **BHA description:**
BHA no:

String component	OD in	ID in	Length m	Acc length m
SPEAR	8.000	2.500	3.77	3.77
SPEAR STOP SUB	15.000	2.500	0.79	4.56
PUMP OPEN SUB	8.000	3.000	4.41	8.97
FISHING JAR	8.000	3.000	4.13	13.10

BHA report

Wellbore: NO 6507/8-7

BHA seq: 9 **BHA category:** **BHA description:**

BHA no:

String component	OD in	ID in	Length m	Acc length m
DRILL COLLAR	8.000	2.270	26.06	39.16
ACCELERATOR	8.000	3.000	5.30	44.46
X-OVER	8.000	3.500	1.00	45.46
DP 5 1/2"	5.500	3.500		45.46

BHA seq: 10 **BHA category:** **BHA description:**

BHA no:

String component	OD in	ID in	Length m	Acc length m
SPEAR	8.000	2.500	3.77	3.77
SPEAR STOP SUB	15.000	2.500	0.79	4.56
PUMP OPEN SUB	8.000	3.000	4.41	8.97
FISHING JAR	8.000	3.000	4.13	13.10
DRILL COLLAR	8.000	2.270	26.06	39.16
ACCELERATOR	8.000	3.000	5.30	44.46
X-OVER	8.000	3.500	1.00	45.46
DP 5 1/2"	5.500	3.500		45.46

BHA seq: 11 **BHA category:** **BHA description:**

BHA no:

String component	OD in	ID in	Length m	Acc length m
BOTTOM NOSE	8.000		0.35	0.35
CASING CUTTER	12.000		1.82	2.17
TOP SUB	10.000	3.500	0.92	3.09
SPACER SUB	8.000	2.250	1.01	4.10
SPACER SUB	8.000	2.250	1.82	5.92
MUD MOTOR	9.500		8.72	14.64
MOST TOOL			0.00	14.64
DRIL COL	8.000	2.750	79.22	93.86
X-OVER	8.000	3.000	1.00	94.86
DRILL PIPE	5.500	4.750	269.14	364.00

5.8.9 Bit record

Bit record

Wellbore: NO 6507/8-7

Run No	Bit Size	Bit No	BHA No	Bit Type	IADC code	Bit manufacturer	Serial No	Nozzles (n/32") no x n	no x n	no x n	no x n	Flow Area in2
1	17 1/2"	1RR	1	MXT1	115	Hughes Christensen	6016407	4 x 14	x	x	x	.602
2	17 1/2"	1RR2	2	MXT1	115	Hughes Christensen	6016407	4 x 14	x	x	x	.602
3	26"	2	3	MSDSSHC	115	Smith Bits	MM3357	3 x 20	1 x 13	x	x	1.051
4	17 1/2"	3	4	MX-ST31	115	Hughes Christensen	6016320	3 x 20	1 x 18	x	x	1.169
5	12 1/4"	4	5	LD565ATHG	M323	Lyng	2825	6 x 11	2 x 12	x	x	.778
6	8 1/2"	5RR	6	MA74PX	M223	Smith Bits	JS0938	3 x 11	3 x 12	x	x	.610

Wellbore: NO 6507/8-7

Run No	Bit Size	Pump Rate l/min	Pump Press bar	Depth in mMD	Depth out mMD	Form drld m	Total drld m	Drld hrs	Circ hrs	ROP m/hr	Min WOB ton	Max WOB ton	Min RPM	Max RPM	Torque Min Nm	Torque Max Nm	Con drag Min 1000 daN	Con drag Max 1000 daN
1	17 1/2"			355	387	32.0		4.9	12.3	6.5	0	3	60	115	7	34		
2	17 1/2"	4480	217	387	409	22.0		6.8	10.2	3.2	6	10	50	115	6	10		
3	26"	4500	165	408	550	142.0		9.7	14.3	14.6	2	11	33	120	1	14		
4	17 1/2"	4500	202	550	1510	960.0		33.1	47.4	29.0	1	25	47	150	1	20		
5	12 1/4"	3400	236	1510	2737	1227.0		32.8	66.1	37.4	1	14	148	162	4	30		
6	8 1/2"	2500	176	2737	2975	238.0	238.0	14.2	27.2	16.8	1	8	65	170	5000	24000		

Wellbore: NO 6507/8-7

Run No	Bit Size	IADC dull grading I	O	DC	L	B	G	OC	RP	Remarks
1	17 1/2"	5	4	WT	A	E	I	RG	TD	
2	17 1/2"	5	4	WT	A	E	I	RG	TD	
3	26"	4	2	NO	A	E	1	NO	TD	
4	17 1/2"	3	5	CT	A	E	1	SD	TD	Limited ROP due to Shacker capasity.
5	12 1/4"	2	1	CT	N	X	1	BT	BHA	RR bit. Drilled plugs and shoe track. Drilled with limited ROP.
6	8 1/2"	4	2	BT	N	X	in	NO	TD	Drld shoe. Planned bit not arrived due to boat WOW.

App A Operational listing

All data are taken from the DBR system (06:00 – 06:00 hrs).

Operations by section

Wellbore: NO 6507/8-7
Section: 36" Start time: 05.01.2004 17:00 End time: 08.01.2004 18:00

Rig: DEEPSEA BERGEN

Time from	Time to	Time used	Depth mMD	Act code	---- Status ---- During opr	End of opr	Description of activities
04.01.2004 23:30	00:00	0,5	,0	MNMU	OK	OK	Rig transferred from well 6507/8-F-1H at 2320 hrs. In transit to 6607/8-7. Meanwhile performed general rig maintenance and prepared spudding equipment.
05.01.2004 00:00	03:30	3,5	,0	MNMU	OK	OK	Rig in transit to 6607/8-7. Dropped anchor no 6 on way in to location at 0310 hrs. On location at 0345 hrs. Meanwhile performed general rig maintenance and prepared spudding equipment.
05.01.2004 03:30	06:00	2,5	,0	MARU	OK	OK	Anchor handling: Mærsk Helper: Anchor no 5 on bottom at 0448 hrs. Mærsk Assister: Anchor no 2 on bottom at 0535 hrs.
05.01.2004 06:00	10:00	4,0	,0	MARU	OK	OK	Anchor handling: Mærsk Helper: Anchor no 7 on bottom at 0710 hrs. Normand Master: Anchor no 9 on bottom at 0728 hrs. Mærsk Assister: Anchor no 3 on bottom at 0734 hrs. Mærsk Helper: Anchor no 8 on bottom at 0850 hrs. Mærsk Assister: Anchor no 4 on bottom at 0924 hrs. While anchor handling PU 8" DC.
05.01.2004 10:00	13:30	3,5	,0	MNBU	OK	OK	Ballasted rig from anchor handling draught at 11,5 m to drilling draught at 22 m. Meanwhile tested emergency release on anchor winches. Ran in with pre made 17 1/2" bit and 26"x36" HO, Anderdrift and PU 8" DC. MU cement stand and CART and racked in derrick. Tested Anderdrift at 88 m - ok.
05.01.2004 13:30	15:00	1,5	,0	MNPU	OK	OK	Finalized rig positioning and load tested anchors. Meanwhile MU 3 joints 8" DC and ran in to 311 m.
05.01.2004 15:00	17:00	2,0	,0	MNPU	OK	OK	Lowered basket with marker bouys to sea bed using pod line. Performed meeting prior to spud well.
05.01.2004 17:00	18:00	1,0	367,0	DDRU	OK	OK	Tagged sea bed at 355 m. ROV deployed 3 ea marker bouys 7 m from string. Spudded in and drilled well from 355 m to 367 m.
05.01.2004 18:00	19:00	1,0	370,5	DDRU	OK	OK	Drilled 36" hole from 367 m to 370,5 m, 3000 lpm, 54 bar, 0-3 mt wob, 60 rpm, 7-14 KNm torque.
05.01.2004 19:00	20:00	1,0	370,5	DCRK	OK	OK	Problems with boulders falling in. Experienced torque up to 34 KNm. Took 30 mt overpull. Worked string up to 360 m, free. Ran back in hole , 1,5 m fill on bottom. Washed/drilled fill from 369 m to 370,5 m. Checked hole - ok. Took survey with Anderdrift, 0,5 deg at 369 m.
05.01.2004 20:00	00:00	4,0	381,0	DDRU	OK	OK	Drilled 36" hole from 370,5 m to 381 m, 3000 lpm, 54 bar, 0-3 mt wob, 100 rpm, 7-14 KNm torque. On connection at 377 m had 30 mt overpull. Worked string up to 366 m and free string. Ran back to bottom. Had 2 m fill.
06.01.2004 00:00	02:30	2,5	385,0	DDRU	OK	OK	Drilled 36" hole from 381 m to 385 m, 4500 lpm, 143 bar, 120 rpm, 0-3 mt wob, 7-14 ftlbs torque. Made several attemptsto take survey at 385 m, no success. Had overpull after survey. Worked string free between 385 m and 375 m.

06.01.2004 02:30	06:00	3,5	387,0	DDRU	OK	OK	Drilled 36" hole from 385 to 387 m, 4500 lpm, 143 bar, 115 rpm, 0-3 mt wob, 7-14 KNm torque. Made several attempts to take survey, no success.
06.01.2004 06:00	07:00	1,0	388,0	DDRU	OK	OK	Drilled 36" hole from 387 to 388 m, 4500 lpm, 152 bar, 120 RPM, 2-4 kNm, 0 - 3 ton WOB. No progress and non conclusive survey readings.
06.01.2004 07:00	07:30	0,5	388,0	DCAU	OK	OK	Displaced hole to 1.35 sg. mud and dropped single shot.
06.01.2004 07:30	11:30	4,0	388,0	DTIK	OK	OK	POOH. Had trouble with breaking out topdrive and the first stands below. Retrieved singleshot, showed 0,5 degres.
06.01.2004 11:30	12:00	0,5	388,0	DTIK	OK	OK	Inspected hole opener, OK. Decided to RIH with same assembly and use more weight on bit.
06.01.2004 12:00	13:30	1,5	388,0	DDOU	OK	OK	Inspected derrick and topdrive after drilling boulders, derrick OK. Changed dies in topdrive, found slack bolts on diesholder.
06.01.2004 13:30	15:30	2,0	388,0	DTIK	OK	OK	Ran in with 17 1/2" bit and 26"x36" HO assembly. Stabbed into 36" hole. Took weight at 384 m. Washed and reamed 4 m fill from 384 m to 388 m. Took survey with Anderdrift at 388 m. 0,7 deg.
06.01.2004 15:30	21:30	6,0	406,0	DDRU	OK	OK	Drilled 17 1/2"x26"x36" hole from 388 m to 406 m, 4000-4500 lpm, 135-165 bar, 6-8 mt wob, 60-100 rpm, 3-10 KNm torque.
06.01.2004 21:30	23:00	1,5	406,0	DDRU	OK	OK	Picked off bottom to take survey. Had 30 mt overpull. Worked string free and attempted to take survey with Anderdrift, no success. Ran back to bottom. ROV checked mark on string to verify bit depth. Picked off bottom and Pumped high visc pill. Re-checked mark on drill string with ROV. Painted mark 3 m abov sea bed.
06.01.2004 23:00	00:00	1,0	407,0	DDRU	OK	OK	Drilled 17 1/2"x26"x36" hole from 406 m to 407 m, 4000-4500 lpm, 135-165 bar, 6-8 mt wob, 60-100 rpm, 3-10 KNm torque.
07.01.2004 00:00	00:30	0,5	408,0	DDRU	OK	OK	Continued drilling 17 1/2"x26"x36" hole from 407 m to 408 m, 4500 lpm, 165 bar, 6-9 mt wob, 100 rpm, 3-10 KNm torque.
07.01.2004 00:30	02:30	2,0	408,0	DDRU	OK	OK	ROV checked painted mark on string to confirm bit depth. Pulled from 408 m to 390 m. Ran back to bottom, 2m fill. Washed and reamed fill.
07.01.2004 02:30	03:30	1,0	408,0	DCAU	OK	OK	Swept hole with 30 m3 high visc pill. Displaced hole to 1,35 sg mud.
07.01.2004 03:30	04:00	0,5	408,0	DUSU	OK	OK	Broke connection and dropped Totco single shot.
07.01.2004 04:00	06:00	2,0	180,0	DTCU	OK	OK	Used rig tongs to break drilling stand connection due to high torque. POOH from 409 m to 375 m. Filled hole with 1,35 sg mud. Continued pooh to 180 m.
07.01.2004 06:00	08:00	2,0	,0	DTCU	OK	OK	Continued break out BHA. L/D 26"x36" hole opener. Two rollers where missing on the 26" hole opener. The 17 1/2" bit had normal ware.
07.01.2004 08:00	08:30	0,5	,0	DDOU	OK	OK	Inspected Topdrive, pipehandling equipment and derrick for loose or broken parts.
07.01.2004 08:30	09:00	0,5	,0	CAOU	OK	OK	Rigged up to run 30" conductor.
07.01.2004 09:00	09:30	0,5	,0	CAOU	OK	OK	Held prejob meeting/ÅSS prior to run 30" conductor.
07.01.2004 09:30	10:00	0,5	,0	CAOU	OK	OK	Continued rig up to run 30" conductor.
07.01.2004 10:00	11:30	1,5	,0	CARU	OK	OK	Lifted up 30" shoe joint and RIH with same. Pumped SW through and continued RIH. PU and landed housing in rotary.
07.01.2004 11:30	12:00	0,5	50,0	CARU	OK	OK	Changed to 5 1/2" equipment and cleaned/cleared rig floor.
07.01.2004 12:00	13:00	1,0	50,0	CARU	OK	OK	M/U innerstring and connected RT to housing. Lowered 30" housing thruogh rotary and locked it to PGB.
07.01.2004 13:00	14:00	1,0	70,0	CARU	OK	OK	Removed seafastening and run PGB through splash zone.
07.01.2004 14:00	16:00	2,0	403,0	CARU	OK	OK	Ran in w/30" conductor on 5 1/2" DP landing string to 336 m. ROV closed ball valve on CART and checked bulls eyes and PGB heading. Stung into 36" hole and continued running in with 30" conductor to 403 m. Filled pipe w/SW while running in.
07.01.2004 16:00	17:30	1,5	403,0	CCCU	OK	OK	Circulated hole clean with 30 m3 sea water. Pressure tested lines to 100 bar for 10 min. Connected guide lines to PGB. Checked bulls eyes with ROV and adjusted rig position.
07.01.2004 17:30	19:30	2,0	403,0	CSSU	OK	OK	Held pre-job meeting / ÅSS prior to cement job. Mixed and pumped 37 m3 1,52 sg x-lite cement slurry. Displaced cement slurry with 8,68 m3 sea water using cement unit. Checked for back flow.

07.01.2004	19:30	23:30	4,0	403,0	CSCW	OK	OK	WOC. Held 30" conductor in position while cement setting up. Meanwhile ROV opened ball valve on CART. Circulated 30" conductor volume down landing string/stinger through ball valve at 400 lpm, 3 bar. ROV inspected bulls eyes on PGB and PGB heading.
07.01.2004	23:30	00:00	0,5	352,0	CTTU	OK	OK	Set off 30" conductor weight. Released RT from 30" housing.
08.01.2004	00:00	02:00	2,0	,0	CTTU	OK	E FAIL	POOH with cement stinger to 5 m below 30" housing. Dropped sponge ball and flushed string with sea water at 5000 lpm. POOH with landing string and LD RT.
08.01.2004	02:00	05:30	3,5	,0	DERD	E FAIL	OK	Attempted to break off saver sub from top drive using pipe handler, no success. Disconnected elevator, bails and pipe handler. Broke and changed saver sub using rig tongs. Installed pipe handler, bails and elevator.
08.01.2004	05:30	06:00	0,5	,0	CTTU	OK	OK	LD cementing stand from derrick and racked drilling stand.
08.01.2004	06:00	06:30	0,5	,0	DTDU	OK	OK	Picked up 26" BHA.
08.01.2004	06:30	07:00	0,5	,0	DDOU	OK	OK	Ckecked out top drive, derrick and equipment. Held pre job meeting with new crew prior to cont. P/U BHA.
08.01.2004	07:00	08:00	1,0	,0	DTDU	OK	OK	Continued P/U 26" BHA.
08.01.2004	08:00	08:30	0,5	,0	DTDU	OK	OK	MU MWD-DCP with saver sub and string stab.
08.01.2004	08:30	09:00	0,5	,0	DDOU	OK	OK	Tested MWD tool.
08.01.2004	09:00	11:00	2,0	,0	DTDU	OK	O FAIL	Continued RIH with 8" DC from derrick. P/U jar from deck. L/D 1 stk. DC.
08.01.2004	11:00	12:30	1,5	214,0	DDOD	O FAIL	OK	POOH with 3 stds. of DC due to wrong make up torque on connections, checked all 3 connections and ran back in hole.
08.01.2004	12:30	13:30	1,0	370,0	DTDU	OK	OK	RIH from 214 m. Adjusted rig position and stabbed into 30" housing at 353 m. Continued RIH to 370 m.
08.01.2004	13:30	15:30	2,0	400,0	DCAU	OK	OK	Washed down from 370 m, 3000 lpm, 80 bar, 50 rpm, 4 KNm torque. Tagged cement at 400 m.
08.01.2004	15:30	18:00	2,5	408,0	CDCK	OK	OK	Drilled cement from 400 m, 4000 lpm, 134 bar, 0-2 mt wob, 60 rpm and 4 KNm torque. Drilled shoe at 403,5 m and cleaned rat hole to 408 m.
Sum 36"			90,5	(3,8 days)				

Section: 26" Start time: 08.01.2004 18:00 End time: 12.01.2004 11:00

Rig: DEEPSEA BERGEN

---- Status ----

Time from	Time to	Time used	Depth mMD	Act code	During opr	End of opr	Description of activities
08.01.2004 18:00	00:00	6,0	455,0	DDRU	OK	OK	Drilled 26" hole from 408 m to 455 m, 4500 lpm,165 bar, 80 rpm, 5-10 mt wob, 9-20 KNm torque. Pumped 5 m3 high visc pill every 15 m drilled. Observed well for shallow gas with ROV sonar.
09.01.2004 00:00	06:00	6,0	520,0	DDRU	OK	OK	Drilled 26" hole from 455 m to 520 m.
09.01.2004 06:00	09:30	3,5	550,0	DDRU	OK	OK	Drilled and surveyed 26" hole 520-550 m, 2-9 ton, 4500 lpm, 170 bar, 120 rpm, 0-34 kNm.
09.01.2004 09:30	10:00	0,5	550,0	DCAU	OK	OK	Circulated the hole clean, 3000 lpm, 120 bar. Rotated and reciprocated the string.
09.01.2004 10:00	11:30	1,5	550,0	DCWK	OK	OK	Took wiper trip to 485 m and back to TD. Detected 1.5 m fill. Circulated out fill pumping 4000 lpm and rotating 50 rpm. Pumped and displaced around 20 m3 hivisc pill.
09.01.2004 11:30	12:00	0,5	550,0	DCAU	OK	OK	Displaced the hole to 1.35 sg mud.
09.01.2004 12:00	13:30	1,5	380,0	DTCU	OK	OK	POOH to 380 m. Topped up the hole with 1.35 sg mud.
09.01.2004 13:30	15:00	1,5	380,0	CSOU	OK	OK	Made up and racked back cement stand in the derrick.
09.01.2004 15:00	18:30	3,5	,0	DTCU	OK	E FAIL	POOH and racked back the 26" bha in the derrick. Dumped MWD.
09.01.2004 18:30	19:30	1,0	,0	DERD	E FAIL	OK	Stab on bha hooked up on manipulator arm gripping head while raising the block. Gripping head parted from telescopic arm. Removed gripping head and racked back the stand.
09.01.2004 19:30	20:30	1,0	,0	DEOU	OK	OK	Performed routine top drive and derrick inspection.
09.01.2004 20:30	22:00	1,5	,0	CERU	OK	OK	Changed to 20" handling equipment. Had pre job meeting.

09.01.2004	22:00	00:00	2,0	60,0	CARU	OK	OK	PU and ran 20" casing. Baker locked first 2 joints.
10.01.2004	00:00	02:30	2,5	193,0	CABU	OK	OK	Cont PU, MU and RIH 20" casing. Filled every joint with sea water.
10.01.2004	02:30	06:00	3,5	490,0	CARU	OK	OK	Changed to 5.5" elevators. PU and MU hanger and running tool. Cont RIH on DP. Stabbed into 30" WH on the way in assisted by ROV.
10.01.2004	06:00	07:00	1,0	545,0	CARU	OK	OK	RIH 20" casing on 5.5" landing string to landing depth. Up/down weights 70/68 ton. Landed 18 3/4" well head in 30" housing. Took 20 ton pull test, ok.
10.01.2004	07:00	07:30	0,5	545,0	CSOU	OK	OK	Flushed surface sementing lines, and tested against lo-torque valves 345 bar/5 min.
10.01.2004	07:30	08:30	1,0	545,0	CCCU	OK	OK	Circulated 40 m3 sea water, 1900 lpm/60 bar.
10.01.2004	08:30	11:30	3,0	545,0	CSSU	OK	OK	Had pre job meeting. Mixpumped 37m3 1.56 sg lead slurry, followed by 15 m3 1.95 sg tail slurry. Released dart, and pumped 4.06 m3 sea water to shear the wiper plug. Switched to rig pumps and displaced the cement pumping 30.8 m3 sea water, 2500 lpm/83 bar. Bumped the plug. Bled off pressure. Floats leaked at 100 lpm. Pump back 0.79m3 at up to 70 bar. Bled off 0.74 m3 sea water. Well static.
10.01.2004	11:30	12:30	1,0	545,0	CSOU	OK	OK	Knocked off cement hose, and released running tool and guide lines.
10.01.2004	12:30	15:00	2,5	,0	CSOU	OK	OK	POOH the landing string and LD running tool.
10.01.2004	15:00	16:00	1,0	,0	DTBU	OK	OK	Cleared rig floor. Had pre job meeting. LD 26" BHA.
10.01.2004	16:00	00:00	8,0	80,0	BBRU	OK	OK	Had pre job meeting. RU and MU handling string. Skidded BOP's into moon pool. MU and ran through the splash zone to 80m. Tested K/C lines at regular intervals 35/345 bar.
11.01.2004	00:00	06:00	6,0	270,0	BBRU	OK	OK	Contd. running the BOP's and riser. Tested K/C lines at regular intervals 35/345 bar.
11.01.2004	06:00	10:00	4,0	330,0	BBRU	OK	OK	Ran BOP's and riser 270-330 m. Tested K/C lines 35/345 bar, 5/10 min.
11.01.2004	10:00	12:00	2,0	330,0	BBRU	OK	OK	PU and MU slip joint. Ran in and connected support ring. Tested K/C lines 35/345 bar, 5/10 min. Installed rucker wire and made loop on pads. Moved rig over location. Installed guide lines and tensioned up.
11.01.2004	12:00	13:00	1,0	351,0	BBRU	OK	OK	Adjusted rig position. Landed BOP's assisted by ROV at 1300 hrs. Took 30 ton overpull test.
11.01.2004	13:00	16:30	3,5	,0	CATU	OK	OK	Pressure tested connector and 20" casing against SR 25/70 bar, 5/10 min. Installed diverter. RD BOP handling equipment, and cleared rig floor. Changed to 5.5" DP equipment.
11.01.2004	16:30	18:30	2,0	,0	BBDU	OK	OK	RIH 5.5" DP string into BOP's. Function tested pipe rams, annulars and fail safes from master panel, blue pod. Tested mini panel on yellow pod. POOH the DP string.
11.01.2004	18:30	20:00	1,5	,0	CSOU	OK	OK	Made up and racked back cementing stand in the derrick.
11.01.2004	20:00	00:00	4,0	218,0	DTBU	OK	OK	MU BHA no 4. Programmed MWD tool in the rotary. RIH to 218 m.
12.01.2004	00:00	02:30	2,5	530,0	DTDU	OK	OK	RIH and tagged bottom at 530 m. PU and closed UAP and had choke drill with drill crew.
12.01.2004	02:30	05:00	2,5	540,0	CDDU	OK	OK	RIH and drilled plug and cement to 540 m.
12.01.2004	05:00	06:00	1,0	542,0	CDDU	OK	OK	Displaced hole to 1,15 sg. mud while cont. drilling shoe track. Displaced K/C and booster line to mud.
12.01.2004	06:00	06:30	0,5	542,0	DCAU	OK	OK	Displaced K/C and booster lines to 1.15 sg mud. Check survey at 526m showed 2.55 deg incl..
12.01.2004	06:30	09:30	3,0	553,0	CDDU	OK	OK	Drilled cement 542-548 m. Drilled through and reamed 20" casing shoe. Tagged TD at 550 m. Drilled new formation to 553 m. Circ hole clean and verified even MW in/out. Took check survey at 536.5 m, 2.46 deg incl.
12.01.2004	09:30	11:00	1,5	550,0	EXLU	OK	OK	Lined up to take LOT. Closed UAP and performed LOT to 4.5 bar, equivalent to 1.23 sg MW.
Sum 26"			89,0	(3,7 days)				

Section: 17 1/2" Start time: 12.01.2004 11:00 End time: 17.01.2004 10:30

Rig: DEEPSEA BERGEN

---- Status ----

Time from	Time to	Time used	Depth mMD	Act code	During opr	End of opr	Description of activities
12.01.2004 11:00	12:00	1,0	557,0	DDRU	OK	OK	Drilled 17.5" hole 553-557 m, 1-2 ton, 50 rpm, 4-14 kNm, 4200 lpm, 130 bar.
12.01.2004 12:00	18:00	6,0	625,0	DDRU	OK	OK	Drilled 17.5" hole 557-625 m, 5 ton, 80-130 rpm, 4-11 kNm, 4200-4500 lpm, 133-154 bar. Reduced parameters while changing pistons on MP 1.
12.01.2004 18:00	00:00	6,0	732,0	DDRU	OK	OK	Drilled 17.5" hole 625-732 m, 2-10 ton, 130 rpm, 3-8 kNm, 4500 lpm, 160 bar. Pressure sub ECD over the interval 1.19-1.23 sg. Reduced parameters while chgs 2 ea liners/pistons on MP 3.
13.01.2004 00:00	06:00	6,0	1,0	DDRU	OK	OK	Contd drilling 17.5" hole 732-880 m, 6-15 ton, 130 rpm, 4-9 kNm, 4500 lpm, 163-165 bar.
13.01.2004 06:00	12:00	6,0	1050,0	DDRU	OK	OK	Drilled 17.5" hole 880-1050 m, 8-15 ton, 130 rpm, 7-12 kNm, 4500 lpm, 180 bar, 1.19-1.24 sg ECD. Max gas 3.8%.
13.01.2004 12:00	18:00	6,0	1195,0	DDRU	OK	OK	Drilled 17.5" hole 1050-1195 m, 8-15 ton, 150 rpm, 7-15 kNm, 4500 lpm, 180 bar, 1.19-1.22 sg ECD. Max gas 2,3%.
13.01.2004 18:00	00:00	6,0	1352,0	DDRU	OK	OK	Contd. drilling 17.5" hole 1195-1352 m, 10-25 ton, 150 rpm, 11-16 kNm, 4500 lpm, 195 bar. Changed piston/liner. Pump rate reduced to 3700 lpm while chainging liner.
14.01.2004 00:00	05:30	5,5	1510,0	DDRU	OK	OK	Drilled 17,5" hole 1352-1510 m, 10-25 ton, 150 rpm, 10-16 kNm, 4500 lpm, 210 bar. Had 1,20-1,23 sg ECD. Added 35 kg/m3 KCL to active from 1440 m. Had max gas peak of 5,2% from connection at 1453 m.
14.01.2004 05:30	06:00	0,5	1510,0	DCAU	OK	OK	Circulated at TD. Pumped and started circ around 20 m3 HiVisc pill.
14.01.2004 06:00	07:30	1,5	1510,0	DCAU	OK	OK	Circulated the hole clean, 4500 lpm, 205 bar, while rotating and reciprocating the string. Flow checked.
14.01.2004 07:30	13:00	5,5	548,0	DTCU	OK	OK	POOH into the shoe. Max overpull 20 ton.
14.01.2004 13:00	15:00	2,0	548,0	RMSD	OK	OK	Slipped 100 ft drill line. Circulated well while slipping.
14.01.2004 15:00	19:00	4,0	,0	DTCU	OK	OK	POOH 17.5" BHA. Broke several connections using rig tongs, due to over torque. Drained MWD and racked the BHA back in the derrick. Inspected racking arms and finger board. Inspected top drive.
14.01.2004 19:00	19:30	0,5	,0	DEOU	OK	OK	Cleared rigfloor and graded the bit.
14.01.2004 19:30	22:30	3,0	,0	CAOU	OK	OK	PU, MU and RIH multi purpose tool and jet sub. Washed BOP and WH area 1300 lpm on the way in, and circulated riser 2300 lpm. Set down and latched into 18 3/4" seat protector. Took Vetco Measurements. POOH and LD MPT/jet sub, and seat protector.
14.01.2004 22:30	00:00	1,5	,0	CARU	OK	OK	Had pre job meeting. RU to run 13 3/8" casing.
15.01.2004 00:00	06:00	6,0	556,0	CARU	OK	OK	MU and ran 13 3/8" casing. Baker locked first 3 conn. Tested floats. Filled casing with mud, initially every joint, later every 5 joints. Ran 47 out of 96 joints.
15.01.2004 06:00	11:30	5,5	1144,0	CARU	OK	OK	RIH 13 3/8" casing to 1144 m. Filled casing every 5 jts.
15.01.2004 11:30	12:30	1,0	1144,0	CERU	OK	OK	PU and installed hanger jnt. Changed elevators and RD casing equipment
15.01.2004 12:30	14:00	1,5	1425,0	CARU	OK	OK	RIH casing on 5.5" landing string. Took 30 ton weight at 1425 m. Unable to RIH any further.
15.01.2004 14:00	17:00	3,0	1500,0	CARU	OK	OK	Circulated down the casing 1425-1490 m, 700 lpm, 20 bar. Installed cement stand. Circulated down and landed casing hanger in well head, while circulating 800 lpm down K/C lines.
15.01.2004 17:00	18:00	1,0	1500,0	CCCU	OK	OK	Checked correct landing by index line. Staged up pumps to 2000 lpm, 65 bar, and circulated a total of 85 m3 mud down the string. Simultaneously circulated K/C lines 1000 lpm. Had pre cementing meeting with the crews.
15.01.2004 18:00	18:30	0,5	1500,0	CSSU	OK	OK	Lined up and tested surface lines 200 bar, 5 min. Pumped 18 m3 1,56 sg spacer.

15.01.2004	18:30	21:00	2,5	1500,0	CSSU	OK	OK	Dropped ball. Mixpumped 18.0 m3 1.92 sg. cement slurry. Dropped the dart. Pumped 4038 liter mud to shear the top plug. Changed to rig pumps and displaced the cement and bumped the plug pumping 87.21 m3 1.16 sg mud. Bled off pressure to cement unit. Pumped back the retrieved volume 2 times to make the floats hold.
15.01.2004	21:00	22:00	1,0	351,0	BHSU	OK	OK	RD cement hose. Set seal assy. Closed UPR and pressured up to 345 bar to lock seal.
15.01.2004	22:00	00:00	2,0	351,0	BBDU	OK	OK	Pressure tested BOP's, 35/250 bar 5/10 min on yellow pod. Took all tests except test of MPR. Function tested BOP's on blue pod from mini panel in the rig office.
16.01.2004	00:00	00:30	0,5	351,0	BBDU	OK	OK	contd. testing BOP's.
16.01.2004	00:30	03:00	2,5	351,0	BBDU	OK	OK	Released RT from 13 3/8" casing hanger. Had 30 ton over pull. Washed hanger area 1500 lpm. Ran back in and landed in csg. hanger. Closed UPR. Pressure tested seal assy. 345 bar. Open UPR. Set back cement stand and POOH. LD RT.
16.01.2004	03:00	04:30	1,5	351,0	BBDU	OK	O FAIL	MU and RIH WB and cup tester assy. Set down 5 ton to set WB.
16.01.2004	04:30	06:00	1,5	,0	BBDD	O FAIL	OK	Closed and attempted to test the MPR against the cup tester. Failed. Opened MPR and POOH the WBRT and 13 3/8" cup tester. Found no damage on the cup tester assy.
16.01.2004	06:00	06:30	0,5	,0	BBOU	OK	OK	Clean and clear rig floor.
16.01.2004	06:30	08:00	1,5	,0	CSOU	OK	OK	L/D cement stand. Turned cem. head upside down to break pub.
16.01.2004	08:00	09:30	1,5	,0	BBOU	OK	OK	MU and set back hang off tool in the derrick.
16.01.2004	09:30	10:30	1,0	,0	DTBU	OK	OK	LD 17 1/2" BHA.
16.01.2004	10:30	11:30	1,0	,0	DTBU	OK	E FAIL	Attempted to breake connection between MWD and MPR tool. No go. Threads galled.
16.01.2004	11:30	12:00	0,5	,0	DEMD	E FAIL	OK	Had SJA meeting. LD 18 m MWD/MPR tool section in one piece.
16.01.2004	12:00	13:30	1,5	,0	BBDU	OK	OK	RU and tested top drive hose, upper- and lover kelly cock 35/345 bar, 5/10 min.
16.01.2004	13:30	18:30	5,0	210,0	DTBU	OK	OK	PU and MU BHA no 5, 12 1/4" locked assy.. Connected up to MWD, and verified logging assy. in the rotary.
16.01.2004	18:30	19:30	1,0	210,0	CATU	OK	OK	Closed shear rams and tested 13 3/8" casing 35/250 bar, 5/30 min.
16.01.2004	19:30	21:00	1,5	700,0	DTDU	OK	OK	RIH to 700 m. Filled string and tested MWD.
16.01.2004	21:00	23:00	2,0	700,0	BBDU	OK	OK	Flushed down choke line, 1100 lpm. Closed MPR and pulled tool joint up against the ram. Pressure tested MPR 35/250 bar, 5/10 min.
16.01.2004	23:00	00:00	1,0	1440,0	DTDU	OK	OK	RIH 12 1/4" BHA to 1440 m.
17.01.2004	00:00	01:00	1,0	1469,0	DTDU	OK	OK	Filled the pipe, and washed down 2000 lpm, 60 bar, and tagged bottom at 1469 m.
17.01.2004	01:00	01:30	0,5	1469,0	DDOU	OK	OK	Had choke drill with the drill crews.
17.01.2004	01:30	06:00	4,5	1500,0	CDDU	OK	OK	Drilled SS plugs and shoe track 1469-1500 m, 2-5 ton, 155 rpm, 4-27 kNm, 2500 lpm, 105 bar.
17.01.2004	06:00	06:30	0,5	1510,0	DCAU	OK	OK	Cleaned rat hole. Tagged TD at 1510 m.
17.01.2004	06:30	08:30	2,0	1513,0	DDOU	OK	OK	Drilled 3 m new formation. Circ. hole clean, and even MW in/out to 1.18 sg. Pulled up into the shoe with no rotation.
17.01.2004	08:30	10:30	2,0	1500,0	EXLU	OK	OK	RU to pump down DP and annulus. Closed BOP's and performed XLOT. Formation broke down at 140 bar, and held 65 bar at injection rate of 100 lpm. LOT equal to 1,62 sg.
17.01.2004	10:30	13:00	2,5	1513,0	DCAU	OK	OK	Displaced K/C - and booster line to 1,42 sg Glydrill mud. Displaced the well to 1,42 sg mud pumping 15 m3 DW, 20 m3 1,42 sg HiVisc Glydrill mud followed by 1,42 sg Glydrill mud all around.
17.01.2004	13:00	15:30	2,5	1513,0	DCAU	OK	E FAIL	Flushed and cleaned surface equipment.
17.01.2004	15:30	19:30	4,0	1500,0	DEOD	E FAIL	OK	Trouble shooting after mud logging unit had shut down at 1500 hrs. Circulated the well 650 lpm, 14 bar in the shoe.
17.01.2004	19:30	00:00	4,5	1652,0	DDRU	OK	OK	Ran back to bottom. Drilled and surveyed 12 1/4" hole 1513-1652 m, 3-6 ton, 60-145 rpm, 4-15 kNm, 3400 lpm, 200 bar. Boosted riser 1300 lpm. ECD 1.44-1,47 sg.
8.01.2004	00:00	06:00	6,0	1890,0	DDRU	OK	OK	Contd. drill and survey 12 1/4" hole 1652-1890 m, 3-5 ton, 150-160 rpm, 4-16 kNm, 3400 lpm, 200-205 bar. Boosted riser 1300 lpm. ECD 1,45-1,47 sg.

Sum 17 1/2" 139,0 (5,8 days)

Section: 12 1/4" Start time: 17.01.2004 10:30 End time: 24.01.2004 12:00

Rig: DEEPSEA BERGEN

---- Status ----

Time from	Time to	Time used	Depth mMD	Act code	During opr	End of opr	Description of activities
18.01.2004 06:00	10:30	4,5	2000,0	DDRU	OK	OK	Drilled and suveyed 12 1/4" hole 1890-2000 m, 1-7 ton, 130-160 rpm, 7-27 kNm, 3400 lpm, 210-213 bar. ECD eq. to 1.43-1.46 sg. Contd boosting riser 1300 lpm till 0810 hrs. Reduced occasionally parameters to minimize stic/slip of the drill string.
18.01.2004 10:30	17:00	6,5	2120,0	DDRU	OK	OK	Drilled and surveyed 2000-2120 m, 0-4 ton, 140-150 rpm, 5-24 kNm, 3400 lpm, 220-221 bar. ECD eq. to 1,44-1,47 sg. Drilled at reduced ROP, limited to 35 m/hr.
18.01.2004 17:00	00:00	7,0	2332,0	DDRU	OK	OK	Drilled and surveyed 2120-2332 m, 1-8 ton, 150-160 rpm, 4-19 kNm, 3400 lpm, 220-225 bar. ECD eq. to 1,45-1,48 sg. Had pit drill with the night crew.
19.01.2004 00:00	02:00	2,0	2400,0	DDRU	OK	OK	Drilled and surveyed 2332-2400 m, 4-10 ton, 150-160 rpm, 4-27 kNm, 3400 lpm, 230-235 bar.
19.01.2004 02:00	06:00	4,0	2475,0	DDRU	OK	OK	Drilled and surveyed 2400-2475 m, 2-5 ton, 150 rpm, 5-21 kNm, 3400 lpm, 230-235 bar. ECD eq. to 1,47-1,49 sg. Drilled at reduced ROP, limited to 35 m/hr.
19.01.2004 06:00	16:30	10,5	2670,0	DDRU	OK	OK	Drilled and surveyed 12 1/4" hole 2475-2670 m, 2-10 ton, 150 rpm, 7-30 kNm, 3400 lpm, 231-234 bar. Max ECD eq. to 1,48-1,50 sg. Drilled at reduced ROP, limited to 35 m/hr.
19.01.2004 16:30	18:30	2,0	2670,0	DCAU	OK	OK	Circulated the hole clean at 3400 lpm, 231 bar. Reciprocated and rotated the string. Flow checked.
19.01.2004 18:30	00:00	5,5	2125,0	DCWK	OK	OK	Performed wiper trip from TD at 2670 m. POOH 2670-2632 m. Had 5-15 ton overpull, increasing. Worked pipe up/down. Nogo. Connected up to TD. Pumped and worked out of tight hole 2632-2125 m, 3100-3000 lpm, 192-183 bar. Reamed and rotated 90 rpm as required through various tight spots over the interval 2493-2212 m.
20.01.2004 00:00	04:30	4,5	1661,0	DCWK	OK	OK	Contd. wiper trip pumping 3000 lpm, 178-172 bar. Reamed tight spots at 2096 m and 1729 m, 50 rpm. Had considerable amount of mostly cuttings over the shakers all through the pumping out of the hole.
20.01.2004 04:30	05:30	1,0	1661,0	DCRK	OK	OK	Made connection at 1661 m. Hole packed off during start of pumps. Lost 2 m3 to the formation. Moved pipe and established circulation and staged up pumps, and circulated BU 3400 lpm, 211 bar while reciprocating and rotating the string 30 rpm. Had fair amount of cuttings and larger size cavings come over the shakers. RU to boost the riser.
20.01.2004 05:30	06:00	0,5	1625,0	DCRK	OK	OK	Reamed tight hole section 1638-1625 m, 2500 lpm, 120 bar. Started boosting riser 1450 lpm.
20.01.2004 06:00	08:30	2,5	1485,0	DCRK	OK	OK	Continued wiper trip 1638-1485 m pumping 3000 lpm, 165 bar. Boosted riser 1450 lpm.
20.01.2004 08:30	10:00	1,5	1485,0	DCAU	OK	OK	Circulated BU and the hole clean, 2800 lpm, 145 bar. Boosted riser 1450 lpm. Inspected derrick, IRA, URA and top drive.
20.01.2004 10:00	13:30	3,5	2580,0	DCRK	OK	OK	RIH to 2580 m. Took 15 ton weight at 2580 m.
20.01.2004 13:30	15:30	2,0	2670,0	DCWK	OK	OK	Washed and reamed 2580-2670 m, 78-92 rpm, 3-7 kNm, 2400 lpm, 130-140 bar.
20.01.2004 15:30	21:00	5,5	2737,0	DDRU	OK	OK	Drilled and surveyed 2670-2737 m, 1-7 ton, 160 rpm, 5-14 kNm, 3400 lpm, 230-235 bar. Drilled at reduced ROP.
20.01.2004 21:00	22:00	1,0	2737,0	DCAU	OK	OK	Circulated BU, 3400 lpm, 235 bar. Reciprocated the string and rotated 90 rpm.
20.01.2004 22:00	23:00	1,0	2737,0	DCWK	OK	OK	Flow checked. Performed wiper trip to 2650 m, and back to TD. Had max drag of 5 ton.
20.01.2004 23:00	00:00	1,0	2737,0	DCAU	OK	OK	Circulated bottom up and the hole clean, 3400 lpm, 225 bar. Reciprocated the string and rotated 90 rpm. Rotated Boosted riser 1500 lpm.

21.01.2004 00:00	00:30	0,5	2737,0	DCAU	OK	OK	Contd circulate the hole clean.
21.01.2004 00:30	06:00	5,5	550,0	DTLU	OK	OK	POOH. Had a few spots of up to 10 ton overpull. Slugged inside the shoe and continued POOH.
21.01.2004 06:00	09:00	3,0	,0	DTLU	OK	OK	POOH from 550 m to surface. Drained MWD in the rotary. Racked back the BHA in the derrick.
21.01.2004 09:00	09:30	0,5	,0	DDOU	OK	OK	Cleared and cleaned rig floor.
21.01.2004 09:30	11:30	2,0	,0	ELWU	OK	OK	Had pre job meeting on the drill floor. Rigged up wire line equipment, and made up the tool string. Tested tools and installed radio active sources.
21.01.2004 11:30	17:30	6,0	2737,0	ELWU	OK	OK	RIH Schlumberger DSI-PEX on wire line to 100 m. Activated compensator. Contd. RIH. Tagged bottom at 2718 m. POOH while logging over the interval 2718-1500 m. POOH to surface. Removed radio active sources from the tool string.
21.01.2004 17:30	18:30	1,0	,0	ELWU	OK	OK	LD tool string and RD wire line equipment.
21.01.2004 18:30	19:00	0,5	,0	ELWU	OK	OK	Cleared and cleaned rig floor.
21.01.2004 19:00	20:30	1,5	,0	CERU	OK	OK	Installed guide block for service loop on top drive. PU and MU remote operated cement head, and racked back cem.std. in the derrick.
21.01.2004 20:30	22:00	1,5	,0	CERU	OK	OK	Had pre job meeting on the drill floor. RU to run 9 5/8" liner. Installed casing modem.
21.01.2004 22:00	00:00	2,0	85,0	CARU	OK	OK	PU and MU shoe track. Checked floats. Baker locked first four connections, and installed centralizers on first four jts. Filled up every joint, later every 5 jts.
22.01.2004 00:00	06:00	6,0	810,0	CARU	OK	OK	Contd.PU and RIH 9 5/8" liner. Filled liner every 5 jts. Ran 67jt out of a total of 109jts. Had pit drill against the night shift.
22.01.2004 06:00	07:30	1,5	966,0	CARU	OK	E FAIL	PU and RIH 9 5/8" liner 810-966 m. Filled up every 5 jts.
22.01.2004 07:30	08:00	0,5	966,0	CAOD	E FAIL	OK	Changed transducer and tachometer on the casing tong.
22.01.2004 08:00	11:00	3,0	1316,0	CARU	OK	OK	PU and RIH 9 5/8" liner 966-1316 m. Filled every 5 jts.
22.01.2004 11:00	20:00	9,0	2233,0	CARU	OK	STUCK	Had pre job meeting on drill floor. PU and MU 9 5/8" liner hanger. Installed 9 5/8" SS plugs under the hanger. MU hanger to 9 5/8" linere. RD 9 5/8" casing equipment, RU 5 1/2" handling equipment and cleaned the drill floor. Filled PBR with hivisc mud and continued RIH 9 5/8" liner 1316-2233 m on 5 1/2" DP. Filled up every 5 stds. Tagged and set down 30 ton weight on fill at 2687 m.
22.01.2004 20:00	22:00	2,0	2723,0	CARU	OK	OK	Made up the landing string to the top drive, filled up and washed down the casing 0-50 ton, 500 lpm, 35 bar. Worked tight spots 2687-2723 m, 0-62 bar, 0-600 lpm.
22.01.2004 22:00	00:00	2,0	2731,0	CARU	OK	O FAIL	Installed cement stand, and circd. down 2723-2731 m, 700 lpm, 40 bar, while working the pipe up/down.
23.01.2004 00:00	02:00	2,0	2737,0	CARU	OK	OK	Contd. wash and work down the liner 2731-2737 m, 700 lpm, 40 bar.
23.01.2004 02:00	02:30	0,5	2736,0	CCCU	OK	OK	Attempted to increase pump rate. Hole pack ed off. Worked the string and established circ. rate of 400 lpm, 30 bar.
23.01.2004 02:30	03:30	1,0	2736,0	CCCU	OK	OK	Staged up pumps to 1000 lpm, 50-80 bar, and circulated 38 m3 mud.
23.01.2004 03:30	04:00	0,5	2736,0	CCCU	OK	OK	Dropped the ball, and circ.down pumping 500 lpm. Set 9 5/8" liner hanger and sheared ball seat at 230 bar.
23.01.2004 04:00	05:00	1,0	2736,0	CCCU	OK	OK	Increased pump rate in stages to a max. loss free rate of 1100 lpm, 114 bar, and circulated 64 m3 mud. Had pre cementing meeting on the drill floor.
23.01.2004 05:00	06:00	1,0	2736,0	CSSU	OK	OK	Pressure tested cementing lines 250 bar/5 min. Pumped 15 m5 spacer. Start mixing cement.
23.01.2004 06:00	06:30	0,5	2736,0	CSSU	OK	OK	Mixed and pumped 27 m3 1,90 sg. cmt. slurry.
23.01.2004 06:30	08:00	1,5	2736,0	CSSU	OK	OK	Displaced cmt. with 1,42 sg. WBM. Wiper plug sheared after 934 strokes, 65 bar. Displaced cmt. with 1470 strokes at 1000 lpm, increased pump rate to 2000 lpm from 1470 - 2273 strokes then decreased to 1000 lpm. FCP = 135 bar, plug bumped after 3995 strokes. Lost a total of 21 m3 mud during cmt. job. Stopped pumping and got 5 m3 backflow, indicating a total loss of 16 m3.
23.01.2004 08:00	08:30	0,5	2736,0	CSSU	OK	OK	Pressure tested 9 5/8" liner to 250 bar/ 10 min, OK.
23.01.2004 08:30	09:30	1,0	2736,0	CAOU	OK	OK	Set TSP packer according to Weatherford procedure.
23.01.2004 09:30	10:00	0,5	2736,0	CERU	OK	OK	R/B cmt. stand and 2 DP stand.

23.01.2004 10:00	11:00	1,0	2736,0	CATU	OK	OK	Closed MPR and pressure tested 13 3/8" csg. and 9 5/8" liner to 250 bar/ 10 min.
23.01.2004 11:00	12:00	1,0	1410,0	CAOU	OK	OK	Opened MPR and RIH w/ 2 stand. Circ. B/U with 4000 lpm/90 bar while reciprocating pipe.
23.01.2004 12:00	13:00	1,0	1410,0	BBDU	OK	OK	Function tested BOP on blue pod from drillers panel and on yellow pod from mini panel on rig office.
23.01.2004 13:00	16:00	3,0	1410,0	CTTU	OK	OK	POOH with liner running string. Laid down running tools.
23.01.2004 16:00	17:00	1,0	,0	CSSU	OK	OK	Laid down cement stand.
23.01.2004 17:00	19:00	2,0	,0	DTBU	OK	OK	Laid down 12 1/4" BHA.
23.01.2004 19:00	21:00	2,0	139,0	DTDU	OK	OK	Held prejob meeting and made up 8 1/2" bit and BHA and RIH.
23.01.2004 21:00	00:00	3,0	1650,0	DTDU	OK	OK	Continued to RIH with 8 1/2" bit & BHA to 1650 m.
24.01.2004 00:00	01:30	1,5	2710,0	DTDU	OK	OK	Continued RIH with 8,5" BHA to 2673 m. Filled pipe and washed down and tagged top of plug @ 2710 m with 3 mt.
24.01.2004 01:30	02:00	0,5	2710,0	DDOU	OK	OK	Performed choke drill with crew. Went through procedure for drilling in reservoir.
24.01.2004 02:00	04:30	2,5	2740,0	CDDU	OK	OK	Drilled plugs, float collar,shoe track and liner shoe. Drilled 3 m new formation to 2740 m. Parameters: 2500 lpm,170 bar, 60 RPM, WOB 1 - 5 mt.
24.01.2004 04:30	06:00	1,5	2740,0	DCAU	OK	OK	Circulated hole clean with 2500 lpm, 175 bar, 30 RPM. Held prejob meeting for displacing to 1,20 SG mud while circulating.
24.01.2004 06:00	09:00	3,0	2740,0	DCAU	OK	OK	Pumped 10 m3 spacer + 15 m3 hi-vis pill down drill pipe. Displaced kill, choke and booster lines with 1,20 SG glydrill mud. Continued displacing well to 1,20 SG glydrill mud.
24.01.2004 09:00	10:00	1,0	2740,0	DDOU	OK	OK	Cleaned flow divider, shakers, shaker pits and mud pit.
24.01.2004 10:00	12:00	2,0	2740,0	EXLU	OK	OK	Lined up from cement unit to rig floor, to pump down both choke and drill pipe.Closed upper pipe ram. Performed extended leakoff test cycle number 1 according to procedure. Performed extended leakoff test cycle number 2 according to procedure. Pumped 1656 l with 100 lpm to 120 bar, bled back 1294 l. XLOT is 1.65 SG EMW. Meanwhile cleaned shaker pits.
Sum 12 1/4"		150,0	(6,3 days)				

Section: 8 1/2" Start time: 24.01.2004 12:00 End time: 26.01.2004 20:00

Rig: DEEPSEA BERGEN

---- Status ----

Time from	Time to	Time used	Depth mMD	Act code	During opr	End of opr	Description of activities
24.01.2004 12:00	16:00	4,0	2775,0	DDRU	OK	OK	Drilled 8,5" hole from 2740 m to 2775 m. Observed drilling break at 2772 m. ROP increased from 15 m/ hrs to 25 m/hrs. Flow checked well for 15 min. Well stable.
24.01.2004 16:00	17:00	1,0	2775,0	ECSU	OK	OK	Circulated bottom up with 2500 lpm / 135 bar while reciprocating and rotating string with 90 rpm / 4070 nm. Max gas 1,23 %.
24.01.2004 17:00	20:30	3,5	2820,0	DDRU	OK	OK	Continued drilling 8,5" hole to 2820 m with 2500 lpm,135 bar and 165 rpm / 10,8 Knm torque, with 5 mt WOB. Observed drilling break from 2818 m - 2820 m. Flow checked - well stabilized.
24.01.2004 20:30	21:00	0,5	2827,0	DDRU	OK	OK	Continued drilling 8,5" hole to 2827 m with 2500 lpm, 135 bar and 24 Knm torq with 3 - 5 mt WOB. Flow checked well.
24.01.2004 21:00	23:00	2,0	2827,0	ECSU	OK	OK	Circulated bottom up @ 2827 m with 2500 lpm, 135 bar and 100 rpm. Continued circulating while checking out samples.
24.01.2004 23:00	00:00	1,0	2850,0	DDRU	OK	OK	Continued drilling 8,5" hole from 2827 m to 2850 m.
25.01.2004 00:00	06:00	6,0	2928,0	DDRU	OK	OK	Continued drilling 8,5" hole to 2928 m with 2500 lpm, 140 bar and 165 rpm / 5 - 20 Knm torque with 1 - 5 mt WOB.

25.01.2004 06:00	09:00	3,0	2975,0	DDRU	OK	OK	Continued drilling 8,5" hole from 2928 m to well TD at 2975 m. Drilling parametres: 2500 lpm / 145 bar and 165 rpm / 5 - 14 Knm torque with 5 - 8 mt WOB.
25.01.2004 09:00	11:30	2,5	2975,0	DCAU	OK	E FAIL	Circulated hole clean with 2500 lpm / 140 bar while reciprocating and rotating pipe with 90 rpm / 5,5 Knm torque. Flow checked well, OK.
25.01.2004 11:30	12:30	1,0	2975,0	DEOD	E FAIL	OK	Changed BX-elevator to air operated elevator due to failure on BX-elevator. Disconnected hydraulic hoses on top drive swivel and connected air hoses on top drive swivel.
25.01.2004 12:30	14:30	2,0	2736,0	DTLU	OK	OK	POOH from 2975 m to 9 5/8" casing shoe @ 2736 m. Flowchecked well in 9 5/8" casing shoe, OK.
25.01.2004 14:30	20:30	6,0	,0	DTLU	OK	OK	POOH from 2736 m. Flow checked with BHA below BOP. Well stable. Broke out bit and stabilizer.
25.01.2004 20:30	21:00	0,5	,0	DTBU	OK	OK	Cleared and cleaned rig floor.
25.01.2004 21:00	21:30	0,5	,0	ELWU	OK	OK	Rigged up Schlumberger wireline equipment.
25.01.2004 21:30	00:00	2,5	200,0	ELWU	OK	OK	Prepared to run log no 1, DSI-HRLA-PEX. Held SJA meeting before rigging up. Installed radioactive sources into logging tools. Ran in log #1 @ 2340 hrs. Continued RIH to 200 m.
26.01.2004 00:00	02:30	2,5	2736,0	ELWU	OK	OK	Continued RIH with logs. Stopped every 500 m and picked up 50 m to work out torque from new cable.
26.01.2004 02:30	04:00	1,5	2979,0	ELWU	OK	OK	Started logging down from 9 5/8" CSG shoe. At TD, started repeat section and main log. Finished main log in 9 5/8" CSG shoe up to 2700 m.
26.01.2004 04:00	06:00	2,0	,0	ELWU	OK	OK	Started POOH. Out of hole @ 5:25 hrs. Removed radioactive sources, and continued rigging down logging tool string.
26.01.2004 06:00	06:30	0,5	,0	ELWU	OK	OK	Continued laying down logging tools.
26.01.2004 06:30	07:00	0,5	,0	ELWU	OK	OK	Prepared to run log suite # 2, VSP - GR. Rigged up seismic tool.
26.01.2004 07:00	09:00	2,0	1400,0	ELWU	OK	E FAIL	RIH with VSP @ 07:10 hrs to 100 m. Activated compensator and continued RIH to 1400 m. Performed check shot @ 1400 m. Observed tool communication problem.
26.01.2004 09:00	11:00	2,0	1400,0	ELOD	E FAIL	OK	POOH with tool string. Replaced telemetry head. RIH to 1400 m with tool string. Performed check shot @ 1400 m. OK.
26.01.2004 11:00	13:30	2,5	2975,0	ELWU	OK	OK	RIH. Made checkshot @ 1800 m. Continued RIH to TD.
26.01.2004 13:30	18:30	5,0	1400,0	ELWU	OK	OK	Performed VSP surveys up to 1953 m. Made check shots with 100 m spacing up to 1400 m.
26.01.2004 18:30	19:30	1,0	,0	ELWU	OK	OK	POOH with logging tools. Laid down logging toolstring. Rigged down Schlumberger wireline sheaves.
26.01.2004 19:30	20:00	0,5	,0	ELWU	OK	OK	Rigged down Compensator wire.Cleared catwalk from logging equipment. Cleared drill floor.
Sum 8 1/2"		56,0	(2,3 days)				

Section: PERM P&A Start time: 26.01.2004 20:00 End time: 31.01.2004 11:30

Rig: DEEPSEA BERGEN

---- Status ----

Time from	Time to	Time used	Depth mMD	Act code	During opr	End of opr	Description of activities
26.01.2004 20:00	20:30	0,5	,0	PTPU	OK	OK	Held prejob meeting prior to pick up cement stinger. Went through SJA and changed to 3,5" DP elevator and slips.
26.01.2004 20:30	00:00	3,5	349,0	PTPU	OK	OK	Picked up 3,5" diverting tool, made up to 3,5" DP and RIH with 3,5" DP to 349 m.
27.01.2004 00:00	01:00	1,0	349,0	PTPU	OK	OK	Changed to BX-elevator for 5,5" DP. Made up cement stand and racked back same.
27.01.2004 01:00	05:00	4,0	2930,0	PTTU	OK	OK	Continued RIH with 5,5" DP to 2930 m. Filled string with mud and broke circulation @ 1290 m and 2670 m. Circulated on booster on the way in with 690 lpm/ 20 bar.
27.01.2004 05:00	06:00	1,0	2975,0	PCCU	OK	OK	Washed down from 2930 m to TD @ 2975 m with 1050 lpm, 35 bar and 30 rpm. Circulated with 2500 lpm, 120 bar and 30 rpm.
27.01.2004 06:00	07:00	1,0	2975,0	PCCU	OK	OK	Circulated bottom up with 2500 lpm/120 bar and 30 rpm.
27.01.2004 07:00	07:30	0,5	2975,0	PBSU	OK	O FAIL	Installed cement stand and hooked up cement line. Attempted to flush cement line.
27.01.2004 07:30	08:00	0,5	2975,0	PAOD	O FAIL	OK	Flushed and hooked up test line due to frozen cement line. Pressure tested same to 200 bar/ 10 min.
27.01.2004 08:00	09:30	1,5	2975,0	PSSU	OK	OK	Held prejob meeting prior to cement job. Pumped 8 m3 spacer with rig pump. Mixed and pumped 13 m3 of 1,9 sg cement slurry and chased to drill floor with 200 ltr fresh water. Displaced cement with 0,8 m3 spacer and 25,7 m3 mud @ 3000 lpm with rig pumps.
27.01.2004 09:30	12:00	2,5	2500,0	PTTU	OK	OK	POOH with cement stinger from 2975 to 2500 m. Circulated 10 m3 mud @ 3500 lpm.
27.01.2004 12:00	14:00	2,0	1500,0	PTTU	OK	OK	POOH from 2500 m to 1500 m.
27.01.2004 14:00	15:00	1,0	1500,0	PCCU	OK	OK	Circulated bottom up with 3500 lpm /132 bar.
27.01.2004 15:00	17:30	2,5	350,0	PTTU	OK	OK	Continued POOH from 1500 m to 350 m. Held prejob meeting for laying down 3,5" DP.
27.01.2004 17:30	19:00	1,5	,0	PTPU	OK	OK	Changed inserts in BX-elevator. POOH and laid down 3,5" DP.
27.01.2004 19:00	21:00	2,0	,0	PTPU	OK	OK	Changed inserts in BX-elevator. Laid down 6"DC's, 2 jts 8" DC's and jar.
27.01.2004 21:00	00:00	3,0	350,0	BBOU	OK	OK	Made up wash tool to one stand of 5,5" hwdp. RIH and washed riser and BOP with 3500 lpm / 25 bar.
28.01.2004 00:00	01:00	1,0	,0	PTTU	OK	OK	POOH with wash tool.
28.01.2004 01:00	03:30	2,5	1510,0	PTTU	OK	OK	RIH with 5 1/2" open ended DP to 1510 m.
28.01.2004 03:30	05:00	1,5	1510,0	PCCU	OK	OK	Circulated bottom up with 3000 lpm.
28.01.2004 05:00	06:00	1,0	1510,0	PSCW	OK	OK	Waiting on cement. Circulated, cut and slipped drill line while W.O.C. Prepared to pressure test casing/ cement plug.
28.01.2004 06:00	07:00	1,0	1510,0	PSSU	OK	OK	Pressure tested lines from cement unit to rig floor to 200 bar/5 min. Closed UAP and pressure tested cement plug # 1 and 9 5/8"x13 3/8" casing to 190 bar/10 min, i.e. 70 bar above XLOT pressure.
28.01.2004 07:00	08:00	1,0	1510,0	PSSU	OK	OK	Installed Perigon cement support tool into drillstring and rigged up cement stand. Pumped PCS tool down with 1500 lpm / 20 bar. Pulled drill pipe up to 1500 m.
28.01.2004 08:00	08:30	0,5	1500,0	PSSU	OK	OK	Flushed cement line from cement pump to cement stand with drill water. Pressure tested surface lines to 200 bar.

28.01.2004	08:30	10:00	1,5	1500,0	PSSU	OK	OK	Pumped 6 m3 1,55 sg spacer with rig pumpes. Mixed and pumped 12m3 1,92 sg cement slurry, sement plug #2 across 9 5/8" liner lap. Chased same with 200 ltr mixwater from cement unit to rig floor. Displaced cement with 0,8 m3 spacer followed by 13,6 m3 mud with rig pumps @ 1500 lpm. Racked back cement stand.
28.01.2004	10:00	11:00	1,0	1200,0	PTTU	OK	OK	POOH from 1500 m to 1200 m.
28.01.2004	11:00	11:30	0,5	1200,0	PSSU	OK	OK	Circulated bottom up @ 1200 m with 4000 lpm/ 50 bar.
28.01.2004	11:30	13:30	2,0	,0	PTTU	OK	OK	POOH with 5 1/2" DP.
28.01.2004	13:30	14:00	0,5	,0	PAOU	OK	OK	Cleared and cleaned rig floor.
28.01.2004	14:00	16:00	2,0	,0	PTTU	OK	OK	Made up casing cutting assy on 5 1/2" DP. RIH to 178 m. Made up marine swivel. Made up annular swivel.RIH and landed marine swivel in wellhead. Cutters at 535 m cutting depth.
28.01.2004	16:00	16:30	0,5	535,0	PACU	OK	OK	Recorded free torque with 100 rpm: 2,7 Knm. Recorded free torque with closed UAP, 100 rpm: 5 Knm. Started cutting 13 3/8" casing @ 16:22 hrs with 130 rpm, 700 lpm, 9,5 Knm - 16 Knm and 165 bar. After 3 min, pressure dropped 4 bar. Continued cutting for 10 min. Pressure dropped 15 bar and torque worked from 11 Knm - 20 Knm.
28.01.2004	16:30	17:30	1,0	535,0	PACU	OK	OK	Flow checked through open choke. Well stable. Opened UAP and flow checked. Well stable.
28.01.2004	17:30	19:00	1,5	,0	PACU	OK	OK	POOH with cutting assy. Racked back annular and marine swivel. Laid down cutting assy.
28.01.2004	19:00	21:00	2,0	350,0	PTTU	OK	OK	Made up and RIH with wear bushing retrieving tool. RIH to top of BOP. Washed down from top of BOP to wellhead. Made several attempts to engage wear bushing. Max overpull 15 mt.
28.01.2004	21:00	22:00	1,0	,0	PTTU	OK	OK	POOH with wear bushing. Recovered hanger and 3 jnts 13 3/8" casing with wear bushing. Secured casing with manuel casing elevator. Unlatched and racked back wearbushing retrieving stand in derrick.
28.01.2004	22:00	00:00	2,0	,0	PAOU	OK	OK	Rigged up casing handling equipment. Extended bailes with shakles. Held SJA meeting with crew prior to lay down casing.
29.01.2004	00:00	02:00	2,0	,0	PACU	OK	OK	Laid down 13 3/8" casing hanger with pup and 2 casing joints.
29.01.2004	02:00	03:00	1,0	,0	PTPU	OK	OK	Rigged down 13 3/8" casing handling equipment. Rigged up 5.5" DP handling equipment.
29.01.2004	03:00	05:00	2,0	378,0	PTTU	OK	OK	Made up 13 3/8" spear and pack-off assembly. RIH with 5 1/2" DP to 378 m. Engaged spear and POOH. No overpull. Pulled up 10 m with 13 mt. Lost 6 mt.
29.01.2004	05:00	06:00	1,0	,0	PACU	OK	OK	POOH with spear and 5 joints 13 3/8" casing.
29.01.2004	06:00	07:00	1,0	,0	PTPU	OK	OK	Laid down accelerator and spear assy. Racked back 8" spear assy.
29.01.2004	07:00	08:30	1,5	,0	PTPU	OK	OK	Held prejob meeting with crew. Rigged up and laid down 5 joints 13 3/8" casing.
29.01.2004	08:30	09:30	1,0	378,0	PTTU	OK	OK	Made up 13 3/8" spear assy. RIH and latched spear to 13 3/8" casing. Pulled casing free with 30 mt up weight.
29.01.2004	09:30	11:00	1,5	,0	PTTU	OK	OK	POOH with 13 3/8" casing. Laid down spear assy.
29.01.2004	11:00	13:00	2,0	,0	PTPU	OK	OK	Changed to manuel 13 3/8" casing elevator. Pulled and laid down 7 ea 13 3/8" casing joints + one cut off piece. Rigged down 13 3/8" casing equipment.
29.01.2004	13:00	14:30	1,5	610,0	PTTU	OK	OK	Cleaned rig floor. Rigged up for handling 5,5" DP. RIH with 5,5" openended DP to 590 m. Installed cement stand and RIH to 610 m. Worked pipe through 13 3/8" casing joint @ 635 m.
29.01.2004	14:30	15:30	1,0	610,0	PSSU	OK	OK	Circulated and conditioned mud. Held prejob meeting.
29.01.2004	15:30	17:00	1,5	610,0	PSSU	OK	OK	Pumped down cement support tool to 610 m. Pressure tested surface lines to 280 bar/ 5 min. PO to 600 m. Pumped 8,0 m3 1,55 SG spacer with rig pumps. Mixed and pumped 17 m3 1,75 SG cement slurry. Displaced cement with 200 ltr mix water from cement unit. Displaced cement with 0,8 m3 spacer and 4,2 m3 mud with rig pumps. Racked back cement stand.

29.01.2004	17:00	18:30	1,5	,0	PSSU	OK	OK	POOH from 600 m to 400 m. Circulated bottom up. POOH. Washed wellhead and BOP on the way out.
29.01.2004	18:30	22:30	4,0	,0	PTPU	OK	OK	Laid down wear bushing RT, marine swivel stand and x-over's, and emergency hang-off stand. Installed 2 extension subs on Most tool.
29.01.2004	22:30	00:00	1,5	,0	PSCW	OK	OK	Performed general rig maintenance while waiting on cement.
30.01.2004	00:00	02:00	2,0	,0	PSCW	OK	OK	Performed general rig maintenance while waiting on cement.
30.01.2004	02:00	03:00	1,0	400,0	PTTU	OK	OK	RIH with cement stinger on 5,5" DP to 400 m.
30.01.2004	03:00	04:00	1,0	400,0	PSTU	OK	OK	Pressure tested surface line from cement unit to rig floor to 100 bar/ 10 min. Closed UAP and pressure tested cement plug # 3 to 74 bar/ 10 min with mud in the well.
30.01.2004	04:00	06:00	2,0	470,0	PCCU	OK	OK	Flushed kill, choke and boster lines with seawater. Emptied trip tank. Displaced well to seawater from 400 m with 3800 lpm/ 30 bar. Received 68 m3 mud in return. Washed down and tagged cement plug @ 470 m. Meanwhile, held prejob meeting for cement plug. Rigged up cement stand.
30.01.2004	06:00	07:00	1,0	469,0	PCCU	OK	OK	Made up top drive on cement stand and ran in to 469 m. Pumped bottom up with 4100 lpm / 30 bar.
30.01.2004	07:00	08:00	1,0	370,0	PSSU	OK	OK	Mixed and pumped 19,6 m3 1,75 SG cement slurry and displaced same with 3,9 m3 SW. Plug set from 470 m to 360 m.
30.01.2004	08:00	08:30	0,5	365,0	PSSU	OK	OK	POOH from 470 m to 365 m. Closed UAP and reverse circulated bottom up.
30.01.2004	08:30	09:00	0,5	,0	PTTU	OK	OK	Opened UAP. POOH from 365 m. Circulated down kill & choke line up riser while POOH.
30.01.2004	09:00	10:30	1,5	353,0	PTPU	OK	OK	Laid down cement stand. RIH with Gefro wash tool and washed BOP area. POOH and laid down wash tool.
30.01.2004	10:30	11:00	0,5	,0	PTPU	OK	OK	Broke out jar. Laid down 13 3/8" spear assembly.
30.01.2004	11:00	12:00	1,0	,0	BBRU	OK	OK	Prepared to pull BOP. Changed to 500 mt bails. Removed floor monkey and installed riser spider.
30.01.2004	12:00	13:00	1,0	,0	BBRU	OK	OK	Installed diverter running tool. Held prejob meeting. Unlocked and pulled diverter.
30.01.2004	13:00	14:00	1,0	,0	BBRU	OK	OK	Picked up stand with riser running tool. Made up same to slip joint and collapsed and locked inner barrel. Disconnected and pulled BOP off wellhead @ 13:50 hrs.
30.01.2004	14:00	18:00	4,0	,0	BBRU	OK	OK	Pulled rig off location, 44 m. Hanged off support ring. Laid down slip joint on deck. Continued pulling riser and BOP to 170 m.
30.01.2004	18:00	23:00	5,0	,0	BBRU	OK	OK	Continued pulling riser & BOP from 170 m. Held prejob/SJA meeting with new crew . Pulled BOP through splash zone on a double riser joint and a 5 m pup. Disconnected sheaves and clamps. Positioned carrier underneath BOP. Set weight on carrier. Closed stack connector. Slacked off weight and disconnected riser from BOP. Skidded BOP to starboard.
30.01.2004	23:00	00:00	1,0	,0	BBRU	OK	OK	Cleaned and cleared rigfloor of BOP & riser handling equipment.
31.01.2004	00:00	03:30	3,5	351,0	PAHU	OK	OK	Pulled rig back to location and established guidelines. Made up MOST toolstring. Attached ropes to the dogcollars around the tool body with shackles on the guidelines. Continued running in on 8 " drill collars and 5 1/2" DP to 351 m.
31.01.2004	03:30	05:30	2,0	364,0	PAHU	OK	OK	Adjusted rig and stabbed in. Landed MOST tool in wellhead. Locked mandrel in housing. Fastened T-bars with ROV. Pulled 12 mt overpull. Started to cut with 3200 lpm / 150 bar. Cut 20" casing after 15 min. Cut 30" casing after 90 min. Wellhead and PGB came free. Wellhead cut at 364 m, 8 m below seabed.
31.01.2004	05:30	06:00	0,5	364,0	PAHU	OK	OK	Prepared to pull wellhead and PGB with MOST while pulling in on guidewires.

31.01.2004 06:00	08:00	2,0	,0	PAHU	OK	OK	Pulled wellhead and PGB with MOST tool while pulling in on guidewires. Meanwhile, performed seabed survey with ROV. Landed PGB on trolley and secured same.
31.01.2004 08:00	11:30	3,5	,0	PAHU	OK	OK	Disconnected MOST tool from wellhead. L/D MOST tool. Installed R/T and released housing from PGB. L/D 20"/ 30" cut. Removed guide posts from PGB.
Sum PERM P&A		111,5	(4,6 days)				

Section: MOVE Start time: 31.01.2004 11:30 End time: 01.02.2004 00:00

Rig: DEEPSEA BERGEN

---- Status ----

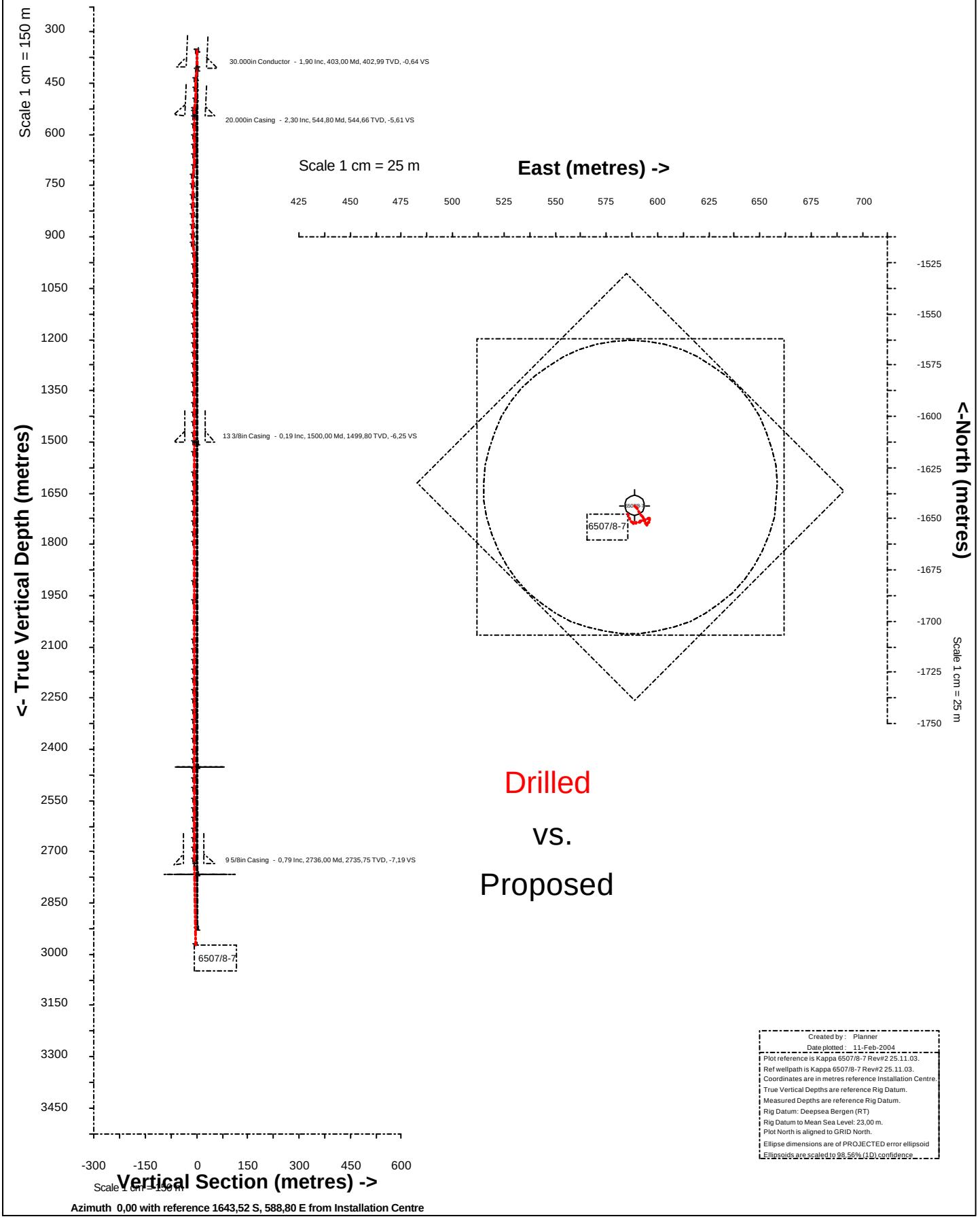
Time from	Time to	Time used	Depth mMD	Act code	During opr	End of opr	Description of activities
31.01.2004 11:30	15:30	4,0	,0	MNBU	OK	OK	Deballasted rig to anchor handling draught.
31.01.2004 15:30	00:00	8,5	,0	MARU	OK	OK	Anchor handling: O. Poseidon: Received pendant no. 4 15:45hrs. Out at anchor @ 16:20hrs. Pendant @ DSB 8:45hrs O. Pegasus: Received pendant no. 3 15:52hrs. Out at anchor @ 16:22hrs. Pendant @ DSB 6:37hrs O. Hercules: Received pendant no. 8 16:10hrs. Out at anchor @ 16:45hrs. Pendant @ DSB 18:38hrs O. Hercules: Received pendant no. 2 18:55hrs. Out at anchor @ 19:15hrs. Anchor on deck 22:00hrs O. Poseidon: Received pendant no. 7 18:57hrs. Out at anchor @ 19:30hrs. Pendant @ DSB 21:30hrs O. Pegasus: Anchor 9 off bottom @ 19:20hrs. Anchor on deck @ 20:20hrs O. Poseidon: Recieved pendant no. 6 21:35hrs. Anchor off btm. @ 22:15hrs. Anchor on deck @ 23:20hrs DSB: Anchor 5 off btm. @ 23:35. Anchor bolstered @ 24:00. Rig towed Kappa to Heidrun C-template by anchor 2 and 9. ----- Operations transferred to well 6507/7-C-4 AHT4 at 24:00 -----
Sum MOVE		12,5	(0,5 days)				
Sum NO 6507/8-7		648,5	(27,0 days)				

App B Directional data, survey listing

B.1 Well plot

Statoil

Location:	**Norway**	**Slot:**	**6507/8-7**
Field:	**EXPLORATION ZONE 32**	**Well:**	**Kappa 6507/8-7**
Installation:	**6507/8 Exploration**	**Wellbore:**	**Kappa 6507/8-7**



Drilled

vs.

Proposed

Azimuth 0,00 with reference 1643,52 S, 588,80 E from Installation Centre

Created by : Planner
Date plotted : 11-Feb-2004

Plot reference is Kappa 6507/8-7 Rev#2 25.11.03.
Ref wellpath is Kappa 6507/8-7 Rev#2 25.11.03.
Coordinates are in metres reference Installation Centre.
True Vertical Depths are reference Rig Datum.
Measured Depths are reference Rig Datum.
Rig Datum: Deepsea Bergen (RT)
Rig Datum to Mean Sea Level: 23,00 m.
Plot North is aligned to GRID North.
Ellipse dimensions are of PROJECTED error ellipsoid
Ellipsoids are scaled to 98,56% (1D) confidence

B.2 Well survey listing

STATOIL

Statoil,6507/8-7
6507/8 Exploration,6507/8
EXPLORATION ZONE 32,Norway

Wellbore: 6507/8-7
Wellpath: 6507/8-7 Definitive
(TD@2975)
Date Printed: 5-Feb-2004

BAKER HUGHES INTEQ

Errors start at Mudline/Ground Level (356.00)
Ellipses scaled to 2.45 standard deviations.
Only Depth and Magnetic Reference Field error terms are correlated across tie points

Wellbore

Name	Created	Last Revised
6507/8-7	9-Jan-2004	5-Feb-2004

Well

Name	Government ID	Last Revised
Kappa 6507/8-7		25-Nov-2003

Slot

Name	Grid Northing	Grid Easting	Latitude	Longitude	North	East
6507/8-7	7242521.0000	423592.0000	N65 17 42.4596	E7 21 41.5394	1643.52S	588.80E

Installation

Name	Easting	Northing	Coord System Name	North Alignment
6507/8 Exploration	423003.393	7244163.984	ED50-UTM-32N on EUROPEAN DATUM 1950 datum	Grid

Field

Name	Easting	Northing	Coord System Name	North Alignment
EXPLORATION ZONE 32	381477.000	7229793.000	ED50-UTM-32N on EUROPEAN DATUM 1950 datum	Grid

Created By

Comments

All data is in Metres unless otherwise stated
Coordinates are from Installation MD's are from Rig and TVD's are from Rig (Deepsea Bergen (RT) 23.0m above Mean Sea Level)
Vertical Section is from 1643.52S 588.80E on azimuth 218.25 degrees
Bottom hole distance is 5.28 Metres on azimuth 218.25 degrees from Wellhead
Calculation method uses Minimum Curvature method
Confidence Limit of 98.56 (1D)
Prepared by Baker Hughes Incorporated

STATOIL

Statoil,6507/8-7
6507/8 Exploration,6507/8
EXPLORATION ZONE 32,Norway

Wellbore: 6507/8-7
Wellpath: 6507/8-7 Definitive
(TD@2975)
Date Printed: 5-Feb-2004

BAKER HUGHES INTEQ

Wellpath (Ellipse Semi-Axis) Report

MD [m]	Inc [deg]	Azi [deg]	TVD [m]	North [m]	East [m]	Dogleg [deg/30m]	Vertical Section[m]	Ellipse Major Semi-Axis [m]	Ellipse Minor Semi-Axis [m]	Ellipse Vertical Semi-Axis [m]	Ellipse Minor Azi. [deg]
356.00	0.00	0.00	356.00	1643.52S	588.80E	0.00	0.00	0.00	0.00	0.86	N/A
409.40	2.16	145.68	409.39	1644.35S	589.37E	1.21	0.30	0.15	0.15	0.86	N/A
437.40	2.37	146.57	437.37	1645.27S	589.98E	0.23	0.64	0.18	0.17	0.86	N/A
466.60	2.52	145.85	466.54	1646.31S	590.68E	0.16	1.03	0.21	0.19	0.87	148.07
497.90	2.49	143.50	497.81	1647.42S	591.47E	0.10	1.41	0.25	0.21	0.88	146.77
526.70	2.71	144.42	526.58	1648.48S	592.24E	0.23	1.77	0.28	0.23	0.89	146.10
532.10	2.47	146.33	531.97	1648.68S	592.37E	1.42	1.84	0.28	0.23	1.24	145.97
547.40	2.27	152.23	547.26	1649.22S	592.70E	0.62	2.06	0.29	0.23	1.24	146.18
574.60	1.78	148.45	574.44	1650.06S	593.17E	0.56	2.43	0.32	0.24	1.25	146.69
603.50	1.25	151.33	603.33	1650.72S	593.56E	0.56	2.71	0.34	0.25	1.26	146.99
632.50	1.19	156.79	632.33	1651.27S	593.83E	0.14	2.98	0.36	0.27	1.28	147.52
662.27	1.13	149.79	662.09	1651.81S	594.10E	0.15	3.23	0.38	0.28	1.29	147.80
691.70	0.72	148.33	691.52	1652.22S	594.34E	0.42	3.40	0.40	0.29	1.31	147.84
720.70	0.50	147.56	720.51	1652.48S	594.50E	0.23	3.51	0.41	0.30	1.33	147.84
750.10	0.25	134.30	749.91	1652.64S	594.62E	0.27	3.55	0.42	0.31	1.35	147.72
779.20	0.18	125.06	779.01	1652.70S	594.70E	0.08	3.56	0.43	0.32	1.37	147.53
808.40	0.25	120.61	808.21	1652.76S	594.79E	0.07	3.55	0.44	0.33	1.39	147.24
837.00	0.04	350.13	836.81	1652.79S	594.84E	0.29	3.53	0.44	0.33	1.41	327.14
865.90	0.17	328.37	865.71	1652.74S	594.82E	0.14	3.51	0.45	0.34	1.43	327.12
894.90	0.33	320.86	894.71	1652.64S	594.75E	0.17	3.48	0.45	0.35	1.46	327.19
921.40	0.44	35.44	921.21	1652.50S	594.76E	0.54	3.36	0.45	0.36	1.48	326.47
951.40	0.59	56.33	951.21	1652.32S	594.95E	0.24	3.10	0.46	0.37	1.51	144.98
981.20	0.40	59.24	981.01	1652.18S	595.17E	0.19	2.85	0.47	0.38	1.54	143.76
1011.40	0.44	43.14	1011.21	1652.04S	595.34E	0.12	2.64	0.48	0.39	1.57	322.57
1039.20	0.49	38.90	1039.01	1651.87S	595.49E	0.07	2.42	0.48	0.39	1.60	321.35
1068.40	0.44	42.29	1068.21	1651.69S	595.64E	0.06	2.18	0.49	0.40	1.63	320.18
1096.70	0.40	50.34	1096.51	1651.55S	595.79E	0.08	1.97	0.49	0.41	1.66	139.13
1126.10	0.38	29.55	1125.91	1651.40S	595.92E	0.15	1.78	0.50	0.42	1.70	318.11
1156.70	0.41	33.71	1156.51	1651.22S	596.03E	0.04	1.57	0.50	0.43	1.73	316.98
1184.90	0.53	25.66	1184.70	1651.02S	596.14E	0.15	1.34	0.51	0.43	1.77	315.72
1214.20	0.44	26.78	1214.00	1650.79S	596.25E	0.09	1.10	0.52	0.44	1.80	314.56
1243.30	0.37	41.17	1243.10	1650.62S	596.36E	0.13	0.89	0.52	0.45	1.84	313.51
1272.70	0.24	344.14	1272.50	1650.49S	596.41E	0.32	0.76	0.53	0.45	1.88	313.00
1300.90	0.34	343.13	1300.70	1650.35S	596.37E	0.11	0.68	0.53	0.46	1.92	312.52
1329.30	0.38	5.51	1329.10	1650.18S	596.35E	0.15	0.55	0.53	0.47	1.96	311.76
1358.90	0.29	0.07	1358.70	1650.01S	596.36E	0.10	0.41	0.54	0.47	2.00	311.13
1388.00	0.14	328.73	1387.80	1649.90S	596.34E	0.19	0.34	0.54	0.48	2.05	310.88
1416.90	0.17	269.60	1416.70	1649.87S	596.28E	0.16	0.36	0.55	0.49	2.09	311.10
1445.70	0.00	0.41	1445.50	1649.87S	596.24E	0.18	0.38	0.55	0.49	2.13	311.18
1475.20	0.16	0.66	1475.00	1649.83S	596.24E	0.16	0.35	0.56	0.50	2.18	310.90
1499.10	0.19	308.18	1498.90	1649.77S	596.21E	0.20	0.32	0.56	0.50	2.38	310.85
1532.20	0.30	252.39	1532.00	1649.77S	596.08E	0.23	0.40	0.56	0.51	2.43	311.52
1590.70	0.29	252.85	1590.50	1649.86S	595.79E	0.01	0.64	0.59	0.53	2.52	313.05
1619.60	0.34	248.89	1619.40	1649.91S	595.64E	0.06	0.78	0.59	0.54	2.57	314.00
1648.70	0.40	253.36	1648.50	1649.97S	595.47E	0.07	0.94	0.59	0.54	2.62	315.10
1676.90	0.30	266.97	1676.70	1650.00S	595.30E	0.14	1.06	0.60	0.55	2.67	315.88
1706.20	0.34	250.58	1706.00	1650.03S	595.14E	0.10	1.19	0.60	0.56	2.72	316.87
1736.10	0.43	259.80	1735.90	1650.08S	594.95E	0.11	1.35	0.61	0.56	2.77	318.08
1765.60	0.34	254.76	1765.40	1650.13S	594.75E	0.10	1.50	0.61	0.57	2.82	319.08
1794.00	0.34	267.89	1793.80	1650.15S	594.59E	0.08	1.62	0.62	0.57	2.87	319.94
1852.50	0.37	280.23	1852.30	1650.12S	594.23E	0.04	1.82	0.63	0.59	2.98	321.63
1910.90	0.40	274.14	1910.69	1650.08S	593.84E	0.03	2.03	0.65	0.62	3.10	323.73

All data is in Metres unless otherwise stated
Coordinates are from Installation MD's are from Rig and TVD's are from Rig (Deepsea Bergen (RT) 23.0m above Mean Sea Level)
Vertical Section is from 1643.52S 588.80E on azimuth 218.25 degrees
Bottom hole distance is 5.28 Metres on azimuth 218.25 degrees from Wellhead
Calculation method uses Minimum Curvature method
Confidence Limit of 98.56 (1D)
Prepared by Baker Hughes Incorporated

STATOIL

Statoil,6507/8-7
6507/8 Exploration,6507/8
EXPLORATION ZONE 32,Norway

Wellbore: 6507/8-7
Wellpath: 6507/8-7 Definitive
(TD@2975)
Date Printed: 5-Feb-2004

BAKER HUGHES INTEQ

Wellpath (Ellipse Semi-Axis) Report

MD [m]	Inc [deg]	Azi [deg]	TVD [m]	North [m]	East [m]	Dogleg [deg/30m]	Vertical Section[m]	Ellipse Major Semi-Axis [m]	Ellipse Minor Semi-Axis [m]	Ellipse Vertical Semi-Axis [m]	Ellipse Minor Azi. [deg]
1967.50	0.41	246.22	1967.29	1650.14S	593.46E	0.10	2.32	0.67	0.64	3.21	326.38
2024.10	0.38	238.32	2023.89	1650.32S	593.11E	0.03	2.67	0.69	0.65	3.33	149.13
2081.90	0.50	250.15	2081.69	1650.51S	592.71E	0.08	3.07	0.70	0.67	3.46	332.55
2110.30	0.62	236.94	2110.09	1650.64S	592.47E	0.19	3.32	0.71	0.68	3.52	154.59
2139.60	0.51	236.27	2139.39	1650.80S	592.22E	0.11	3.59	0.71	0.68	3.58	156.42
2169.90	0.64	244.75	2169.68	1650.94S	591.96E	0.15	3.87	0.72	0.69	3.65	158.68
2198.30	0.55	238.29	2198.08	1651.08S	591.70E	0.12	4.14	0.72	0.69	3.72	160.54
2227.60	0.67	236.32	2227.38	1651.25S	591.44E	0.12	4.44	0.73	0.70	3.79	162.71
2257.60	0.58	247.64	2257.38	1651.41S	591.15E	0.15	4.73	0.73	0.70	3.86	164.85
2286.80	0.61	254.56	2286.58	1651.50S	590.86E	0.08	4.99	0.74	0.71	3.93	166.97
2315.50	0.57	247.08	2315.28	1651.60S	590.59E	0.09	5.24	0.74	0.71	4.00	168.85
2344.10	0.62	244.51	2343.88	1651.72S	590.32E	0.06	5.50	0.75	0.71	4.07	170.83
2374.00	0.50	248.84	2373.77	1651.84S	590.05E	0.13	5.76	0.75	0.72	4.15	172.60
2402.90	0.46	247.14	2402.67	1651.93S	589.82E	0.04	5.97	0.76	0.72	4.22	174.05
2431.20	0.58	256.94	2430.97	1652.01S	589.58E	0.16	6.18	0.76	0.73	4.29	175.78
2459.90	0.54	262.18	2459.67	1652.06S	589.30E	0.07	6.39	0.77	0.73	4.37	177.52
2489.10	0.52	267.57	2488.87	1652.08S	589.03E	0.06	6.58	0.77	0.74	4.45	179.23
2517.50	0.59	259.05	2517.27	1652.11S	588.76E	0.11	6.77	0.77	0.74	4.52	181.03
2546.00	0.57	270.97	2545.77	1652.14S	588.48E	0.13	6.97	0.78	0.74	4.60	182.85
2575.40	0.64	284.15	2575.17	1652.10S	588.17E	0.16	7.12	0.78	0.75	4.68	4.87
2603.50	0.70	287.16	2603.26	1652.01S	587.86E	0.07	7.25	0.79	0.75	4.76	7.02
2633.60	0.79	304.08	2633.36	1651.84S	587.51E	0.24	7.33	0.79	0.76	4.84	9.46
2664.00	0.74	320.33	2663.76	1651.57S	587.21E	0.22	7.30	0.79	0.76	4.93	11.60
2692.70	0.75	336.31	2692.45	1651.25S	587.01E	0.22	7.18	0.79	0.77	5.01	13.25
2721.90	0.79	337.64	2721.65	1650.89S	586.86E	0.05	6.99	0.80	0.77	5.17	15.07
2975.00	0.79	337.64	2974.73	1647.67S	585.53E	0.00	5.28	1.05	1.04	5.94	N/A

All data is in Metres unless otherwise stated
Coordinates are from Installation MD's are from Rig and TVD's are from Rig (Deepsea Bergen (RT) 23.0m above Mean Sea Level)
Vertical Section is from 1643.52S 588.80E on azimuth 218.25 degrees
Bottom hole distance is 5.28 Metres on azimuth 218.25 degrees from Wellhead
Calculation method uses Minimum Curvature method
Confidence Limit of 98.56 (1D)
Prepared by Baker Hughes Incorporated

STATOIL

Statoil,6507/8-7
6507/8 Exploration,6507/8
EXPLORATION ZONE 32,Norway

Wellbore: 6507/8-7
Wellpath: 6507/8-7 Definitive
(TD@2975)
Date Printed: 5-Feb-2004

BAKER HUGHES INTEQ

Hole Sections

Diameter [in]	Start MD[m]	Start TVD[m]	Start North[m]	Start East[m]	End MD[m]	End TVD[m]	End North[m]	Start East[m]	Wellbore
36.000	356.00	356.00	1643.52S	588.80E	409.00	408.99	1644.34S	589.36E	6507/8-7
26.000	409.00	408.99	1644.34S	589.36E	550.00	549.86	1649.31S	592.75E	6507/8-7
17 1/2	550.00	549.86	1649.31S	592.75E	1510.00	1509.80	1649.76S	596.17E	6507/8-7
12 1/4	1510.00	1509.80	1649.76S	596.17E	2737.00	2736.75	1650.70S	586.78E	6507/8-7
8 1/2	2737.00	2736.75	1650.70S	586.78E	2975.00	2974.73	1647.67S	585.53E	6507/8-7

Casings

Name	Top MD[m]	Top TVD[m]	Top North[m]	Top East[m]	Shoe MD[m]	Shoe TVD[m]	Shoe North[m]	Shoe East[m]	Wellbore
30.000in Conductor	356.00	356.00	1643.52S	588.80E	403.00	402.99	1644.17S	589.24E	6507/8-7
20.000in Casing	356.00	356.00	1643.52S	588.80E	544.80	544.66	1649.13S	592.65E	6507/8-7
13 3/8in Casing	356.00	356.00	1643.52S	588.80E	1500.00	1499.80	1649.77S	596.21E	6507/8-7
9 5/8in Casing	356.00	356.00	1643.52S	588.80E	2736.00	2735.75	1650.71S	586.79E	6507/8-7

Survey Tool Program

Reference	Survey Name	MD[m]	TVD[m]	Survey Tool	Error Model
693734	6507/8-7 BHI.MWD 26" (0-532.10)	532.10	531.97	Magnetic (MWD, EMS)	MWD, standard, mag-corr
693808	6507/8-7 BHI.MWD 17 1/2" (532.10-1499.10)	1499.10	1498.90	Magnetic (MWD, EMS)	MWD, standard, mag-corr
693912	6507/8-7 BHI.MWD 12 1/4" (1499.10-2721.90)	2721.90	2721.65	Magnetic (MWD, EMS)	MWD, standard, mag-corr
694481	6507/8-7 Extrapolation (TD@2975)	2975.00	2974.73	Magnetic (MWD, EMS)	MWD, standard, mag-corr

All data is in Metres unless otherwise stated
Coordinates are from Installation MD's are from Rig and TVD's are from Rig (Deepsea Bergen (RT) 23.0m above Mean Sea Level)
Vertical Section is from 1643.52S 588.80E on azimuth 218.25 degrees
Bottom hole distance is 5.28 Metres on azimuth 218.25 degrees from Wellhead
Calculation method uses Minimum Curvature method
Confidence Limit of 98.56 (1D)
Prepared by Baker Hughes Incorporated

App C Contractors list

Service	Company
Casing/ Liner running	Odfjell Casing Services
Cementing	Halliburton AS
Coring	Security DBS
Directional drilling	Baker Hughes INTEQ
Diving	Oceaneering AS
Drilling contractor	Odfjell Drilling Services A.S
Electric logging	Schlumberger Offshore Service NV
Helicopters	Helikopter Service AS
Helicopter booking	Lufttransport (Statoil)
Mud	M-I Norge AS
Mud logging	Baker Hughes INTEQ
MWD	Baker Hughes INTEQ
Rig positioning	Thales Survey
Site survey	Fugro Survey AS
Wellhead system	Dril-Quip

App D Wellsite sample description

STATOIL

WELLSITE SAMPLE DESCRIPTION			Page 1 of 23
Country: Norway	Area: Haltenbanken	Field: .Kappa	
Well no: 6507/8-7	Company: Statoil ASA, Petoro AS, Eni Norge AS, Norske ConocoPhillips AS		
RKB: 23 meters	Geologist: Edw/ard Homson, Lars Rasmussen		
Hole size: 17 1/2”	Cut solvent: Iso propanol	Date: 12.01.2004	

Depth (m RKB)	Lithology (%)	Lithological Description: Rock name, mod.lith, colour, grain size, sorting, roundness, matrix, cementation, hardness, sed.structures, accessories, fossils, porosity, contamination	Remarks: Show/s, cavings, mud additives, etc.
560	100	Clst: olv gry med dk gry, sft, amor, stky, slty – sdy, calc – v calc, mafic min, mica, occ glauc	
	Tr	Sd: lse Qtz, clr - trnsl, v f – med, occ crs, sbang – sbrndd, pr srt	
570	a.a.		
580	a.a.		
590	100	Clst: lt olv gry – med gry, else a.a.	
	Tr	Sd: a.a.	
600	a.a.		
610	a.a.		
620	100	Clst a.a., Tr mica, xln Calc, rr Tr foss frags, slily calc-calc	
	Tr	Sd a.a.	
630	100	Clst a.a.	
	Tr	Sd a.a.	
640	100	Clst a.a.	
	Tr	Sd a.a.	
650	100	Clst med gry- olv gry, decr calc, r foss, foram, shl frags	
	Gd tr	Sd pred clrlss, trnsp, lse Qtz, f-med grn, occ crs grn, sbrndd - sbang, mod - pr srt, w/ com Sst: clrlss, trnsl, v hd, blky, med - crs grn, v w cmt w/sil, com mica + pyr overgrows	
660	100	Clst a.a., incr shl frags	
	Gd tr	Sd a.a., Tr carb Mat.	
670	100	Clst a.a., incr gry-mod gry, no olv gry.	
	Tr	Sd a.a.	
680	100	Clst a.a., lt - mod gry, incr sticky.	
	Tr	Sd a.a., com lithic frags upto v crs grn.	
690	100	Clst lt gry - mod gry, sft, lt gn gry I.P, stky, amor, slty - sdy, slily - non calc, micromic, com dissem glauc, occ v dk gry - blk mafic min, occ shl frags and foss.	
	Tr	Sd a.a., com varic lithic frags upto v crs grn.	
700	100	Clst a.a.	
	Tr	Sd a.a., occ upto v crs grn, trnsl, frosted, lse Qtz	
710	90	Clst a.a. w/ Tr micro foss, pred shl frags	
	10	Sd a.a. pred f - med grn, w/ com crs - v crs lithic frags and Qtz shards	

WELLSITE SAMPLE DESCRIPTION					Page 2 of 23
Country: Norway		Area: Haltenbanken		Field: .Kappa	
Well no: 6507/8-7		Company: Statoil ASA, Petoro AS, Eni Norge AS, Norske ConocoPhillips AS			
RKB: 23 meters		Geologist: Edward Homson, Lars Rasmussen			
Hole size: 17 1/2”		Cut solvent: Iso propanol		Date: 13. – 14. 01.2004	

Depth (m RKB)	Lithology (%)	Lithological Description: Rock name, mod.lith, colour, grain size, sorting, roundness, matrix, cementation, hardness, sed.structures, accessories, fossils, porosity, contamination			Remarks: Show/s, cavings, mud additives, etc.
720	100	Clst	lt gry - mod gry, sft, lt gn gry I.P, stky, amor, slty - sdy, slily - non calc, micromic, com dissem glauc, occ v dk gry - blk mafic min, occ shl frags and foss.		718m gas peak 3.1%
	Tr	Sd	pred clrlss, trnsp, lse Qtz, f-med grn, occ crs grn, sbrndd - sbang, mod - pr srt, w/ com Sst: clrlss, trnsl, v hd, blky, med - crs grn, v w cmt w/sil, com mica + pyr overgrows		
730	100	Clst	a.a.		
	Tr	Sd	pred lithic frags (Meta w/ rare igneous)		
740	100	Clst	a.a.		
	Tr	Sd	a.a.		
750	100	Clst	a.a., occ shl frags + forams (decr content)		
	Tr	Sd	a.a.		
760	100	Clst	a.a., decr fossil content		
	Tr	Sd	a.a.		
770	100	Clst	a.a., non - slily calc		
	Tr	Sd	a.a.		
780	100	Clst	a.a., occ shl frags		
	Tr	Sd	a.a.		
790	100	Clst	a.a., fossil/shl frags incr		
	Tr	Sd	a.a.		
800	100	Clst	a.a.		
	Tr	Sd	a.a.		
810	100	Clst	a.a.		
	Tr	Sd	a.a.		
820	100	Clst	a.a.		
	Tr	Sd	a.a.		
830	100	Clst	a.a., incr calc		
	Tr	Sd	a.a.		
840	100	Clst	a.a.		
	Tr	Sd	a.a.		
850	100	Clst	a.a.		
	Tr	Sd	a.a.		
860	100	Clst	a.a.		
	Tr	Sd	a.a.		
870	100	Clst	a.a.		
	Tr	Sd	a.a.		

STATOIL

WELLSITE SAMPLE DESCRIPTION					Page 3 of 23
Country: Norway		Area: Haltenbanken		Field: .Kappa	
Well no: 6507/8-7		Company: Statoil ASA, Petoro AS, Eni Norge AS, Norske ConocoPhillips AS			
RKB: 23 meters		Geologist: Edward Homson, Lars Rasmussen			
Hole size: 17 1/2”		Cut solvent: Iso propanol		Date: 13. – 14. 01.2004	

Depth (m RKB)	Lithology (%)	Lithological Description: Rock name, mod.lith, colour, grain size, sorting, roundness, matrix, cementation, hardness, sed.structures, accessories, fossils, porosity, contamination	Remarks: Show/s, cavings, mud additives, etc.
880	100 Clst	lt gry – lt gry, lt gn gry, sft, stky, amor, slty – sdy, non – slily calc, micromic, r Tr glauc, occ shl frags + forams	
	Tr Sd	varic Qtz, f – med, occ crs, sbang – ang, occ sbrndd, pr srt, also mafic grns	
890	100 Clst	a.a.	
	Tr Sd	a.a.	
900	100 Clst	a.a.	
	Tr Sd	a.a.	
910	100 Clst	a.a.	
	Tr Sd	a.a.	
920	100 Clst	a.a.	
	Tr Sd	a.a.	
930	100 Clst	a.a.	
	Tr Sd	a.a.	
940	100 Clst	a.a.	
	Tr Sd	a.a.	
950	100 Clst	a.a.	
	Tr Sd	a.a.	
960	100 Clst	a.a.	
	Tr Sd	a.a.	
970	100 Clst	a.a.	
	Tr Sd	a.a.	
980	100 Clst	a.a.	
	Tr Sd	a.a.	
990	100 Clst	a.a.	
	Tr Sd	a.a.	
1000	100 Clst	a.a.	
	Tr Sd	a.a.	
1010	100 Clst	a.a.	
	Tr Sd	a.a.	
1020	100 Clst	a.a.	
	Tr Sd	a.a.	
1030	LOST		
1040	100 Clst	a.a.	
	Tr Sd	a.a.	

STATOIL

WELLSITE SAMPLE DESCRIPTION			Page 4 of 23
Country: Norway	Area: Haltenbanken	Field: .Kappa	
Well no: 6507/8-7	Company: Statoil ASA, Petoro AS, Eni Norge AS, Norske ConocoPhillips AS		
RKB: 23 meters	Geologist: Edward Homson, Lars Rasmussen		
Hole size: 17 1/2"	Cut solvent: Iso propanol	Date: 13. – 14. 01.2004	

Depth (m RKB)	Lithology (%)	Lithological Description: Rock name, mod.lith, colour, grain size, sorting, roundness, matrix, cementation, hardness, sed.structures, accessories, fossils, porosity, contamination	Remarks: Show/s, cavings, mud additives, etc.
1050	100 Clst	lt gry – lt gry, lt gn gry, sft, stky, amor, slty – sdy, non – slily calc, micromic, r Tr glauc, occ shl frags + forams	
	Tr Sd	varic Qtz, f – med, occ crs, sbang – ang, occ sbrndd, pr srt, also mafic grns	
1060	100 Clst	a.a.	
	Tr Sd	a.a.	
1070	100 Clst	a.a.	
	Tr Sd	a.a.	
1080	100 Clst	a.a.	
	Tr Sd	a.a.	
1090	95 Clst	a.a.	
	5 Sd	a.a.	
1100	100 Clst	a.a.	
	Tr Sd	a.a.	
1110	90 Clst	a.a.	
	10 Sd	a.a.	
1120	100 Clst	sft – frm, slily stky, slty – sdy, occ v sdy, else a.a.	
	Tr Sd	a.a.	
1130	100 Clst	a.a., abd glauc	
	Tr Sd	a.a., pred f-med grn lse Qtz, com lith frags	
1140	100 Clst	a.a.	
	Tr Sd	a.a.	
1150	100 Clst	a.a., sponge? frags	
	Tr Sd	a.a. lithic frags tending to be dark in colour	
1160	100 Clst	a.a., r shl frags	
	Tr Sd	a.a., Meta lithic pred psammitic	
1170	100 Clst	a.a., decr glauc	
	Tr Sd	a.a.	
1180	100 Clst	a.a.	
	Tr Sd	a.a.	
1190	100 Clst	a.a., forams and shl frags.	
	Tr Sd	a.a.	
1200	100 Clst	a.a.	
	Tr Sd	a.a.	

Depth (m RKB)	Lithology (%)	Lithological Description: Rock name, mod.lith, colour, grain size, sorting, roundness, matrix, cementation, hardness, sed.structures, accessories, fossils, porosity, contamination	Remarks: Show/s, cavings, mud additives, etc.
1210	100 Clst	lt gry – lt gry, lt gn gry, sft, stky, amor, slty – sdy, non – slily calc, micromic, r Tr glauc, occ shl frags + forams	
	Tr Sd	varic Qtz, f – med, occ crs, sbang – ang, occ sbrndd, pr srt, also mafic grns, incr lithic frags	
1220	100 Clst	a.a., occ r glauc, v r Tr gry brn, sft, crmbly amor Sltst	
	Tr Sd	a.a., incr lithic frags	
1230	90 Clst	a.a., incr glauc	
	10 Sd	a.a., lithics, dark, f grn, vol to psammitic metam + poss igneous	
1240	40 Clst	lt-med gry, lt gn gry I.P, sft, stky, amor, slty - sdy, slily - non calc, Tr glauc nod, micromic I.P, com microfoss foram’s, ostracods, shl frags	
	60 Sd	clrlss, pa gn, pa orng stn, trnsp, occ trnsl, lse Qtz, f-med grn, com crs-v crs grn, sbang - w rnd, mod - hi sph, mod srt, no vis cmt, pr - mod inf por, com crs - v crs varic lithic frags + Qtz shards.	
1250	80 Clst	a.a., Tr ostracodes, spikules?	
	20 Sd	a.a.	
1260	90 Clst	a.a., abd foss frags.	
	10 Sd	a.a.	
1270	100 Clst	a.a.	
	Tr Sd	a.a.	
1280	90 Clst	a.a., com shl frags dom foss	
	10 Sd	a.a. pred lse Qtz, f-med grn, occ crs - v crs grn	
1290	100 Clst	a.a.	
	Tr Sd	a.a.	
1300	100 Clst	a.a., decr shl frags	
	Tr Sd	a.a.	
1310	100 Clst	a.a., r Tr brn, sft, crmb Sltst	
	Tr Sd	a.a.	
1320	100 Clst	a.a., r Tr pyr	
	Tr Sd	a.a.	
1330	100 Clst	a.a.	
	Tr Sd	a.a.	
1340	100 Clst	a.a.	
	GTr Sd	a.a., incr lith frags	
1350	90 Clst	a.a.	
	10 Sd	a.a., pred f – med lse Qtz	

WELLSITE SAMPLE DESCRIPTION				Page 6 of 23
Country: Norway	Area: Haltenbanken		Field: .Kappa	
Well no: 6507/8-7	Company: Statoil ASA, Petoro AS, Eni Norge AS, Norske ConocoPhillips AS			
RKB: 23 meters	Geologist: Edward Homson, Lars Rasmussen			
Hole size: 17 1/2"	Cut solvent: Iso propanol		Date: 14.01.2004	

Depth (m RKB)	Lithology (%)	Lithological Description: Rock name, mod.lith, colour, grain size, sorting, roundness, matrix, cementation, hardness, sed.structures, accessories, fossils, porosity, contamination			Remarks: Show/s, cavings, mud additives, etc.
1360	100	Clst	gry – med gry, gn gry i.p., sft, stky, amor, slty, sdy, non – slily calc, Tr glauc, com microfoss/shl frags, mica i.p.		
	Gd tr	Sd	clr – trnsl, pa yel – brn, orng, gn lse Qtz, f – med, occ crs – v crs, sbang – rndd, mod sph, mod srt, no vis cmt, mod – inf por, com crs – v crs, occ gran varic lithic frags of Qtz		
1370	90	Clst	a.a.		
	10	Sd	a.a.		
1380	100	Clst	a.a.		
	Gd tr	Sd	a.a.		
1390	100	Clst	a.a.		
	Gd tr	Sd	a.a.		
1400	100	Clst	a.a.		
	Gd tr	Sd	a.a.		
1410	100	Clst	a.a., Tr pyr		
	Gd tr	Sd	a.a.		
1420	100	Clst	a.a.		
	Gd tr	Sd	a.a.		
1430	70	Clst	a.a.		
	30	Sd	a.a.		
1440	70	Clst	a.a., decr calc		
	30	Sd	a.a.incr lithic frags		
1450	100	Clst	a.a.		1453/1454 m gas peak 5.3%(at bottom of stand poss swab gas)
	Gd tr	Sd	a.a., pred lithic frags		
1460	100	Clst	olv gry – med gry, sft – frm, slily stky, amor – sbblky, slty – v f sdy, micromic, Tr microglauc, Tr mafic min, Tr micropyr, non – slily calc		
	Tr	Sd	lse clr – trnsl Qtz, v f – f, occ med – crs, sbang – sbrndd, Tr Qtz cmt Sst		
1470	100	Clst	a.a.		
	Tr	Sd	a.a.		
1480	100	Clst	a.a.		
	Tr	Sd	a.a.		
1490	100	Clst	a.a.		
	Tr	Sd	a.a.		
1500	100	Clst	a.a.		
	Tr	Sd	a.a.		

Depth (m RKB)	Lithology (%)	Lithological Description: Rock name, mod.lith, colour, grain size, sorting, roundness, matrix, cementation, hardness, sed.structures, accessories, fossils, porosity, contamination	Remarks: Show/s, cavings, mud additives, etc.
1510	100 Clst	olv gry – med gry, sft – frm, slily stky, amor – sbblky, slty – v f sdy, micromic, Tr microglauc, Tr mafic min, Tr micropyr, non – slily calc	
	Tr Sd	lse clr – trnsl Qtz, v f – f, occ med – crs, sbang – sbrndd, Tr Qtz cmt Sst	
		TD for 17 ½" hole section at 1510 mMD RKB	
1520	100 Clst	olv gry – med gry, sft – frm, stky, amor – sbblky, slty – v f sdy, micromic, Tr microglauc, Tr micropyr, Tr microcarb, slily – mod calc	
	Gd tr Sd	clr – trnsl Qtz, v f – f, occ med – crs, sbang – sbrndd, occ rnd, lse	
1530	100 Clst	a.a.	
1540	100 Clst	v glauc i/p, else a.a.	
	Sl tr Sd	a.a.	
1550	100 Clst	incr micropyr, else a.a.	
	Tr Sd	a.a.	
1560	100 Clst	a.a.	
	Tr Sd	a.a.	
1570	100 Clst	v glauc, else a.a.	
1580	100 Clst	mod – v calc, else a.a.	
1590	100 Clst	a.a.	
1600	100 Clst	a.a.	
1610	100 Clst	a.a.	
1620	100 Clst	v spkld w/ glauc, incr sdy, else a.a.	
1630	100 Clst	a.a.	
	Tr Sd	v f – f, else a.a.	
1640	a.a.		
1650	a.a.		
1660	a.a.		
1670	a.a.		
1680	100 Clst	a.a.	
	Tr Ls	yelsh gry, mdst, sft, crpxln-microxln, arg, occ micropyr	

Depth (m RKB)	Lithology (%)	Lithological Description: Rock name, mod.lith, colour, grain size, sorting, roundness, matrix, cementation, hardness, sed.structures, accessories, fossils, porosity, contamination	Remarks: Show/s, cavings, mud additives, etc.
1690	100 Clst	olv gry – med gry, sft – frm, stky, amor – sbblky, slty – v f sdy, micromic, Tr microglauc, Tr micropyr, Tr microcarb, slily – mod calc	
	Tr Ls	yelsh gry, mdst, sft, crpxln-microxln, arg, occ micropyr	
1700	100 Clst	also brnsh gry, else a.a.	
	Tr Ls	a.a.	
1710	a.a.		
1720	a.a.		
1730	a.a.		
1740	100 Clst	slily glauc – occ v glauc, slty, else a.a.	
	Gd tr Ls	a.a.	
1750	100 Clst	brnsh gry – occ olv gry, sft – frm, stky, amor – sbblky, slty, occ micropyr, occ slily glauc, occ micromic, pred v calc grad arg Ls	
1760	100 Clst	a.a.	
	Tr Ls	yelsh gry – lt gnsh gry – lt olv gry, sft, mdst, crp-microxln, arg, occ micropyr	
1770	100 Clst	incr glauc, else a.a.	
	GdTr Ls	a.a.	
1780	100 Clst	pred brnsh gry, slily – mod calc, else a.a.	
	Tr Ls	a.a.	
1790	100 Clst	brnsh gry, else a.a.	
	Tr Ls	a.a.	
1800	a.a.		
1810	100 Clst	a.a.	
1820	100 Clst	brn gry – brn blk, sft – occ frm, sbblky, glauc, none – slily calc, slty, occ slily stky	
1830	a.a.		
1840	100 Clst	mnly brn gry, slty – occ v f sdy, else a.a.	
1850	a.a.		
1860	100 Clst	less glauc, else a.a.	
1870	100 Clst	also lt gn gry, micromic i.p., else a.a.	
1880	100 Clst	gn gry – dk gn gry, brn gry, frm – occ mod hd, sbblky, slily micromic, glauc i.p., slty i.p., micropyr, none calc	

Country: Norway	Area: Haltenbanken	Field: .Kappa
Well no: 6507/8-7	Company: Statoil ASA, Petoro AS, Eni Norge AS, Norske ConocoPhillips AS	
RKB: 23 meters	Geologist: Lars Rasmussen, Tore Klungsøyr, Jon Kristian Hansen	
Hole size: 12 1/4"	Cut solvent: Iso propanol	Date: 19.01.2004

Depth (m RKB)	Lithology (%)	Lithological Description: Rock name, mod.lith, colour, grain size, sorting, roundness, matrix, cementation, hardness, sed.structures, accessories, fossils, porosity, contamination	Remarks: Show/s, cavings, mud additives, etc.
1890	100 Clst	gn gry – dk gn gry, brn gry, frm – occ mod hd, sbblky, slily micromic, glauc i.p., slty i.p., micropyr, none calc	
1900	a.a.		
1910	100 Clst	gn gry – occ dk gn gry, med dk gry, occ brn gry (cvgs?), frm – occ mod hd, sbblky – blky, slily micromic, microglauc, micropyr, slty, non calc	
1920	100 Clst	a.a.	
	Tr Ls	pa yel gry – yel gry, frm – mod hd, blky, cryptoxln, slily arg	
1930	100 Clst	a.a.	
	Tr Ls	also wh, else a.a.	
1940	100 Clst	gn gry, occ med dk gry, frm – occ mod hd, sbblky – blky, slily micromic, microglauc i.p., micropyr, non calc	
	Tr Ls	pa yel orng gry – yel gry, wh, frm – mod hd, blky, cryptoxln, slily arg	
1950	a.a.		
1960	a.a.		
1970	100 Clst	also brn blk, else a.a.	
	Tr Ls	a.a.	
1980	100 Clst	incr. brn blk, else a.a.	
	Tr Ls	a.a.	
1990	100 Clst	gn gry, med dk gry, brn gry – brn blk, else a.a.	
	Tr Ls	a.a.	
2000	100 Clst	also gry brn, else a.a.	
	Tr Ls	mnly wh, else a.a.	
2010	100 Clst	occ blk spks of Tf in gn gry Clst, else a.a.	
	Tr Ls	a.a.	
2020	a.a.		
2030	100 Clst	blk and wh Tf spks in gn gry and med dk gry Clst, else a.a.	
	Tr Ls	a.a.	
2040	a.a.		
2050	100 Clst	less tuffitic, else a.a.	
	Tr Ls	a.a.	
2060	100 Clst	lt gn gry – gn gry, med dk gry, brn gry, frm – occ mod hd, microglauc i.p., micropyr, non calc	
	Tr Ls	wh – occ yel gry, frm – mod hd, blky, cryptoxln, slily arg	

WELLSITE SAMPLE DESCRIPTION				Page 10 of 23
Country: Norway	Area: Haltenbanken		Field: .Kappa	
Well no: 6507/8-7	Company: Statoil ASA, Petoro AS, Eni Norge AS, Norske ConocoPhillips AS			
RKB: 23 meters	Geologist: Lars Rasmussen, Tore Klungsøyr, Jon Kristian Hansen			
Hole size: 12 1/4"	Cut solvent: Iso propanol		Date: 19.01.2004	

Depth (m RKB)	Lithology (%)	Lithological Description: Rock name, mod.lith, colour, grain size, sorting, roundness, matrix, cementation, hardness, sed.structures, accessories, fossils, porosity, contamination	Remarks: Show/s, cavings, mud additives, etc.
2070	100 Clst	lt gn gry – gn gry, med dk gry, occ Tf, frm – occ mod hd, microglauc i.p., micropyr, non calc	
	Tr Ls	wh – occ yel gry, frm – mod hd, blky, cryptoxln, slily arg	
2080	100 Clst	no Tf, else a.a.	
	Tr Ls	a.a.	
2090	a.a.		
2100	a.a.		
2110	100 Clst	lt gn gry – gn gry, med dk gry – dk gry, else a.a.	
2120	100 Clst	gnsh gry – dk gnsh gry, med dk gry – dk gry, blky – sbblky, frm – occ mod hd, occ slily microglauc, occ micropyr, non calc	
	Tr Ls	wh – yelsh gry, mod or pnk, mdst, sft, crypto- to microxln, arg	
2130	100 Clst	gnsh gry – dk gnsh gry, med dk gry – dk gry, blky – sbblky, frm – occ mod hd, occ slily microglauc, occ micropyr, non calc	
	Tr Ls	wh – yelsh gry, mod or pnk, mdst, sft, crypto- to microxln, arg	
2140	100 Clst	a.a.	
	Tr Ls	a.a.	
	Tr	Pyr	
2150	100 Clst	gnsh gry – dk gnsh gry, med dk gry – dk gry, a.a.	
	Tr Clst	mod brn, frm – occ mod hd, sbblky, slily slty, non calc	
	Tr Ls	a.a.	
	Tr	Pyr	
2160	90 Clst	gnsh gry – dk gnsh gry, med dk gry – dk gry, a.a.	
	10 Clst	mod brn, a.a.	
	Tr Ls	a.a.	
	Tr	Pyr, Glauc	
2170	100 Clst	gnsh gry – dk gnsh gry, med dk gry – dk gry, a.a..	
	Tr Clst	mod brn, a.a.	
2180	100 Clst	gnsh gry – dk gnsh gry, med dk gry – dk gry, blky – sbblky, frm – occ mod hd, occ slily microglauc, occ micropyr, non calc	
2190	a.a.		
2200	100 Clst	a.a.	
	Tr Ls	a.a.	
2210	100 Clst	a.a.	
	Tr Ls	a.a.	
	Tr	Pyr	
2220	100 Clst	a.a.	

WELLSITE SAMPLE DESCRIPTION				Page 11 of 23
Country: Norway	Area: Haltenbanken		Field: .Kappa	
Well no: 6507/8-7	Company: Statoil ASA, Petoro AS, Eni Norge AS, Norske ConocoPhillips AS			
RKB: 23 meters	Geologist: Lars Rasmussen, Tore Klungsøyr, Jon Kristian Hansen			
Hole size: 12 1/4"	Cut solvent: Iso propanol		Date: 19.01.2004	

Depth (m RKB)	Lithology (%)	Lithological Description: Rock name, mod.lith, colour, grain size, sorting, roundness, matrix, cementation, hardness, sed.structures, accessories, fossils, porosity, contamination		Remarks: Show/s, cavings, mud additives, etc.
2230	100	Clst	gnsh gry – dk gnsh gry, med dk gry – dk gry, blky – sbblky, frm – occ mod hd, occ slily microglauc, occ micropyr, non calc	
2240	100	Clst	a.a.	
	Tr	Ls	wh – yelsh gry, mod or pnk, mdst, sft, crypto- to microxln, arg	
2250	100	Clst	med dk gry – dk gry, occ slily carb, else a.a.	
	Tr	Ls	a.a.	
2260	a.a.			
2270	a.a.			
2280	a.a.			
2290	90	Clst	a.a.	
	10	Ls	wh – yelsh wh, grysh or, mdst, sft - frm, occ mod hd, cryptoxln, occ slily carb	
2300	90	Clst	gnsh gry, med dk gry – dk gry, blky – sbblky, frm – occ mod hd, occ slily microglauc, occ micropyr, occ slily carb, non calc	
	10	Ls	wh – yelsh wh, grysh or, mdst, sft - frm, occ mod hd, cryptoxln, occ slily carb	
	Tr		Pyr	
2310	100	Clst	a.a.	
	Gd tr	Ls	a.a.	
2320	a.a.			
2330	100	Clst	a.a.	
	Gd tr	Ls	a.a.	
	Sl tr	Sd	lse clr – trnsl Qtz grns, v f – f, sbang – sbrndd	
2340	a.a.			
2350	a.a.			
2360	100	Clst	a.a.	
	Tr	Ls	a.a.	
	Tr	Sd	a.a.	
	Tr		Pyr	
2370	100	Clst	a.a.	
	Tr	Ls	a.a.	
2380	100	Clst	a.a.	
	Tr	Ls	a.a.	
2390	a.a.			

Country: Norway	Area: Haltenbanken	Field: .Kappa
Well no: 6507/8-7	Company: Statoil ASA, Petoro AS, Eni Norge AS, Norske ConocoPhillips AS	
RKB: 23 meters	Geologist: Lars Rasmussen, Tore Klungsøyr, Jon Kristian Hansen	
Hole size: 12 1/4"	Cut solvent: Iso propanol	Date: 19.01.2004

Depth (m RKB)	Lithology (%)	Lithological Description: Rock name, mod.lith, colour, grain size, sorting, roundness, matrix, cementation, hardness, sed.structures, accessories, fossils, porosity, contamination	Remarks: Show/s, cavings, mud additives, etc.
2400	100	Clst	gnsh gry, med dk gry – dk gry, blky – sbblky, frm – occ mod hd, occ slily microglauc, occ micropyr, occ slily carb, non calc
	Tr	Ls	wh – yelsh wh, grysh or, mdst, sft - frm, occ mod hd, cryptoxln, occ slily carb
	Sl tr	Sd	lse clr – trnsl Qtz grns, v f – f, sbang – sbrndd occ med – crs
2403	95	Clst	a.a.
	5	Ls	a.a.
	Tr	Sd	a.a.
	Sl tr		Pyr
2406	LOST		
2409	100	Clst	med dk gry – gnsh grey, else a.a.
	Tr	Ls	micro – cryptoxln, else a.a.
2412	100	Clst	a.a.
	Gd tr	Ls	a.a.
	Tr		Glauc
2415	a.a.		
2418	a.a.		
2421	a.a.		
2424	100	Clst	med dk gry - gnsh gry, blky – sbblky, frm – occ mod hd, occ slily microglauc, occ micropyr, occ slily carb, non calc
	Tr	Ls	wh – yelsh wh, grysh or, mdst, sft - frm, occ mod hd, micro-cryptoxln, occ slily carb
	Tr	Sd	lse clr – trnsl Qtz grns, v f – f, occ med – crs, sbang – sbrndd
	Tr		Glauc
2427	a.a.		
2430	LOST		
2433	a.a.		
2436	a.a.		
2439	a.a.		
2442	70	Ls	lt olv gry – gnsh gry, yelsh gry, microxln, frm – occ mod hd, arg – v arg grad Mrl, occ microglauc, slty – v f sdy i.p.
	30	Clst	a.a.
2445	80	Ls/Mrl	a.a.
	20	Clst	a.a.
2448	a.a.		

Country: Norway	Area: Haltenbanken	Field: .Kappa	
Well no: 6507/8-7	Company: Statoil ASA, Petoro AS, Eni Norge AS, Norske ConocoPhillips AS		
RKB: 23 meters	Geologist: Lars Rasmussen, Tore Klungsøyr, Jon Kristian Hansen		
Hole size: 12 1/4"	Cut solvent: Iso propanol	Date: 19.01.2004	

Depth (m RKB)	Lithology (%)	Lithological Description: Rock name, mod.lith, colour, grain size, sorting, roundness, matrix, cementation, hardness, sed.structures, accessories, fossils, porosity, contamination	Remarks: Show/s, cavings, mud additives, etc.
2451	90 Ls/Mrl	, lt olv gry – gnsh gry, yelsh gry, also gry brn – mod brn, micromic, microxln, frm – occ mod hd, arg – v arg, occ microglauc, slty – v f sdy i.p.	
	10 Clst	med dk gry - gnsh gry, blky – sbblky, frm – occ mod hd, occ slily microglauc, occ micropyr, occ slily carb, non calc	
2454	100 Ls/Mrl	a.a.	
	Tr Clst	a.a.	
2457	a.a.		
2460	95 Ls/Mrl	a.a.	
	5 Clst	med dk gry – dk gry, frm – mod hd, sbblky – blky, micromic, non calc	
2463	a.a.		
2466	100 Ls/Mrl	micropyr i.p., else a.a.	
	Tr Clst	a.a.	
2469	100 Ls/Mrl	a.a.	
2472	a.a.		
2475	a.a.		
2478	100 Ls/Mrl	predom med dk gry – dk gry, else a.a.	
2481	100 Calc Clst	med dk gry – dk gry, Tr gry brn, frm – occ sft, stky, slty micromic i.p., calc – v calc	
2484	100 Calc Clst	a.a.	
	Gd tr Ls	lt gry – yel gry, blky, frm, sdy, arg, microxln	dk yel, fluor from Ls
2487	a.a.		
2490	a.a.		
2493	LOST		
2496	100 Clst	med dk gry – dk gry, gry brn, sft – frm, stky, slty, none – slily calc, micromic i.p.	
	Gd tr Ls	a.a.	
2499	a.a.		
2502	100 Clst	also olv gry, else a.a.	
	Gd tr Ls	a.a.	
2505	a.a.		

WELLSITE SAMPLE DESCRIPTION					Page 14 of 23
Country: Norway		Area: Haltenbanken		Field: .Kappa	
Well no: 6507/8-7		Company: Statoil ASA, Petoro AS, Eni Norge AS, Norske ConocoPhillips AS			
RKB: 23 meters		Geologist: Lars Rasmussen, Tore Klungsøyr, Jon Kristian Hansen			
Hole size: 12 1/4"		Cut solvent: Iso propanol		Date: 19.01.2004	

Depth (m RKB)	Lithology (%)	Lithological Description: Rock name, mod.lith, colour, grain size, sorting, roundness, matrix, cementation, hardness, sed.structures, accessories, fossils, porosity, contamination	Remarks: Show/s, cavings, mud additives, etc.
2508	100 Clst	med dk gry – dk gry, gry brn, sft – frm, stky, slty, none – slily calc, micromic i.p.	
	Gd tr Ls	lt gry – yel gry, blky, frm, sdy, arg, microxln	
2511	a.a.		
2514	100 Clst	not stky, slily calc – calc, else a.a.	
	Tr Ls	a.a.	
2517	a.a.		
2520	100 Clst	a.a.	
	Tr Ls	a.a.	
	Tr	Pyr	
2523	100 Clst	mnly gry brn, else a.a.	
	Tr Ls	a.a.	
2526	100 Clst	none – slily calc, else a.a.	
	Tr Ls	a.a.	
2529	100 Clst	gry brn – mod brn, also med dk gry – dk gry, olv gry, frm, sbblky – blky, slily slty, occ microglauc, none – slily calc	only yel min fluor from Ls
	Tr Ls	lt gry – occ yel gry, blky, frm, slty – occ v f sdy	
2532	a.a.		
2535	a.a.		
2538	a.a.		
2541	a.a.		
2544	a.a.		
2547	LOST		
2550	LOST		
2553	a.a.		
2556	a.a.		
2559	a.a.		
2562	a.a.		
2565	a.a.		
2568	100 Clst	predom med dk gry – dk gry, olv gry, frm – occ mod hd, sbblky – blky, slily slty, micromic, slily calc	only min fluor from Ls
	Tr Ls	a.a.	

Depth (m RKB)	Lithology (%)	Lithological Description: Rock name, mod.lith, colour, grain size, sorting, roundness, matrix, cementation, hardness, sed.structures, accessories, fossils, porosity, contamination	Remarks: Show/s, cavings, mud additives, etc.
2571	100 Clst	predom med dk gry – dk gry, olv gry, frm – occ mod hd, sbblky – blky, slily slty, micromic, micropyr, slily calc	
	Tr Ls	lt gry – occ yel gry, blky, frm, slty – occ v f sdy	
2574	a.a.		
2577	a.a.		
2580	95 Clst	a.a.	
	5 Ls	a.a.	
2583	LOST		
2586	90 Clst	a.a.	
	10 Ls	a.a.	
2589	LOST		
2592	a.a.		
2595	LOST		
2598	100 Clst	sft – frm, else a.a.	
	Tr Ls	a.a.	
2601	100 Clst	micropyr i.p., else a.a.	
	Tr Ls	a.a.	
2604	100 Clst	predom med dk gry – dk gry, olv gry, sft - frm, sbblky – blky, slily slty, micromic, micropyr i.p., slily calc	
	Tr Ls	a.a.	
2607	90 Clst	a.a.	
	10 Ls	a.a.	
2610	a.a.		
2613	95 Clst	also gry brn – mod brn, else a.a.	
	5 Ls	a.a.	
2616	a.a.		
2619	90 Clst	a.a.	
	10 Ls	a.a.	
2622	95 Clst	mod brn – gry brn, also med dk gry – dk gry, sft – frm, sbblky – blky, slily slty, micromic, micropyr i.p., slily calc – calc	
	5 Ls	a.a.	

Depth (m RKB)	Lithology (%)	Lithological Description: Rock name, mod.lith, colour, grain size, sorting, roundness, matrix, cementation, hardness, sed.structures, accessories, fossils, porosity, contamination	Remarks: Show/s, cavings, mud additives, etc.
2625	95	Clst	mod brn – gry brn, occ med dk gry – dk gry, sft, stky, sbblky, slty, micromic, micropyr, calc – v calc grad Mrl/Calc Clst
	5	Ls	lt gry – occ yel gry, blky, frm, slty – occ v f sdy
2628	a.a.		
2631	LOST		
2634	a.a.		
2637	70	Calc Clst	a.a.
	30	Ls	wh – lt gry, else a.a.
2640	80	Ls	wh – lt gry, blky, frm – mod hd, micropyr i.p., slily arg i.p.
	20	Calc Clst	a.a.
2643	95	Ls	micropyr, else a.a.
	5	Calc Clst	a.a.
2646	a.a.		
2649	80	Clst	gry blk – dk gry, frm – mod hd, blky, micromic, slily fiss, micromic, micropyr, non calc
	15	Ls	a.a.
	5	Calc Clst	a.a.
2652	100	Clst	a.a.
	Tr	Ls	a.a.
2655	a.a.		
2658	100	Clst	a.a.
2661	100	Clst	occ med dk gry, else a.a
2664	a.a.		
2667	100	Clst	gry blk – dk gry only, else a.a.
2670	a.a.		
2673	100	Clst	olv blk, dk gry, frm – mod hd, blky – fiss, com slty, micropyr, slily micromic, non – occ mod calc
	Tr	Ls	pred wh, mod hd – hd, microxln – cryptoxln
2676	a.a.		
2679	100	Clst	a.a.
	Tr	Ls	Also lt gnsh gry, yelsh gry, occ sdy/slty, slily arg
2682	a.a.		

Depth (m RKB)	Lithology (%)	Lithological Description: Rock name, mod.lith, colour, grain size, sorting, roundness, matrix, cementation, hardness, sed.structures, accessories, fossils, porosity, contamination	Remarks: Show/s, cavings, mud additives, etc.
2682	100 Clst	olv blk, dk gry, frm – mod hd, blky – fiss, com slty, micropyr, slily micromic, non – occ mod calc	
	Tr Ls	wh – lt gry, also lt gnsh gry, yelsh gry, blky, frm – mod hd, micropyr i.p., occ sdy/slty, slily arg	
2685	a.a.		
2688	a.a.		
2691	a.a.		
2694	100 Clst	pred non calc – occ slily calc, else a.a.	
2697	a.a.		
2700	a.a.		
2703	a.a.		
2706	100 Clst	a.a.	
	Tr Ls	pred wh, mod hd, cryptoxln	
2709	a.a.		
2712	100 Clst	olv blk – brnsh blk, else a.a.	
	Tr Ls	a.a.	
2715	a.a.		
2718	100 Clst	pred olv blk, dk gry, frm – mod hd, blky – fiss, com slty, micropyr, slily micromic, non – mod calc	
	Tr Ls	wh – occ , yelsh gry , mod hd, cryptoxln, occ slily arg	
2721	a.a.		
2724	a.a.		
2727	a.a.		
2730	a.a.		
2733	a.a.		
2736	100 Clst	a.a.	
2737	100 Clst	a.a.	
	Gd tr Sd	clr – trnsl Qtz grns, lse, v f grad slt, sbang – sbrndd	
	Sl tr Pyr		
		BASE OF 12 ¼ " HOLE SECTION AT 2737 mMD RKB; SECTION TD IN SPEKK FM.	

STATOIL

WELLSITE SAMPLE DESCRIPTION

Country:	Norway	Area:	Haltenbanken	Field:	Kappa
Well no:	6507/8-7	Company:	Statoil ASA, Petoro AS, Eni Norge AS, Norske ConocoPhillips AS		
RKB:	23 meters	Geologist:	T. Bjørgen, C. Jebsen, T. F. Kristensen		
Hole size:	8 1/2”	Cut solvent:	Iso Propyl Alcohol	Date:	24.01.2004

Depth (m RKB)	Lithology (%)	Lithological Description: Rock name, mod.lith, colour, grain size, sorting, roundness, matrix, cementation, hardness, sed.structures, accessories, fossils, porosity, contamination	Remarks: Shows, cavings, mud additives, etc.
2739	100 Clst	brn blk – dsky yel brn, frm – mod hd, sbblky, carb, micropyr, met lstr, slty i.p., occ slily sdy, micromic i.p., non calc	Sample contam with cavings / cuttings from 12 ¼” section. No fluor, weak blooming – v slow stream bl wh cut fluor
2742	100 Clst	brn blk – olv blk, sft – frm, sbblky – fiss, micropyr, met lstr, non calc, occ carb frags	a.a
2745	100 Clst	a.a.	a.a
2751	100 Clst	a.a.	
2754	100 Clst	dk gry – grysh blk, blky – sbfiss, sft – frm, micropyr, occ micomic, occ carb frag, non calc, occ slty	
	Sl tr Ls	lt gry, v lt gry, sft, amor - micr	
2757	a.a.	also bec slty	
2760	a.a.	non slty	
2763	a.a.	bec slty, occ olv gry – brnish blk	
2766	100 Clst	pred olv gry, else a.a.	
2769	a.a.		
2772	a.a.		
2775	a.a.	bec slily slty	
2778	95 Clst	a.a. also dk gry – grysh blk	
	5 Ls	yel gry, sft – frm, blky, arg lam, micr	
2781	80 Clst	occ slty, occ sdy , occ slily calc, gen non calc	
	20 Ls	a.a.	
2784	60 Clst	pred dk gry – grysh blk, occ v slty, occ sdy, micropyr, micromic, occ carb frag	
	40 Ls	a.a.	
2787	70 Clst	a.a.	
	30 Ls	occ Tr ooliths, else a.a.	
2790	70 Clst	a.a.	
	30 Ls	a.a.	
	Tr Pyr		

STATOIL

WELLSITE SAMPLE DESCRIPTION			Page 19 of 23
Country: Norway	Area: Haltenbanken	Field: Kappa	
Well no: 6507/8-7	Company: Statoil ASA, Petoro AS, Eni Norge AS, Norske ConocoPhillips AS		
RKB: 23 meters	Geologist: T. Bjørgen, C. Jebsen, T. F. Kristensen		
Hole size: 8 1/2”	Cut solvent: Iso Propyl Alcohol	Date: 24.01.2004	

Depth (m RKB)	Lithology (%)		Lithological Description: Rock name, mod.lith, colour, grain size, sorting, roundness, matrix, cementation, hardness, sed.structures, accessories, fossils, porosity, contamination	Remarks: Shows, cavings, mud additives, etc.
2793	70	Clst	dk gry – gry blk, frm – mod hd, sbblky – blky, slty – occ v slty, occ sdy, micromic, carb, micropyr, non calc	No shows
	30	Ls	yel gry – med gry, sft – frm, micr, slily arg – arg	
	Abd	Pyr	washed out from clst	
2796	a.a.			a.a.
2799	100	Clst	dk gry – gry blk, frm – mod hd, sbblky – blky, slty – occ v slty, occ sdy, micromic, carb, micropyr, non calc	a.a.
	Tr	Ls	yel gry – med gry, sft – frm, micr, slily arg – arg	
	Abd	Pyr		
2802	100	Clst	dk gry – gry blk, sft – mod hd, sbblky – blky, slty – v slty, sdy – occ v sdy, loc grad Sst, micromic, micropyr – pyr, carb i.p., non calc	a.a.
	Tr	Ls	a.a.	
	Tr	Sst	med gry, clr - trnsl Qtz, v f, Tr f, wl srt, sbang – sbrndd, lse – occ fri, Tr wk calc cmt	
	Tr	Pyr		
2805	70	Clst	a.a.	a.a.
	20	Ls	yel gry – med gry, sft – frm, micr, slily arg – arg	
	10	Sst	clr – trnsl Qtz, v f, Tr f, wl srt, sbang – sbrndd, lse – occ fri, Tr wk calc cmt	
	Tr	Pyr	abd, washed out from clst	
2808	60	Clst	olv gry i.p., else a.a.	a.a.
	20	Ls	a.a.	
	20	Sst	a.a.	
	Tr	Pyr		
2811	90	Clst	olv gry – dk gry – gry blk, sft – mod hd, amor – blky, slty – v slty, sdy – v sdy, loc grad v arg Sst, micromic, micropyr – pyr, carb i.p., none – occ mod calc	a.a.
	10	Ls	a.a.	
	Gd tr	Sst	a.a.	
	Tr	Pyr		
2814	a.a.			
2817	a.a.			
2820	80	Clst	a.a.	No shows
	10	Ls	a.a.	
	10	Sst	clr – trnsl Qtz, v f, occ med, wl srt, sbang – rndd, lse	
2823	50	Sst	clr – trnsl Qtz, f – med, wl srt, sbang – sbrndd, lse, ex vis por	a.a.
	50	Clst	pred dk gry, olv gry, frm – mod hd, sbblky – blky, slty, sdy, micromic, occ slily carb, non calc	
	Tr	Mica		

STATOIL

WELLSITE SAMPLE DESCRIPTION			Page 20 of 23
Country: Norway	Area: Haltenbanken	Field: Kappa	
Well no: 6507/8-7	Company: Statoil ASA, Petoro AS, Eni Norge AS, Norske ConocoPhillips AS		
RKB: 23 meters	Geologist: T. Bjørgen, C. Jebsen, T. F. Kristensen		
Hole size: 8 1/2”	Cut solvent: Iso Propyl Alcohol	Date: 24.01.2004	

Depth (m RKB)	Lithology (%)		Lithological Description: Rock name, mod.lith, colour, grain size, sorting, roundness, matrix, cementation, hardness, sed.structures, accessories, fossils, porosity, contamination	Remarks: Shows, cavings, mud additives, etc.
2826	70	Sst	clr – trnsl Qtz, f – med, pred f, wl srt, sbang – sbrndd, lse, ex vis por	No shows
	30	Clst	pred dk gry, olv gry, frm – mod hd, sbblky – blky, slty, sdy, micromic, occ slily carb, non calc	
	Tr	Mica		
2829	100	Sst	clr – trnsl Qtz, occ mlky Qtz, f – crs, Tr v crs, mod srt, sbang – rndd, lse, ex vis por	a.a.
	Tr		Clst, Ls, Mica, Pyr	
2832	100	Sst	clr – trnsl Qtz, occ mlky Qtz, f – crs, Tr v crs, mod srt, sbang – rndd, lse, ex vis por	a.a.
	Sl tr		Mica, Pyr, Clst	
2835	100	Sst	clr – trnsl Qtz, Tr pk trnsl Qtz, pred f – med, Tr crs, wl srt, sbang – rndd, lse, ex vis por	a.a.
	Sl tr		Mica, Pyr, Clst	
2838	100	Sst	med – crs, Tr f, Tr v crs, else a.a.	a.a.
	Sl tr		Mica, Pyr, Clst	
2841	100	Sst	clr – trnsl Qtz, f – v crs, pr srt, sbang – sbrndd, lse – occ fri, Tr sil cmt, Tr lt gry arg mtrx, ex vis por	a.a.
	Sl tr		Mica, Pyr, Clst	
2844	LOST			
2847	LOST			
2850	LOST			
2853	LOST			
2856	LOST			
2861	LOST			
2862	100	Sst	clr – trnsl Qtz, v f – crs, occ v crs, pr srt, sbang – sbrndd, lse, occ fri – hd, Tr sil cmt, Tr lt gry arg mtrx, gd – ex vis por	a.a.
	Abd	Mica		
2865	LOST			
2868	LOST			
2871	LOST			
2874	100	Sst	clr – trnsl Qtz, Tr pk trnsl Qtz, v f – v crs, pr srt, sbang – sbrndd, lse – occ fri, Tr sil cmt, gd vis por	a.a.
	Abd	Mica		
	Tr	Pyr		
2877	a.a.			

STATOIL

WELLSITE SAMPLE DESCRIPTION

Country: Norway	Area: Haltenbanken	Field: Kappa
Well no: 6507/8-7	Company: Statoil ASA, Petoro AS, Eni Norge AS, Norske ConocoPhillips AS	
RKB: 23 meters	Geologist: T. Bjørgen, C. Jebsen, T. F. Kristensen	
Hole size: 8 1/2”	Cut solvent: Iso Propyl Alcohol	Date: 24.01.2004

Depth (m RKB)	Lithology (%)	Lithological Description: Rock name, mod.lith, colour, grain size, sorting, roundness, matrix, cementation, hardness, sed.structures, accessories, fossils, porosity, contamination	Remarks: Shows, cavings, mud additives, etc.
2880	100 Sst	clr – trnsl Qtz, Tr pk trnsl Qtz, pred f – med, occ crs – v crs, pr srt, sbang – sbrndd, lse – occ fri, Tr sil cmt, gd vis por, Tr wk calc cmt,	No shows
	Gd tr Mica		
	Tr Pyr		
2883	100 Sst	a.a.	a.a.
	Tr Clst	med gry, sft, amor, slty, sdy, non – slily calc	
	Gd tr Mica		
	Tr Pyr		
2886	100 Sst	clr – trnsl Qtz, v f – med, occ crs, pr – mod srt, sbang – sbrndd, lse – fri, wk calc cmt, Tr sil cmt, Tr lt gry arg mtrx, gd vis por	a.a.
	Tr Clst	med gry – olv gry, sft – frm, amor – sbblky, slty – v slty, sdy i.p., non – occ slily calc	
	Tr	Mica, Pyr	
2889	a.a.		
2892	80 Sst	clr – trnsl Qtz, v f – med, occ crs, occ grad sltst, pr – mod srt, sbang – sbrndd, lse – hd, calc cmt, Tr sil cmt, Tr lt gry arg mtrx, pr – mod vis por	a.a.
	10 Ls	lt gry, sft, micr, slily arg – arg	
	10 Clst	med gry – med dk gry, olv gry, sft – frm, amor – sbblky, slty – v slty, sdy i.p., slily – mod calc	
	Tr Mica		
2895	a.a.		
2898	a.a.		
2901	LOST		
2904	60 Sst	clr – trnsl Qtz, v f – f, occ med – crs grns, mod srt, sbang – sbrndd, fri – hd, occ lse, calc cmt, Tr sil cmt, slily arg i.p., pr vis por	a.a.
	40 Clst	med gry – med dk gry, olv gry, sft – frm, amor – sbblky, slty – v slty, sdy i.p., slily – mod calc	
	10 Ls	yel gry – lt gry, sft, micr, arg, sdy i.p.	
2907	50 Clst	a.a.	a.a.
	40 Sst	a.a.	
	10 Ls	a.a.	
2910	a.a.		
2913	a.a.		a.a.

STATOIL

WELLSITE SAMPLE DESCRIPTION			Page 22 of 23
Country: Norway	Area: Haltenbanken	Field: Kappa	
Well no: 6507/8-7	Company: Statoil ASA, Petoro AS, Eni Norge AS, Norske ConocoPhillips AS		
RKB: 23 meters	Geologist: T. Bjørgen, C. Jebsen, T. F. Kristensen		
Hole size: 8 1/2”	Cut solvent: Iso Propyl Alcohol	Date: 24.01.2004	

Depth (m RKB)	Lithology (%)		Lithological Description: Rock name, mod.lith, colour, grain size, sorting, roundness, matrix, cementation, hardness, sed.structures, accessories, fossils, porosity, contamination	Remarks: Shows, cavings, mud additives, etc.
2916	70	Clst	med dk gry, sft, amor, slty – v slty, sdy i.p., non clac	No shows
	20	Sst	pkish gry – yel gry, clr, trnsl– trnsp, Qtz, f – med, sbang – sbrndd, mod srt, fri – mod hd, gen lse, i.p. calc cmt, i.p. lt gry arg mtx , glauc, pr vis por	
	10	Sd	clr, trnsl – trnsp, Qtz, lse, med – crs, occ v f, sbrndd, mod srt	
	Tr	Ls	yel gry, sft, micr	
	Tr	Pyr		
				a.a.
2919	a.a.			
2922	90	Clst	a.a.	a.a.
	10	SSt	a.a.	
2925	90	Clst	a.a.	a.a.
	10	Sst	a.a., also med – crs, lse	
2928	100	Clst	a.a., also grad to v arg v f Sst	a.a.
	Tr	Sst	a.a.	
2931	100	Clst	a.a.	a.a.
	Tr	Sst	a.a.	
	Tr	Ls	a.a.	
2934	a.a.			a.a.
2937	100	Clst	med dk gry, sft, amor, slty – v slty, sdy i.p., non clac, occ grad to v arg v f Sst	a.a.
	Tr	Pyr		
2940	100	Sst	dk gry – brnish gry, v f Sst grad v sdy – slty Clst	a.a.
	Gd tr	Pyr		
2943	a.a.			a.a.
2946	100	Clst	pred olv blk, occ v sdy, sft, amor, non calc	a.a.
	Tr	Pyr		
2949	a.a.			a.a.
2952	100	Clst	a.a. – occ grad v arg Sst	a.a.
2955	100	Clst	a.a.	a.a.
	Tr	Pyr		
	Tr	Ls	yel gry, sft, micr	
2958	80	Sd	clr, trnsp, occ trnsl Qtz, lse, f – med, occ crs, occ v f, mod srt, sbang – sbrndd	a.a.
	10	Clst	a.a.	
	10	Ls	a.a.	

STATOIL

WELLSITE SAMPLE DESCRIPTION			Page 23 of 23
Country: Norway	Area: Haltenbanken	Field: Kappa	
Well no: 6507/8-7	Company: Statoil ASA, Petoro AS, Eni Norge AS, Norske ConocoPhillips AS		
RKB: 23 meters	Geologist: T. Bjørgen, C. Jebsen, T. F. Kristensen		
Hole size: 8 1/2”	Cut solvent: Iso Propyl Alcohol	Date: 24.01.2004	

Depth (m RKB)	Lithology (%)	Lithological Description: Rock name, mod.lith, colour, grain size, sorting, roundness, matrix, cementation, hardness, sed.structures, accessories, fossils, porosity, contamination	Remarks: Shows, cavings, mud additives, etc.
2961	90 Sd	clr, trnsp, occ trnsl Qtz, lse, med – crs, occ f – med, occ v f, mod srt, sbang – sbrndd,	No shows
	5 Clst	pred olv blk, occ v sdy, sft, amor, non calc	
	5 Ls	yel gry, sft, micr	
	Tr Pyr		
2964	100 Sd	pred f – med, occ v f, else a.a.	a.a.
	Tr Clst	a.a.	
	Tr Ls	a.a.	
2967	a.a.		a.a.
2970	a.a.		a.a.
2973	100 Sd	a.a.	a.a.
	Tr Ls	a.a.	
2975	a.a.		a.a.

TD of the well; 8 ½” hole section, 2975m MD RKB

App E NPD standard sheet for reporting shallow gas

INFO TIL OD SKJEMA

1. *Avstand fra boredekk til havnivå:* 23m

2. *Vanndyp:* 333m MSL

3a. *Settedyp for lederør:* 403 mMD RKB

3b. *Evt. formasjonstyrketest (g/cc):* N/A

4a. *Settedyp for foringsrør hvorpå BOP settes:* 545 mMD RKB

4b. *Formasjonstyrketest (g/cc)*: 1.34 g/cc

6. *Dybdeintervall (mRKB og mTVD) og alder for sandlag grunnere enn 1000 m under havbunnen. Oppgi hvilke lag som evt. inneholder gass.*
   Kvartære sandlag på 476 –481 mRKB, 492 – 493 mRKB og 534 – 547 mRKB alle vannvåte.

7. *Grunn gass er ikke påvist i brønnen.*

8. *Sammensetning og opprinnelse til gassen:* N/A

9. *Beskriv alle målinger i gassførende lag:* N/A

10. *Angi dyp (mRKB og TVG) til inkonformiteter i borehullsposisjonen:* N/A

11. *Angi utbredelsen av sandlagene (kommunikasjon, kontinuitet, trunkering, etc.):* N/A

12. *Angi utbredelsen av evt. gass- skygging ("gas blanking"):* N/A

13. *Angi eventuelle seismiske indikasjoner på at gassen stammer fra dypere nivå. Beskrivelse dersom gassen stammer fra dypere nivå:* N/A

14. *Hvordan samsvarer tolkingen av borestedsundersøkelsen med borehullsdata mht. :*

- *grunn gass*
  Stemmer bra. Ingen grunn gass prognosert i 36” og 26” hullseksjonene og ingen grunn gass er observert.

- *korrelasjon til nærliggende borehull*
  God korrelasjon til nærmeste referansebrønn 6507/8-1 som ligger ca. 1.8 km mot nord. Kvaliteten på loggene i korrelasjonsbrønnen og i brønnen er gode.

App F Listing of other relevant reports

NO.	REPORTS
1	Site Survey at Planned Well Location 6507/8-7 – Vol 1
2	Site Survey at Planned Well Location 6507/8-7 – Vol 2
3	Well Programme PL 124, Well 6507/8-7
---	6507/8-7: Zero Offset VSP Acquisition Data
4	Processing Report Well 6507/8-7 Kappa
5	End of Well Report MWD, Mud Logging, Dir.Drilling
6	Biostratigraphy of the Interval 1,500m – 2,975m, Statoil Well 6507/8-7 + CD rom nr.480
7	Final Drilling Report Well 6507/8-7 Kappa, PL124

Enclosures

Completion Log
Formation Evaluation Log
Pressure Evaluation Log