STATOIL

Final Well Report
PL128
Well 6608/11-3

03Y94*14309

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Title:		
Final Well Report **PL 128** **Well 6608/11-3**		
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1 Introduction

1.1 Well data record

Well name	:	6608/11-3	
Type of well	:	Exploration	
Prospect	:	Blåmeis	
Country	:	Norway	
Area	:	Nordland II	
License	:	PL 128	
Licencees	:	Statoil ASA	40.45 %
		Petoro AS	24.55 %
		Norsk Hydro ASA	13.50 %
		Norsk Agip A/S	11.50 %
		AS Norske Shell	10.00 %
Drilling unit	:	Stena Don	
Type	:	Semi submersible drilling rig	
Water depth	:	374 mMSL	
Air gap	:	24 m	
On license	:	25.11.02	
Rig release	:	15.12.02	
Formation at TD	:	Triassic Grey Beds Formation	
Geographic co-ordinates	:	66^o 06’ 34.01” N	
		08^o 29’ 48.87” E	
Datum/Spheroid	:	ED-1950 / Int. 1924	
UTM	:	UTM Zone 32, CM 09^o E	
		7 332 387 N	
		477 263 E	
Seismic location	:	Seismic survey ST01M01, Inline 3314, Cross-line 12738.	

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

Index Map

PL128, Well 6608/11-3 Blåmeis Prospect

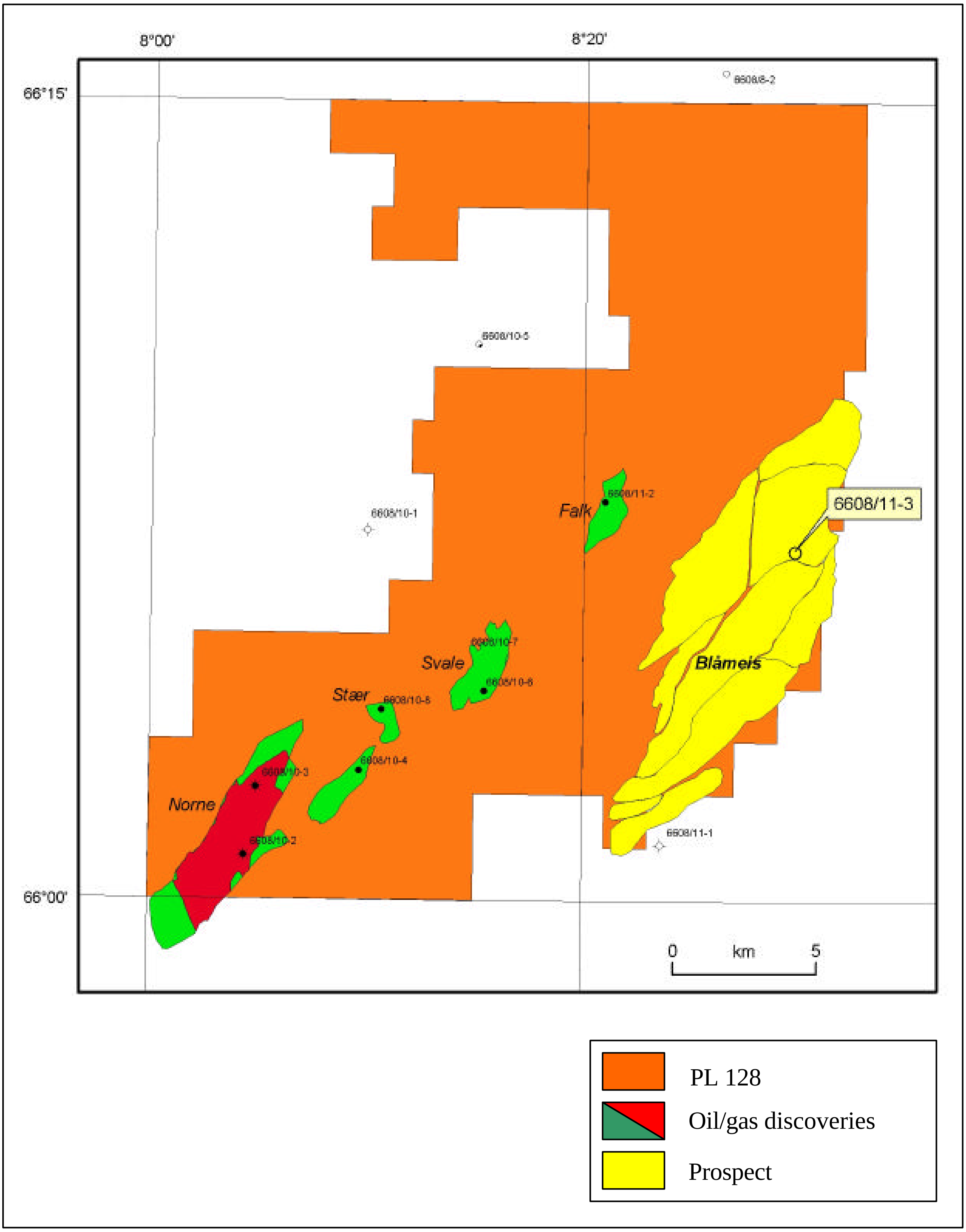


Fig. 1.1

1.2 Well objectives

The main objective of well 6608/11-3 was to prove hydrocarbons in the Lower Jurassic sandstones of the Åre Formation, the secondary objectives were to prove hydrocarbons in the Upper Jurassic sandstones of the Melke Formation and to gain geological data from the Triassic Grey Beds Formation.

1.3 Result of the well

Well 6608/11-3 was spudded in a water depth of 374 mMSL and drilled to a total depth of 2031 mMD.

A class 2 shallow gas warning was issued prior to drilling the well, and the well was thus designed accordingly with the BOP set above the potential gas sands. No indications of shallow gas were seen on the MWD logs or in the gas/cuttings in this section.

Reservoir zones were penetrated in the Melke, Tilje and Åre Formations, all of which proved to be water bearing. Good quality reservoir sands were also penetrated in the Triassic Grey Beds Formation. One core was taken in the Triassic Grey Beds Formation.

Wireline logs showed a possible thin gas bearing sand in the lowermost Tertiary section. A fluid sample was taken from this sand that contained formation water with small amounts of dry gas.

1.4 Drilling summary

1.4.1 Casing

A 30” conductor was run with the shoe at 458 mMD. Thereafter the 18 $^{3}/_{4}$” was run on the 13 $^{3}/_{8}$” casing with the shoe at 725 mMD.

Table 1.1 Casing

Casing	Shoe depth	Leak off tests
30”	458 mMD	-
13 $^{3}/_{8}$”	725 mMD	1.34 g/cm^3

1.4.2 Drilling fluids

The well was drilled with seawater until the surface casing was set. From the 13 $^3/_8$" casing shoe to TD, the well was drilled with water-based mud.

Table 1.2 Drilling fluids

Section	Section TD (mMD)	Maximum mud weight [g/cm³]	Mud type
36"	458	1.03	Sea water / high vis. sweeps
17 ½"	725	1.03	Sea water / high vis. sweeps
12 ¼"	2031	1.22	Glydril

1.5 Data acquisition summary

See Figures 1.2 & 1.3.

PL 128

RKB - Sea: 24 m

Water Depth: 374 m MSL

Formation Evaluation Well 6608/11-3

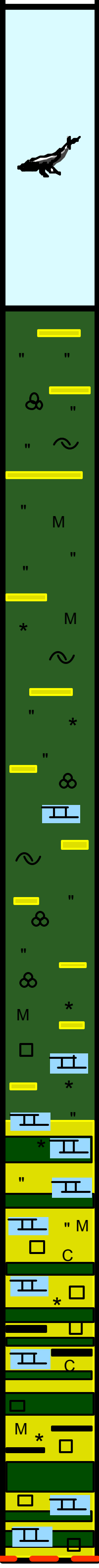
STATOIL

Made by: AF/MART

Date: 14.07.2003

Stratigraphy: System	Formations (mMD RKB)
	Seabed
Quaternary	398
Tertiary	Naust 663
Tertiary	Kai 1240
Tertiary	Brygge 1297
Tertiary	Tare 1363
Tertiary	Tang 1428.5
Jurassic	Melke 1443.5
Jurassic	Not 1476.7
Jurassic	Ile 1508.7
Jurassic	Tilje 1517.4
Jurassic	Åre 2 1530
Jurassic	Åre 1 1666.6
Triassic	1907
Triassic	Grey Beds 1940

Lithology



Casing: 30" at 458 m; 13 3/8" at 725 m

Depth mMD RKB: 100, 200, 300, 400, 500, 600, 700, 800, 900, 1000, 1100, 1200, 1300, 1400, 1500, 1600, 1700, 1800, 1900, 2000, 2100

TD 2030.8 mMD RKB

Coring Programme

One core in Grey Beds Fm. 6.12 m
61.2% recovery

Sampling Programme

Returns to seabed

Samples every 3 m from 760 - 950 mRKB through potential shallow gas zone

One bulk (ca. 5 l.) and one washed and dried sample every 10 m down to 1450 mRKB

One 1l. mud-sample every 100 metres down to TD

Samples every 3 m from 1430 - 1550 mRKB through potential reservoir

Samples every 6m from 1550 – 2031 m RKB (well TD) due to high ROP

Poor sample quality due to high flow rates

Logging Programme

MWD (BHI)
MPR-LITE: GR-RES-DIR

Intermittent MWD tool failure in 17 ½" section

MWD
GR-RES-DIR

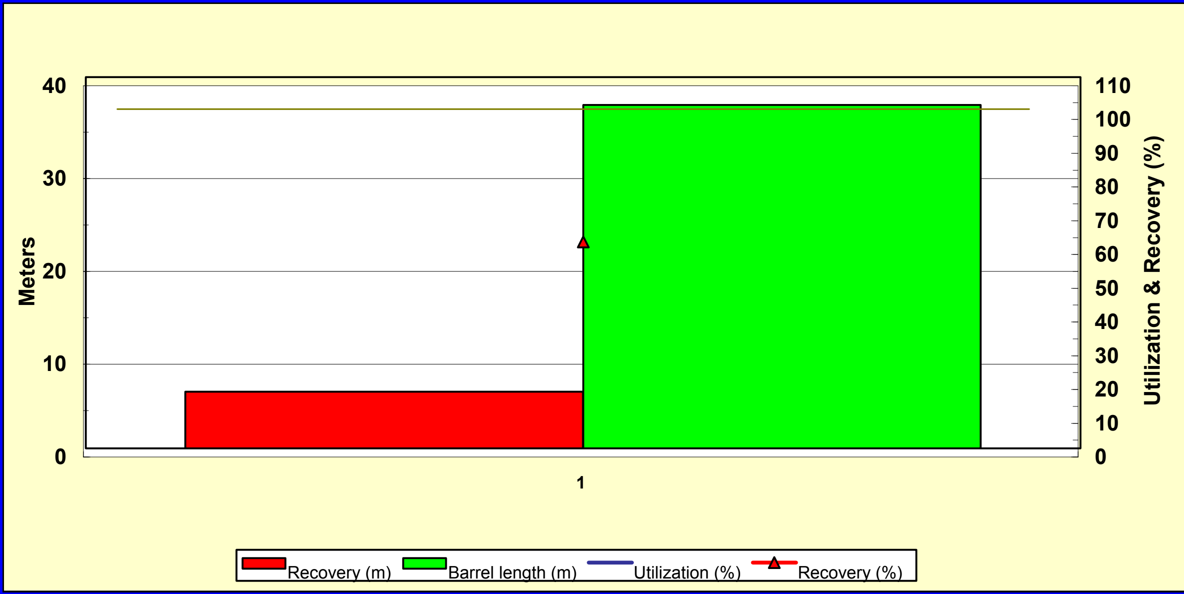
WIRELINE (Schlumberger)

density/neutron-sonic-formation imager
pressure points
vertical seismic profile
MDT sample
sidewall cores

Fig. 1.2

PL128: Coring summary, Well 6608/11-3

Core No.	Top of cored interval (mMD)	Bottom of cored interval (mMD)	Core recovery (m)	Core recovery (%)	ROP m/hr	Attempted core length	Utilization (%)
1	1 985.0	1 995.0	6.12	61.2	4.2	37	16.5



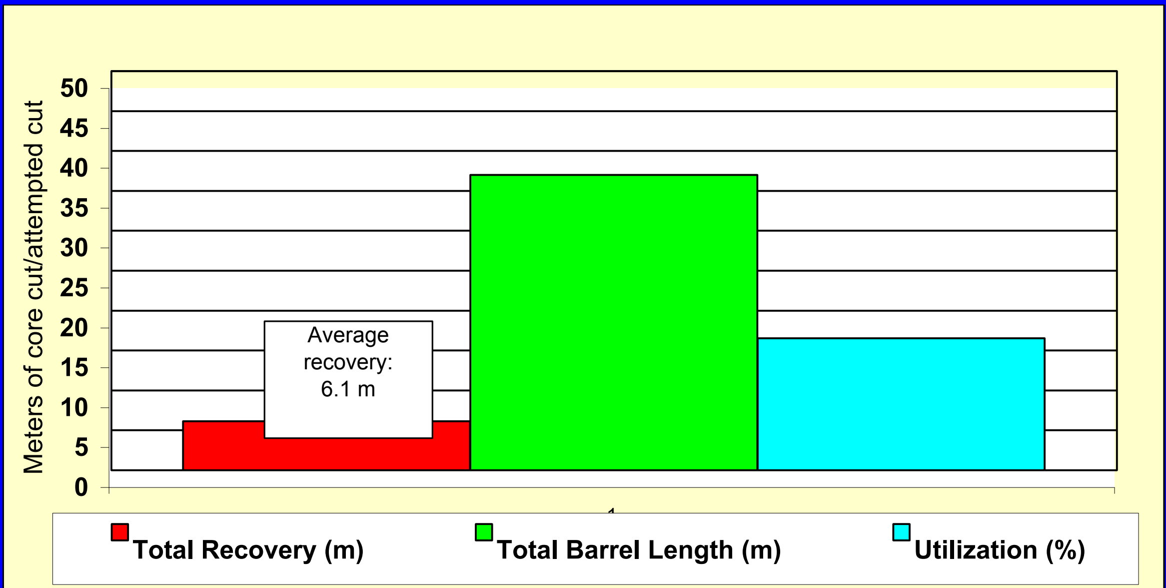


Fig. 1.3

2 Exemptions and non-conformances

The following exemptions have been identified and approved during the operations.

Table 2.1 Exemptions and non-conformances

Dispensation from	Synergy no.	Date	Title
WR0442:6608/11-3	198870	18.10	Application for exeption to carrying out Peer Review

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

3.1 RUH

Table 3.1 RUH reporting

Category	Number of RUHs	From Stena	From service companies	From Statoil
HSE	11	7	4	
Quality	4	3	1	
HSE/Quality	0			
Total	15	10	5	

3.2 Comments to RUH

There were no incidents with personnel injuries or actual spill to the environment. One of the incidents caused minor material damage; a small hole in the helideck.

Two of the 15 reported incidents were of such a nature that they might have caused personnel injuries under different circumstances. Both were graded 3. One was a bumper bar that fell over and the other one was personnel working above each other with a potential of falling object.

3.3 Experience summary

There are no experiences of a character that it led to reporting in the Synergi system.

Experience transfer of the coring, logging and drilling operations are covered in the respective chapters four and five.

3.4 Time distribution

Time distribution on well 6608/11-3:

Table 3.2 Time distributions

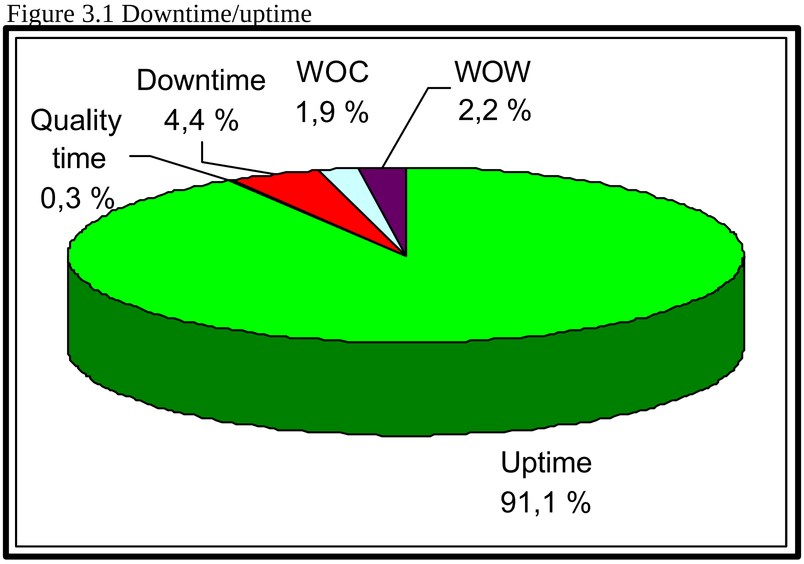
Planned total time	29.5 days
Actual total time	20.4 days
Planned total time, revised scope	25.6 days
Actual total time	20.4 days
Total down time	21.5 hrs
Waiting on weather (WOW)	11.0 hrs

Table 3.3 Operations factor

Ops. Factor: $= \frac{Total\_time - Down\_time - WOW}{Total\_time - WOW} * 100$	**95.5**

The down time divides as follows:

Figure 3.1 Downtime/uptime



4 Geology and formation data report

4.1 Geological setting and results

The structural framework on the Dønna Terrace was established during the Upper Jurassic/Lower Cretaceous extensional tectonics in the region. Later structuring is mainly related to the Cretaceous and Tertiary basinal subsidence. Block 6608/11 is situated in the southern part of the Nordland II area. The NE-SW trending Revfallet Fault Complex separates the block in two structural provinces, the Nordland Ridge and the Dønna Terrace. The Blåmeis prospect is down-faulted from the Nordland Ridge in the East and from the Hauk and Due prospects in the west.

Well 6608/11-is located on the Dønna Terrace in the central part of block 6608/11. Well 6608/11-3 penetrates rocks of Quaternary, Tertiary, Jurassic and Triassic age. TD of the well is in the Grey Beds Formation of Triassic age.

4.2 Shallow gas results

The well was given a class 2 shallow gas warning with potential gas bearing sands interpreted in the interval from 750 – 950 m in the Naust Formation. Four potential shallow gas sands were prognosed in this interval with a maximum potential hydrocarbon column of 35 m.

The well was drilled with seawater down to 725 m where the 13 $^3/_8$" casing was set and the BOP run. The potential shallow gas interval was drilled with 1.20 g/cm^3 water-based mud and using controlled drilling parameters. MWD data, cuttings descriptions and gas levels were used to evaluate the interval.

No shallow gas was detected throughout the section.

4.3 Stratigraphy

The stratigraphical division is based on the biostratigraphic report, wireline log curves and on correlation with nearby wells. The stratigraphy of the entire well is shown in Figure 4.1 and Tables 4.1 and 4.2.

4.3.1 Table of chronostratigraphy

Table 4.1 Chronostratigraphy

Stratigraphic succession		mMD	
Studied interval 1200 – 2031 mMD		**From**	**To**
Quaternary	Pleistoce (top not seen) - Upper Pliocene	1200	1240
Tertiary	Middle Miocene	1240	1297
	--- Miocene/Oligocene unconformity ---		
	?Oligocene	1297	1300
	Lower Oligocene	1300	1316
	--- Lower Oligocene/Eocene unconformity---		
	Lower Eocene	1316	1402
	Upper Paleocene	1402	1434.5
	--- intra Paleocene unconformity ---		
	Upper Paleocene	1434.5	1443.5
---------- base Tertiary unconformity ---------			
Jurassic	Upper Bajocian	1449.5	1475
	Upper Bajocian	1478	
	Lower Bajocian	1481	1490
	Upper Aalenian	1496	1499
	Middle Aalenian	1502	1505
	Middle Aalenian	1508	1514
	--- Hiatus ---		
	Upper Pliensbachian	1517	1529
	Sinemurian	1532	1538
	Sinemurian	1541	1859
	Hettangian	1859	1907
Triassic	Rhaetian	1907	2031
TD		**2031**	

4.3.2 Table of lithostratigraphy

Table 4.2 Lithostratigraphy

Table of lithostratigraphy					
Period	**Group / Formation**	**Observed depth**			**TWT**
		mMD	**mTVD**	**mMSL**	**sec.**
QUATERNARY	NORDLAND GROUP (Sea Floor)	398	398	374	
TERTIARY	Naust Formation	663	663	639	0.754
	Kai Formation	1240	1239.9	1215.9	1.258
	HORDALAND GROUP	1297	1296.9	1272.9	1.303
	Brygge Formation	1297	1296.9	1272.9	1.303
	ROGALAND GROUP	1363	1362.9	1338.9	1.367
	Tare Formation	1363	1362.9	1338.9	1.367
	Tang Formation	1428.5	1428.4	1404.4	1.434
JURASSIC	VIKING GROUP	1443.5	1443.4	1419.4	1.448
	Melke Formation	1443.5	1443.4	1419.4	1.448
	FANGST GROUP	1476.7	1476.6	1452.6	1.477
	Not Formation	1476.7	1476.6	1452.6	1.477
	Ile Formation	1508.7	1508.6	1484.6	1.503
	BÅT GROUP	1517.4	1517.2	1493.2	1.511
	Tilje Formation	1517.4	1517.2	1493.2	1.511
	Åre Formation (2)	1530	1529.9	1505.9	1.523
	Åre Formation (1)	1666.6	1666.5	1642.5	1.633
TRIASSIC	Grey Beds Formation	1940	1939.8	1915.8	1.853
TD		2031	2030.8	2006.8	

4.4 Lithostratigraphic description

General information
System, series and stage: partly based on biostratigraphy and partly on log interpretation and correlation.

Lithology: the lithological description is based on the cuttings and cores descriptions, see Appendix 4.

Depositional environment: based on biostratigraphic and regional reports. The depths are in metres with drill floor as datum unless otherwise stated.

Geological summary
It should be noted that high pump rates resulted in non-representative cuttings samples due to heavy clay washout of the formation. This is particularly true for the Melke and Grey Beds Formations.

NORDLAND GROUP 398- 1297 mMD, (374 – 1272.9 mTVD MSL)

The Nordland Group comprises the Quaternary, the Naust and the Kai Formations.
The upper part of the Nordland Group, including the Quaternary and the uppermost part of the Naust Formation down to 730m MD, was drilled with all returns to the sea floor.
The lithology from 460 m down to 730 m is inferred from the recorded BHI MWD memory log, which was working intermittently, logging about 50% of the section in addition to drilling parameters, and information from offset wells.

Quaternary 398 – 663 mMD, (374 – 639 mTVD MSL)
System: Quaternary
Series: Pleistocene

The Quaternary sediments are dominated by firm clay, with possibly thin sand layers. The MWD resistivity log suggests a sand bed from 628m to 635m.

High torque when drilling at 423 mMD and 428 mMD indicates boulders at these depths. Minor torque peaks were recorded throughout the upper part of the section and indicate that coarser material has been deposited in smaller amounts.

Naust Formation 663 – 1240 mMD, (639 – 1215.9 mTVD MSL)
System: Tertiary
Series: Pleistocene - Pliocene

The upper 70 m of the Naust Formation was drilled with returns to the seafloor and is therefore interpreted from the intermittent MWD logs. Cuttings returns were established from 730 mMD.

The boundary to the overlying Quaternary sediments coincides with a gap in the MWD logs, but the logs above and below indicate that the boundary is not far off the prognosed depth.

The Naust Formation penetrated in this section is dominated by claystone with minor sandy and/or silty intervals.

The claystone is medium light grey to olive grey in the upper section, becoming medium dark grey to olive grey towards the middle and lower parts. The claystone is predominantly soft, amorphous and soluble. It is slightly silty to sandy and occasionally calcareous.

The sparse sand is generally seen as loose quartz grains, mostly clear to translucent, but also occasionally opaque. The grains are predominantly very fine to coarse, poorly sorted and subangular to subrounded.

There are traces of mica in the uppermost part of the formation, whereas rock- and shell-fragments and microfossils are predominant in the rest of the Naust Formation.

Kai Formation 1240 – 1297 m, (1215.9 – 1272.9 mTVD MSL)
System: Tertiary
Series: Middle Miocene
Depositional environment: Marine, inner shelf

The top of the Kai Formation is picked at a slight increase of the gamma ray readings. The resistivity log is unchanged. According to the cuttings, there are no changes in the lithology from the above Naust formation. The Kai Formation consists mainly of claystone with minor traces of sand/rock fragments.

The claystone is medium dark grey to olive grey. It is persistently soft, amorphous, soluble, slightly sticky and non calcareous. Further there are traces of silt and sand.

The good trace of sand present appears as clear to translucent quartz grains, and they are fine to very coarse and subangular to subrounded. The sand is poorly sorted.

There are also traces of rock- and shell- fragments and microfossils present.

HORDALAND GROUP 1297 - 1363 m, (1272.9 – 1338.9 mTVD MSL)

The Hordaland Group is represented by the Brygge Formation in this well. The top Brygge Formation is defined by a sharp change in the resistivity and sonic readings.

Brygge Formation 1297 - 1363 m, (1272.9 – 1338.9 mTVD MSL)
System: Tertiary
Series: Lower Eocene – Lower Oligocene
Depositional environment: Marine, inner to outer shelf to upper bathyal

The Brygge Formation consists of claystone with traces of various minerals.

The claystone is varicoloured, but appears predominantly as brownish grey to olive grey. It is soft to firm, amorphous to blocky and sandy to silty in parts. The claystone is also non calcareous, micromicaceous, micropyritic and glauconitic in parts.

ROGALAND GROUP 1363 – 1443.5 m, (1338.9 – 1419.4 mTVD MSL)

The Rogaland Group consists of the Tare and Tang Formations in this well. The top of the Tare Formation is picked at a gamma ray top, which coincides with a slight increase in the resistivity and drop in the sonic logs.

Tare Formation 1363 – 1428.5 m, (1338.9 – 1404.4 mTVD MSL)
System: Tertiary
Series: Upper Paleocene - Lower Eocene
Depositional environment: Marine, inner to outer shelf to upper bathyal

The Tare Formation is composed of claystone and minor stringers of dolomite and limestone.

The claystone in the upper part of the Tare Formation is medium dark grey to brownish grey, and brownish black, it is also soft to firm with glauconite specks in part.

The few dolomite stringers are olive grey to olive black, blocky and hard to very hard.

The limestone is off-white, micritic and firm or as clear crystalline fragments.

The traces of sand are seen as loose quartz grains appearing as in the Brygge Formation above. Traces of pyrite are also found.

Tang Formation 1428.5 – 1443.5 m, (1404.4 - 1419.4 mTVD MSL)
System: Tertiary
Series: Upper Paleocene
Depositional environment: Marine, inner to outer shelf to upper bathyal

The top of the Tang Formation is picked at gamma ray topwich coincide with a minor resistivity peak. The Tang Formation is composed of claystone and some minor stringers limestone.

The claystone appears as olive green to greenish blue grey, blocky, firm to moderately hard with occasional traces of glauconite.

The limestone is as described for the Tare Formation.

The traces of sand are seen as loose quartz grains and traces of pyrite are also recorded.

VIKING GROUP 1443.5 – 1476.7 m, (1419.4 – 1452.6 mTVD MSL)

The Viking Group is represented by the Melke Formation in this well. The unconformity between the above Tang Formation and the Viking Group is defined as a drop in the gamma ray values and an increase in the resistivity readings. The drop in the gamma ray readings is a function of the extent of erosion of the Melke Formation. The resistivity log response shows, however, a trend shift to higher readings.

Melke Formation 1443.5 – 1476.7 m, (1419.4 – 1452.6 mTVD MSL)
System: Jurassic
Series: Middle Jurassic
Stage: Upper Bajocian
Depositional environment: Marine, inner shelf

The Melke Formation correlates well with the closest well, 6608/11-2. The upper Melke claystone is eroded away. The present Melke Formation can be described as a coarsing-up unit with sandstone/siltstone in the upper and middle parts and predominantly claystone in the lower part. Thin stringers of limestone also appear to be present.

Both the claystone and siltstone are predominantly medium grey to medium dark grey, and also moderate brown in parts. The claystone is soft, amorphous and very silty to sandy. The claystone is in parts geyish blue green to dusky blue green, firm and blocky, but non calcareous throughout.

The sandstone appears as loose, clear to translucent quartz grains, which are fine to medium, occasionally coarse, loose and poor to moderately sorted. The grains are angular to subrounded.
The limestone is off white to clear, firm and micritic to crystalline.

FANGST GROUP 1476.7 – 1517.4 m, (1452.6 – 1493.2 mTVD MSL)

The Fangst Group is represented by the Not and Ile Formations in this well. The transition between the overlying Melke Formation and the Fangst Group is similar to that in neighbouring well 6608/11-2. A gradual increase in gamma ray response in the lower part of the Melke Formation ends in a steady high value in the Not Formation. The resistivity log response shows the same trend.

Not Formation 1476.7 – 1508.7 m, (1452.6 – 1484.6 mTVD MSL)
System: Jurassic
Series: Middle Jurassic
Stage: Middle Aalenian – Upper Bajocian
Depositional environment: Marine, inner shelf

The Not Formation consists predominantly of claystone and minor stringers of marl or limestone.

The claystone is medium grey to medium dark grey, soft, soluble and amorphous to subblocky. It is very silty and calcareous.

The limestone/marl is off white to pale yellow grey, firm to moderately hard and micritic to crystalline.

Ile Formation 1508.7 – 1517.4 m, (1484.6 – 1493.2 mTVD MSL)
System: Jurassic
Series: Middle Jurassic
Stage: Middle Aalenian
Depositional environment: Marine, inner shelf

The top of the Ile Formation is defined by a drop in both the gamma- and the resistivity logs. The formation consists of interbedded sandstone and silty claystone with traces of pyrite.

The claystone is medium dark grey, soft, amorphous to subblocky, very silty and non to slightly calcareous.

The sandstone consists of clear to translucent quartz. The grains are fine to coarse, occasionally very coarse, angular to subrounded, loose and poor sorted.

BÅT GROUP **1517.4 - 1940 m, (1493.2 – 1915.8 mTVD MSL)**

The Båt Group consists of the Tilje and Åre Formations in this well. The formation top is defined by an increase in both the gamma- and resistivity- logs. In this well the top represents a disconformity defined by the biostratigraphic interpretation.

Tilje Formation **1517.4 – 1530 m, (1493.2 – 1505.9 mTVD MSL)**
System: Jurassic
Series: Lower Jurassic
Stage: Upper Pliensbachian
Depositional environment: Marginal marine

The Tilje Formation consists of interbedded sandstone and claystone with minor limestone stringers.

The sandstone appears predominantly as loose, clear to translucent quartz grains with occasionally kaolinite matrix. The grains are very fine to very coarse, angular to subrounded and poor to moderately sorted.

The claystone is medium dark grey, soft, amorphous to subblocky, very silty and non to slightly calacareous.

The limestone is off-white, micritic or clear and crystalline.

Åre Formation **1530 - 1940 m, (1505.9 – 1915.8 mTVD MSL)**
System: Jurassic - Triassic
Series: Lower Jurassic – Upper Triassic
Stage: Rhaetian - Sinemurian
Depositional environment: Fluviodeltaic to marginal marine

The top of the Åre Formation is defined by the gamma log where the curve changes from decreasing to increasing values, defining a minor low section. A similar appearance occurs with resistivity curve.
The Åre Formation consists of interbedded claystone and limestone with several coal beds in the lower part. The Åre Formation is subdivided into the Åre 2 (1546.0 – 1666.6 m) and the Åre 1 (1666.6 – 1940.0 m) units. Top of the Åre 1 Formation is defined by the first appearance of a distinct coal layer.

The sandstone consists of clear to translucent quartz grains, which vary from fine to coarse, but are predominantly medium grained and subangular to subrounded. The sandstone is poor to well sorted and locally has a white clay matrix.

The claystone is brownish grey to olive grey, soft to firm, amorphous to subblocky, very silty in parts and non to slightly calcareous.

The limestone is very light grey to light grey in colour, it is blocky, moderately hard to occasionally very hard, silty in parts and micro-cryptocrystalline.

The coal is black, hard, shiny, blocky and brittle.

Trace amounts of mica, micropyrite and pyrite nodules are recorded throughout the Åre Formation.

Grey Beds Formation 1940 – 2031 m, (1915.8 – 2006.8 mTVD MSL)
System: Triassic
Series: Upper Triassic
Stage: Rhaetian
Depositional environment: Fluviodeltaic - marginal marine

The top of the Grey Beds is picked on a transition between a thick claystone unit at the base of the Åre Formation and a sandstone layer in the Grey Beds. It is fairly well defined on the logs, with a gradual decrease in both gamma ray and resistivity values. The Åre and Grey Beds formations are very similar in character with changing fluvial channel deposits, however, the Grey Beds Formation has been identified by the absence of coal and the presence of limestone. The Grey Beds Formation consists of sandstone interbedded with claystone and minor limestone stringers.

The claystone appears as brownish grey to medium dark grey, soft, amorphous and soluble. It is very silty and sandy and contains fragments of carbonaceous matter.

The sandstone is comprised of clear to transparent quartz. The grains are predominantly fine to medium, occasionally very fine to coarse. They are occasionally poorly, but mostly well sorted, mostly loose, with occasional silica to calcite-cemented clasts.

The Grey Beds Formation contains good traces of pyrite.

TD: 2031m, (2006.8 mTVD MSL)

4.5 Hydrocarbon indications

No shows were observed neither in the cuttings nor in the cores (see Appendix 4-6) in this well during drilling. A thin sand, 1416.5 to 1419 m, was investegated with the MDT, but did not give any conclusive results.

Table 4.3 Gas peaks (The 36" and 17 ½" sections were drilled with returns to seabed.)

DEPTH mRKB	GAS %	C_1 ppm	C_2 ppm	C_3 ppm	iC_4 ppm	nC_4 ppm	C_5 ppm	TYPE	BG %
788	0.3	2816	245	5	2	2	4	FG	0.1
973	0.8	6777	275	9	2	2	4	FG	0.1
1346	0.8	5095	883	7	2	2	4	FG	0.1
1405	0.5	4614	133	7	2	2	4	FG	0.1
1854	0.1	1429	105	5	2		4	FG	0.05
1906	0.1	983	21	4	2		4	FG	0.05
1996	0.3	2134	19	5	2	4	5	FG	0.1

4.6 Geophysical results

Refer to Figure 4.2, prognosed vs. actual stratigraphy.

4.7 Data acquisition

4.7.1 Cuttings and mud samples

A standard mud-logging unit was used for this well (see End of Well Report, Halliburton). Cuttings were sampled every 10 m from 740 – 760 mMD, every 3 m from 760 – 950 mMD, every 10 m from 950 – 1430 mMD, every 3 m from 1430 - 1532 and every 6 m from 1532 – 1985 mMD. Some samples were missed due to a high ROP; see Appendix 4 for the wellsite samples descriptions.

4.7.2 Conventional coring

One core was cut in the Triassic Grey Beds Formation in this well. The core was taken using 12 ¼" coring equipment with a Tripax bit and vented fibreglass liners. See Appendix 5 for the core description.

Table 4.4 Core summary

Core no.	Cored interval (m)	Recovered interval (m)	Recovered m	Recovered %	Barrel length	Depth shifted to log depth (m)	Comments
1	1985 - 1995	1985 - 1991.12	6.12	61.2	37 m	1988.5 – 1994.62	Jammed off

4.7.3 MWD/LWD

The MWD logging was performed by Baker Hughes Inteq.

Table 4.5 MWD logging

Run no.	Depth interval (mMd)	Collar diam.	Tool type	Comments
1	458 - 730	12 ¼”	MPR-LITE	Tool worked only intermittently, resulting in gaps in the log.
2	730 - 1985	12 ¼”	MPR-PWD	

4.7.4 Wireline logging

The wireline logging was performed by Schlumberger, without any problems.

Table 4.6 Wireline logging runs

Run No.	Tool combination	Interval (mMD)	Comments
1A	PEX-DSI-FMI-GR	725 – 2031	
1A	MDT (pre-tests)	1416 – 1985	Pressure points
1A	VSP-GR	400 – 2010	Problems getting good signals on upper geophone due to large, vertical hole.
1B	MDT	1399 – 1419	Sampling
1A	CST-GR	1309.5 – 1955	53 of 60 cores recovered

4.7.4.1 Sidewall cores

One run with 60 sidewall cores was shot in this well. 53 of the cores were recovered, 4 misfired, 2 were lost and 1 was empty (see Appendix 6 for sidewall core descriptions).

4.7.4.2 Velocity survey

A zero offset VSP was run by Schlumberger using a single level CSI tool. A total of 110 levels were shot, 80 levels with an interval of 7.56 m and 29 levels with an interval of 15.12 m.

4.7.4.3 Sampling

Two samples were taken from a thin gas filled sand in the Lower Tertiary Tare Formation at 1418.6 m MD. For details regarding the samples, see Chapter 4.9 and Table 4.8.

4.7.5 Data quality

The data quality from wireline logging was good.
Generally good quality on Mud logging and MWD data delivered from Halliburton and BHI respectively except for intermittent MWD in the 17 ½" section.

4.8 Formation pressure

The pore pressure profile shows a normal pressure gradient down to approximately 1300 mMD were a rapid increase starts. At 1330 mMD the formation pressure has reached 1.15 g/cm^3, which is the maximum pressure in the well. This pressure gradient was measured with the MDT tool in the area from 1399 to 1418 mMD. At the top of the Melke Formation the MDT log shows a pressure gradient of 1.02 g/cm^3, which remains constant down to TD of the well.

In the area from approximately 1280 to 1475 mMD the density log shows values as low as 1.6 g/cm^3. This low density affects the sonic log and resistivity logs. XRD and SEM analyses indicate that this interval consists of shale with high smectite content and also materials containing silica.

The formation pressure is calculated with several methods. In the area of the pressure build-up several lithology changes complicate calculation of the formation pressure using trend lines. The calculated pressure should fit the pressures measured with MDT.

For all the methods used the formation pressure may easily be calculated too high. To get a formation pressure that corresponds best with the MDT pressures, a normal trend line through the shale points in the Melke Formation seems to give the best result. The sonic log and D-exponent gives the best estimation of the formation pressure profile.

The overburden gradient is calculated from the density log. Above 725 mMD no density log was run, and density data from well 6506/12-1 is used. Below this depth, recorded data from well 6608/11-3 is used.

LOT was performed below the 13 3/8" casing shoe at 725 mMD. When performing the test, leak off pressure was calculated to 1.34 g/cm^3, using data recorded at surface. The MWD tool included a PWD sub that recorded the down hole pressure data, these data were retrieved after the drilling of the section was completed. The data from the PWD sub showed a slightly higher pressure than calculated from surface date. An exact leak off pressure was difficult to calculate, but the revised fracture gradient is in the range of 1.39 to 1.44 g/cm^3. The difference between surface and down hole data is due to uncertainty in the surface data as the weight of the seawater/mud column is not exactly known.
Final estimated LOT is in the range of 1.39 to 1.44 g/cm^3.

4.8.1 *Reservoir pressure summary*

In the first MDT run a total of 25 pre-tests were attempted. 3 pre-tests did not seal to the formation, 10 were tight, while 12 measured the formation pressure.

The main objective of the second run was to take a sample in the Tare Formation, but 3 additional pre-tests were also collected.
The standard quartz gauge was used.

<u>Summary</u>
Sandstone, below the top Melke sandstone seem to be in pressure communication and measured pressure fall on a well defined water gradient line of 1.01 g/cm^3.

In the Tare Formation, pressure measurements were performed at three different levels. The Tare Formation is slightly overpressured, and is not in pressure communication with the Jurassic sandstone below. The low permeability makes the uncertainty in the pressure measurements too high to draw a reliable gradient line between the pressure points.

Table 4.7 MDT pressures, Run 1A

Formation	Test no	DEPTH ()mMD)	DEPTH (m TVD)	FORM. Pressure (bar)	HYDROSTATIC PRESSURE (bar) BEFORE	AFTER	TEMP (°C)	GOOD SEAL (Y/N)	REMARKS	Mobility (mD/cP)
Run 1A MDT Pressures										
Tare	1	1417.5	1417.5	159.9	176.3	176.26	34.6	Y	Tight/Aborted	12.1
Tare	2	1418.5	1418.5	-	176.37	176.35	35.2	Y	Tight	-
Melke	3	1467.5	1467.5	-	182.46	-	37.5	Y	Tight	-
Melke	4	1457	1457	-	181.08	-	38.2	N	Lost seal	-
Melke	5	1457	1457	-	181.08	181.06	33.5	N	Lost seal	-
Åre	6	1448.2	1448.2	145.93	179.95	179.65	33.7	Y	Tight/ok	13.1
Åre	7	1511	1511	151.74	187.66	187.63	39.4	Y	Good	554.6
Åre	8	1525	1525	154.3	189.36	189.6	40.2	Y	Tight/Aborted	8.6
Åre	9	1530.5	1530.5	153.68	190.04	190.3	41.5	Y	Good	172.8
Åre	10	1540.7	1540.7	154.71	191.26	190.9	41.6	Y	Good	5.6
Åre	11	1552	1552	-	192.65	192.35	41.5	Y	Tight	-
Åre	12	1559	1559	-	193.48	193.18	41.7	N	Lost seal	15.2
Åre	13	1573	1573	157.93	195.2	195.18	42.1	Y	Tight	4.8
Åre	14	1610	1610	161.62	199.75	199.46	42.9	Y	Good	3.7
Åre	15	1625	1625	163.13	201.6	210.59	43.2	Y	Good	457.1
Åre	16	1804	1804	180.78	223.65	223.35	45.7	Y	Good	427.4
Åre	17	1850	1850	185.44	229.31	229.3	47.5	Y	Good	395.9
Åre	18	1880	1880	188.34	232.99	232.69	48.9	Y	Good	63.6
Grey	19	1950	1950	195.33	241.64	241.63	50.5	Y	Good	26
Grey	20	1975	1975	197.82	244.717	244.41	51.4	Y	Good	5627
Grey	21	1984	1984	198.71	245.86	245.5	52.4	Y	Good	240.7
Tare	22	1418.7	1418.7	-	176.06	-	44.7	Y	Tight/aborted	-
Tare	23	1418.2	1418.2	-	176.02	-	42.7	Y	Tight/aborted	-
Tare	24	1417.6	1417.6	-	175.93	-	41.4	Y	Tight/aborted	-
Tare	25	1416.9	1416.9	159.93	175.93	175.63	40.2	Y	Good/tight	1.4

Table 4.8 MDT pressures, Run 1B

Run 1B MDT Sampling										
Formation	Test no	DEPTH (mMD)	DEPTH (mTVD)	FORM. Pressure (bar)	HYDROSTATIC PRESSURE (bar)		TEMP (°C)	GOOD SEAL (Y/N)	REMARKS	Mobility (mD/cP)
					BEFORE	AFTER				
Tare		1418.6	1418.6	159.86	-	-	-	Y	Sampling	2.7
Tare	26	1412.7	1412.7	159.8	175.3	175.25	41.5	Y	Tight/aborted	0.6
Tare	27	1399	1399	158.25	173.61	173.61	41.1	Y	Good/tight	1.4
Tare	28	1412	1412	159.55	175.23	175.21	40.1	Y	Tight/aborted	0.6

4.9 Reservoir fluid sampling

Wireline logs indicated that a sand stringer in the Tare Formation could be HC saturated. A rush mobilization of MDT sampling equipment was done, only with conventional sampling chambers. Unfortunately the drawdown can not be controlled with this sample configuration., therefore this resulted in a very high drawdown during sampling.

The sampling string included a 1gallon and a 2 ¾ gallon chamber. The 2 ¾ gallon chamber was drained offshore and contained mudfiltrate/water and approximately 3 litres (~0.003 sm^3) of gas.

The 1 gallon chamber was positioned so that the content was drained from the top, this was an attempt to drain the gas first, into a 1 litre geochemical bottle. The rest was drained offshore and contained mud filtrate/formation water with no gas.

An offshore analysis of the gas was performed by the mudlogger. The analyse showed a gas with heavy components, but the relation between the components is strange and the measurement is thus regarded as erratic. The result of the sampling showed that the moveable fluid was formation water and dissolved gas was dry. Onshore analysis of the gas showed a dry gas containing mainly C1.

Table 4.9 Samples collected

Depth mMD	Formation	Chamber no.	Oilphase bottle no.	Chamber volume	Opening Press bar	Drawdown bar	Volume cc
Run1B							
1418.6m	Tare	MPSR 024	-	2 ¾ Gallon	120	147	
1418.6m	Tare	MPSR 194	W1C5617	1 Gallon	110	147	1000

Flowing pressure only 13 bar in the beginning of each sampling.

4.10 Identification of Mineralogy in Anomalous Intervals in the Tare Fm.

During logging of the Tare Fm. in well 6608/11-3 an apparent sandy interval in the lower Tare Fm. (1416-1420 m MD) was observed on the logs. Here the density/neutron separation suggests a hydrocarbon-filled sand and a marked increase in resistivity to approx. 5 ohmm supports this interpretation. During the first run of the MDT formation pressure tester, attempts were made to obtain a formation pressure from this interval. Out of six attempts, two apparently valid formation pressures were obtained, indicating that the interval was slightly permeable.

Due to these observations, it was decided to re-run the MDT and attempt to sample the formation fluid from this interval in order to clarify if any moveable hydrocarbons were present or not.

After receiving the results of this sample it became difficult to explain the response of the density/neutron and resistivity logs in this interval. The sonic logs indicate that the interval may be a low-porosity, cemented interval. This could be the reason for the increased resistivity, but was not consistent with the porosity indicated by the density/neutron logs.

Since the presence of low-density minerals in the interval was believed be the cause of the anomalous log readings, focus was shifted towards determining the mineralogy of the interval.

No sidewall cores were obtained from this interval in well 6608/11-3 (one misfire and one lost bullet). A correlation of the logs to neighboring wells showed, however, that the same interval (and log response) could be seen in the majority of the wells in the area. A review of available well information from the area revealed that it is common to find volcanic tuff intervals in the Tare Fm. Low-density minerals can often be associated with tuff.

The formation immediately above the interval in question has very low density and this was thought to be due to the presence of diatomite (silica ooze) as has been identified in the Brygge and Tare Formations in many wells in the area.

When the 6608/10-9 (Lerke) well was drilled, a similar log response was observed in the Tare Fm. and it was possible to obtain 2 sidewall cores from this apparent “sand” interval.

In order to clarify the mineralogy of the interval in question and to verify the presence of silica ooze in the overlying sediments, 6 sidewall core samples were sent for X-ray diffraction (XRD) analysis, 3 from the suspected ooze interval in well 11-3, one from a similar interval in well 10-9 and two from the apparent resistive sand interval in well 10-9. Two of these samples were also sent to scanning electron microscope (SEM) analysis, see Figure 4.2 and 4.3.

The samples from well 11-3 in the interval 1390.5-1409.5 were confirmed to be diatomite by SEM interpretation. The XRD data shows an abundance of low density opal-A (2.16 g/cc) and Sylvite (1.86 g/cc). The Sylvite is believed to come from the KCl drilling mud.. Clays were also present. The abundance of diatoms and opal in the interval explains the very low measured formation density. Diatoms can have very low densities since these fossils may contain isolated porosities of up to 60%.

The samples from the apparent "sand" interval in well 10-9 were identified as silica-rich mudstone containing large amounts of smectite clay, low density cristobalite silica (2.19 g/cc) and zeolites. All of these minerals are associated with tuffaceous volcanics. Since cristobalite matrix has an apparent density/neutron porosity of 18%, this explains the anomalous density/neutron and resistivity response in the interval, i.e. the real porosity is lower than the apparent porosity and the increased resistivity is due to low porosity.

What the mineralogy does not explain is how it was possible to obtain an MDT sample from the apparent sand interval in 11-3 at 1418.6 m MD. This type of formation would not be expected to have sufficient permeability to allow for successful MDT sampling.

Table 4.10 X-ray diffraction analysis.

X-ray Diffraction Analysis
Size Fraction : Whole Rock

Well	Depth(m)	Smectite	Illite/Smec	Illite+Mica	Kaolinite	Chlorite	Opal-A	Cristobalite	Quartz	Plagioclase	Zeolite	Pyrite	Sylvite	Barite	Total
6608/11-3	1390.50	0.0	3.6	10.5	TR	4.2	21.3	0.0	13.4	3.7	0.0	29.9	13.5	0.0	100
6608/11-3	1394.00	0.0	9.5	6.2	2.1	2.0	19.7	0.0	13.0	2.6	0.0	21.3	23.6	0.0	100
6608/11-3	1409.50	0.0	3.0	6.8	0.0	3.9	42.8	0.0	7.3	0.0	0.0	16.1	20.0	0.0	100
6608/10-9	1712.00	62.0	0.0	TR	0.2	0.3	0.0	0.0	6.3	10.3	17.4	3.7	0.0	0.0	100
6608/10-9	1739.00	0.0	0.0	0.0	1.5	0.0	0.0	69.8	5.6	0.0	3.0	7.0	9.2	3.9	100
6608/10-9	1745.00	18.7	0.0	2.5	2.1	0.9	0.0	16.7	8.6	12.4	10.6	20.9	0.0	6.6	100

Note: Zeolite is Clinoptilolite

Fig. 4.1 Petrophysical composite, well 6608/11-3.

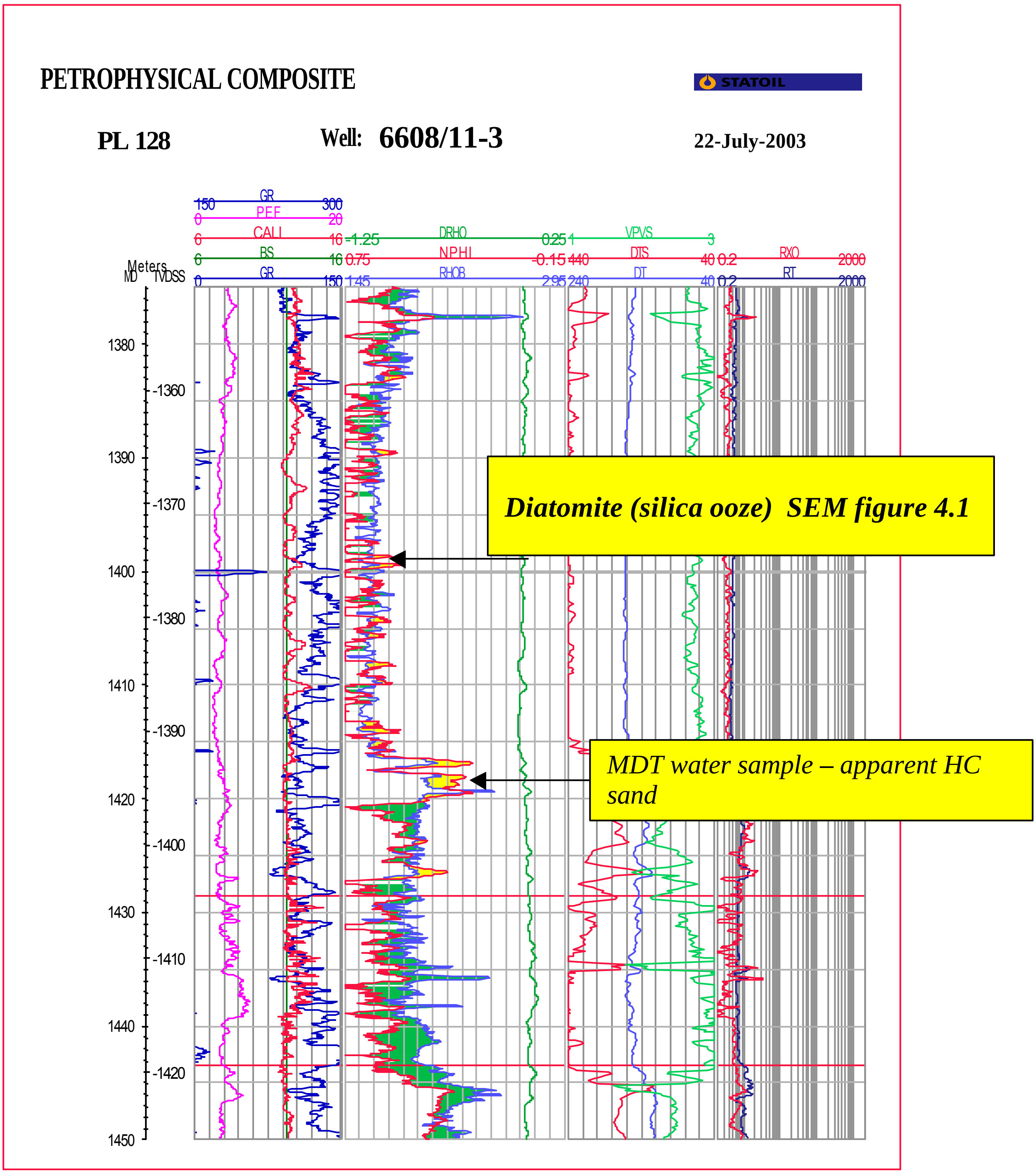


Fig. 4.2 Petrophysical composite, well 6608/10-9.

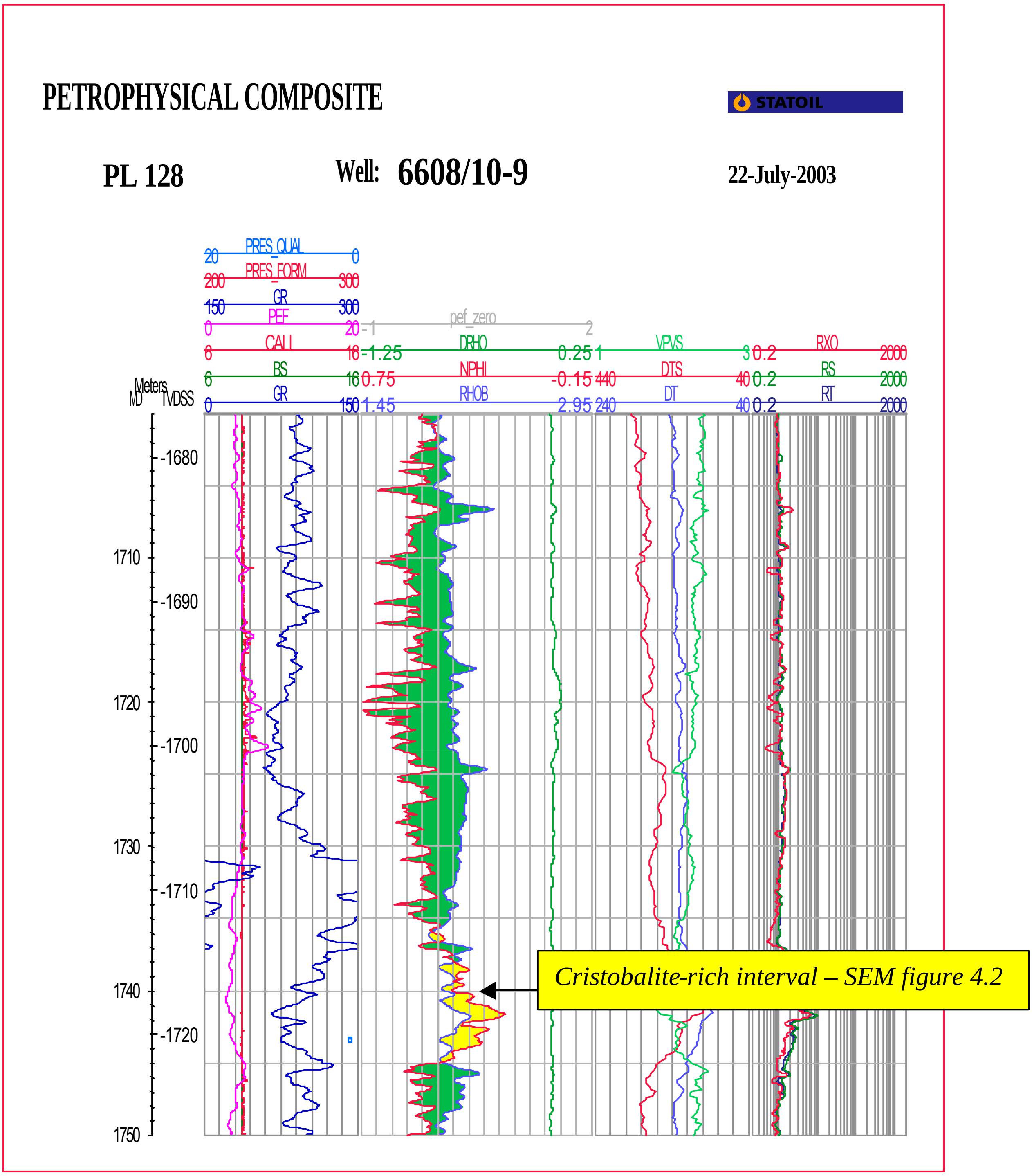
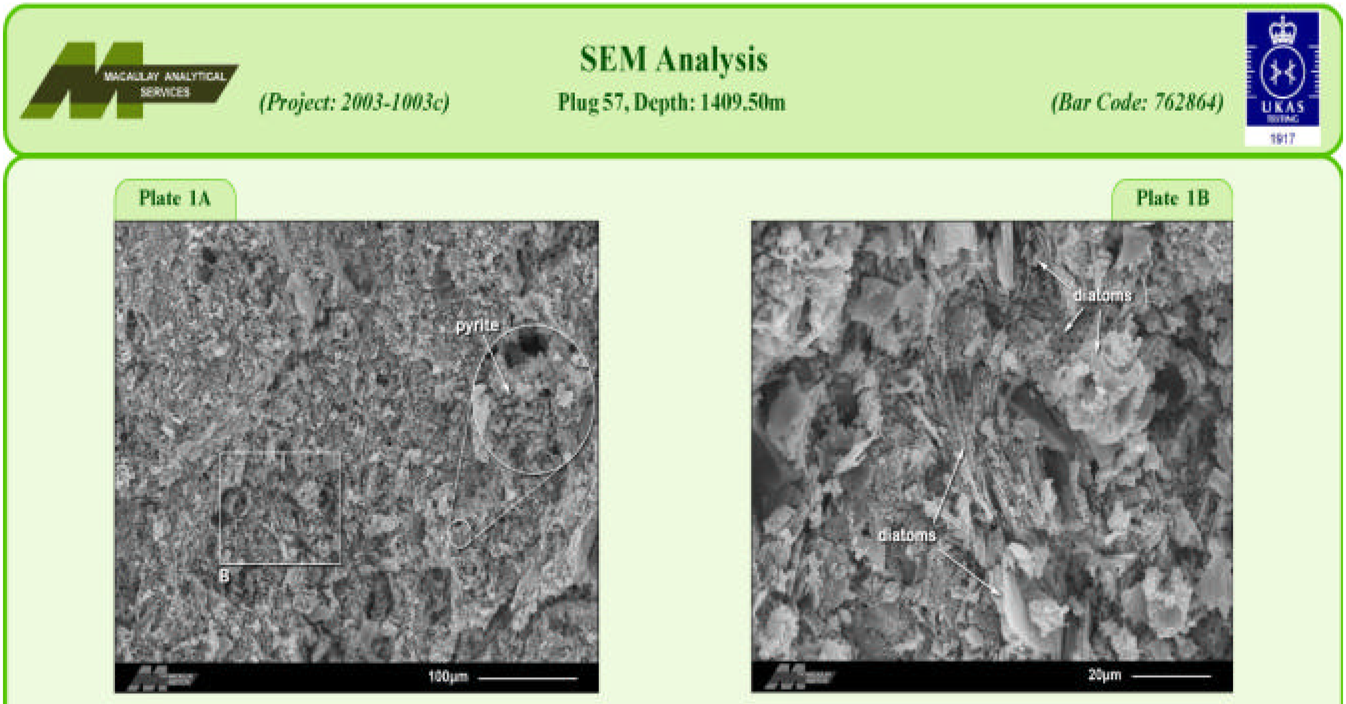


Fig 4.3 SEM analysis, well 6608,11-3.

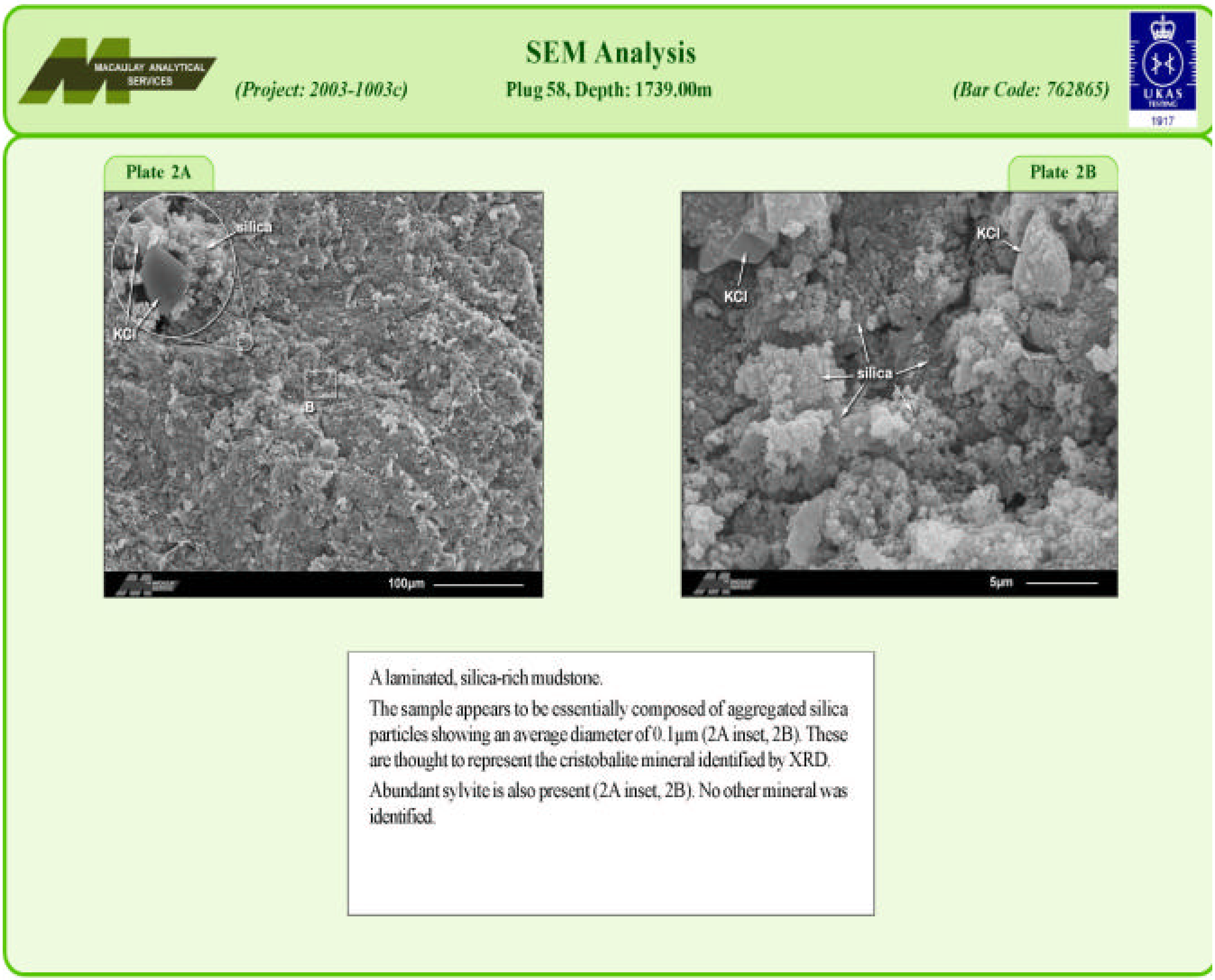


A very friable, laminated, diatomite.

The sample is mostly composed of silica particles of various shapes and sizes, believed to be related to diatoms (1B). Pyrite is common, present as small crystals (1-1.5µm) either in clusters (1A inset) or scattered throughout the sediment.

Clays are also present in the sample, although they are poorly crystallised and cannot be differentiated.

Fig 4.4 SEM analysis, well 6608/10-9.



4.11 Formation temperature

Based on log temperatures, an average temperature gradient of 4.2 ^{o}C /100 meter is calculated from seabed down to TD of the well. This gradient gives a formation temperature of 71.7 ^{o}C at TD.

A lot of temperature measurements have been performed in the area. The temperature gradient for 6608/11-3 shows good correspondence with observations from the neighbour wells.

Formation temperature is calculated using recorded temperature corrections for time since circulation. Use of the Horner method has also been considered, but due to the different depths of the measurements this method was not used.

Temperature measurement when sampling in the Tare formation is believed to be a good indication of the formation temperature. The actual temperature at the end of the sampling period is approximately 2 degrees lower than calculated formation temperature.

Temperature data is plotted in Figure 4.6.

Temperature measurements are available from all the logging runs except the CST run.

Table 4.11 Measured and evaluated temperatures

Tool Combination	Depth of measurement (m TVD)	Recorded max temperature (^{0}C)	Time since last circulation (hrs)	Evaluated temperature (^{0}C)
PEX.DSI-FMI-GR	2026	52	14.67	72^{0}C at 2031 m
MDT pressure	1984	52	29.73	
MDT sampling	1418	41.5	38.75	
VSP	2010	52	49.17	
CST	2026	-	54.2	

4.12 Experiences / recommendations

The wireline operation went very well, but the data presentation was slow. In the future it should be discussed in the operational phase between Schlumberegr logging team and Statoil reprentative in order to have a quick and continuous flow of data both on the rig and Interact.

A further recommendation is be to focus more on logistic, both during the planning phase and in the operational phase.

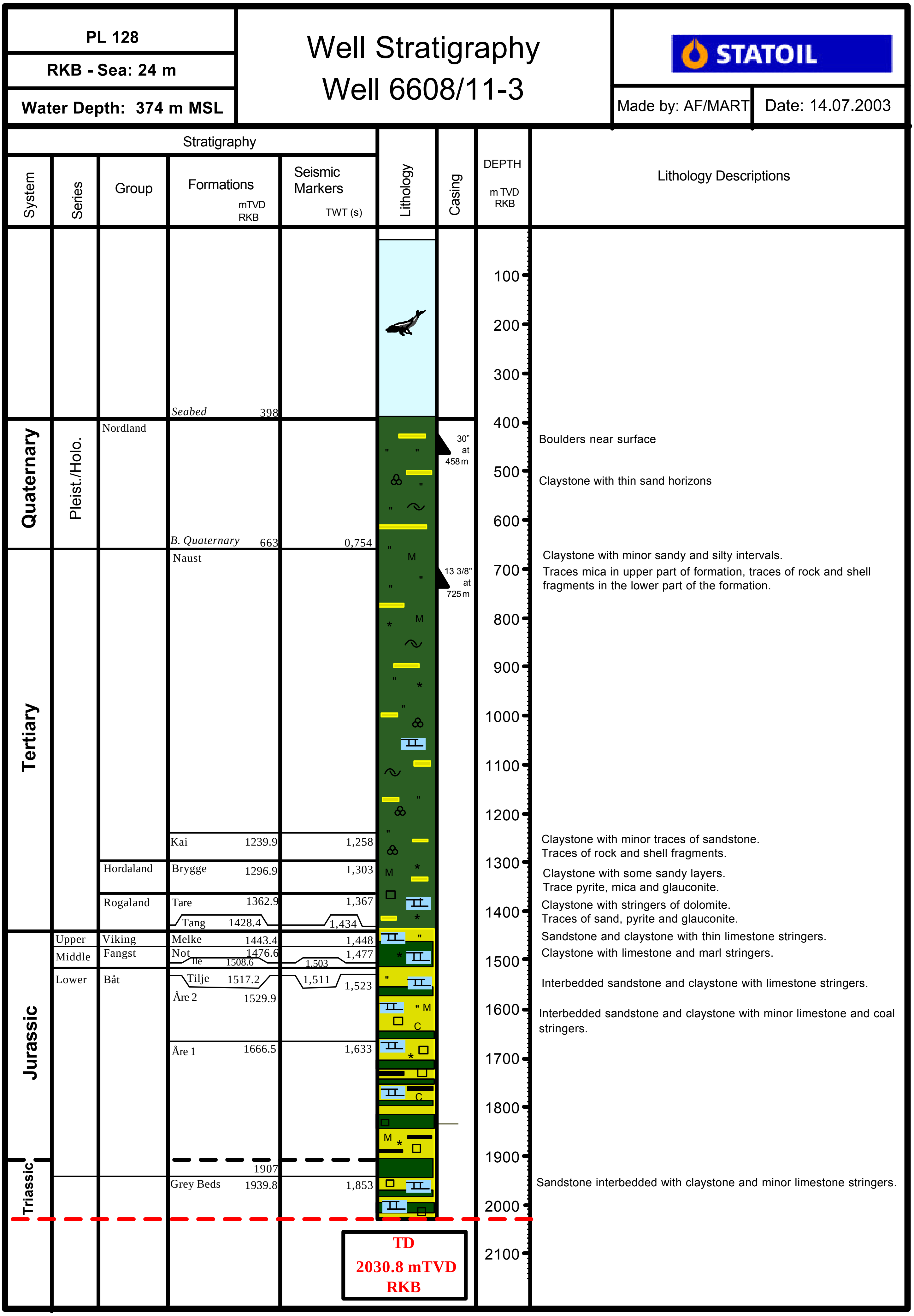

PL 128
RKB - Sea: 24 m
Water Depth: 374 m MSL
Well Stratigraphy
Well 6608/11-3
STATOIL
Made by: AF/MART
Date: 14.07.2003
Stratigraphy
System
Series
Group
Formations
mTVD RKB
Seismic Markers
TWT (s)
Lithology
Casing
DEPTH
m TVD RKB
Lithology Descriptions
Seabed 398
Quaternary
Pleist./Holo.
Nordland
B. Quaternary 663 0,754
Naust
Tertiary
Kai 1239.9 1,258
Hordaland
Brygge 1296.9 1,303
Rogaland
Tare 1362.9 1,367
Tang 1428.4 1,434
Jurassic
Upper
Viking
Melke 1443.4 1,448
Middle
Fangst
Not 1476.6 1,477
Ile 1508.6 1,503
Lower
Båt
Tilje 1517.2 1,511 1,523
Åre 2 1529.9
Åre 1 1666.5 1,633
1907
Triassic
Grey Beds 1939.8 1,853
30" at 458 m
13 3/8" at 725 m
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300
1400
1500
1600
1700
1800
1900
2000
2100
TD
2030.8 mTVD RKB
Boulders near surface
Claystone with thin sand horizons
Claystone with minor sandy and silty intervals.
Traces mica in upper part of formation, traces of rock and shell fragments in the lower part of the formation.
Claystone with minor traces of sandstone.
Traces of rock and shell fragments.
Claystone with some sandy layers.
Trace pyrite, mica and glauconite.
Claystone with stringers of dolomite.
Traces of sand, pyrite and glauconite.
Sandstone and claystone with thin limestone stringers.
Claystone with limestone and marl stringers.
Interbedded sandstone and claystone with limestone stringers.
Interbedded sandstone and claystone with minor limestone and coal stringers.
Sandstone interbedded with claystone and minor limestone stringers.

Fig. 4.5

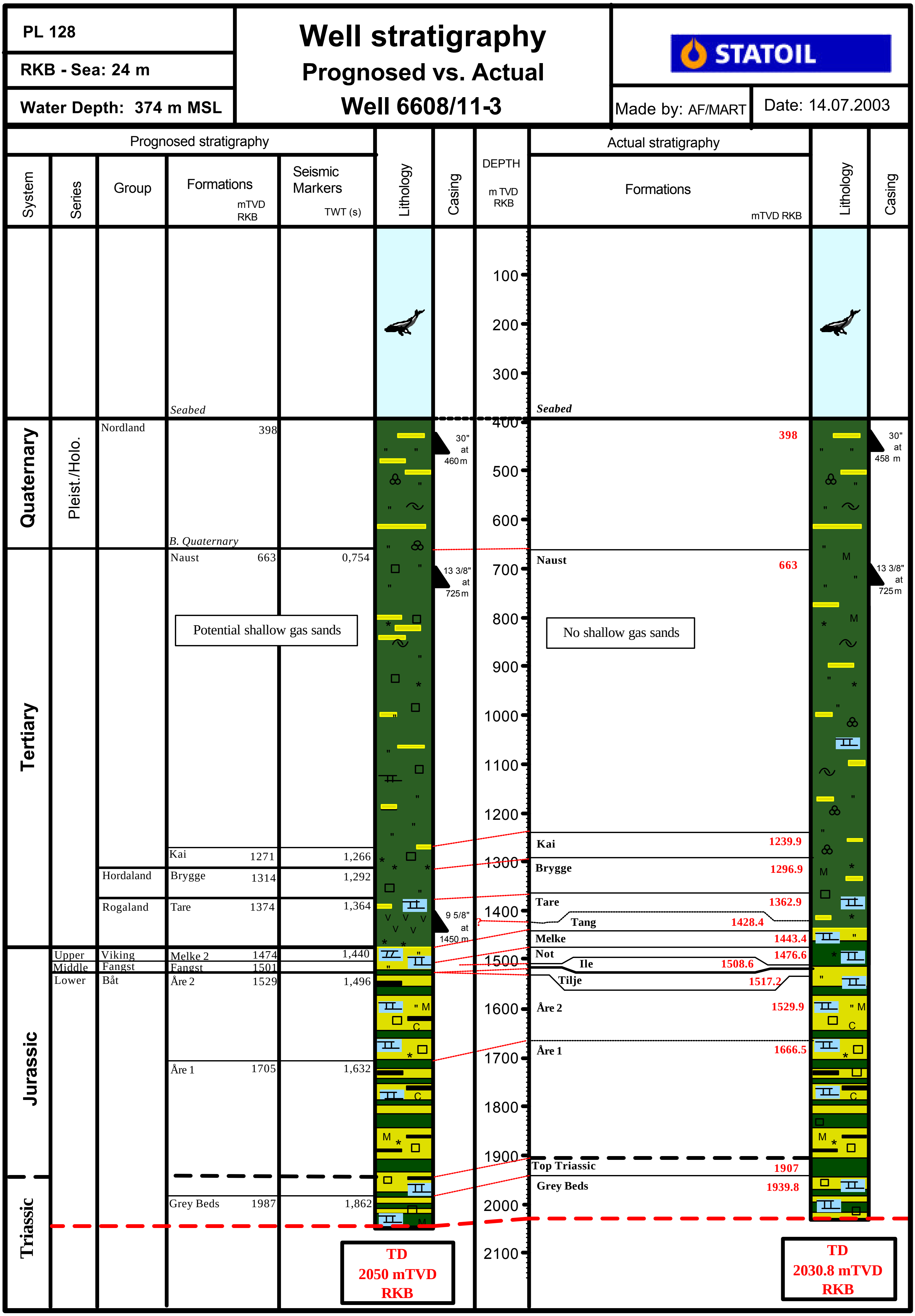

PL 128
RKB - Sea: 24 m
Water Depth: 374 m MSL
Well stratigraphy
Prognosed vs. Actual
Well 6608/11-3
STATOIL
Made by: AF/MART
Date: 14.07.2003
Prognosed stratigraphy
System
Series
Group
Formations
mTVD RKB
Seismic Markers
TWT (s)
Lithology
Casing
DEPTH
m TVD RKB
Actual stratigraphy
Formations
mTVD RKB
Lithology
Casing
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300
1400
1500
1600
1700
1800
1900
2000
2100
Seabed
Seabed
Quaternary
Pleist./Holo.
Nordland
398
398
30" at 460 m
30" at 458 m
B. Quaternary
Tertiary
Naust 663 0,754
Naust 663
13 3/8" at 725 m
13 3/8" at 725 m
Potential shallow gas sands
No shallow gas sands
Kai 1271 1,266
Kai 1239.9
Hordaland
Brygge 1314 1,292
Brygge 1296.9
Rogaland
Tare 1374 1,364
Tare 1362.9
Tang 1428.4
9 5/8" at 1450 m
Melke 1443.4
Not 1476.6
Ile 1508.6
Tilje 1517.2
Jurassic
Upper
Middle
Lower
Viking
Fangst
Båt
Melke 2 1474 1,440
Fangst 1501
Åre 2 1529 1,496
Åre 2 1529.9
Åre 1 1705 1,632
Åre 1 1666.5
Top Triassic 1907
Grey Beds 1939.8
Triassic
Grey Beds 1987 1,862
TD 2050 mTVD RKB
TD 2030.8 mTVD RKB

Fig. 4.6

PL 128	Pressure Plot Well 6608/11-3	STATOIL
RKB - Sea: 24 m		
Water Depth: 374 m MSL		Made by: TM / Date:14.07.03

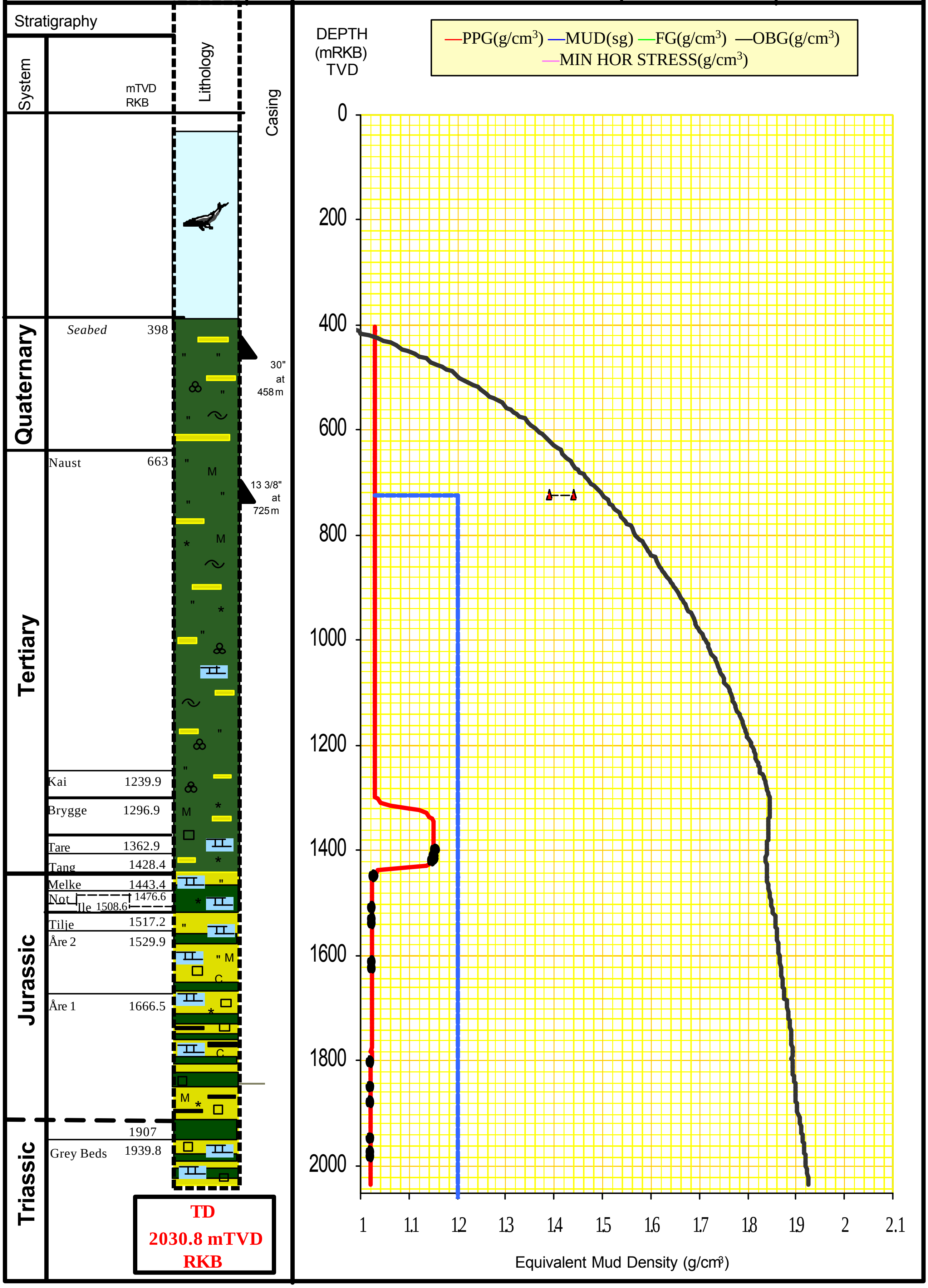


Fig. 4.7

PL 128	MDT Pressure Plott Well 6608/11-3	STATOIL	
RKB - Sea: 24 m			
Water Depth: 374 m MSL		Made by: TM	Date:14.07.03

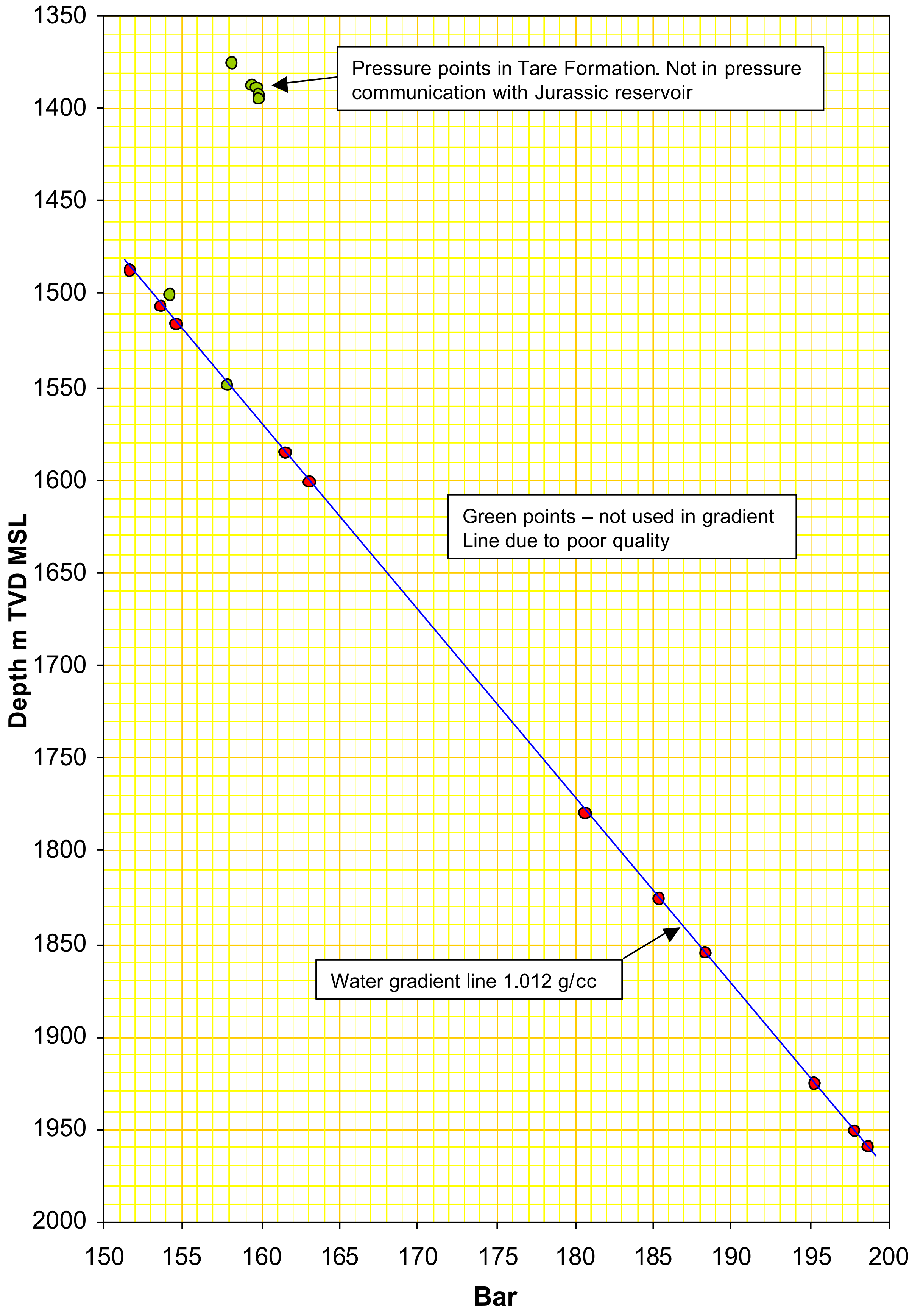


Figure 4.8

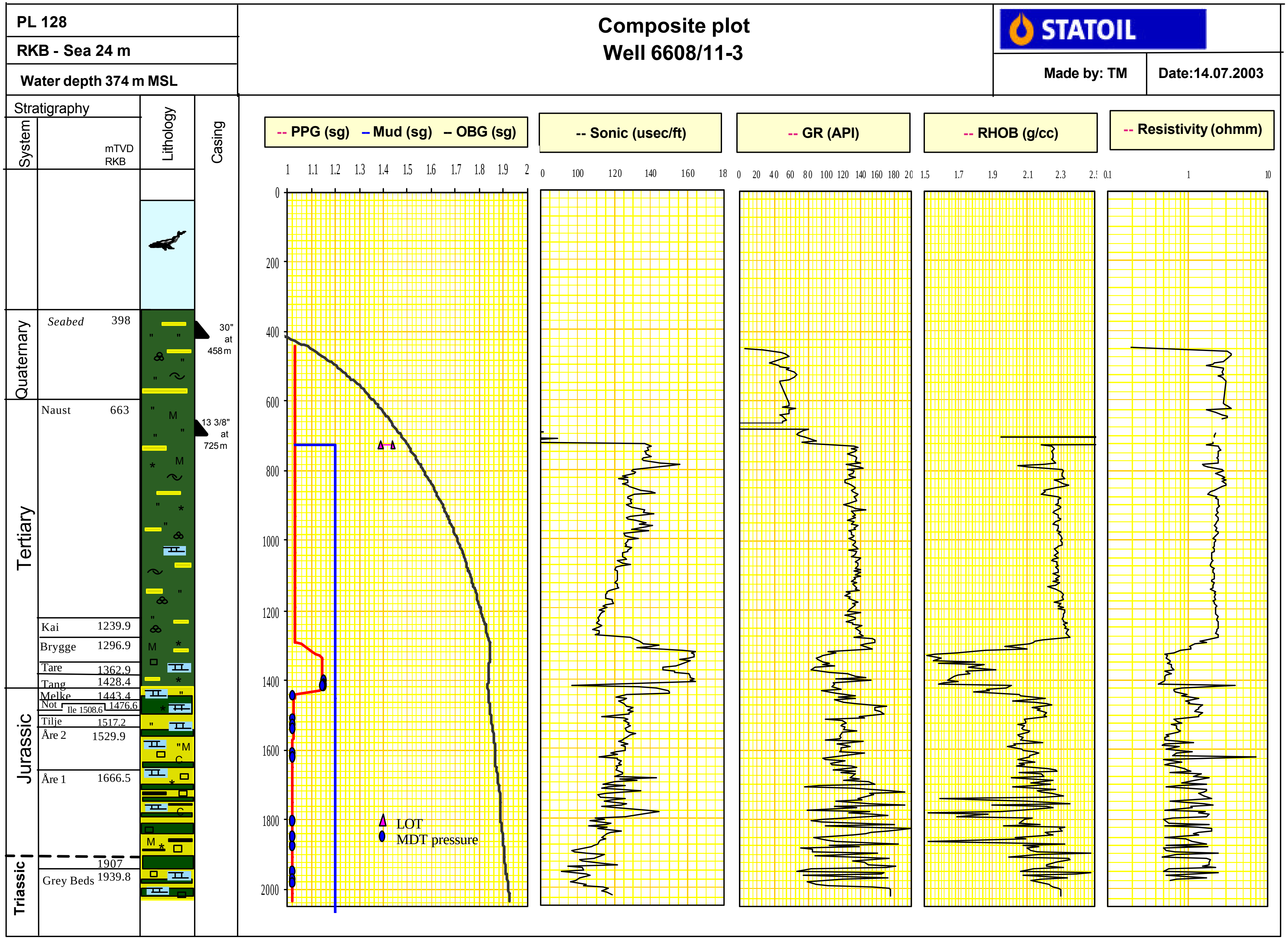
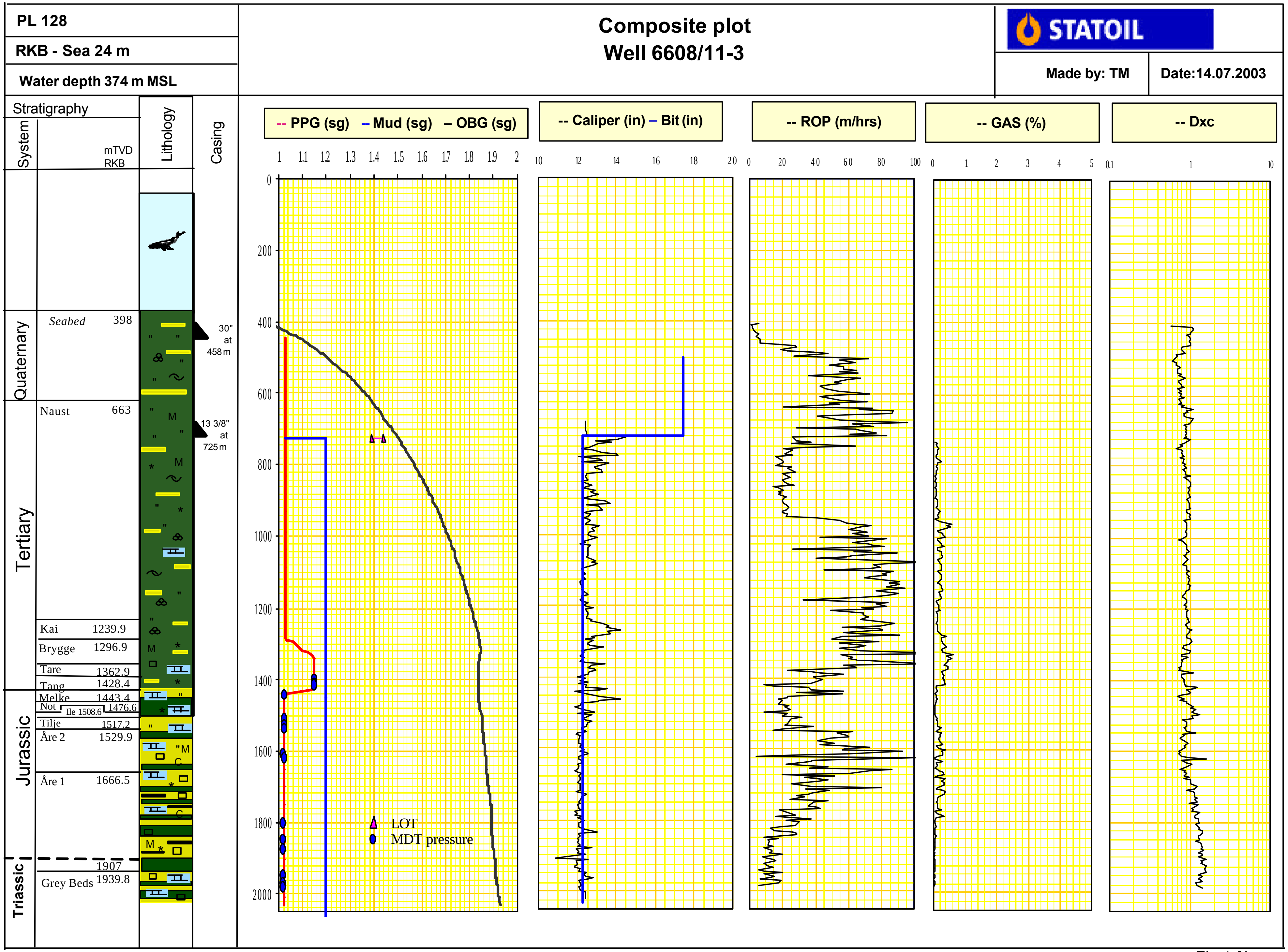
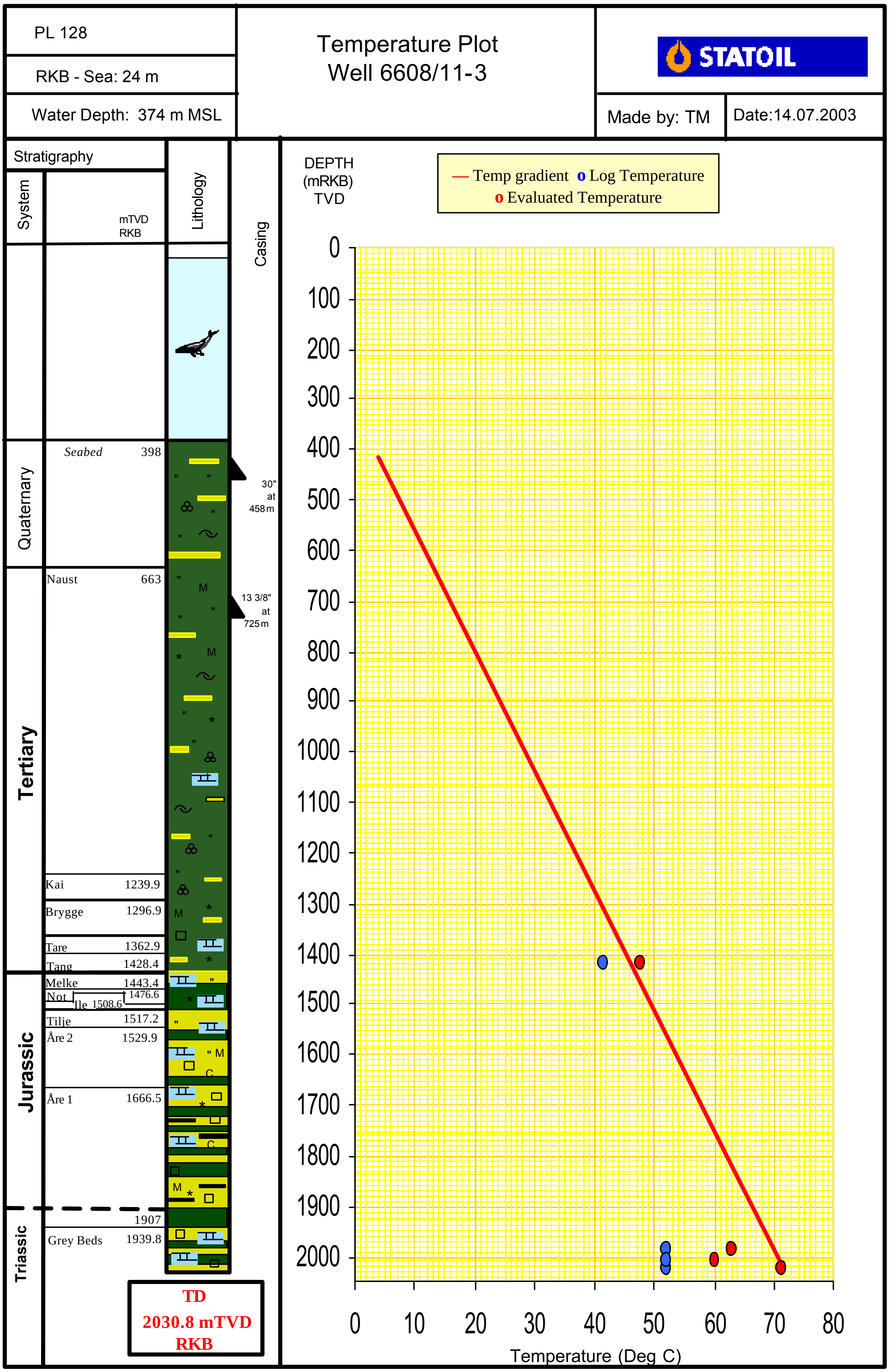

PL 128
RKB - Sea 24 m
Water depth 374 m MSL
Composite plot
Well 6608/11-3
STATOIL
Made by: TM
Date:14.07.2003
Stratigraphy
System
mTVD RKB
Lithology
Casing
Quaternary
Tertiary
Jurassic
Triassic
Seabed 398
Naust 663
Kai 1239.9
Brygge 1296.9
Tare 1362.9
Tang 1428.4
Melke 1443.4
Not 1476.6
Ile 1508.6
Tilje 1517.2
Åre 2 1529.9
Åre 1 1666.5
1907
Grey Beds 1939.8
30" at 458 m
13 3/8" at 725 m
-- PPG (sg) – Mud (sg) – OBG (sg)
-- Sonic (usec/ft)
-- GR (API)
-- RHOB (g/cc)
-- Resistivity (ohmm)
LOT
MDT pressure

Fig 4.9a



PL 128
RKB - Sea 24 m
Water depth 374 m MSL
Composite plot
Well 6608/11-3
STATOIL
Made by: TM
Date:14.07.2003
Stratigraphy
System
mTVD RKB
Lithology
Casing
-- PPG (sg) – Mud (sg) – OBG (sg)
-- Caliper (in) – Bit (in)
-- ROP (m/hrs)
-- GAS (%)
-- Dxc
Quaternary
Tertiary
Jurassic
Triassic
Seabed 398
Naust 663
Kai 1239.9
Brygge 1296.9
Tare 1362.9
Tang 1428.4
Melke 1443.4
Not 1476.6
Ile 1508.6
Tilje 1517.2
Åre 2 1529.9
Åre 1 1666.5
1907
Grey Beds 1939.8
30" at 458 m
13 3/8" at 725 m
LOT
MDT pressure

Fig 4.9b



PL 128
RKB - Sea: 24 m
Water Depth: 374 m MSL
Temperature Plot
Well 6608/11-3
STATOIL
Made by: TM
Date:14.07.2003
Stratigraphy
System
mTVD RKB
Lithology
Casing
DEPTH (mRKB) TVD
— Temp gradient o Log Temperature
o Evaluated Temperature
Quaternary
Tertiary
Jurassic
Triassic
Seabed 398
Naust 663
Kai 1239.9
Brygge 1296.9
Tare 1362.9
Tang 1428.4
Melke 1443.4
Not 1476.6
Ile 1508.6
Tilje 1517.2
Åre 2 1529.9
Åre 1 1666.5
1907
Grey Beds 1939.8
30" at 458 m
13 3/8" at 725 m
TD 2030.8 mTVD RKB
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300
1400
1500
1600
1700
1800
1900
2000
0 10 20 30 40 50 60 70 80
Temperature (Deg C)

Fig 4.10

5 Drilling operations report

5.1 Rig move and anchor handling

5.1.1 Summary

The semi-submersible and dynamic positioned (DP) rig Stena Don was moved from block 6608/10 at the Norne Field to the Blåmeis location 6608/11-3. The transit distance, 12.2 Nm, was sailed in three hours. The sea and weather was calm en route.

During transit some maintenance on rig equipment were carried out and a pre spud meeting was held.

Performed DP arrival test.

5.2 Drilling top hole section

5.2.1 Summary

Tagged seabed carefully at 398.4 m. Attempted to take final spud position, but had to retrieve ROV to change transponder. After placing marker buoys, a 36" hole was drilled from sea bed at 398 m to section TD at 460 m with a two stage heavy duty 26/36" hole opener assembly and a 17 ½" insert bit. Used low weight on bit, maximum 5 t, to ensure vertical hole and the average ROP was 3.0 m/hr. The top hole section was drilled using seawater and high viscosity pills as drilling fluid. Swept hole at TD.

The inclination surveys measured by Anderdrift varied between 1.00° in the very top of the hole to 0.00° at TD. The single shot dropped at TD prior to pulling out showed 0.25° inclination. At TD the hole was displaced to 1.35 g/cm³ mud prior to pulling out. No over pull was experienced when pulling out of hole.

The 30" conductor was run to 458.0 m and cemented in place with 30" WH and 3 metres stick up and an angle of *0-0.5°*. The conductor was landed on bottom of the 26" hole opener TD. The cement slurries used for the conductor was 1.56 g/cm³ Econolite-extended as lead cement and 1.95 g/cm³ G-cement accelerated with $CaCl_2$ as tail cement, and 300% OH excess was used. Waited on cement for 6.0 hrs.

Drilling out the 30" conductor shoe and cleaning the rat hole took 3.5 hours.

5.2.2 Experiences / recommendations

- Drilling parameters
  The top hole was drilled with maximum flow (4750 lpm), high rotational speed (30 - 125 PRM) and low WOB (0-5 mt). This has proved to be the best way to ensure a vertical top hole in this area. Experience shows that patience and acceptance of low ROP are necessary to keep the hole inclination within the limit when drilling through boulders.

- Cement slurry
  X-lite cement slurry to be assessed in future wells drilled with DP rigs to save time on WOC.

- Cement excess
  Re-evaluate best practice for excess cement volume with DP-rigs.

- Bottom Hole Assembly
  Used a Red Baron Heavy Duty two stage hole 26"/36" opener with a 17 ½" milled tooth bit, together with a 9 ½" Anderdrift and 8" drill collars. This BHA should provide the necessary stiffness to drill top holes in this area.

5.3 Drilling 17 ½" section

5.3.1 Summary

A 17 ½" section was drilled out of the 30" conductor and down to TD at 730 m in one bit run. A pendulum assembly on 5" DP with a milled tooth bit, IADC-code 115, was used. This section depth was decided to set the 13 3/8" surface casing above a class 2 shallow gas warning from 750 to 950m. The section was overall drilled with an average ROP on bottom of 41.5 m/hr, included the 3.5 hrs used on drilling out the 30" conductor. Seawater and high viscosity pills were used as drilling fluid in this section. At TD the hole was circulated clean and displaced to 1.30 g/cm³ mud.

The 13 3/8" casing was run and set at 725 m. The casing was successfully cemented, except one did not see the bottom cement plug sheared. Had full returns during cement job and bumped the cement plugs with 97% pump efficiency.

Ran the BOP through the splash zone after WOW. The high pressure test of kill and choke lines failed and the BOP was pulled. Located a leak in a hose. Ran and installed the riser and BOP and pressure tested the well to 320 bar/15 min. Total time used was 67.0 hrs, included 11.0 hrs WOW and 15.5 hrs down time.

Drilled out with 12 ¼" BHA and a rock bit: 38 m cement, plugs, 13 3/8" shoe and the rat hole in 6.0 hrs, of which 2.5 hrs on wiper plugs and 10 min on float and shoe. (No anti-rotation sleeve was installed inside the casing.)

Prior to performing the extended leak off test (XLOT), a conventional leak off test (LOT) was performed. In the planning phase a minimum necessary LOT value was set, and the conventional LOT had to meet this value in order to continue carrying out the extended LOT. The reason for this was to avoid problems with the casing design as the XLOT reduces the available formation strength. The XLOT was planned as the second cycle to a successful LOT with value above 1.40 g/cm³ EMW. The calculated LOT value 1.34 g/cm³ EMW from surface data and too low to perform the XLOT. Using down hole data the LOT was estimated to be in the range of 1,39 to 1,44 g/cm^3, see Chapter 4.8 for more details.

The LOT was performed to 22 bars with seawater.Experiences / recommendations

- XLOT
  The requirement for an XLOT must be included in the task document.
  A strategy for XLOT is recommended for future wells if the LOT is critical for the well design.

- Drilling out of 13 3/8" casing shoe
  Drilled out of the 13 3/8" casing shoe with the 12 1/4" drilling assembly in less than 3 hours.

- Pressure testing on Stena Don
  Stena Don should consider to install a valve to enable pressure testing of either choke or kill valve.

5.4 Drilling 12 1/4" section

5.4.1 Summary

The 12 ¼"" section was drilled from the 13 3/8" casing shoe at 725 m and down to TD at 2031 m. This was a planned option in the case no shallow gas was encountered and also a dry reservoir, whilst the main plan was to run a 9 5/8" liner above the reservoir. One core was cut and recovered from the Triassic Grey Beds Formation. The reservoir was successfully logged on wire line before the well was plugged back.

The section was drilled using a packed Core Point Finder (CPF) rotary assembly and a milled tooth bit, IADC code 1-1-7W, on a 5" DP. The drilling fluid used was 1.22 g/cm³ KCl/glycol/polymer water based mud.

The section down to coring point at 1985 m was drilled with a Security DBS EBXLC1, with an average ROP of 25.9 m/hr. The penetration rate was restricted to 20 m/hr in the intervals 750-950 m and 1443-1546 m, but very high at intervals without restrictions. Continued drilling to the core point. While POOH one had 30 t over pull at a tight spot at 1645 m and had to ream tight spots also from 1655-1626m. The stabilizer was 1/8" UG and the bit was graded 6-4-WT-A-F-4/16-LN-CP.

RIH with 12 ¼” coring assembly and a DBS Security CT103HS core bit. Unable to pass tight spot at 1907 m with 30 t weights down, reamed and worked tight interval down to 1985 m where the bit had drilled under gauge hole. Cut core from 1985-1994 m. Torque dropped gradually and indicated that the core jammed off. POOH with the coring assembly.

RIH with a slick 12 ¼” drilling assembly and a new bit of same type. Drilled 12 ¼” hole from 1994 to the well TD at 2031 m with an average ROP of 25.7 m/hr. POOH and worked tight hole from 1986 m. Reamed tight interval at 2003-1885 m.

Five wireline logging runs were carried out without operational problems, including MDT sampling and sidewall cores.

Coring and logging is thoroughly described in chapter 4.7.

5.4.2 Experiences / recommendations

- Engineering
  Sufficient engineering time in the well design phase saved one hole section, estimated to 3.8 days. This also avoided the use of an expensive mud to drill an 8 ½” section.

- Drill bit
  The Security DBS EBXLC1 milled tooth bit drilled fast with low vibrations above the reservoir.

- Bit balling
  There was not experienced any signs of bit balling.

- Mud parameters
  The water based KCl/polymer/glycol drilling fluid was at first run with glycol content around 3.5 – 4.2 % and a KCl content of 120 – 155 kg/m³. This proved to be sufficient to avoid problems with sticky clay down hole.

- Cuttings quality
  Poor cuttings quality due to high flow rates. The samples were non-representative as the clay content was largely washed out.

- Sidewall cores
  Successful CST run with 53 of 60 cores recovered.

- Core recovery
  Poor core recovery.

5.5 Permanent P&A

5.5.1 Summary

The 12 ¼" open hole was plugged with three 250 m high cement plugs of which the upper was gas tight. The plugs were set from TD at 2031 m to 1281 m. Displaced the cement with 1.22 g/cm³ KCl/glycol mud. Above the open hole cement plugs a Perigon tool was set at 825 m as support for the cement plug of 200 m, which was placed through the transition zone into the 13 3/8" surface casing. Pressure tested this cement plug to 80 bars for 10 min. An EZSV bridge plug was set at 620 m, above the transition zone cement plug. A 200 m surface cement plug placed at 619 m finished the plugging.

When circulating after having placed the bottom plug, 44 m^3 mud got cement contaminated.

The 20x30" casing was cut at 402 m, but one was not able to pull the casing free on first attempt. A second attempt was done to cut and pull, but the casing did not come free. A third cut was then done at 400 m, with the casing in tension, above the first cut. The casing came free after pulling with 155 t over pull. At surface it showed that it was pulled at the first cut at 402 m. It was not cut through the casing wall in a length of 33 cm at one side of the casing. Recovered transponding with ROV.
The rig was transferred to Norne Unit at 2100 hrs on the 15.12.2002.

5.5.2 Experiences / recommendations

- <u>Balanced cement plug 12 ¼" open hole</u>
  Fresh water is not recommended as a spacer for open hole plugs, because it may lead to contamination of the mud.

- <u>Rubber sleeve on conductor</u>
  On this conductor there was no rubber sleeve mounted to ease pulling. It is recommended to install a rubber sleeve on future conductors to earn more experience.

5.6 Figures and tables

5.6.1 P&A well bore schematic

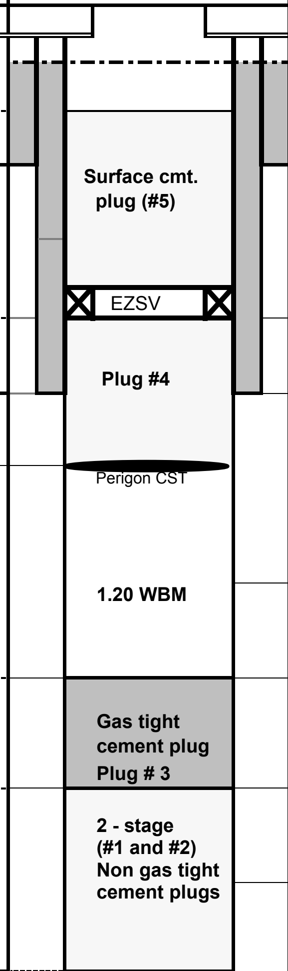
Well: **6608/11-3**
Field: **Blåmeis**
Rig: **Stena Don**

PERMANENT P&A WELL SCHEMATIC

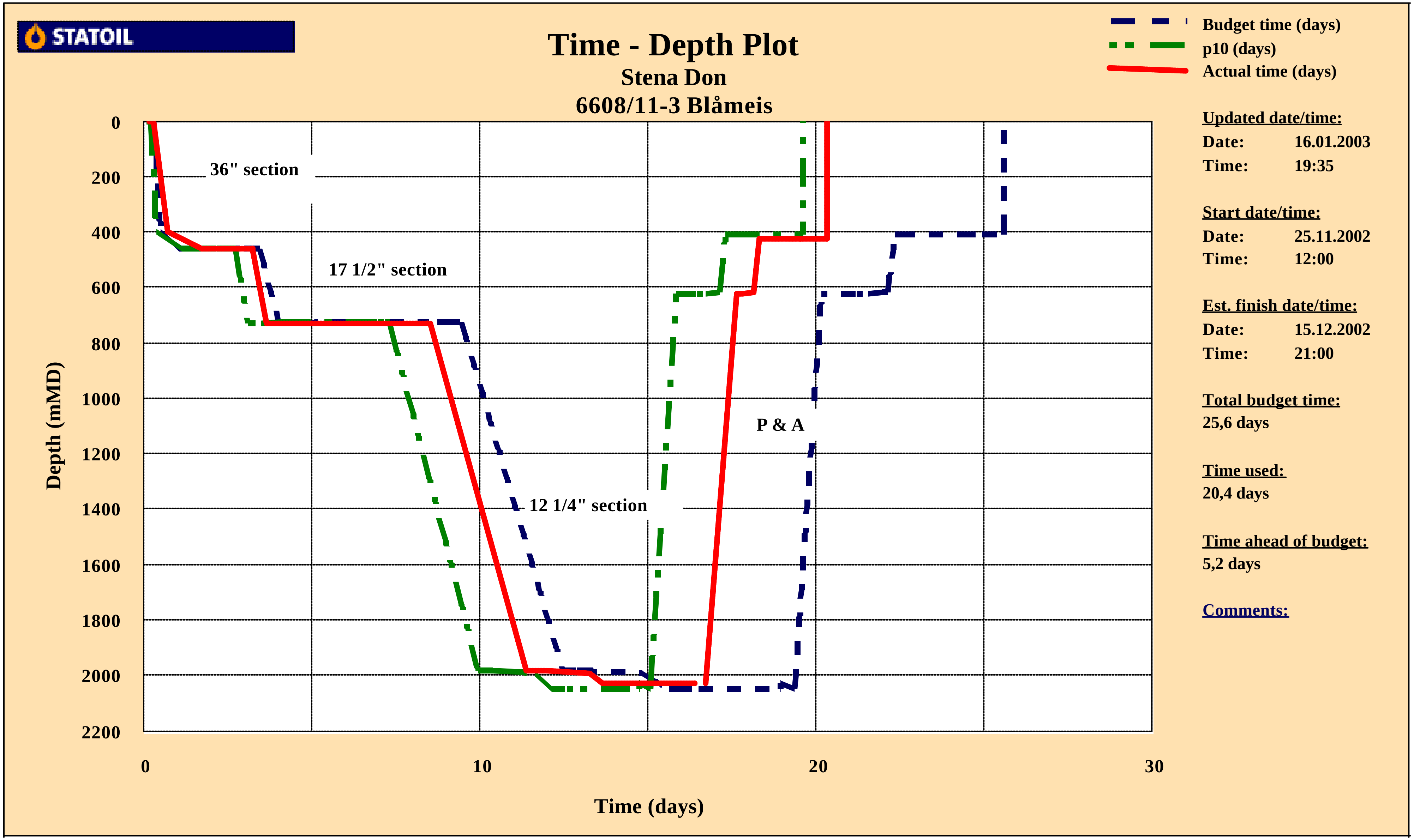
Date of abandonment: **December 2002**

HOLE SIZE	HOLE TVD MD	CASING SIZE	TYPE	PERMEABLE ZONES	TEST PRESS [bar]	LOT FIT	PLUG BACK TVD	PLUG BACK MD	CSG. SHOE TVD	CSG. SHOE MD	CASING CUT	LOAD / PRESSURE TEST
Sea Bed	398.0						398.0	398.0				
36"	460	**30"**	5 jnts. 30", 309.7 lb/ft, X-52, ST-2. incl 30" WH housing & shoe joint	None	**N/A**		425	425	460	460	403 m	
17 1/2"	730 730	**13 3/8"**	18 3/4" WH hanger incl. extension jnt. x-over to 13 3/8" 72 lb/ft, P-110, New Vam	None	**320**	LOT 1.34	625	625	725	725		PRESS. TEST 70 bar ABOVE LOT AT 13 3/8" SHOE (155 bar @ 725 m)
12 1/4"	2 031 2 031		None	Water filled Tare fm.: 1399 mMD / 1399 mTVD Gas filled sand in Tare fm.: 1419 mMD / 1419 mTVD Top Melke fm. 1442 mMD / 1442 mTVD Top Åre fm. 1509 mMD / 1509 mTVD			825 1 281 1 531	825 1 281 1 531	2031	2031		

RKB



5.6.2 Time/depth curve


STATOIL
Time - Depth Plot
Stena Don
6608/11-3 Blåmeis
Budget time (days)
p10 (days)
Actual time (days)
36" section
17 1/2" section
12 1/4" section
P & A
Depth (mMD)
0
200
400
600
800
1000
1200
1400
1600
1800
2000
2200
0
10
20
30
Time (days)
Updated date/time:
Date: 16.01.2003
Time: 19:35
Start date/time:
Date: 25.11.2002
Time: 12:00
Est. finish date/time:
Date: 15.12.2002
Time: 21:00
Total budget time:
25,6 days
Time used:
20,4 days
Time ahead of budget:
5,2 days
Comments:

5.6.3 Time planner

Thu 16.01.2003 19:35 Updated

TIMEPLANNER

STATOIL

Mon 25.11.2002 12:00 Start date

Stena Don

Time ahead of budget:

Sun 15.12.2002 21:00 Est. finish date

6608/11-3 Blåmeis

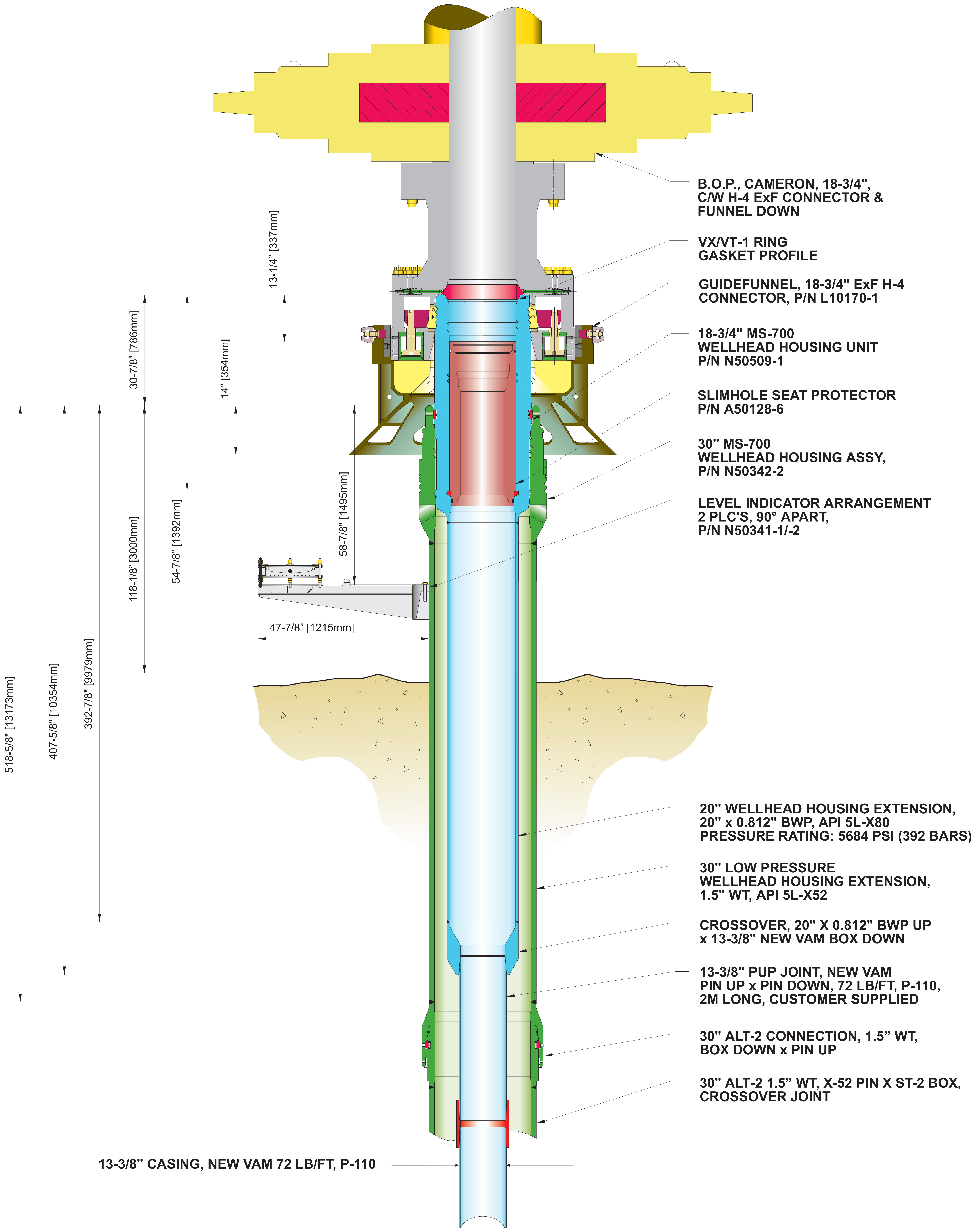
5,2 days

DAY	START DATE	START TIME	Budg. time (hrs)	Acc. budg. time (days)	Opt. time (hrs)	Acc. opt. time (days)	Budg./Opt. depth (mMD)	Plan time (hrs)	Actual time (hrs)	Acc. actual time (days)	Actual Depth (mMD)		Activity description	Company
													36" hole section (398 - 460 m)	
Mon	25.11.2002	12:00	4,0	0,2	3,0	0,1	0	3,0	5,0	0,2	0	F	Transit from Norne to well location (12.2 Nm, avg 3.0 knots). Mix spud mud. Service TDS.	
Mon	25.11.2002	17:00	4,0	0,3	3,0	0,3	0	6,0	3,0	0,3	0	F	Ballasting and final rig positioning. Install DP-transponders.	
Mon	25.11.2002	20:00	5,0	0,5	4,0	0,4	398	3,0	9,5	0,7	398	F	MU 30" CART & cmt stand. MU and RIH with 36" BHA. Finalize spud position w/ROV beacon.	
Tue	26.11.2002	05:30	13,0	1,1	18,0	1,2	460	27,0	24,0	1,7	460	F	Drill 36" hole. (36" to 457 m)	
Wed	27.11.2002	05:30	5,0	1,3	4,0	1,3	460	2,0	0,5	1,8	460	F	Circulate hole clean and displace hole to weighted mud.	
Wed	27.11.2002	06:00	5,0	1,5	4,0	1,5	460	3,0	3,5	1,9	460	F	POOH with 36" BHA and rack back / lay down same.	
Wed	27.11.2002	09:30	17,0	2,2	8,0	1,8	460	12,0	8,5	2,3	460	F	PU 30" conductor and install slope indicators. Run conductor and cement stinger.	
Wed	27.11.2002	18:00	6,0	2,5	4,0	2,0	460	4,0	3,0	2,4	460	F	Circulate, pump and displace cement.	
Wed	27.11.2002	21:00	6,0	2,7	5,0	2,2	460	6,0	6,0	2,6	460	F	WOC	
Thu	28.11.2002	03:00	7,0	3,0	4,0	2,4	460	6,0	5,0	2,8	460	F	Retrieve running tool and landing string. MU Cmt stand.	
Thu	28.11.2002	08:00	7,0	3,3	6,0	2,6	460	6,0	7,0	3,1	460	F	MU and RIH with 17 1/2" BHA.	
Thu	28.11.2002	15:00	4,0	3,5	3,0	2,8	460	2,0	3,5	3,3	460	F	Drill out cement & 30" shoe.	
Section time (days)			3,5		2,8			3,3	3,3				Section time ahead of/behind (-) budg:0,2 days, Tot. time ahead of/behind (-) budg:0,2 days	
													17 1/2" hole section (460 - 725 m)	
Thu	28.11.2002	18:30	14,0	4,0	9,0	3,1	730	10,0	10,0	3,7	730	F	Drill 17 1/2" hole to TD at 730 m.	
Fri	29.11.2002	04:30	3,0	4,2	1,0	3,2	730	2,0	1,5	3,8	730	F	Circulate hole clean.	
Fri	29.11.2002	06:00	10,0	4,6	8,0	3,5	730	8,0	6,0	4,0	730	F	Displace to weighted mud and POOH. Rack back 17 1/2" BHA.	
Fri	29.11.2002	12:00	24,0	5,6	15,0	4,1	725	14,0	13,0	4,5	730	F	RU and run 20" x 13 3/8" casing.	
Sat	30.11.2002	01:00	8,0	5,9	5,0	4,3	725	5,0	4,5	4,7	730	F	Circulate, pump and displace cement. Release RT	
Sat	30.11.2002	05:30	5,0	6,1	6,0	4,6	725	3,0	6,5	5,0	730	F	POOH and wash well head area. LD cement head, RT and 17 1/2" BHA.	
Sat	30.11.2002	12:00	53,0	8,3	44,0	6,4	725	53,0	66,0	7,8	730	F	Run BOP / Riser and pressure test same. Test 13 3/8" csg/ BOP connector to 320 bar/ 15 min.	
Tue	03.12.2002	06:00	10,0	8,8	9,0	6,8	725	6,0	9,5	8,1	730	F	MU and RIH with 12 1/4" BHA.	
Tue	03.12.2002	15:30	5,0	9,0	5,0	7,0	725	4,0	6,5	8,4	733	F	Perform choke drill. Drill out shoe track and 3 m new formation using sw/Hivis.	
Tue	03.12.2002	22:00	7,0	9,3	5,0	7,2	725	5,0	1,5	8,5	733	F	Circulate, spot pill & perform (X)LOT.	
Section time (days)			5,8		4,5			4,6	5,2				Section time ahead of/behind (-) budg:0,6 days, Tot. time ahead of/behind (-) budg:0,8 days	
													12 1/4" hole section (725 - 2050 m)	
Tue	03.12.2002	23:30	5,0	9,5	3,0	7,3	725	3,0	2,0	8,6	733	F	Displace well to 1,20 sg WBM.	
Wed	04.12.2002	01:30	73,0	12,5	64,0	10,0	1985	68,5	68,5	11,4	1985	F	Drill 12 1/4" hole to Grey Beds fm at 1985 m.	
Fri	06.12.2002	22:00	10,0	12,9	10,0	10,4	1985	12,0	13,5	12,0	1985	F	Circulate hole clean and POOH.	
Sat	07.12.2002	11:30	46,0	14,8	30,0	11,7	1996	30,0	32,0	13,3	1996	F	PU & RIH with coring assembly. Cut core and POOH.	
Sun	08.12.2002	19:30	20,0	15,7	12,0	12,2	2050	12,0	8,5	13,7	2031	F	RIH with 12 1/4" BHA and drill 31 m to well TD at +/- 2031 m.	
Mon	09.12.2002	04:00	12,0	16,2	11,0	12,6	2050	12,0	9,5	14,1	2031	F	Circulate well clean and POOH.	
Mon	09.12.2002	13:30	67,0	19,0	51,0	14,8	2050	56,0	56,0	16,4	2031	F	Perform open hole logging. Performed 5 logging runs	
Section time (days)			9,7		7,5			8,1	7,9				Section time ahead of/behind (-) budg:1,8 days, Tot. time ahead of/behind (-) budg:2,6 days	
													Not in use	
Wed	11.12.2002	21:30		19,0		14,8	2050			16,4				
Wed	11.12.2002	21:30		19,0		14,8	2050			16,4				
Section time (days)														
													Not in use	
Wed	11.12.2002	21:30		19,0		14,8	2050			16,4				
Wed	11.12.2002	21:30		19,0		14,8	2050			16,4				
Section time (days)														
													Not in use	
Wed	11.12.2002	21:30		19,0		14,8	2050			16,4				
Wed	11.12.2002	21:30		19,0		14,8				16,4				
Section time (days)														
													Plug & Abandon	
Wed	11.12.2002	21:30	10,0	19,4	9,0	15,1	2050	8,0	8,0	16,7	2031	F	PU cement stinger and RIH to TD.	
Thu	12.12.2002	05:30	20,0	20,2	18,0	15,9	625	24,0	22,5	17,7	625	F	Plug back open hole with 3 cement plugs. Set cement plug across 13 3/8" shoe. POOH.	
Fri	13.12.2002	04:00	25,0	21,3	15,0	16,5	625	0,0	0,0	17,7	625	F	RIH dress off cement, load and pressure test.	
Fri	13.12.2002	04:00	8,0	21,6	6,0	16,8	625	6,0	4,0	17,8	625	F	RIH w/jet assembly and WB RT. Retrieve WB.	
Fri	13.12.2002	08:00	14,0	22,2	10,0	17,2	620	10,0	8,0	18,2	620	F	RIH with bridge plug. Pressure test cmt. with bridge above BOP. Set bridge plug. Displace well to SW.	
Fri	13.12.2002	16:00	5,0	22,4	4,0	17,3	410	3,0	4,5	18,4	423	F	Set surface cement plug. POOH	
Fri	13.12.2002	20:30	53,0	24,6	35,0	18,8	410	30,0	29,0	19,6	423	F	Pull Riser / BOP.	
Sun	15.12.2002	01:30	25,0	25,6	20,0	19,6	410	12,0	19,5	20,4	423	F	Cut & retrieve 20" x 30" csg / WH.	
Sun	15.12.2002	21:00	0,0	25,6		19,6	0	0,0		20,4	0		END OF WELL.	
Sun	15.12.2002	21:00	6,7		4,9			3,9	4,0				Section time ahead of/behind (-) budg:2,7 days, Tot. time ahead of/behind (-) budg:5,2 days	
End of operation														

5.6.4 Wellhead system

Stena Don

Well 6608/11-3
‘BLÅMEIS’



MS-700 Wellhead System
18-3/4” x 15,000 PSI

Concept AS

Drawing Number: N601021-3

5.6.5 Drilling fluids

Well:	**6608/10-9**	
Field:	**Blåmeis**	
Rig:	**Stena Don**	

DRILLING FLUIDS

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 100 rpm [lb/sqft]	Fann 3 rpm [lb/sqft]	PV [cP]	FV [sec]	HTHP FL [ml]	YP [Pa]	pH	Activity	ES [Volt]	Ex. Lime [kg/m³]	OWR [vol %]	Total Volume Old Volume New Volume Usage [m³]
36"	460	**30"**	460	SW/ Bentonite sweeps, SW/CMC displ.mud	1.03 - 1.35															502 0 502 234 60 m3 kill mud mixed and transferred

COMMENTS, Ref. Anchor/M-I, Operational Procedures - Rev. 0 - 20.03.00:
80 m3 of kill mud - density 1,6 sg - was built. The hole was drilled with sea water, pumping 5-8 m3 of high vis SW/bentonite sweeps every 15 m drilled. At TD the hole was swept with a 40 m3 high vis pill before displacing the hole to 1.35 sg SW/CMC displacement fluid and pulling out to run conductor. The kill mud was transferred to the 17 1/2" section.

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 100 rpm [lb/sqft]	Fann 3 rpm [lb/sqft]	PV [cP]	FV [sec]	HTHP FL [ml]	YP [Pa]	pH	Activity	ES [Volt]	Ex. Lime [kg/m³]	OWR [vol %]	Total Volume Old Volume New Volume Usage [m³]
17 1/2"	730	**13 3/8"**	725	SW/ Bentonite sweeps, SW/CMC/ bentonite displ.mud	1.03 - 1.30															273 248 25 273

COMMENTS, Ref. Anchor/M-I, Operational Procedures - Rev. 2 - 18.08.02: 60 m3 of kill mud - density 1.6 sg - was received from previous section. The hole was drilled with sea water, pumping 8-10 m3 of high vis SW/bentonite sweeps every 15 m drilled. At TD the hole was swept with with a 40 m3 high vis pill before displacing the hole to 1.30 sg mud - displacement fluid was mixed by diluting the kill mud to 1.30 sg.

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 100 rpm [lb/sqft]	Fann 3 rpm [lb/sqft]	PV [cP]	FV [sec]	HTHP FL [ml]	YP [Pa]	pH	Activity	ES [Volt]	Ex. Lime [kg/m³]	OWR [vol %]	Total Volume Old Volume New Volume Usage [m³]
12 1/4"	2 031	**NA**		Glydril (KCL/ Pac/Glycol) 99% KCl	1.34	132 - 193	3 - 4	4 - 5	22 - 23	5 - 6	13 - 14	63 - 68	n/a 3.2 - 4.9 API	11 - 12	8.1 - 9.0					535 0 535 248

COMMENTS, Ref. Anchor/M-I, Operational Procedures - Rev. 2 - 18.08.02:
Saturated 99 % KCl brine was shipped to the rig. The KCl concentration was maintained at 120 - 146 kg/m3. Glycol concentration was maintained in the range of 3.5 - 4.2 % by volume.

5.6.6 Cementing data

Well: 6608/11-3
Field: Blåmeis
Rig: Stena Don

CEMENTING DATA

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 [SG]	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"	460	**30"**	457	Seabed	Lead: 28 m3 Tail: 21 m3 H ex = 300 9	Norcem "G" 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	6-8	L: > 6 T: 3 - 4	n/a	n/a	L: +/- 200 T: +/- 500	Min. 30 m3 Sea water	Sea water 1000 - 2000 lpm
17 1/2"	730	**13 3/8"**	725	Seabed	Lead: 53 m3 Tail: 15 m3 200% OH	Norcem "G" Cmt. (100 kg) Econolite NF-6 Sea water	3.20 0.10 95.07	- 0.10 45.00	L: 1,56 T: 1,92	L: 129,42 Code STL10 T: 76,16 Code STTNT	18/15	L: 09:50 T: 05:30	n/a	n/a	L: +/- 200 T: 1000	Casing volume Sea water	Sea water 3000 lpm
12 1/4" OH	2 031 2 031	**P&A** **Plug #1** **& #2**	2 031	1531	2 stage plug 18,8 m3 + 18,8 m3 calliper vol.	Norcem "G" Cmt. (100 kg) HR-5L Halad-99LE+ NF-6 Freshwater		0.80 1.00 0.10 42.14		75.09 Code MPT05	72/59	04:50	0.3	n.a	2500	10 m3 freshwater	WBM 2000 - 4000 lpm
12 1/4" OH		**P&A** **Plug #3**	1 531	1281	18,8 m3 calliper vol.	Norcem "G" Cmt. (100 kg) Gascon 469 Halad-99 LE+ CFR-3L NF-6 Fresh water		3.50 12.00 2.50 0.10 26.89	1.92	76.04 Code GTT90	48/35	04:17	0	76	+/- 2500	10 m3 freshwater	WBM 2000 lpm
		P&A **Plug #4** 12 1/4"OH x 13 3/8"	825	625	15,2 m3	Norcem "G" Cmt. (100 kg) CaCl2 NF-6 Seawater		4.35 0.10 39.56	1.95	75.06 Code STT10	17/14	01:45	n.a	n.a.	+/- 1800	14 m3 freshwater	WBM 2000 lpm
		P&A **Plug #5** surface plug	620	420	15,5 m3	Norcem "G" Cmt. (100 kg) NF-6 Seawater		0.10 46.74	1.90	77.90 Code STTNT	14.des	+/- 4 hrs	n.a.	n.a.	+/- 1000	6 m3 freshwater	Freshwater 900 lpm

5.6.7 Bit record

Bit record

Wellbore: NO 6608/11-3

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	26"/36"	2	1	HEAVYDUTY	XXX	Smith Red Baron	D 60045	6 x 12	6 x 12	x	x	1,326
1	17 1/2"	1	1	MAXGT09	435M	Eastman Christensen	A96DW	3 x 18	1 x 14	x	x	,896
2	17 1/2"	3	2	XT1C	115M	Security DBS	739416	3 x 20	1 x 18	x	x	1,169
3	12 1/4"	4	3	EBXLC1	117W	Security DBS	10394375	2 x 18	1 x 16	1 x 14	x	,844
4	12 1/4"	4	4	CT103HS	T5X9	DIAMANT BOART S	7950096	x	x	x	x	
5	12 1/4"	5	5	EBXLC1	117W	Security DBS	10394376	2 x 18	1 x 16	1 x 14	x	,844

Wellbore: NO 6608/11-3

Run No	Bit Size	Pump Rate l/min	Pump Press bar	Depth in mMD	Depth out mMD	Drilled length m	Hours Drilled	ROP	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	26"/36"	4750	144	398	458	60	21	2,9	0	5	30	125	2000	12000		
1	17 1/2"	4750	144	398	460	62	21	3,0	0	5	30	125	2000	12000		
2	17 1/2"	4500	190	460	730	270	6,5	41,5	2	12	60	160	2000	15000		
3	12 1/4"	4000	270	730	1985	1255	48,4	25,9	4	20	100	200	2000	15000		
4	12 1/4"	1400	80	1985	1995	10	2,4	4,2	12	20	100	120	4000	12000		
5	12 1/4"	4000	260	1995	2031	36	1,4	25,7	15	23	150	200	4000	11000		

Wellbore: NO 6608/11-3

Run No	Bit Size	IADC dull grading I	O	DC	L	B	G	OC	RP	Remarks
1	26"/36"									Red Baron heavy duty holeopener run wi th 17 1/2" MAXGT -PT09DDT Bit. Serial no: A96DW, IADC 435.
1	17 1/2"	2	6	BT	G	E	I	CT	TD	Run in grading: 2-6-BT-G-E-I-CT-UNK.
2	17 1/2"	1	2	WT	A	E	0	NO	TD	Also drilled cmt and shoe from 454 - 457 m. Total 51,9 k bit revs on btm.
3	12 1/4"	6	4	WT	A	F	4	LN	CP	Also drilled 38 m cmt in shoe track. Tot 518 k revs on btm. Drilled from 730 - 950 m and 1443 - 1546 m with restricted ROP to 20 m/hr. Center nozzle washed out. Other dull : possible erosion, cone interference.
4	12 1/4"	2	2	CT	A	X	I	NO	FM	
5	12 1/4"	1	1	NO		E	I		TD	13.4 Krevs

5.6.8 Bottom hole assemblies

BHA report

Wellbore: NO 6608/11-3

BHA seq: 1 BHA category: Drilling BHA description: 17 1/2"/ 26"/ 36"

BHA no: 1

String component	OD in	ID in	Length m	Acc length m
DP 5"	5,000	4,280		0,00
HW DRILL PIPE	5,000	3,000	85,77	85,77
X-OVER	7,875	2,813	0,90	86,67
X-OVER	9,250	3,000	0,92	87,59
ANDERDRIFT	9,500	2,800	2,87	90,46
BIT	17,500		0,40	90,86
HOLE OPENER	26,000	3,000	1,50	92,36
DRILL COLLAR	8,000	2,813	112,41	204,77
FLOAT SUB	9,500	3,000	0,87	205,64
HOLE OPENER	36,000	3,000	2,83	208,47

BHA seq: 2 BHA category: Drilling BHA description: 17 1/2"

BHA no: 2

String component	OD in	ID in	Length m	Acc length m
DRILL COLLAR	8,000	2,813	18,78	227,25
BIT	17,500		0,42	227,67
MPR SUB	8,250	2,813	5,06	232,73
HW DRILL PIPE	5,000	3,000	85,77	318,50
X-OVER	7,875	2,813	0,90	319,40
XO SUB	9,500	3,000	0,95	320,35
DRILL COLLAR	8,000	2,813	84,27	404,62
BIT SUB	9,500	3,000	0,92	405,54
MWD DCP	8,250	2,813	11,37	416,91
JAR	8,000	3,000	9,74	426,65
DRILL COLLAR	8,000	2,813	9,36	436,01
STAB STRING	17,500	2,813	1,52	437,53
SAVER SUB	8,250	2,813	0,98	438,51
STAB STRING	17,500	2,813	1,45	439,96

BHA seq: 3 BHA category: Drilling BHA description: 12 1/4"

BHA no: 3

String component	OD in	ID in	Length m	Acc length m
MWD DCP	8,250	2,813	11,27	451,23
MOD STAB	12,250	3,000	1,38	452,61
MPR SUB	8,250	2,813	3,74	456,35
EXTENSION SUB	8,125	3,000	0,63	456,98
SAVER SUB	8,250	2,813	0,98	457,96
BIT	12,250		0,33	458,29
NEAR BIT STAB	12,250	3,000	1,02	459,31
HW DRILL PIPE	5,000	3,000	85,77	545,08
X-OVER	7,875	2,813	0,90	545,98
DRILL COLLAR	8,000	2,813	18,78	564,76
JAR	8,000	3,000	9,74	574,50
DRILL COLLAR	8,000	2,813	84,24	658,74
FLOAT SUB	8,000	3,000	0,79	659,53
STAB STRING	12,250	2,813	1,88	661,41

BHA seq: 4 BHA category: Drilling BHA description: 12 1/4" Core run #1.

BHA no: 4

String component	OD in	ID in	Length m	Acc length m
DP 5"				661,41
X-OVER	7,875	2,813	0,90	662,31
DRILL COLLAR	8,000	2,813	18,78	681,09
JAR	8,000	3,000	9,74	690,83
DRILL COLLAR	8,000	2,813	84,24	775,07
FLOAT SUB	8,000	3,000	0,92	775,99
SAFETY JOINT	8,000		0,72	776,71
STAB STRING	12,219		1,22	777,93
CORE BARREL	8,000	6,630	7,92	785,85
STAB STRING	12,219		1,22	787,07
CORE BARREL	8,000	6,630	7,92	794,99
STAB STRING	12,219		1,22	796,21
CORE BARREL	8,000	6,630	7,92	804,13
STAB STRING	12,219		1,22	805,35
CORE BARREL	8,000	6,630	7,92	813,27
HW DRILL PIPE	5,000	3,000	85,77	899,04
STAB STRING	12,219		1,22	900,26
CORE HEAD	12,250		0,43	900,69

BHA seq: 5 BHA category: Drilling BHA description: 12 1/4" hole after coring

BHA no: 5

String component	OD in	ID in	Length m	Acc length m
X-OVER	7,875	2,813	0,90	901,59
DRILL COLLAR	8,000	2,813	18,78	920,37
JAR	8,000	3,000	9,74	930,11
DRILL COLLAR	8,000	2,813	84,24	1014,35
BIT SUB W/FLOAT	12,219		0,91	1015,26
HW DRILL PIPE	5,000	3,000	85,77	1101,03
ROCK BIT	12,250		0,33	1101,36
DP 5"				1101,36

BHA seq: 6 BHA category: Drilling BHA description: Cutting well head.

BHA no: 6

String component	OD in	ID in	Length m	Acc length m
DRILL PIPE	5,000	2,740		1101,36
H W DRILL PIPE	6,625	3,000	85,77	1187,13
X-OVER	6,500	2,813	0,91	1188,04
DRILL COLLAR	8,000	2,813	84,20	1272,24
MUD MOTOR	9,500		8,72	1280,96
TOP SUB	8,000	3,500	0,91	1281,87
CASING CUTTER	9,969	0,750	1,83	1283,70
BULL NOSE	8,000	1,500	0,41	1284,11

6 Appendices

A.1 Operational listing

Operations

Wellbore: NO 6608/11-3

Time from	Time to	Time used	Depth mMD	Act code	Status ---- During opr	---- End of opr	Description of activities
25.11.2002 12:00	17:00	5,0		MNMU	OK	OK	Rig in transit from Norne Well 6608/10-C04H to Blåmeis Well 6608/11-3. Meanwhile changed saver sub to 4 1/2" IF. Serviced top drive. Performed Pre-spud meeting with crew.
25.11.2002 17:00	20:00	3,0		MNPU	OK	OK	Performed DP field arival tests. Meawhile continued service on top drive. Prelimanery position: N 66 deg 06' 34", E 008 deg 29' 49". Total distance sailed: 12,2 Nm, Average speed: 3,0 knots.
25.11.2002 20:00	21:30	1,5		CERU	OK	OK	MU cement stand and racked in derick. MU 30" CART to 5" DP and racked in derrick.
25.11.2002 21:30	22:00	0,5		DTPU	OK	OK	MU 36" hole opener assembly.
25.11.2002 22:00	22:30	0,5		DTPU	OK	OK	Performed pre-job meeting with new crew.
25.11.2002 22:30	00:00	1,5		DTPU	OK	OK	Continued to MU 36" BHA.
26.11.2002 00:00	02:00	2,0	123,0	DTPU	OK	OK	Continued to MU 36" BHA.
26.11.2002 02:00	03:00	1,0	398,0	DTDU	OK	OK	RIH with 36" BHA on 5" DP. Spaced out to tag sea bed, made up drilling stand. Tagged sea bed carefully at 398,4 m.
26.11.2002 03:00	03:30	0,5	398,0	DTDU	OK	E FAIL	Attempted to take final spud position, no go.
26.11.2002 03:30	04:00	0,5	398,0	ROVD	E FAIL	OK	Retrieved ROV to surface. Changed transponder.
26.11.2002 04:00	05:00	1,0	398,0	DTDU	OK	OK	Confirmed rig position with ROV.
26.11.2002 05:00	05:30	0,5	398,0	DTDU	OK	OK	Deployed marker buoys.
26.11.2002 05:30	06:00	0,5	404,0	DTDU	OK	OK	Tested Anderdrift. Drilled 36" hole from 398 m to 404 m.
26.11.2002 06:00	12:00	6,0	410,0	DDRU	OK	OK	Drilled 17 1/2" x 26"/36" hole from 404 m to 410 m. Held back on parameters due to boulders, swept hole with 5 m3 hi-vis pills. Parameters: 1200-4000 lpm, 30-100 RPM , 0-3 mt WOB, 2-12 kNm.
26.11.2002 12:00	00:00	12,0	436,0	DDRU	OK	OK	Drilled 17 1/2" x 26"/36" hole from 410m to 436 m. Swept hole with 5 m3 hi-vis pills every 5 m drilled. Parameters: 4000-4750 lpm, 100-125 RPM, 2-3 mt WOB, 3-12 kNm.
27.11.2002 00:00	05:00	5,0	460,0	DDRU	OK	OK	Drilled 17 1/2" x 26"/36" hole from 436m to 460m. Swept hole with 8 m3 hi-vis pills every 15 m drilled. Parameters: 4750 lpm, 120 RPM, 3-5 mt WOB, 6-9 kNm.
27.11.2002 05:00	05:30	0,5	460,0	DUSU	OK	OK	Swepth hole with 10 m3 hi-vis pill and performed survey. Anderdrift reading at TD: 0 deg. Checked space out with ROV.
27.11.2002 05:30	06:00	0,5	460,0	DCAU	OK	OK	Pumped 40 m3 hi-vis sweep and commenced displacing hole to 1,35 sg mud.
27.11.2002 06:00	06:30	0,5	460,0	DCAU	OK	OK	Displaced hole to 1,35 SG WBM.
27.11.2002 06:30	07:00	0,5	408,0	DTCU	OK	OK	POOH to 408 m and topped up hole with 1,35 SG WBM. Hole in good condition.
27.11.2002 07:00	09:30	2,5		DTCU	OK	OK	POOH. LD 36" hole opener assembly.
27.11.2002 09:30	10:30	1,0		CARU	OK	OK	Performed pre-job meeting prior to run 30" conductor. RU 30" conductor handling equipment.
27.11.2002 10:30	12:30	2,0	62,0	CARU	OK	OK	PU and ran 30" conductor.
27.11.2002 12:30	13:00	0,5	62,0	CARU	OK	OK	RD 30" conductor handling equipment. RU 5" handling equipment. Filled 30" conductor with sea water.
27.11.2002 13:00	14:30	1,5	62,0	CARU	OK	OK	MU cement stinger, locked CART to WH housing.
27.11.2002 14:30	15:00	0,5	62,0	CARU	OK	OK	Installed bullseyes. Opened fill-up valve on CART.
27.11.2002 15:00	17:00	2,0	384,0	CARU	OK	OK	Ran in to 384 m. Closed fill-up valve with ROV.
27.11.2002 17:00	18:00	1,0	458,0	CARU	OK	OK	Stabbed conductor into 36" hole while observing with ROV. Ran in to setting depth. MU cement stand and established circulation at 500 lpm. ROV confirmed 3 m stickup. Checked bullseyes: 0,5 & 0,0 deg.
27.11.2002 18:00	19:00	1,0	458,0	CARU	OK	OK	Pressure tested cement lines to 150 bars. Performed pre-job meeting while circulating 4000 lpm, 31 bars.
27.11.2002 19:00	21:00	2,0	458,0	CSSU	OK	OK	Mixed and pumped 28 m3 1,56 SG Lead slurry and 21 m3 1,95 SG Tail slurry. Displaced cement with 7,5 m3 sea water from cement unit.
27.11.2002 21:00	00:00	3,0	458,0	CSCW	OK	OK	WOC. Meanwhile confirmed 3 m stickup with ROV. Checked bulleyes: 0,5 & 0,0 deg.
28.11.2002 00:00	03:00	3,0	458,0	CSCW	OK	OK	WOC.

28.11.2002 03:00	04:00	1,0		CTTU	OK	OK	Released 30" CART and racked cement stand in derrick. Pulled out to 5 m below 30" housing, flushed housing area for 5 min at 4500 lpm.
28.11.2002 04:00	05:30	1,5		CTTU	OK	OK	Pulled out. LD 30" CART and pulled out 5" DP stinger.
28.11.2002 05:30	06:00	0,5		CERU	OK	OK	MU 13 3/8" CMT stand.
28.11.2002 06:00	08:00	2,0		CSOU	OK	OK	MU 13 3/8" CMT stand and racked same.
28.11.2002 08:00	09:00	1,0	19,0	DTPU	OK	OK	MU 17 1/2" BHA.
28.11.2002 09:00	09:30	0,5	19,0	DTPU	OK	OK	Programmed MWD tool.
28.11.2002 09:30	14:00	4,5	385,0	DTPU	OK	OK	RIH with 17 1/2" BHA to 385 m. Conducted pre spud meeting.
28.11.2002 14:00	15:00	1,0	454,0	DTPU	OK	OK	Stabbed into hole. Washed from 434 - 454 m with 4750 lpm/ 200 BAR. Tagged cmt at 454 m.
28.11.2002 15:00	18:30	3,5	460,0	CDDU	OK	OK	Drilled cmt and shoe from 454 - 457 m. Reamed rathole to 460 m. Parameters: 1-5 t wob/ 50-80 rpm/ 4500 lpm/ 165-170 bar/ 2-8 knm.
28.11.2002 18:30	00:00	5,5	597,0	DDRU	OK	OK	Drilled 17 1/2" hole 460 - 597 m. Pumped 8 m3 hivis mud two times pr stand. Parameters: 2-7 t wob/ 60-160 rpm/ 4500 lpm/ 165-184 bar/ 1-9 knm.
29.11.2002 00:00	04:30	4,5	730,0	DDRU	OK	OK	Drilled 17 1/2" hole 597 - 730 m. Pumped 8 m3 hivis mud two times pr stand. Parameters: 3-12 t wob/ 160 rpm/ 4500 lpm/ 180-190 bar/ 5-15 knm.
29.11.2002 04:30	06:00	1,5	730,0	DCAU	OK	OK	Swept hole with 40 m3 hivis mud. Meanwhile decreased mudweight of kill mud in pits from 1,60 - 1,30 sg. Commenced displacing hole to 1,30 sg mud.
29.11.2002 06:00	06:30	0,5	730,0	DCAU	OK	OK	Displaced hole to 1,30 sg mud with 4500 lpm/ 180 bar.
29.11.2002 06:30	07:30	1,0	489,0	DTCU	OK	OK	POOH to 489 m.
29.11.2002 07:30	09:00	1,5	489,0	DCAU	OK	OK	Worked stabilizer through the 30" shoe. Displaced hole to 1,30 sg mud.
29.11.2002 09:00	12:00	3,0		DTCU	OK	OK	POOH. Racked MWD, LD bit and MPR. Washed wellhead with 4700 lpm/ 180 bar while POOH.
29.11.2002 12:00	13:30	1,5		CERU	OK	OK	RU 13 3/8" csg handling equipment. Held prejob safety meeting.
29.11.2002 13:30	19:00	5,5	318,0	CARU	OK	OK	PU and ran 13 3/8" csg to 318 m.
29.11.2002 19:00	22:00	3,0	329,0	CARU	OK	OK	Changed handling equipment. PU and MU Hsg joint. Removed PS 30 power slips, installed 20" master bushing. Ran Hsg joint. Cleared rig floor. RD csg tong.
29.11.2002 22:00	23:00	1,0	390,0	CARU	OK	OK	RIH with 13 3/8" csg on 5" dp landing string to 390 m. Drifted landing string to 2,75".
29.11.2002 23:00	23:30	0,5	400,0	CAOU	OK	OK	Fine positioned rig. Stabbed csg into 30" Hsg with assistance of ROV.
29.11.2002 23:30	00:00	0,5	530,0	CARU	OK	OK	Continued RIH with 13 3/8" csg on 5" dp landing string to 530 m. Drifted landing string to 2,75".
30.11.2002 00:00	01:00	1,0	720,0	CARU	OK	OK	Continued RIH with 13 3/8" csg on 5" dp landing string to 720 m. Drifted landing string to 2,75".
30.11.2002 01:00	02:00	1,0	725,0	CARU	OK	OK	MU cmt stand. Installed cmt std. Connected cmt hose. Washed down csg from 719 - 725 m with 500 lpm/ 8 bar. Landed csg in 30" wellhead. Confirmed latched with 25 t O-pull. Bullseye reading: 0 and 0,5 deg.
30.11.2002 02:00	02:30	0,5	725,0	CCCU	OK	OK	Pumped 63 m3 swtr (1,5 times btms up) at 2300 lpm/ 58 bar.
30.11.2002 02:30	03:00	0,5	725,0	CSSU	OK	OK	Tested surface lines to 200 Bar/ 5 min. Dropped ball for btm cement plug.
30.11.2002 03:00	05:00	2,0	725,0	CSSU	OK	OK	Mixed and pumped 53 m3 1,56 sg lead slurry at 800-1100 lpm/ 16-34 bar and 15 m3 1,92 sg tail slurry at 700 lpm/ 20-22 bar. Did not see the btm cmt plug shear. Dropped dart for upper cmt plug. Displaced with 3,7 m3 swtr with cmt pump. Sheared upper cmt plug with 162 bar.
30.11.2002 05:00	05:30	0,5	400,0	CSSU	OK	OK	Displaced with mud pumps 23 m3 swtr at 3000 lpm/ 75-90 bar (500 lpm/ 16 bar for the last 1,5 m3). Bumped cmt plug with 95 bar. Held pressure for 5 min. Bled off pressure. Checked for backflow. OK. Disconnected cmt hose. Released 18 3/4" CART. Had approx 19 m3 cmt returns to seabed. Bullseye reading: 0,5 deg, second one accidently broken.
30.11.2002 05:30	06:00	0,5	370,0	CTTU	OK	OK	Racked cmt stand. POOH to 370 m.
30.11.2002 06:00	08:00	2,0		CTTU	OK	OK	POOH with CART. LD same. Meanwhile moved rig 40 m off location. Inspected wellhead with ROV

30.11.2002 08:00	10:00	2,0		CTTU	OK	OK	LD cmt stand.
30.11.2002 10:00	12:00	2,0		DTPU	OK	OK	LD MWD tool and 2 ea 8" DC
30.11.2002 12:00	23:00	11,0		BBWW	OK	OK	WOW to RU for running BOP. Meanwhile change from 5 1/2" to 5" HOT. Tested rotary hose and top drive valves to 35 bar/ 5 min and 345 bar/ 10 min. MU drilling stand. Changed saver sub on drilling stand. MU and racked 12 1/4" BHA (incl programming MWD).
30.11.2002 23:00	00:00	1,0		BBRU	OK	OK	RD 500 t handling equipment. Installed 750 t bails.
01.12.2002 00:00	01:00	1,0		BBRU	OK	OK	Installed 750 t elevator and riser RT.
01.12.2002 01:00	03:30	2,5		BBRU	OK	OK	Installed riser guide head on hydraracker. RU riser gimble and spider. Installed hydraulics and function tested same.
01.12.2002 03:30	06:00	2,5		BBRU	OK	OK	Lifted and moved BOP aft with BOP crane. Installed BOP guide funnel. Transferred BOP to BOP transporter in moonpool.
01.12.2002 06:00	07:00	1,0		BBRU	OK	OK	Skidded BOP below rotary in moonpool. Meanwhile installed riser yoke on stbd crane.
01.12.2002 07:00	10:00	3,0		BBRU	OK	OK	Held prejob safety meeting. MU double of riser. Connected same to BOP. Installed mux clamps and cables.
01.12.2002 10:00	11:30	1,5	46,0	BBRU	OK	OK	Monitored sea status prior to deploy BOP. Ran BOP through splash zone. Installed mux clamps and cables on double riser.
01.12.2002 11:30	13:00	1,5	46,0	BBRU	OK	E FAIL	RU for pressure testing of conduit, choke and kill line. Got good test on conduit lines (35 bar/ 345 bar). High pressure test on choke and kill lines failed.
01.12.2002 13:00	14:00	1,0	46,0	BBRD	E FAIL	OK	Investigated leak. Found no leak on surface equipment.
01.12.2002 14:00	16:00	2,0		BBRD	E FAIL	OK	Removed mux cables. Pulled BOP back through splash zone. Landed same on transporter. Investigated leak. Found small leak in choke and kill lines on double riser. Difficult to locate leak due to wet BOP.
01.12.2002 16:00	20:30	4,5		BBRD	E FAIL	OK	Broke off double riser. Skidded BOP to port side in moonpool. Installed test flange on BOP. Pressure tested choke and kill lines against failsafe valves and isolation valves - all tests indicated leaks.
01.12.2002 20:30	21:00	0,5		BBRD	E FAIL	OK	Pressure tested surface system incl test hose. Located leak in test hose. Removed damaged hose section. Retested system: OK.
01.12.2002 21:00	21:30	0,5		BBRD	E FAIL	OK	Pressure tested choke and kill lines to 345 bar/ 10 min. OK.
01.12.2002 21:30	22:30	1,0		BBRD	E FAIL	OK	Splitted double riser. Changed out choke and kill lines seals on double riser due to suspected leak. Meanwhile RD test flange on BOP.
01.12.2002 22:30	23:30	1,0		BBRD	E FAIL	OK	Skidded BOP under rotary and MU double riser.
01.12.2002 23:30	00:00	0,5	46,0	BBRD	E FAIL	OK	Ran BOP through splash zone. Installed mux clamps and cables on double riser.
02.12.2002 00:00	01:00	1,0	46,0	BBRD	E FAIL	OK	RU and pressure tested conduit, choke and kill line to 35/ 345 bar for 5/ 10 min.
02.12.2002 01:00	03:00	2,0	205,0	BBRU	OK	OK	Ran BOP on riser to 205 m (7 joint). Total 9 joints run.
02.12.2002 03:00	04:00	1,0	205,0	BBRU	OK	OK	RU and pressure tested conduit, choke and kill line to 35/ 345 bar for 5/ 10 min.
02.12.2002 04:00	06:00	2,0	324,0	BBRU	OK	OK	Ran BOP on riser to 324 m (7 joints). Total 16 jts run. 1 jt, 3 pup jts and slip jnt remaining.
02.12.2002 06:00	09:00	3,0	358,0	BBRU	OK	OK	Ran one riser joint. Changed handling equipment on port crane. PU and ran 3 riser pup joints.
02.12.2002 09:00	10:00	1,0	358,0	BBRU	OK	OK	RU and pressure tested conduit, choke and kill lines to 20/ 345 bar for 5/ 10 min.
02.12.2002 10:00	12:00	2,0	390,0	BBRU	OK	OK	Held tool box talk. PU and ran slip joint and landing joint.
02.12.2002 12:00	15:00	3,0	390,0	BBRU	OK	OK	Installed goose necks on slip joint.
02.12.2002 15:00	16:00	1,0	390,0	BBRU	OK	OK	RU and pressure tested choke and kill lines to 20/ 345 bar for 5/ 10 min.
02.12.2002 16:00	18:00	2,0	390,0	BBRU	OK	OK	Installed riser tensioners and saddles for choke and kill lines.
02.12.2002 18:00	19:00	1,0	395,0	BBRU	OK	OK	Moved rig over location (observed with ROV). Landed BOP at 1845 hrs. Latched connector with 25 t weight downwards. Confirmed latched with 25 t O-pull.
02.12.2002 19:00	20:00	1,0		BBDU	OK	OK	Closed blind/ shear ram with acoustics. Pressure tested 13 3/8" csg/ BOP connector to 320 bar for 15 min.
02.12.2002 20:00	20:30	0,5		BBRU	OK	O FAIL	Unlocked slip joint, stroke out inner barrel. Found inefficient riser space-out to set riser spider dogs on landi ng joint (riser spaced -out too short).
02.12.2002 20:30	00:00	3,5		BBRD	O FAIL	OK	Performed risk assessment. Hung off inner barrel in

							moonpool winches below rotary.
03.12.2002 00:00	01:00	1,0		BBRU	OK	OK	Disconnected and LD landing joint.
03.12.2002 01:00	02:00	1,0		BBRU	OK	OK	RD riser handling equipment, riser spider and gimble.
03.12.2002 02:00	03:00	1,0		BBRU	OK	OK	PU diverter. Installed same on slip joint inner barrel below rotary. Locked in diverter (confirmed with 10 t O-pull).
03.12.2002 03:00	06:00	3,0		BBRU	OK	OK	Released diverter RT. LD same. RD riser handling equipment (hydrаracker head, elevators and bails). Meanwhile released moonpool winches.
03.12.2002 06:00	08:00	2,0		DTDU	OK	OK	RU pipe handling equipment. Cleared rig floor.
03.12.2002 08:00	09:00	1,0	31,0	DTDU	OK	OK	PU MWD stand from derrick. Loaded tool.
03.12.2002 09:00	12:00	3,0	668,0	DTDU	OK	OK	RIH with 12 1/4" BHA to 668 m.
03.12.2002 12:00	12:30	0,5	668,0	DDOU	OK	OK	Shallow tested MWD. Took scr`s.
03.12.2002 12:30	13:30	1,0	668,0	BBDU	OK	OK	Function tested BOP from both pods.
03.12.2002 13:30	15:00	1,5	668,0	DDOU	OK	OK	Performed well control exercise. Function tested diverter system.
03.12.2002 15:00	15:30	0,5	687,0	DCAU	OK	OK	Washed down from 668 - 687 m. Tagged cmt at 687 m.
03.12.2002 15:30	21:30	6,0	730,0	CDDU	OK	OK	Drilled cmt from 687 - 696 m (semi hard), wiper plugs, float, cmt from 697 - 724 m and shoe at 725 m. Reamed rathole to 730 m. Parameters: 0-12 t WOB/ 40-80 rpm/ 1700-3000 lpm/ 35-120 bar/ 2-15 knm. Cmt: semi hard above float, hard below float, no cmt in rathole. Used 2,5 hrs to drill wiper plugs, 10 min to drill float and shoe.
03.12.2002 21:30	22:00	0,5	733,0	DDRU	OK	OK	Drilled 12 1/4" hole from 730 - 733 m. Parameters: 6 t WOB/ 80 rpm/ 3000 lpm/ 120 bar/ 5-6 knm.
03.12.2002 22:00	23:00	1,0	733,0	ECFU	OK	OK	Circulated hole clean/ swept hole with 30 m3 hivis. Spotted 5 m3 hivis on btm. Pulled into csg. Tested surface lines to 85 bar/ 5 min.
03.12.2002 23:00	23:30	0,5	733,0	EXLU	OK	OK	Performed LOT to 22 bar with sw. EMD = 1,34 sg. LOT result to low to perform XLOT.
03.12.2002 23:30	00:00	0,5	733,0	DCAU	OK	OK	Pumped 12 m3 drillwater spacer and commenced displacing hole to 1,20 sg WBM.
04.12.2002 00:00	01:30	1,5	733,0	DCAU	OK	OK	Displaced hole and K/C lines to 1,20 sg WBM. Took SCR`s up riser and choke line.
04.12.2002 01:30	06:00	4,5	816,0	DDRU	OK	OK	Drilled 12 1/4" hole from 733 - 816 m. (Controlled rop at 20 m/h from 750 - 816 m). Parameters: 4-6 t WOB/ 100-110 rpm/ 3800-4000 lpm/ 176-198 bar/ 2-6 knm.
04.12.2002 06:00	14:30	8,5	950,0	DDRU	OK	OK	Drilled 12 1/4" hole from 816 - 950 m. (Limited ROP to 20 m/h). Parameters: 0-6 t WOB/ 110-160 rpm/ 4000 lpm/ 197-210 bar/ 3-7 knm.
04.12.2002 14:30	00:00	9,5	1267,0	DDRU	OK	OK	Drilled 12 1/4" hole from 950 - 1267 m. Parameters: 6-13 t WOB/ 180-200 rpm/ 4000 lpm/ 216-232 bar/ 4-10 knm.
05.12.2002 00:00	06:00	6,0	1426,0	DDRU	OK	OK	Drilled 12 1/4" hole from 1267 - 1426 m. Parameters: 6-12 t WOB/ 200 rpm/ 4000 lpm/ 232-240 bar/ 6-10 knm.
05.12.2002 06:00	06:30	0,5	1443,0	DDRU	OK	OK	Drilled 12 1/4" hole from 1426 - 1443 m. Parameters: 9-13 t WOB/ 100-200 rpm/ 4000 lpm/ 245 bar/ 4-8 knm.
05.12.2002 06:30	14:30	8,0	1546,0	DDRU	OK	OK	Drilled 12 1/4" hole from 1443 - 1546 m (ROP limited to 20 m/hr). Parameters: 2-17 t WOB/ 100-200 rpm/ 4000 lpm/ 245-252 bar/ 4-8 knm.
05.12.2002 14:30	00:00	9,5	1734,0	DDRU	OK	OK	Drilled 12 1/4" hole from 1546 - 1734 m. Parameters: 5-20 t WOB/ 100-200 rpm/ 4000 lpm/ 252-268 bar/ 4-8 knm.
06.12.2002 00:00	06:00	6,0	1827,0	DDRU	OK	OK	Drilled 12 1/4" hole from 1734 - 1827 m. Observed sudden pressure drop at 0300 hrs/ 1783 m. Parameters: 5-15 t WOB/ 200 rpm/ 4000 lpm/ 268-237 bar/ 4-7 knm.
06.12.2002 06:00	10:30	4,5	1879,0	DDRU	OK	OK	Drilled 12 1/4" hole from 1827 - 1879 m. Parametres : 4000 LPM / 215-230 Bar / 9-17 t WOB / 200 RPM / 4-8 Knm.
06.12.2002 10:30	11:30	1,0	1879,0	DDOU	OK	OK	Pressure tested surface equipment due to abnormal fluctuations in pressure readings. Neg, no leaks identified.
06.12.2002 11:30	22:00	10,5	1985,0	DDRU	OK	OK	Drilled 12 1/4" hole from 1879 - 1985 m (core point). Parametres : 4000 LPM / 215-230 Bar / 9-17 t WOB / 200 RPM /5-12 Knm.
06.12.2002 22:00	23:30	1,5	1985,0	DDRU	OK	OK	Circulated hole clean (1.5 x BU) with 4000 LPM / 215

							Bar. Meanwhile reciprocated string with 150 RPM / 4 Knm.
06.12.2002 23:30	00:00	0,5	1840,0	DTRU	OK	OK	Pulled 5 stds wet, no excessive drag. Pumped slug.
07.12.2002 00:00	01:00	1,0	1645,0	DTRU	OK	OK	POOH with 5" DP from 1840 - 1645 m, hole OK. Unable to pass tight spot at 1645 m, max overpull 30 t.
07.12.2002 01:00	02:00	1,0	1645,0	DCAU	OK	OK	MU topdrive and reamed tight spots from 1655 - 1626 m with 3500 LPM / 135 RPM. Passed tight interval without rotation and flow, hole OK.
07.12.2002 02:00	04:30	2,5	1010,0	DTRU	OK	OK	POOH with 5" DP from 1645 - 1010 m. Reamed tight spot at 1645 m with 3500 LPM, otherwise hole OK.
07.12.2002 04:30	05:00	0,5	1010,0	DCAU	OK	OK	Circulated BU into riser and cleaned BHA with 4000 LPM due to slightly increase in hole drag. Circulated riser with 2000 LPM.
07.12.2002 05:00	06:00	1,0	745,0	DTRU	OK	OK	POOH with 5" DP to 745 m.
07.12.2002 06:00	08:00	2,0	221,0	DTRU	OK	OK	Pumped slug. POOH with 5" DP from 745 - 221 m. Performed kick drill.
07.12.2002 08:00	11:30	3,5		DTRU	OK	OK	POOH and racked back BHA. LD MWD modules and bit. Found 12 1/4" bit 1/2" undergauge, NB stab 1/4" undergauge and mod stab 1/8" undergauge.
07.12.2002 11:30	17:00	5,5	239,0	EECU	OK	OK	Held toolbox talk. MU 120' core BHA and RIH.
07.12.2002 17:00	19:00	2,0	705,0	ETCU	OK	E FAIL	RIH with core BHA on 5" DP to 705 m.
07.12.2002 19:00	21:00	2,0	705,0	DERD	E FAIL	OK	RD torque wrench from topdrive. Changed out worn dies and guide bushings on torque wrench telescopic arm.
07.12.2002 21:00	00:00	3,0	1740,0	ETCU	OK	OK	RIH with 5" DP to 1740 m. Filled pipe every 20 stds.
08.12.2002 00:00	01:00	1,0	1907,0	ETCU	OK	OK	RIH with 5" DP to 1907 m. Some tight spots, otherwise hole OK.
08.12.2002 01:00	04:00	3,0	1985,0	ETCU	OK	OK	Unable to pass tight spot at 1907 m with up to30 t weight down. MU topdrive and reamed and worked tight interval down to 1983 m with 1400 LPM / 42 Bar / 100 RPM / 4-18 Knm. PU DP single from deck to be able to work undergauge hole from 1983 - 1985 m with acceptable working height in derrick. Initialy neccessary with 30 -40 t overpull to free pipe after reaming down.
08.12.2002 04:00	04:30	0,5	1985,0	ETCU	OK	OK	LD single and MU stand for optimum space-out. Dropped ball and pumped down same with 500 LPM. Had 6 Bars pressure increase when ball landed in ball seat. Took SCR's and up/down weights.
08.12.2002 04:30	06:00	1,5	1994,0	ERCU	OK	OK	Cut core from 1985 - 1994 m. Parametres : 1400 LPM / 75-85 Bar / 120 RPM / 4-12 Knm / 10 -15 t WOB.
08.12.2002 06:00	07:00	1,0	1995,0	ERCU	OK	OK	Cut core from 1994 - 1995 m. Parametres : 1400 LPM / 75-80 Bar / 120 RPM / 4-23 Knm / 10 -15 t WOB. Torque dropped gradually and stabilised at 3-5 Knm indicating core jammed off. Pulled off bottom, no overpull.
08.12.2002 07:00	11:30	4,5	725,0	ETCU	OK	OK	Flowchecked for 10 min. POOH with 5" DP into 13 3/8" csg shoe. Max. overpull of 20 t at 1930 m.
08.12.2002 11:30	13:30	2,0	100,0	ETCU	OK	OK	Flowchecked for 10 min and performed kick drill. POOH with 1 min/std to 350 m and 2 1/2 min/std to 100 m.
08.12.2002 13:30	15:30	2,0		ETCU	OK	OK	POOH with core BHA. Pulling speed 5 min/std.
08.12.2002 15:30	17:30	2,0		ETCU	OK	OK	Held toolbox talk and LD 120' inner barrels. Core length : 6.12 m. Core recovery : 61.2 %. Barrel utilisation : 16.5 %.
08.12.2002 17:30	19:00	1,5		ETCU	OK	OK	LD outer barrels and core bit.
08.12.2002 19:00	19:30	0,5		ETCU	OK	OK	Cleared drill floor for excessive equipment.
08.12.2002 19:30	21:30	2,0		DTBU	OK	OK	MU and RIH with slick 12 1/4" BHA.
08.12.2002 21:30	00:00	2,5	1180,0	DTDU	OK	OK	RIH with 12 1/4" BHA on 5" DP to 1180 m. Filled pipe every 20 std.
09.12.2002 00:00	02:30	2,5	1993,0	DTDU	OK	OK	RIH from 1180 - 1993 m. MU topdrive, tagged bottom and took SCR's.
09.12.2002 02:30	04:00	1,5	2031,0	DDRU	OK	OK	Drilled 12 1/4" from 1993 - 2031 m. Parameters : 3500-4000 LPM / 215-265 Bar / 150-200 RPM / 4-11 Knm / 15-23 t WOB.
09.12.2002 04:00	05:00	1,0	2031,0	DCAU	OK	OK	Circulated hole clean while reciprocated string with 4000 LPM / 250 Bar / 150 RPM.
09.12.2002 05:00	06:00	1,0	1977,0	DTLU	OK	OK	Flowchecked well and pumped slug. POOH with 5" DP to 1977 m. Worked tight hole from 1986 m.

09.12.2002 06:00	07:30	1,5	1885,0	DCRK	OK	OK	MU topdrive and reamed tight intervall from 2002 - 1885 m with 3400 LPM / 205 Bar / 120 RPM / 3-9 Knm. Max overpull of 20 t at 1960 m. Checked for free passage without rotation and circulation.
09.12.2002 07:30	10:30	3,0	725,0	DTDU	OK	OK	POOH with 5" DP from 1885 m into 13 3/8" csg shoe. Flow checked for 10 min. Circulated riser with 1200 LPM while POOH.
09.12.2002 10:30	11:30	1,0	200,0	DTDU	OK	OK	POOH with 5" DP.
09.12.2002 11:30	13:30	2,0		DTBU	OK	OK	POOH and racked back BHA. Broke off bit and cleared drill floor.
09.12.2002 13:30	15:00	1,5		ELWU	OK	OK	Held toolbox talk and RU for WL logging.
09.12.2002 15:00	17:00	2,0		ELWU	OK	OK	PU and MU tool string for WL run #1 : FMI/DSI/PEXlite.
09.12.2002 17:00	00:00	7,0		ELWU	OK	OK	RIH with WL run #1. Logged downwards, tool stopped 7 m off bottom. POOH and logged upwards.
10.12.2002 00:00	03:00	3,0		ELWU	OK	OK	POOH and logged 100 m into 13 3/8" casing.
10.12.2002 03:00	04:00	1,0		ELWU	OK	OK	LD tool string #1. Removed RA sources.
10.12.2002 04:00	05:30	1,5		ELWU	OK	OK	PU and MU WL tool string for WL run #2 : MDT/GR
10.12.2002 05:30	06:00	0,5		ELWU	OK	OK	RIH to 1440 m with WL run #2. Started correlation logging for first pressure point.
10.12.2002 06:00	12:30	6,5		ELWU	OK	OK	Correlated wireline run no 2: MDT/GR and took pressure readings from 1417,5 m to 1984 m. POOH with wireline.
10.12.2002 12:30	15:00	2,5		ELWU	OK	OK	LD wireline tool string, run no 2: MDT/GR, on deck.
10.12.2002 15:00	16:30	1,5		ELWU	OK	OK	RU wireline tool string, run no 3: ASI/GR and checked tool string.
10.12.2002 16:30	19:30	3,0	2000,0	ELWU	OK	OK	RIH with logging run no 3: ASI/GR to 2000 m. Meanwhile deployed and tested air guns.
10.12.2002 19:30	00:00	4,5		ELWU	OK	OK	Correlated and logged VSP from 2010 m.
11.12.2002 00:00	01:00	1,0		ELWU	OK	OK	Continued logging VSP to 400 m. POOH logging run no 3: ASI/GR.
11.12.2002 01:00	02:00	1,0		ELWU	OK	OK	RD ASI/GR tool string.
11.12.2002 02:00	03:00	1,0		ELWU	OK	OK	RU wireline tool string no 4: MDT/GR sampling and tested tools.
11.12.2002 03:00	06:00	3,0	1418,0	ELWU	OK	OK	RIH logging run no 4: MDT/GR sampling. Correlated and attempted to take samples at 1418 m.
11.12.2002 06:00	08:30	2,5	1418,6	ELWU	OK	OK	Performed sampling, run no 4: MDT/GR at 1418,6 m.
11.12.2002 08:30	10:00	1,5		ELWU	OK	OK	POOH logging run no 4: MDT/GR.
11.12.2002 10:00	11:00	1,0		ELWU	OK	OK	LD wireline tool string.
11.12.2002 11:00	14:00	3,0		ELCU	OK	OK	Prepared and MU wireline tool string, run no 5: CST/GR.
11.12.2002 14:00	18:00	4,0	1955,0	ELCU	OK	OK	RIH wireline logging run no 5: CST/GR. Correlated and took a total of 60 side wall cores from 1955 m to 1390 m.
11.12.2002 18:00	20:00	2,0		ELCU	OK	OK	POOH logging run no 5: CST/GR. Recovered 53 side wall cores.
11.12.2002 20:00	21:30	1,5		ELCU	OK	OK	LD tool string and RD wireline.
11.12.2002 21:30	22:30	1,0	25,0	PTPU	OK	E FAIL	Held pre-job meeting. MU and racked cement stand assembly in derrick. Installed mouse hole. MU mule shoe to stand of 5" DP and RIH with stand. Unable to lower TDS below 3 m from rotary.
11.12.2002 22:30	00:00	1,5	25,0	DERD	E FAIL	OK	Troubleshot problems with TDS.
12.12.2002 00:00	01:00	1,0	25,0	DERD	E FAIL	OK	Continued troubleshooting problems wit TDS. Found one lifting cylinder stroke sensor defective. Selected different sensor.
12.12.2002 01:00	05:30	4,5	2031,0	PTTU	OK	OK	RIH with 5" DP from 25 m. Broke circulation and tagged bottom at 2031 m with 500 lpm. set down 4 mt weight to verify depth. Pulled off bottom.
12.12.2002 05:30	06:00	0,5	2031,0	PCCU	OK	OK	Circulated bottoms up. Meanwhile held pre-job meeting prior to cementing job.
12.12.2002 06:00	06:30	0,5	2031,0	PCCU	OK	OK	Continued circulating bottoms up.
12.12.2002 06:30	08:30	2,0	2031,0	PSSU	OK	OK	Pressure tested surface lines to 200 bars. Pumped 10 m3 fresh water spacer, mixed and pumped 13,8 m3 1,92 sg cement slurry (plug no 1, OH from TD). Chased same with 1,0 m3 fresh water from cement unit. Displaced cement with 13,9 m3 1,22 sg WBM, 3 bars, using mud pumps.
12.12.2002 08:30	10:00	1,5	1779,0	PTTU	OK	OK	POOH from 2031 m to 1779 m.
12.12.2002 10:00	12:00	2,0	1779,0	PCCU	OK	OK	Dropped spong ball, circulated hole clean while checking for cement returns. Parameters: 4000 lpm, 119 bars. Dumped 44 m3 cement contaminated WBM.
12.12.2002 12:00	12:30	0,5	1779,0	PTTU	OK	OK	Laid out 2 single joints 5" DP, picked up cement std and spaced out to 1779 m.
12.12.2002 12:30	15:00	2,5	1779,0	PSSU	OK	OK	Pressure tested surface lines to 200 bars. Pumped 10 m3 fresh water spacer, mixed and pumped 18,8 m3 1,92 sg cement slurry (plug no 2, OH). Chased same with 1,0

							m3 fresh water from cement unit. Displaced cement with 11,7 m3 1,22 sg WBM, 2000 lpm, 3 bars, using mud pumps.
12.12.2002 15:00	16:00	1,0	1529,0	PTTU	OK	OK	POOH from 1779 m to 1529 m.
12.12.2002 16:00	18:00	2,0	1529,0	PCCU	OK	OK	Dropped sponge ball. Circulated bottoms up, 2000 lpm, 32 bar. Dumped 22 m3 contaminated mud. Lined up and circulated through kill and choke lines, 1650 lpm, 25 bar.
12.12.2002 18:00	19:00	1,0	1529,0	PSSU	OK	OK	Pressure tested surface lines to 200 bar. Pumped 10 m3 fresh water spacer. Mixed and pumped 18,75 m3 1,92 sg gas tight cement slurry (plug no 3, OH). Chased cement slurry with 1,37 m3 fresh water from cement unit. Displaced cement with 9,4 m3 1,22 sg WBM at 2000 lpm, 3 bar using mud pumps.
12.12.2002 19:00	20:00	1,0	1279,0	PTTU	OK	OK	POOH from 1529 m to 1279 m.
12.12.2002 20:00	21:30	1,5	1279,0	PCCU	OK	OK	Dropped sponge ball. Circulated bottoms up, 2000 lpm, 25 bar. Dumped 23 m3 contaminated mud.
12.12.2002 21:30	23:00	1,5	825,0	PTTU	OK	OK	POOH from 1279 m to 825 m.
12.12.2002 23:00	23:30	0,5	825,0	PSSU	OK	OK	Installed Perigon CST in string. Installed cementing stand.
12.12.2002 23:30	00:00	0,5	825,0	PSSU	OK	OK	Pressure tested surface lines to 200 bar. Pumped fresh water spacer.
13.12.2002 00:00	01:00	1,0	825,0	PSSU	OK	OK	Continued pumping 14 m3 fresh water spacer. Mixed and pumped 15,22 m3 1,95 sg cement slurry (plug no 4, transition zone). Chased cement slurry with 1,37 m3 fresh water from cement unit. Displaced with 3,75 m3 1,22 sg WBM at 2000 lpm, 3 bar using mud pumps.
13.12.2002 01:00	01:30	0,5	623,0	PTTU	OK	OK	POOH from 825 m to 623 m.
13.12.2002 01:30	02:30	1,0	623,0	PCCU	OK	OK	Dropped sponge ball. Circulated bottoms up. Recovered 16 m3 contaminated mud to reserve pit.
13.12.2002 02:30	04:00	1,5		PTTU	OK	OK	POOH from 623 m. LD mule shoe.
13.12.2002 04:00	06:00	2,0	395,0	PAOU	OK	OK	MU jet sub, stand of 5" DP and WBRRT. RIH, washed well head area and latched on to wear bushing. Pulled free with 11 mt overpull.
13.12.2002 06:00	06:30	0,5	395,0	PCCU	OK	OK	Continued to wash WH and BOP area.
13.12.2002 06:30	08:00	1,5		PTTU	OK	OK	POOH. Broke out and LD WB, WBRRT and jet sub.
13.12.2002 08:00	11:30	3,5		PSCW	OK	OK	WOC. Meanwhile performed pre-job meeting. Laid out hang off tool. Job stopped for safety re-briefing crew of ongoing task. Proceeded LD hang off tool and 8" & 6" jars.
13.12.2002 11:30	13:30	2,0	370,0	PTPU	OK	OK	Performed pre-job meeting. MU 13 3/8" EZSV bridge plug assembly and RIH to 370 m. Meanwhile lined up cement unit to kill line, closed BSR and pressure tested cement plug (no 4) to 80 bars / 10 min
13.12.2002 13:30	15:00	1,5	620,0	PTTU	OK	OK	Opened BSR. Continued to RIH with 13 3/8" EZSV Bridge plug from 370 m to 620 m and set same.
13.12.2002 15:00	16:00	1,0	620,0	PCCU	OK	OK	Stung out of EZSV. Set down 2 mt weight to verify plug depth. Displaced well from 1,22 sg WBM to sea water. Parameters: 2500 lpm, 22 bars. Displaced K&C lines to sea water.
13.12.2002 16:00	16:30	0,5	619,0	PTPU	OK	OK	MU cement stand, spaced out to 619 m. Pressure tested cement hose to 100 bars.
13.12.2002 16:30	17:30	1,0	619,0	PSSU	OK	OK	Pumped 6 m3 fresh water spacer, mixed and pumped 15,45 m3 1,90 sg slurry (surface plug, no 5), displaced cement with 2,76 m3 fresh water.
13.12.2002 17:30	18:30	1,0	423,0	PTTU	OK	OK	POOH with 5" DP from 619 m to 423 m.
13.12.2002 18:30	19:00	0,5	423,0	PCCU	OK	OK	Circulated for 15 min. Circulated riser volume through booster line.
13.12.2002 19:00	20:00	1,0		PTTU	OK	OK	POOH. LD bridge plug running tool.
13.12.2002 20:00	20:30	0,5		PTPU	OK	OK	LD cement stand from derrick.
13.12.2002 20:30	00:00	3,5		BBRU	OK	OK	LD Weatherford tubescope and mouse hole. Held pre-job meeting. Installed riser guide head and changed to 750 mt bails and links. Installed 8 5/8" elevator inserts and riser running tool. Removed master bushing and function tested guide head. Installed gimbal and riser spider. RU hydraulic control lines.
14.12.2002 00:00	02:00	2,0		BBRU	OK	OK	Installed diverter handling tool. Nippled down, pulled and LD diverter.
14.12.2002 02:00	05:30	3,5		BBRU	OK	OK	PU and nippled up riser handling joint to slip joint. Collapsed and locked slip joint.
14.12.2002 05:30	06:00	0,5		BBRU	OK	OK	Unlocked well head connector and lifted BOP clear of well head. Moved rig 40 m to port side. Disconnected riser tensioners and mux cables.
14.12.2002 06:00	08:30	2,5	390,0	BBRU	OK	OK	Performed pre-job meeting. Removed mux sadles and goosenecks.

14.12.2002 08:30	09:30	1,0		BBRU	OK	OK	Pulled and laid out slip joint and landing joint.
14.12.2002 09:30	11:30	2,0		BBRU	OK	OK	Pulled riser and BOP. Laid out 3 ea. pup joints. Rigged up and installed riser yoke.
14.12.2002 11:30	20:00	8,5		BBRU	OK	OK	Continued pulling riser and BOP. Pulled through splash zone. Landed and secured BOP on transporter.
14.12.2002 20:00	21:30	1,5		BBRU	OK	OK	ND and skidded BOP clear of rotary. LD double riser joint.
14.12.2002 21:30	23:00	1,5		BBRU	OK	OK	Skidded BOP in position below rotary. Installed test flange and skidded BOP to port side of moon pool. Meanwhile rigged down riser yoke from port rig crane. Rigged down spider and torque wrenches hydraulic control lines.
14.12.2002 23:00	00:00	1,0		BBRU	OK	OK	LD riser spider and gimbal ring. Installed rotary bushing.
15.12.2002 00:00	01:30	1,5		BBRU	OK	OK	LD riser guide head and riser running tool. Changed to 500 mt bails and links. Installed BX elevator.
15.12.2002 01:30	02:30	1,0		PTPU	OK	OK	Held pre-job meeting. PU casing cutting assembly. Function tested MOST tool.
15.12.2002 02:30	05:30	3,0	406,0	PTTU	OK	OK	RIH with cutting BHA on 5" DP to 385 m. Moved rig to well center and stabbed cutting assembly into well head at 395 m assisted by ROV. Continued RIH to 406 m and landed MOST tool on well head.
15.12.2002 05:30	06:00	0,5	402,0	PAHU	OK	OK	Started pumping, 3000 lpm, 130 bar. Increased pump rate to 3200 lpm, 150 bar to cut 20"x30" casing at 402 m using mud motor.
15.12.2002 06:00	08:30	2,5	402,0	PAHU	OK	OK	Continued to cut 20" x 30" casing at 402 m. Parameters: 3200 lpm, 156 bar, 5-10 ton WOB.
15.12.2002 08:30	09:30	1,0	402,0	PAHU	OK	OK	Engaged MOST tool, locked most tool with ROV. Staged up overpull to 128 ton. Unable to pull casing free.
15.12.2002 09:30	10:30	1,0	402,0	PAHU	OK	OK	Slacked off to neutral weight, ROV unlocked most tool. Commenced cutting 20" x 30" casing. Parameters: 3200 lpm, 156 bar, 5-10 ton WOB.
15.12.2002 10:30	11:30	1,0	402,0	PAHU	OK	OK	Engaged MOST tool, locked most tool with ROV. Attempted to pull casing free, staged up to 240 ton overpull. Unable to pull casing free.
15.12.2002 11:30	15:30	4,0	400,0	PAHU	OK	OK	Slacked off to 20 ton overpull on most tool. Commenced cutting 20" x 30" casing in tension, increased overpull from 20 to 50 ton. Parameters: 2800-3200 lpm, 130-156 bar, 5-10 ton WOB.
15.12.2002 15:30	16:00	0,5	400,0	PAHU	OK	O FAIL	Staged up to 155 ton overpull and pulled casing free. Started to POOH.
15.12.2002 16:00	17:00	1,0	374,0	PAOD	O FAIL	OK	Set slips prior to rack back 1 std 5" DP. After setting slips, the top-drive accidentally lowered while testing joystick on drillers chair. Emergency stop was activated. Laid out 4 ea damaged 5" DP joints.
15.12.2002 17:00	21:00	4,0		PACU	OK	OK	Continued POOH with 30" x 20" casing. In moon pool removed slope indicator from well head. Pulled well head through rotary and landed on c-plate. Released MOST tool and LD cutting assembly. Pulled 20"x30" casing stump through rotary. Found casing cut on first attempt, and pulled from 402 m. On one side of 30" casing 0,33 m steel still not cut from cutting attempt no 2. Meanwhile ROV recovered transponders from sea bed. On deck at 2107 hrs. End of the Blåmeis operation. Rig transferred to Norne well D-4H.

A.2 Directional data, survey listing

Statoil,6608/11-3
6608/11- Exploration,6608/11
EXPLORATION ZONE 32,Norway

Wellbore: 6608/11-3
Wellpath: 6608/11-3 Definitive
(TD@2031)
Date Printed: 20-Jun-2003

BAKER HUGHES
INTEQ

Wellbore

Name	Created	Last Revised
6608/11-3	28-Feb-2003	4-Mar-2003

Well

Name	Government ID	Last Revised
6608/11-3		28-Feb-2003

Slot

Name	Grid Northing	Grid Easting	Latitude	Longitude	North	East
6608/11-3	7332386,6755	477263,3260	N66 6 34,0100	E8 29 48,8700	1774,65S	6656,76E

Installation

Name	Easting	Northing	Coord System Name	North Alignment
6608/11- Exploration	470609,156	7334160,635	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 (Stena Don (RT) 24.0m above Mean Sea Level)
Vertical Section is from 1774,65S 6656,76E on azimuth 114,46 degrees
Bottom hole distance is 23,86 Metres on azimuth 114,46 degrees from Wellhead
Calculation method uses Minimum Curvature method
Prepared by Baker Hughes Incorporated

Wellpath (Grid) Report

MD[m]	Inc[deg]	Dir[deg]	TVD[m]	North[m]	East[m]	Dogleg [deg/30m]	Vertical Section[m]	Easting	Northing
398,00	0,00	0,00	398,00	1774,65S	6656,76E	0,00	0,00	477263,33	7332386,68
481,00	0,14	130,41	481,00	1774,72S	6656,84E	0,05	0,10	477263,40	7332386,61
510,00	0,28	69,54	510,00	1774,71S	6656,93E	0,25	0,18	477263,50	7332386,61
568,00	0,28	41,38	568,00	1774,56S	6657,16E	0,07	0,32	477263,72	7332386,77
597,00	0,22	90,57	597,00	1774,51S	6657,26E	0,22	0,39	477263,83	7332386,82
684,00	0,49	49,33	684,00	1774,27S	6657,71E	0,12	0,70	477264,27	7332387,06
714,00	0,31	91,10	714,00	1774,18S	6657,89E	0,33	0,83	477264,45	7332387,14
762,90	0,31	117,87	762,90	1774,25S	6658,14E	0,09	1,09	477264,70	7332387,08
850,10	0,73	104,99	850,09	1774,50S	6658,88E	0,15	1,87	477265,45	7332386,82
908,30	0,68	106,23	908,29	1774,69S	6659,57E	0,03	2,58	477266,14	7332386,63
937,40	0,79	110,13	937,38	1774,81S	6659,93E	0,12	2,95	477266,49	7332386,51
966,40	0,84	118,95	966,38	1774,98S	6660,30E	0,14	3,36	477266,86	7332386,34
995,40	0,92	116,12	995,38	1775,19S	6660,70E	0,09	3,80	477267,26	7332386,14
1024,50	0,88	110,51	1024,47	1775,37S	6661,12E	0,10	4,26	477267,68	7332385,96
1052,90	0,87	102,62	1052,87	1775,49S	6661,53E	0,13	4,69	477268,09	7332385,83
1082,70	0,93	99,30	1082,67	1775,58S	6661,99E	0,08	5,14	477268,55	7332385,74
1111,70	1,01	92,10	1111,66	1775,63S	6662,48E	0,15	5,61	477269,04	7332385,70
1140,80	1,05	87,60	1140,76	1775,63S	6663,00E	0,09	6,08	477269,56	7332385,70
1169,80	0,96	94,21	1169,76	1775,63S	6663,51E	0,15	6,55	477270,07	7332385,69
1198,90	0,98	93,36	1198,85	1775,67S	6664,00E	0,03	7,01	477270,56	7332385,66
1228,00	1,03	98,64	1227,95	1775,72S	6664,51E	0,11	7,49	477271,07	7332385,61
1257,10	0,92	97,85	1257,04	1775,79S	6665,00E	0,11	7,97	477271,56	7332385,54
1286,20	0,80	126,98	1286,14	1775,95S	6665,39E	0,46	8,39	477271,95	7332385,38
1315,30	0,79	121,75	1315,24	1776,17S	6665,72E	0,08	8,79	477272,28	7332385,15
1344,30	0,90	124,15	1344,23	1776,41S	6666,08E	0,12	9,21	477272,64	7332384,92
1373,40	0,84	121,80	1373,33	1776,65S	6666,45E	0,07	9,65	477273,01	7332384,68
1402,50	0,72	118,03	1402,43	1776,85S	6666,79E	0,13	10,04	477273,35	7332384,48
1431,50	1,37	144,34	1431,42	1777,21S	6667,16E	0,82	10,52	477273,72	7332384,11
1460,60	1,30	139,12	1460,51	1777,75S	6667,58E	0,14	11,12	477274,14	7332383,58
1489,30	1,72	138,46	1489,20	1778,31S	6668,07E	0,44	11,81	477274,63	7332383,01
1518,30	1,62	139,00	1518,19	1778,95S	6668,63E	0,10	12,58	477275,19	7332382,38
1547,80	1,45	136,99	1547,68	1779,54S	6669,16E	0,18	13,31	477275,72	7332381,79
1576,80	1,44	133,13	1576,67	1780,05S	6669,68E	0,10	13,99	477276,24	7332381,27
1605,90	1,30	130,63	1605,76	1780,52S	6670,19E	0,16	14,66	477276,75	7332380,81
1635,00	1,18	126,23	1634,86	1780,91S	6670,69E	0,16	15,27	477277,24	7332380,42
1664,00	1,15	122,52	1663,85	1781,24S	6671,17E	0,08	15,85	477277,73	7332380,09
1693,10	1,10	126,45	1692,94	1781,57S	6671,64E	0,09	16,41	477278,20	7332379,76
1722,20	1,10	124,07	1722,04	1781,89S	6672,10E	0,05	16,96	477278,66	7332379,44
1751,30	1,14	122,68	1751,14	1782,20S	6672,57E	0,05	17,52	477279,13	7332379,13
1780,40	1,13	117,78	1780,23	1782,49S	6673,07E	0,10	18,09	477279,63	7332378,84
1809,40	1,21	118,38	1809,22	1782,77S	6673,60E	0,08	18,68	477280,15	7332378,56
1837,50	1,23	117,79	1837,32	1783,05S	6674,12E	0,03	19,28	477280,68	7332378,28
1867,50	1,32	114,87	1867,31	1783,35S	6674,72E	0,11	19,95	477281,28	7332377,98
1895,60	1,30	112,22	1895,40	1783,61S	6675,31E	0,07	20,59	477281,87	7332377,73
1925,30	1,42	108,12	1925,09	1783,85S	6675,97E	0,16	21,29	477282,53	7332377,48
1972,60	1,41	104,41	1972,38	1784,17S	6677,09E	0,06	22,45	477283,65	7332377,16
2031,00	1,41	104,41	2030,76	1784,53S	6678,48E	0,00	23,86	477285,04	7332376,80

All data is in Metres unless otherwise stated
Coordinates are from Installation MD's are from Rig and TVD's are from Rig (Stena Don (RT) 24.0m above Mean Sea Level)
Vertical Section is from 1774,65S 6656,76E on azimuth 114,46 degrees
Bottom hole distance is 23,86 Metres on azimuth 114,46 degrees from Wellhead
Calculation method uses Minimum Curvature method
Prepared by Baker Hughes Incorporated

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	398,00	398,00	1774,65S	6656,76E	459,00	459,00	1774,69S	6656,80E	6608/11-3
17 1/2	459,00	459,00	1774,69S	6656,80E	730,00	730,00	1774,19S	6657,97E	6608/11-3
12 1/4	730,00	730,00	1774,19S	6657,97E	2031,00	2030,76	1784,53S	6678,48E	6608/11-3

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	398,00	398,00	1774,65S	6656,76E	458,00	458,00	1774,69S	6656,80E	6608/11-3
13 3/8in Casing	398,00	398,00	1774,65S	6656,76E	725,00	725,00	1774,19S	6657,95E	6608/11-3

A.3 Contractors list

Service	Company	Telephone main office
Casing / liner hanger	Weatherford Norge AS	51 81 44 00
Cementing	Halliburton AS	51 83 70 00
Coring	Security DBS	51 83 70 00
Diving	Oceaneering AS	51 82 51 00
Drilling contractor	Stena Don AS	+ 49 17 29 97 70 22
Electric logging	Schlumberger Offshore Service NV	55 98 61 00
Helicopters	Helikopter Service AS, Brønnøysund	75 01 80 80
Mud	MI Norge AS	55 52 98 00
Mud logging	Sperry Sun, Halliburton	51 83 70 00
MWD	Baker Hughes Inteq	51 71 75 00
Rig positioning	Thales	55 34 94 00
Site survey	Fugro Survey AS	22 13 46 00
Wellhead system	ABB Offshore System AS	51 63 44 00

A.4 Wellsite sample descriptions

STATOIL

WELLSITE SAMPLE DESCRIPTION				Page 1 of 16
Country: Norway		Area: Nordland II		Field: Blåmeis
Well no: 6608/11-03		Company: Statoil ASA, Petoro AS, Norsk Hydro ASA, Norsk Agip A/S, AS Norske Shell		
RKB: 24 meters		Geologist: T. F. Kristensen, S. Solymar		
Hole size: 12 1/4 "		Cut solvent:		Date: 04.12.2002
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.

Depth	Lithology (%)		Description	Remarks
740	80	Cl:	med lt gry - olv gry, slty, sft, v calc, tr mic, amor, sol, stky	barite, cmt
	20	Sd/Sst:	lse Qtz gr, clr - trnsl, f-med, wl srt, sbang - sbrndd	
	Tr	Mic, Rk frags		
750	80	Cl:	a.a	barite, cmt
	20	Sst:	occ crs, mod srt, else a.a.	
	Tr	Mic, Rk frags		
760	90	Cl:	a.a.	tr barite, tr cmt
	10	Sst:	v f - med, occ crs, mod srt else a.a.	
	Tr	Mic, Rk frags		
763	80	Cl:	a.a	
	20	Sd/Sst:	a.a	
	Tr	Mic, Rk frags		
766	80	Cl:	a.a	
	20	Sd/Sst:	a.a	
	Tr	Mic, Rk frags		
	R	Pyr		
769	90	Cl:	a.a	
	10	Sd/Sst:	a.a	
	Tr	Mic, Rk frags		
772	80	Cl:	a.a	
	20	Sd/Sst:	a.a	
	Tr	Mic, Rk frags		
775	a.a			
778	a.a			
784	70	Cl:	a.a	
	30	Sd/Sst:	a.a	
	Tr	Mic, Rk frags		
	R	Ls		
787	80	Cl:	a.a	
	20	Sd/Sst:	a.a	
	Tr	Mic, Rk frags		
	R	Ls		
790	70	Cl:	a.a	
	30	Sd/Sst:	a.a	
	Tr	Mic, Rk frags		
	R	Ls		

WELLSITE SAMPLE DESCRIPTION				Page 2 of 16
Country: Norway		Area: Nordland II		Field: Blåmeis
Well no: 6608/11-03		Company: Statoil ASA, Petoro AS, Norsk Hydro ASA, Norsk Agip A/S, AS Norske Shell		
RKB: 24 meters		Geologist: T. F. Kristensen, S. Solymar		
Hole size: 12 1/4 "		Cut solvent:		Date: 04.12.2002

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.
793	80	Cl:	med lt gry - olv gry, slty, v calc, sft, tr mic, amor, sol, stky	No shows
	20	Sd/Sst:	lse Qtz gr, clr- trnsl, v f - med, occ crs, mod srt, sbang - sbrndd	
	Tr	Mic		
	R	Ls, Shl frags, Rk frags, Microfoss		
799	90	Cl:	a.a	a.a.
	10	Sd/Sst:	a.a	
	Tr	Mic, Shl frags, Rk frags, Microfoss		
805	a.a			a.a.
808	a.a.			a.a.
814	90	Cl:	med gry - olv gry, sft, amor, sol, stky, slty/sdy, slily - occ mod calc	a.a.
	10	Sd:	clr - trnsl - op qtz, v f - crs, pr srt, ang - sbrndd	
	Tr	Pyr, Shl frags, Microfoss, Rk frags		
817	90	Cl:	a.a.	a.a.
	10	Sd:	a.a.	
	Tr	Rk frags, Glauc, Shl frags, Microfoss(forams)		
820	100	Cl:	a.a.	a.a.
	Tr	Sd:	clr - trnsl qtz, v f - f, wl srt, sbang - sbrndd	
	Tr	Shl frags		
826	100	Cl:	a.a.	a.a.
	Tr	Sd:	a.a.	
	Tr	Rk frags, Shl frags		
829	100	Cl:	med gry - olv gry, sft, amor, sol, stky, slty - sdy, non - occ slily calc	a.a.
	Tr	Sd:	clr - trnsl qtz, v f - f, wl srt, sbang - sbrndd	
	Tr	Rk frags, Shl frags		
832	a.a.			a.a.
835	100	Cl:	a.a.	a.a.
	Tr	Sd:	clr - trnsl qtz, occ op qtz, f - med, mod srt, ang - sbrndd,	
	Tr	Rk frags, Glauc, Microfoss (forams), Mic		
841	100	Cl/Clst:	med gry - olv gry, sft, amor, sol, stky, slty/sdy, non - occ slily calc	a.a.
	Tr	Sd:	f - crs, pr srt, else a.a.	
	Tr	Rk frags, Shl frags, Microfoss (forams)		
844	a.a.			a.a.
847	80	Cl/Clst:	a.a.	a.a.
	20	Sd:	clr - trnsl - op qtz, f - v crs, pr srtd, ang - rndd	
	Tr	Rk frags		

WELLSITE SAMPLE DESCRIPTION			
Country: Norway	Area: Nordland II		Field: Blåmeis
Well no: 6608/11-03	Company: Statoil ASA, Petoro AS, Norsk Hydro ASA, Norsk Agip A/S, AS Norske Shell		
RKB: 24 meters	Geologist: T. F. Kristensen, S. Solymar		
Hole size: 12 1/4 "	Cut solvent:		Date: 04.12.2002

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.
850	90	Cl/Clst: med gry - med dk gry - olv gry, sft, amor, sol, stky, slty/sdy, non calc - occ slily calc	No shows
	10	Sd: clr - trnsl - op qtz, f - crs, pr srt, ang - sbrndd	
	Tr	Rk frags, Microfoss (forams)	
856	a.a.		a.a.
862	100	Cl/Clst: a.a.	a.a.
	Tr	Sd: a.a.	
	Tr	Rk frags, Microfoss (forams), Shl frags	
865	80	Cl/Clst: a.a.	a.a.
	20	Sd: clr - trnsl qtz, occ op qtz, f - med, occ crs, mod srt, sbang - sbrndd	
	Tr	Rk frags, Shl frags, Microfoss	
871	100	Cl/Clst: a.a.	a.a.
	Tr	Sd: a.a.	
	Tr	Rk frags, Shl frags, Microfoss	
874	100	Cl/Clst: a.a.	a.a.
	Tr	Sd: clr - trnsl qtz, v f - f, wl srt, sbang - sbrndd	
	Tr	Shl frags, Microfoss	
877	90	Cl/Clst : a.a.	a.a.
	10	Sd: clr - trnsl qtz, occ op & pk qtz, pred f, occ med, wl srt, sbang - sbrndd	
	Sl tr	Rk frags, Shl frags	
880	90	Cl/Clst: a.a.	a.a.
	10	Sd: pred f, occ crs - v crs grns, else a.a.	
	Tr	Shl frags	
886	a.a.		a.a.
892	90	Cl/Clst: a.a.	a.a.
	10	Sst: clr - trnsl - op qtz, f - crs, pr srt, ang - sbrndd,	
	Tr	Shl frags, Rk frags, Glauc, Pyr	
904	100	Cl/Clst: med gry - med dk gry - olv gry, sft, amor, sol, stky, slty/sdy, non - slily calc	a.a.
	Tr	Sd: clr - trnsl qtz, v f - f, wl srt, sbang - sbrndd	
	Tr	Microfoss, Shl frags	
910	100	Cl/Clst : a.a.	a.a.
	Gd tr	Sd: occ crs - v crs grns, else a.a.	
	Tr	Shl frags, Microfoss, Rk frags	
916	a.a.		a.a.
919	100	Cl/Clst: a.a.	a.a.
	Gd tr	Sd: clr - trnsl - op qtz, pred v f - f, occ crs - v crs grns, wl srt, sbang - rndd	
	Tr	Shl frags, Rk frags, Glauc	

![STATOIL]

WELLSITE SAMPLE DESCRIPTION				Page 4 of 16
Country: Norway	Area: Nordland II		Field: Blåmeis	
Well no: 6608/11-03	Company: Statoil ASA, Petoro AS, Norsk Hydro ASA, Norsk Agip A/S, AS Norske Shell			
RKB: 24 meters	Geologist: T. F. Kristensen, S. Solymar			
Hole size: 12 1/4 "	Cut solvent:		Date: 04.12.2002	

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.
922	100	Cl/Clst:	med dk gry - olv gry, sft, amor, sol, stky, slty/sdy, non - occ slily calc	No shows
	Gd tr	Sd:	clr - trnsl qtz, v f -f , wl srt, sbang - sbrndd,	
	Tr	Shl frags, Rk frags, Glauc		
925	70	Cl/Clst:	a.a.	a.a.
	30	Sd:	clr - trnsl qtz, occ op qtz, f - crs, pr srtd, ang - sbrndd	
	Tr	Shl frags, Rk frags, Glauc		
928	100	Cl/Clst:	a.a.	a.a.
	Gd tr	Sd:	clr - trnsl qtz, v f - f, occ med, wl srt, sbang - sbrndd	
	Tr	Shl frags, Rk frags, Glauc		
934	80	Cl/Clst:	a.a.	a.a.
	20	Sd:	clr - trnsl - op qtz, f - med, occ crs grns, mod srt, sbang - sbrndd	
	Tr	Rk frags, Shl frags		
937	100	Cl/Clst:	a.a.	a.a.
	Gd tr	Sd:	pred v f - f, occ med - crs gms, wl srt, else a.a.	
	Tr	Rk frags		
940	a.a.			a.a.
946	80	Cl/Clst:	med dk gry - olv gry, sft, amor, sol, stky, slty/sdy, non calc	a.a.
	20	Sd:	clr - trnsl - op qtz, f - v crs, pr srt, sbang - sbrndd,	
	Tr	Shl frags, Rk frags, Microfoss		
950	90	Clst:	a.a.	a.a.
	10	Sd:	a.a.	
	Sl tr	Rk frags, Shl frags, Microfoss(forams)		
960	100	Clst:	a.a.	a.a.
	Gd tr	Sd:	a.a.	
	Sl tr	Rk frags, Shl frags, Microfoss(forams)		
970	a.a.			a.a.
980	a.a			a.a.
990	a.a.			a.a.
1000	a.a.			a.a.
1010	90	Cl:	a.a	a.a.
	10	Sd:	a.a	
	Sl tr	Rk frags, Shl frags, Microfoss		
1020	100	Cl:	a.a	a.a.
	Gd tr	Sd:	a.a	
	Sl tr	Rk frags, Shl frags, Microfoss		
1030	a.a.			a.a.

WELLSITE SAMPLE DESCRIPTION				Page 5 of 16
Country: Norway		Area: Nordland II		Field: Blåmeis
Well no: 6608/11-03		Company: Statoil ASA, Petoro AS, Norsk Hydro ASA, Norsk Agip A/S, AS Norske Shell		
RKB: 24 meters		Geologist: T. F. Kristensen, S. Solymar		
Hole size: 12 1/4 "		Cut solvent:		Date: 04.12.2002
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.

Depth	Lithology		Description	Remarks
1040	90	Cl:	med dk gry - olv gry, sft, amor, sol, stky, slty/sdy, non calc	No shows
	10	Sd:	clr - trnsl Qtz, f – v crs, pr srt, sbang-sbrndd	
	Sl tr	Rk frags, Shl frags, Microfoss		
1050	a.a			a.a.
1060	a.a			a.a.
1070	a.a.			a.a.
1080	a.a			a.a.
1090	a.a			a.a.
1100	a.a.			a.a.
1110	100	Cl:	a.a	a.a.
	Tr	Sd:	a.a.	
	Sl tr	Rk frags, Shl frags, Microfoss		
1120	90	Cl:	a.a	a.a.
	10	Sd:	a.a.	
	Sl tr	Rk frags, Shl frags, Microfoss		
1130	100	Cl:	a.a.	a.a.
	Tr	Sd:	a.a.	
	Sl tr	Rk frags, Shl frags, Microfoss		
1140	a.a			a.a.
1150	Lost			
1160	90	Cl:	a.a.	a.a.
	10	Sd:	a.a.	
	Sl tr	Rk frags, Shl frags, Microfoss		
1170	Lost			
1180	a.a.			a.a.
1190	80	Cl:	a.a.	a.a.
	20	Sd:	a.a.	
	Sl tr	Rk frags, Shl frags, Microfoss		
1200	90	Cl:	a.a.	a.a.
	10	Sd:	a.a.	
	Sl tr	Rk frags, Shl frags, Microfoss		
1210	a.a.			a.a.
1220	Lost			

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WELLSITE SAMPLE DESCRIPTION				Page 6 of 16
Country: Norway		Area: Nordland II		Field: Blåmeis
Well no: 6608/11-03		Company: Statoil ASA, Petoro AS, Norsk Hydro ASA, Norsk Agip A/S, AS Norske Shell		
RKB: 24 meters		Geologist: T. F. Kristensen, S. Solymar		
Hole size: 12 1/4 "		Cut solvent:		Date: 04.12.2002
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.

Depth	Lithology (%)		Description	Remarks
1230	90	Cl:	med dk gry - olv gry, sft, amor, sol, stky, slty/sdy, non calc	No shows
	10	Sd:	clr - trnsl Qtz, f – v crs, pr srt, sbang-sbrndd	
	Sl tr	Rk frags, Shl frags, Microfoss		
1240	80	Cl:	a.a.	a.a.
	20	Sd:	a.a.	
	Sl tr	Rk frags, Shl frags, Microfoss		
1250	a.a			a.a.
1260	90	Cl:	a.a	a.a.
	10	Sd:	a.a.	
	Sl tr	Rk frags, Shl frags, Microfoss		
1270	a.a			a.a.
1280	Lost			
1290	a.a			a.a.
1300	90	Cl:	med dk gry - olv gry, sft, amor, sol, slily stky, slty/sdy, non calc	mud add
	10	Sd:	clr - trnsl qtz, v f - med, occ crs gr, pr srt, sbang - sbrndd	
	Tr	Rk frags		
	R	Pyr		
1310	Lost			
1320	100	Cl/Clst:	varic, med dk gry, brnsh gry, pa yelsh brn, dk gnsh gry, sft-frm, slty, occ sdy, amor - blky, non calc, i.p. glauc	a.a.
	Tr	Sd:	a.a	
	Tr	Rk frags		
	R	Pyr		
1330	a.a			
1340	100	Clst:	brnsh gry, sft - frm, slily slty, slily micromic, i.p. micrpyr, r glauc	a.a.
	Tr	Sd:	a.a	
1350	Lost			
1360	100	Clst:	occ carb else a.a	a.a.
	Tr	Sd:	a.a	
	Tr	Pyr		

WELLSITE SAMPLE DESCRIPTION				Page 7 of 16
Country: Norway		Area: Nordland II		Field: Blåmeis
Well no: 6608/11-03		Company: Statoil ASA, Petoro AS, Norsk Hydro ASA, Norsk Agip A/S, AS Norske Shell		
RKB: 24 meters		Geologist: T. F. Kristensen, S. Solymar, J. Basset		
Hole size: 12 1/4 "		Cut solvent:		Date: 04.12.2002
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.

1370	100	Clst:	brnsh gry - olv gry, also brnsh blk - blk, sft - frm, blky, i.p. slty, micromic, i.p. micropyr, i.p. v carb, i.p. glauc, non calc	No shows
	Tr	Sd:	clr - trnsl qtz, v f - med, occ crs gr, pr srt, sbang - sbrndd	
	Tr	Pyr, Glauc		
1380	a.a			
1390	Lost			
1400	100	Clst:	med dk gry - brnsh gry, occ brnsh blk - blk, else a.a.	a.a.
	Tr	Sd:	a.a	
	Tr	Pyr, Glauc		
1410	a.a.			a.a.
1420	100	Clst:	olv gr - olv blk, brnsh gry-brnsh blk, blky, frm - mod hd, occ sft, occ slty, non calc	a.a.
	Tr	Sd, Glauc, Dol		
1430	90	Clst:	grsh bl gr - dsky bl gn sft - frm, blky, glauc	a.a.
	10	Dol:	olv gry - olv blk, blky, hd - v hd	
	tr	Pyr, Qtz, Kaol		
1433	a.a			a.a.
1439	a.a			a.a.
1442	100	Clst:	occ mod brn, occ med gry,	a.a.
	Tr	Dol, Pyr,		
1445	90	Sd:	clr - trnsl, f-med, occ crs, mod srt, sbang - sbrndd, lse	a.a.
	10	Clst:	grysh bl gn - dsky bl gn, occ mod brn, occ med gry, sft - frm, blky, glauc	
	Tr	Dol:	a.a.	
1448	80	Clst:	grysh bl gn - dsky bl gn, lt - mod brn, frm, blky, non calc, occ glauc	
	20	Sd:	a.a.	a.a., bar cont.
	GdTr	Lst:	off wh - clr, frm, micr - xln	
	GdTr	Pyr		
1451	50	Clst:	also med gry - med dk gry, slty, sdy, v f, else a.a.	
	40	Sd:	a.a.	a.a.
	5	Lst:	a.a.	
	5	Pyr		
1454	70	Sltst:	med gry - med dk gry, sft, amor - sbblky, v slty	Fm. change.
	25	Clst:	a.a.	clay washout
	5	Sd:	a.a.	else a.a.
	Tr	Pyr		
1457	a.a.			a.a.
1460	lost			

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WELLSITE SAMPLE DESCRIPTION				
Country: Norway		Area: Nordland II		Field: Blåmeis
Well no: 6608/11-03		Company: Statoil ASA, Petoro AS, Norsk Hydro ASA, Norsk Agip A/S, AS Norske Shell		
RKB: 24 meters		Geologist: J. Basset, S. Solymar		
Hole size: 12 1/4 "		Cut solvent: Aceton		Date: 05.12.2002
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.

Depth	%	Rock	Description	Remarks
1463	40	Clst:	grsh bl gn - dsky bl gn, occ mod brn, occ med gry, sft - frm, blky, non clac, glauc	Mostly cavings?
	40	Sltst:	med gry - med dk gry, sft, amor - sbblky, v slty	Clay wachout
	20	Sd:	clr - trnsl, f - crs occ v crs, pr - mod srt, ang - sbrndd, lse	No show
	GdTr	Pyr, Lst		
1466	a.a.			a.a.
1469	60	Slty Clst:	a.a.	
	30	Clst:	a.a.	
	10	Sd:	a.a.	a.a.
	Tr	Pyr		
1472	a.a.			a.a.
1475	70	Slty Clst:	v calc, else a.a.	
	20	Clst:	a.a.	
	10	Sd:	a.a.	a.a.
	Tr	Pyr		
1478	65	Slty Clst:	calc, else a.a.	
	20	Clst:	a.a.	
	10	Sd:	a.a.	a.a.
	5	Mrl:	brnsh gry, mod hd,	
	Tr	Pyr		
1481	80	Slty Clst:	med gry - med dk gry, sft, amor - sbblky, v slty, calc	clay washout
	10	Clst:	a.a.	
	10	Lst:	off wh - pa yel gry, micr - xln, mrly i.p.	a.a.
	Tr	Pyr		
1484	lost			
1487	non rep sample			
1490	90	Clst:	med dk gry, calc, else a.a	a.a.
	10	Lst/Mrl:	a.a.	
	Tr	Clst:	a.a.	
	Tr	Pyr		
1493	lost			
1496	90	Clst:	med dk gry, calc, else a.a	a.a.
	10	Lst/Mrl:	a.a.	
	Tr	Clst:	a.a.	
	Tr	Pyr		
1499	a.a.			a.a.
1502	100	Sltst/Clst:	med dk gry, sft, amor - sbblky, v slty, non - sl calc	a.a.
	Tr	Pyr, Sd, Clst: a.a.		

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WELLSITE SAMPLE DESCRIPTION				Page 9 of 16
Country: Norway	Area: Nordland II			Field: Blåmeis
Well no: 6608/11-03	Company: Statoil ASA, Petoro AS, Norsk Hydro ASA, Norsk Agip A/S, AS Norske Shell			
RKB: 24 meters	Geologist: J. Basset, S. Solymar			
Hole size: 12 1/4 "	Cut solvent: Aceton			Date: 05.12.2002

Depth (m RKB)	Lithology (%)	Lithological Description		Remarks
		Rock name, mod.lith, colour, grain size, sorting, roundness, matrix, cementation, hardness, sed.structures, accessories, fossils, porosity, contamination		Shows, cavings, mud additives, etc.
1505	100	Sltst/Clst:	med dk gry, sft, amor - sbblky, v slty, non - slily calc	Clay washout
	Tr	Clst:	grsh bl gn - dsky bl gn, occ mod brn, occ med gry, sft - frm, blky, non clac, glauc	
	Tr	Sd:	clr - trnsl, f - crs occ v crs, pr srt, ang - sbrndd, lse	No shows,
	Tr	Pyr		Mud add contam.
1508	60	Sltst/Clst:	a.a.	
	40	Sd:	a.a.	a.a.
1511	lost			
1514	60	Sd:	a.a.	a.a.
	40	Sltst/Clst:	a.a.	
	GdTr	Pyr		
1517	a.a.			
1520	60	Sd:	a.a.	a.a.
	40	Sltst/Clst:	a.a.	
	Gd tr	Pyr		
1523	60	Sltst/Clst:	a.a.	
	40	Sd:	a.a.	a.a.
1526	non rep sample			
1529	70	Sd/Sst:	clr - trnsl, mlky qtz, brnsh, v f - v crs, ang - sbrndd, occ kaol mtx	No shows
	30	Sltst/Clst:	a.a.	Mud add contam
	Tr	Lst:	off wh - clr, micr - xln	
	GdTr	Pyr		
1532	60	Sltst/Clst:	tr grysh bl gn, else a.a.	clay washout
	40	Sst:	a.a.	
1538	50	Sd/sst:	a.a.	No shows
	40	Sltst/clst:	a.a.	
	10	Coal:	brnsh blk - blk, blky, brt, shny	
	Tr	Pyr		
1544	80	Clst:	brnsh gry - olv gry, sft - frm, amor - sbblky, slty, non calc - calc, sdy, occ carb, also gnsh gry, mod hd, blky	a.a.
	20	Sd:	a.a.	
	Tr	Pyr, Coal frags		
1550	50	Clst:	a.a., also dsky yel i.p., mod hd, blky – sbfiss	a.a.
	40	Sd:	v f - v crs, pr srt, else a.a.	
	10	Lst:	med lt gry - off wh, frm, arg & mic lam	

WELLSITE SAMPLE DESCRIPTION				Page 10 of 16
Country: Norway		Area: Nordland II		Field: Blåmeis
Well no: 6608/11-03		Company: Statoil ASA, Petoro AS, Norsk Hydro ASA, Norsk Agip A/S, AS Norske Shell		
RKB: 24 meters		Geologist: J. Basset, S. Solymar		
Hole size: 12 1/4 "		Cut solvent:		Date: 05.12.2002

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.
1556	50	Clst:	pred brnsh gry - olv gry, sft - frm, amor - sbblky, slty, non calc - calc, sdy, occ carb, also gnsh gry, mod hd, blky	clay washout
	20	Sd:	clr - trnsl, mlky qtz, brnsh, v f - v crs, ang - sbrndd, pr srt	No shows
	30	Lst:	off wh - med lt gry, frm, arg & mic lam	
1562	30	Clst:	a.a.	a.a.
	30	Sltst:	med dk gry - brnsh gry, sft, amor, calc, arg, mic	
	30	Sd:	a.a.	
	10	Lst:	pred clr - off wh, micr - xln	
1568	a.a.			
1574	60	Sd:	pred f - med, mod srt, else a.a.	a.a.
	30	Sltst/Clst:	pred brnsh gry - olv gry, sft - frm, amor - sbblky, slty, non calc - calc, sdy, occ carb, also gnsh gry, mod hd, blky	clay washout
	10	Clst:	a.a.	
	Tr	Coal frags		
1580	50	Slsts:	med dk gry - brnsh gry, sft, amor, mic, arg, slily calc	No shows
	40	Sd:	clr - trnsl Qtz, f - med, occ crs, mod srt, sbang - sbrndd	
	10	Clst:	brnsh blk - blk, blky, frm - mod hd, carb, non calc also gnsh gry, blky, frm - mod hd, non calc	
	Tr	Ls, Mic, Pyr		
1586	90	Clst:	pred brnsh gry, sft, amor, sol, v slty, slily calc also gnsh gry, blky, frm - mod hd, non calc	mud cont
	10	Sd:	a.a	
	Tr	Mic, Ls		
1595	80	Clst:	occ brnsh blk, carb else a.a.	No shows
	20	Sd:	a.a	
	Tr	Mic, Ls		
1601	80	Clst:	a.a	clay washouts
	20	Sd:	clr- trnsl Qtz, f - med, occ crs, mod srt, sbang-sbrndd	
	Gd tr	Mic		
	Tr	Ls, Pyr		
1613	50	Clst:	a.a	clay washouts
	50	Sd:	a.a	
	Tr	Mic, Ls, Pyr		
1619	70	Clst:	a.a	clay washouts
	30	Sd:	a.a	
	Tr	Mic, Ls, Pyr		
1625	70	Ls:	v lt gry - lt gry, blky, mod hd, occ hd-v hd, slty - arg, microxln – cryptoxln	No shows
	20	Clst:	a.a.	
	10	Sd:	a.a.	

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WELLSITE SAMPLE DESCRIPTION			Page 11 of 16
Country: Norway	Area: Nordland II		Field: Blåmeis
Well no: 6608/11-03	Company: Statoil ASA, Petoro AS, Norsk Hydro ASA, Norsk Agip A/S, AS Norske Shell		
RKB: 24 meters	Geologist: J. Basset, S. Solymar		
Hole size: 12 1/4 "	Cut solvent:		Date: 05.12.2002

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.
1631	60	Ls:	v lt gry - lt gry, blky, mod hd, occ hd - v hd, v slty - arg, microxln - cryptoxln	No shows
	40	Sd:	clr - trnsl Qtz, f-med, occ crs, mod srt, sbang – sbrndd	
	Tr	Mic, Pyr		
1637	50	Clst:	Clst: pred brnsh gry, sft, amor, sol, v slty, slily calc also gnsh gry, blky, frm - mod hd, non calc	abd barite minor gnsh cavings
	40	Sd/Sst:	clr - trnsl lse Qtz gr, f - med, occ crs, mod srt, sbang - sbrndd v lt gry - yelsh gry, v f - f, hd, occ v hd, calc cmt, poor vis por	
	10	Ls:	i.p. sdy else a.a	
	Tr	Mic, Pyr,		
	Tr	Dol:	dk gry - gnsh blk, v hd	
1643	80	Sd/Sst:	a.a	abd barite poor samples
	10	Ls:	a.a.	
	10	Clst:	a.a	
	Tr	Mic, Pyr		
1649	50	Clst:	a.a	a.a
	40	Sd/Sst:	a.a	
	10	Ls:	a.a	
	Tr	Mic, Pyr, Dol		
1655	800	Clst:	a.a	a.a
	10	Sd/Sst:	a.a	
	10	Ls:	a.a	
	Tr	Mic, Pyr, Dol		
1667	40	Clst:	a.a	a.a
	30	Sd/Sst:	a.a	
	10	Ls:	a.a	
	10	C:	blk, waxy - lstr, frm-brit, occ mod hd, blky	
	Tr	Mic, Pyr, Dol		
1673	80	Clst:	a.a	a.a
	10	Sd/Sst:	a.a	
	10	Ls:	a.a	
	Gd tr	C:	a.a	
	Tr	Mic, Pyr, Dol		
1679	80	Clst:	a.a	a.a
	10	Sd/Sst:	a.a	
	10	C:	a.a	
	Gd tr	Ls:	a.a	
	Tr	Mic, Pyr, Dol		
1697	80	Sd:	clr - trnsl lse Qtz gr, f - med, occ crs, mod srt, sbang-sbrndd	a.a.
	10	Clst:	a.a.	
	10	C:	a.a.	

WELLSITE SAMPLE DESCRIPTION

Country: Norway	Area: Nordland II	Field: Blåmeis
Well no: 6608/11-03	Company: Statoil ASA, Petoro AS, Norsk Hydro ASA, Norsk Agip A/S, AS Norske Shell	
RKB: 24 meters	Geologist: J. Basset, S. Solymar	
Hole size: 12 1/4 "	Cut solvent: Aceton	Date: 06.12.2002

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.
1703	90	Sd:	clr - trnsl Qtz, f - med, occ crs, mod - pr srt, sbang-sbrndd	No shows
	10	Clst:	Clst: pred brnsh gry, sft, amor, sol, v slty, slily - non calc	
	Gd tr	C:	blk, waxy - lstr, frm - brit, occ mod hd, blky, i.p. grad carb Clst	
	Tr	Mic, Pyr, Ls		
1709	80	Sd:	a.a.	a.a.
	10	C:	a.a	
	Tr	Clst:	a.a.	
	Tr	Mic, Pyr, Ls		
1715	60	Sd:	a.a.	a.a.
	30	Clst:	a.a	
	10	C:	a.a	
	Tr	Mic, Pyr, Ls		
1721	60	Sd:	a.a.	a.a.
	40	Clst:	a.a	
	Tr	C, Mic, Pyr, Ls		
1739	80	Clst:	a.a.	a.a.
	20	Sd:	a.a	
	Tr	C, Mic, Pyr, Ls		
1745	90	Clst:	a.a.	a.a.
	10	C:	a.a	
	Gd tr	Sd:	a.a	
	Tr	Mic, Pyr, Ls		
1751	90	Clst:	a.a.	a.a.
	10	C:	a.a	
	Gd tr	Sd:	a.a	
	Tr	Mic, Pyr, Ls		
1757	80	Sd:	clr - trnsl Qtz, f, occ med, wl srt, sbang - sbrndd	a.a.
	20	Clst:	a.a.	
	Tr	C, Mic, Pyr, Ls		
1763	60	Clst:	a.a	a.a.
	30	Sd:	a.a.	
	10	C:	i.p. grad carb Clst else a.a	
	Tr	Mic, Ls, Pyr		
1769	60	Clst:	a.a	a.a.
	40	Sd:	a.a	
	Tr	Mic, Ls		
1775	60	Clst:	a.a.	a.a.
	30	Sd:	a.a.	
	10	C:	a.a.	
	Tr	Mic, Ls, Pyr		

WELLSITE SAMPLE DESCRIPTION			Page 13 of 16
Country: Norway	Area: Nordland II		Field: Blåmeis
Well no: 6608/11-03	Company: Statoil ASA, Petoro AS, Norsk Hydro ASA, Norsk Agip A/S, AS Norske Shell		
RKB: 24 meters	Geologist: J. Basset, S. Solymar		
Hole size: 12 1/4 "	Cut solvent: Aceton		Date: 06.12.2002

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.
1781	70	C:	brnsh blk - blk, blky, sft - frm, occ mod hd, i.p. grad carb Clst	
	30	Clst:	brnsh gry, sft, amor, v slty, sol, non calc	
	Tr	Sd:	clr - trnsl Qtz, f-med, occ crs, mod srt, sbrndd - sbang	No shows
	Tr	Mic, Ls, Pyr		
1787	70	C:	a.a.	a.a.
	20	Clst:	a.a.	
	10	Sd:	a.a.	
	Tr	Mic, Ls, Pyr		
1793	80	Sd:	a.a.	a.a.
	20	Clst:	a.a.	
	Tr	C, Mic Ls, Pyr		
1799	80	Clst:	a.a.	a.a.
	20	Sd:	a.a.	
	Tr	C, Mic, Ls, Pyr		
1805	75	Sd:	a.a.	a.a.
	20	Clst:	a.a.	
	5	C		
	Tr	Mic, Ls		
1811	lost			
1817	70	Sd:	a.a.	a.a.
	30	Clst:	a.a.	
	Tr	C		
1823	60	Sd:	a.a.	a.a.
	40	Clst:	a.a.	
	Tr	C, Pyr		
1829	60	Clst:	a.a.	a.a.
	40	Sd:	a.a.	
	Tr	C, Pyr		
1835	a.a.			a.a.
1841	50	Sd:	v f - crs, pr - mod srt, else a.a.	a.a.
	50	Clst:	a.a.	
	Tr	C, Pyr		
1847	50	Sd:	pred f - med, occ v f, crs, pred sbang, mod srt, else a.a.	a.a.
	30	Clst:	a.a.	
	20	Tr	C	
1853	85	Sd:	mod - wl srt, sbang - sbrndd, else a.a.	a.a.
	10	Clst:	a.a.	
	5	C		
	Tr	Lst,Pyr		

WELLSITE SAMPLE DESCRIPTION				Page 14 of 16
Country: Norway		Area: Nordland II		Field: Blåmeis
Well no: 6608/11-03		Company: Statoil ASA, Petoro AS, Norsk Hydro ASA, Norsk Agip A/S, AS Norske Shell		
RKB: 24 meters		Geologist: J. Basset, O. Bøe		
Hole size: 12 1/4 "		Cut solvent: Aceton		Date: 06.12.2002
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.

Depth	%	Lithology	Description	Remarks
1859	60	Clst:	brnsh gry, sft, amor, v slty, sol, non calc	
	40	Sd:	clr - trnsl Qtz, pred v f - f, occ crs, mod srt, sbrndd - sbang	No shows
	Tr	C:	brnsh blk - blk, blky, frm, occ mod hd, brt, i.p. grad carb Clst	
1865	60	Sd:	f - med, else a.a.	a.a.
	40	Clst:	a.a.	
	Tr	Lst:	clr - off wh, xln - micr, moc hd	
	Tr	C		
1871	60	Clst:	f - med, else a.a.	a.a.
	40	Sd:	a.a.	
	Tr	Pyr		
1877	70	Clst:	a.a.	a.a.
	25	Sd:	pred f - med, v f - crs, pr - mod srt,	
	5	C		
	Tr	Pyr		
1883	a.a.			a.a.
1889	90	Sd:	clr - trnsp qtz, pred med, occ f - crs, wl srt, sbrndd, occ Sst, wh mtx, kaol?	a.a.
	10	Clst:	a.a.	
	Tr	C, Pyr		
1895	a.a.			a.a.
1901	90	Sd:	pred f - crs, occ v crs, pr - mod srt, sbang, occ calc cmt	a.a.
	10	Clst:	a.a.	
	Tr	C		
1907	70	Sd:	pred f - med, occ crs, mod srt, sbang, occ carb & pyr coat	a.a.
	30	Shly C:	brnsh blk - blk, frm - mod hd, pred brit, grad to C, non calc	
	Tr	C, Pyr		
1913	50	Clst:	a.a.	a.a.
	50	Sd:	a.a.	
	Tr	Pyr, C		
1919	a.a.			a.a.
1925	95	Clst:	brnsh gry - med dk gry, sft, amor, v slty & sdy, sol, carb matr	Clay washout
	5	Sd:	a.a.	
1931	100	Clst:	a.a.	No shows
	Tr	Sd, C frgs		
1937	a.a.			a.a.
1943	60	Sd:	f - med, occ crs, wl srt, else a.a.	a.a.
	40	Clst:	a.a.	
	Tr	C, Pyr		

WELLSITE SAMPLE DESCRIPTION				Page 15 of 16
Country: Norway		Area: Nordland II		Field: Blåmeis
Well no: 6608/11-03		Company: Statoil ASA, Petoro AS, Norsk Hydro ASA, Norsk Agip A/S, AS Norske Shell		
RKB: 24 meters		Geologist: J. Basset, O. Bøe		
Hole size: 12 1/4 "		Cut solvent: Aceton		Date: 06.12.2002
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.

Depth	Lithology (%)		Description	Remarks
1949	70	Sd:	clr - trnsp Qtz, f - med, occ crs, wl srt, pred lse, occ sil & calc Sst, f - med	No shows
	30	Clst:	brnsh gry - med dk gry, sft, amor, v slty & sdy, sol, carb matr	Clay washout
	Tr	C frags, Pyr		
1955	50	Clst:	a.a.	No shows
	50	Sd:	v f - crs, pr srt, lse	
	Tr	Carb matr.,Pyr		
1958	80	Sd :	clr - trnsp qtz, f - med, wl srt, sbrndd	a.a.
	20	Clst :	a.a.	
	Gr tr	Pyr		
	R tr	C		
1961	70	Sd:	a.a	a.a.
	30	Clst:	a.a	
	R tr	C		
1964	70	Sd:	occ wh Cl mtrx, a.a	a.a.
	30	Clst:	a.a	
	R tr	C		
1967	a.a			a.a.
1970	50	Sd:	a.a	a.a.
	50	Clst:	a.a	
	Tr	C		
1973	70	Sd:	a.a	a.a.
	30	Clst:	occ grysh gn, else a.a	
	R tr	C		
1976	a.a			a.a.
1979	a.a			a.a.
1982	70	Sd:	a.a	a.a.
	30	Clst:	a.a	
	Gd tr	Ls:	v lt gry - lt gry, frm, blky, microxln	
	R tr	C		
1985	60	Sd:	a.a	a.a.
	40	Clst:	a.a	
	Gd tr	Ls, C		

POOH for coring at 1985m.

WELLSITE SAMPLE DESCRIPTION				Page 16 of 16
Country: Norway		Area: Nordland II		Field: Blåmeis
Well no: 6608/11-03		Company: Statoil ASA, Petoro AS, Norsk Hydro ASA, Norsk Agip A/S, AS Norske Shell		
RKB: 24 meters		Geologist: J. Basset, O. Bøe		
Hole size: 12 1/4 "		Cut solvent: Aceton		Date: 06-09.12.2002
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.

2003	50	Clst:	dk gry, frm, slty, non calc, micropyr	
	40	Sd:	clr – trnsl qtz, v f – v crs, pred f – med, pr - mod srt, lse	No Shows
	10	Lst:	off wh – lt brnsh gry, mod hd, micr	
	Tr	C frags, Pyr		
2009	60	Clst:	a.a.	a.a.
	40	Sd:	a.a.	
	Tr	Lst, Pyr		
2015	80	Sd:	clr – trnsp qtz, f – med, wl srt, sbang – sbrndd, lse	a.a.
	20	Clst:	a.a.	
	Tr	Pyr		
2021	a.a.			a.a.
2027	90	Sd:	sbang, else a.a.	a.a.
	20	Clst:	a.a.	
2031	70	Sd:	a.a.	a.a.
	30	Clst:	a.a.	
	Tr	Pyr		

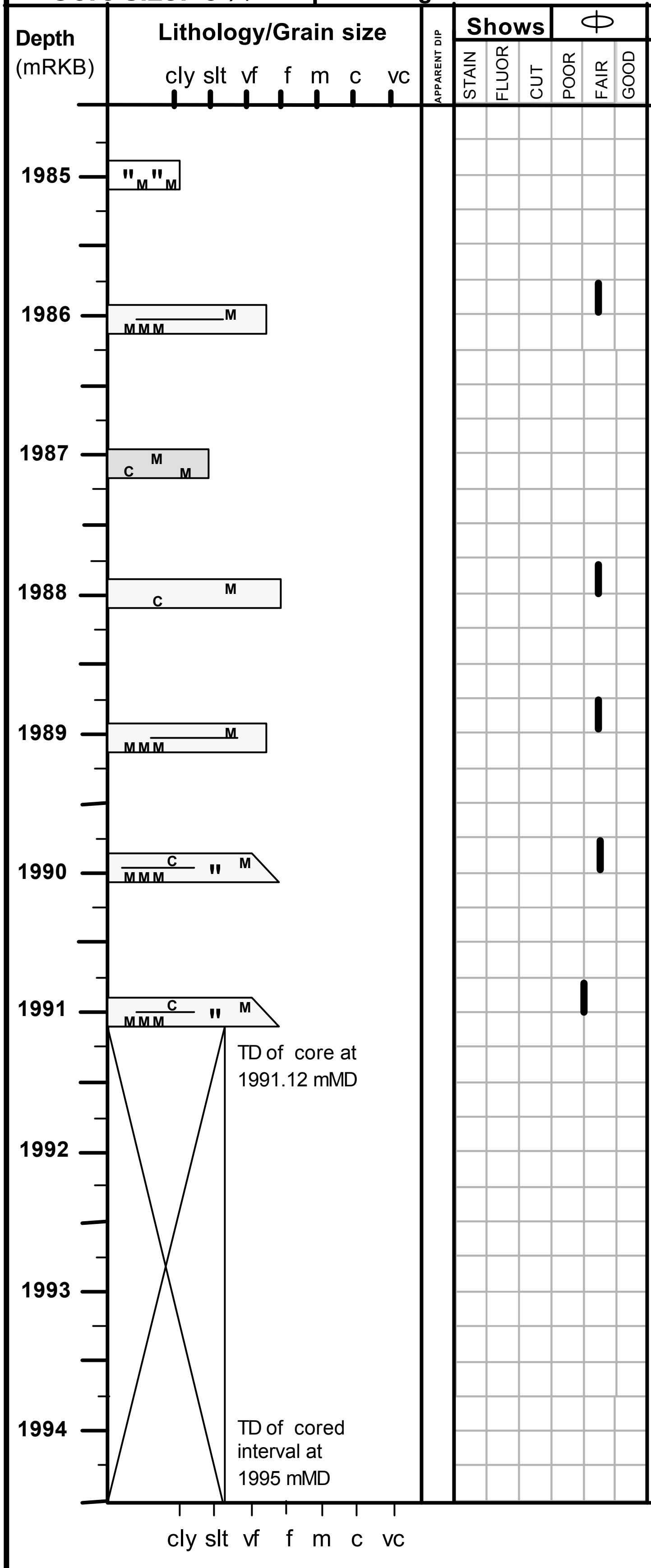
TD of well at 2031m.

A.5 Core description

STATOIL

CONVENTIONAL CORE DESCRIPTION

Country: Norway	**Area:** Nordland II	**Field:** Blåmeis - prospect
Well no: 6608/11-3	**Formation:** Grey Beds Fm.	
Core no: 1	**Interval:** 1985 -1995	**Cored:** 10m **Rec:** 6.12m 61.2 %
Core size: 5 ¼"	**Geologists:** Jon Basset / Oddvar Bøe	**Date:** 08.12.02



Depth (mRKB)	Lithological Description (Rock name, mod. lith., colour, grain size, sorting, round -ness, matrix, cementation, hardness, sed. struct.,accessories, fossils, porosity, contamination)	Remarks (Shows, etc)
1985	**CLST:** olv blk – med dk gry, frm – sft, lam, gen v micromic, slty, loc grad arg Sltst, Tr v crs Qtz Gr, non calc, no vis Por	No shows
1986	**SST:** lt olv gry – pa yelsh brn, f – v f, trnsp ind Gr, mod – wl srt, sbang – sbrndd, slily mod Sil cmt, frm, slily mic, loc Lam w/ abd Mic, fr vis Por	a.a
1987	**SLTST:** dk gry – olv gry, mod hd, arg, gen v mic, r Tr carb Frag, non calc, no vis Por	a.a
1988	**SST:** lt olv gry – pa yelsh brn, trnsp ind Gr, pred f, Tr med Gr, mod – wl srt, sbang, slily – mod Sil cmt, frm, r Tr carb Frag, slily mic, fr – mod vis Por	a.a.
1989	**SST:** lt olv gry – pa yelsh brn, v f – f, trnsp ind Gr, mod – wl srt, sbang – sbrndd, slily – mod Sil cmt, frm, slily mic, loc Lam w/ abd Mic, fr vis Por	a.a.
1990	**SST:** olv gry – pa yelsh brn, v f – f, trnsp – trnsl ind Gr, mod srt, sbang – sbrndd, slily slty I.P., slily – mod mic, r Tr carb Frag, loc Lam w/ abd Mic, fr vis Por	a.a.
1991	**SST:** olv gry – med dk gry, pred v f, occ f, mod srt, sbang – sbrndd, slily – mod Sil cmt, frm, slily slty, Tr carb Frag, mod mic, loc Lam w/ abd Mic, pr – fr vis Por	a.a.

A.6 Sidewall core descriptions

SIDEWALL CORE DESCRIPTION				Page 1 of 3
Country: Norway		Area: Nordland II		Field: Blåmeis
Well no: 6608/11-3		Company: Statoil ASA, Petoro AS, Norsk Hydro ASA, Norsk Agip A/S, AS Norske Shell		
Hole size: 12 1/4 "		Geologist: Jon Basset, Oddvar Bøe		RKB: 24 meters
Run no.: 1A		Reference log: Run 1A: PEX-DSI-FMI		Date: 11-12.12.2002
Total number of shots: 60	Total recovery: 53	Empty: 1	Misfired: 4	Lost: 2

Shot no.	Depth (m RKB)	Rec. (mm)	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.
60	1390.5	43	Clst:	dk olv gry, mod hd, micropyr, slily sdy i.p, v f, occ grnsh gry, Clst clas, slily calc, hom	
59	1394	44	Clst:	olv gry, mod hd, slily blk frgs (ox), micropyr – pyr, non lam, hom, non calc	
58	1403	39	Clst:	olv gry, mod hd, slily lam, slily blk frgs (ox) slily micropyr, non calc	
57	1409.5	43	Clst:	dk olv gry – dk gry, mod hd, slily slty, slily lam, slily mic, non calc	
56	1418.5	Empty			
55	1418.7	Misfire			
54	1431.5	43	Clst:	dk grnsh gry, mod hd, slily micropyr, non calc, hom	
53	1439	40	Clst:	med dk gry – dk grnsh gry, frm – mod hd, slily calc, hom	
52	1442	57	Clst:	gry blk, mod hd, slily slty, slily micromic, non calc	
51	1446	26	Sst:	pa yel gry – med lt gry, v f – f, calc, arg strks, pr vis por	No shows
50	1449.5	34	Clst:	med dk gry – olv blk, frm mod hd, slily fis, v mic, abd pyr, non calc	
49	1453	Misfire			
48	1455	26	Clst:	med dk gry – dk gry, frm, v sdy – sdy lam, v f, mic, non calc	
47	1461	38	Clst:	a.a.	
46	1465	30	Clst:	a.a.	
45	1469	32	Clst:	grysh blk, slily fis, slily sdy, pyr i.p, mic, slily wxy	
44	1472	33	Clst:	a.a.	
43	1477	49	Clst:	med dk gry, mod hd, slily mic, micropyr, slily slty & sdy	
42	1480	46	Clst:	dk gry – gry blk, mod hd, mic – micromic, pyr i.p, slily calc	
41	1486	36	Clst:	dk gry, slt/sdy, slily mic, slily calc	
40	1490	45	Clst:	gry blk, abd micropyr, pyr i.p, non calc, slily fis	
39	1493	52	Clst:	med dk gry – dk olv gry, frm – mod hd, wxy, micropyr, micromic, slily slty, non calc	
38	1494.5	45	Clst:	med dk gry – olv gry, mod hd, slily sdy – abd sdy i.p, Tr pyr, Tr mic, slily wxy, non calc lig clas, Ls/Mrl clas; lt gry, sdy	

SIDEWALL CORE DESCRIPTION					Page 2 of 3
Country: Norway		Area: Nordland II			Field: Blåmeis
Well no: 6608/11-3		Company: Statoil ASA, Petoro AS, Norsk Hydro ASA, Norsk Agip A/S, AS Norske Shell			
Hole size: 12 1/4 "		Geologist: Jon Basset, Oddvar Bøe			RKB: 24 meters
Run no.: 1A		Reference log: Run 1A: PEX-DSI-FMI			Date: 11-12.12.2002
Total number of shots: 60	Total recovery: 53		Empty: 1	Misfired: 4	Lost: 2

Shot no.	Depth (m RKB)	Rec. (mm)	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.
37	1499	44	Clst: med dk gry – olv gry, mod hd, slily sdy – abd sdy i.p, Tr pyr, Tr mic, slily wxy, non calc lig frgs	
36	1502	43	Clst: med dk gry – olv gry, mod hd, slily sdy – abd sdy i.p, Tr pyr, Tr mic, slily wxy, non calc	
35	1503	30	Clst: olv gry – olv blk, frm, slily slty, pyr i.p, non calc, slily wxy, slily mic	Crushed
34	1505	53	Clst: a.a.	
33	1510	16	Sst: med gry, v f – f, Tr med, mod srt, sbang - sbrndd, slily arg, Tr pyr, pr – fr vis por	No shows
32	1512	Misfire		
31	1515	25	micro flt, pred Sst: lt olv gry, v f, wl srt, slily arg, non calc, pr – fr vis por	No shows
30	1518.5	25	Lam Clst/Sst: pred Clst: brnsh gry – olv blk, frm, non calc, slty & sdy, abd mic, arg, pyr Sst: lt olv gry, v f, wl srt, slily arg, non calc, pr – fr vis por	No shows
29	1522.5	20	Sltst: brn gry – brn blk, frm, cly strks, slily sdy, micropyr, arg	No shows
28	1524	30	Clst: brnsh gry – olv blk, frm, non calc, slty & sdy, abd mic, Sst lam, v f, arg	No shows
27	1529	28	Sst: med olv gry, v f – f, wl srt, arg frgs, frm – lse, non calc, fr vis por	No shows
26	1537	32	Clst: olv blk, frm – mod hd, slty, slily sdy, sdy strks, mic, non calc	
25	1544	40	Interb. Sst/Clst lam/rpls: Clst: med brn gry, frm – mod hd, non calc Sst: lt gry – lt olv gry, v f – f, , frm – lse, arg/mic lam i.p, fr vis por	No shows
24	1551	30	a.a.	No shows
23	1558	25	Sst: lt gry – lt olv gry, v f, frm – lse, arg/mic lam i.p, fr vis por, abd Clst lam, olv gry – brn blk	No shows
22	1561	18	Sst: lt gry – lt olv gry, v f, frm – lse, arg/mic lam i.p, fr vis por	No shows
21	1578	25	Clst: med brn gry, frm – mod hd, non calc, abd Sst lam, v f, micromic	
20	1590	34	Boundary Sst/Clst: Sst: lt brnsh gry, v f – f, wl srt, sbang, lse – frm, pyr, gd vis por pred Clst: olv gry, brn blk, frm, non calc, mic lam, mic, slily slty/sdy, sdy strks, mic ropyr, Tr lig/C frgs	No shows
19	1601.5	24	Sst: med lt gry – lt olv gry, v f – f, wl srt, sbang, lse – frm, r Tr pyr, gd vis por	No shows

STATOIL

SIDEWALL CORE DESCRIPTION						Page 3 of 3
Country: Norway		Area: Nordland II				Field: Blåmeis
Well no: 6608/11-3		Company: Statoil ASA, Petoro AS, Norsk Hydro ASA, Norsk Agip A/S, AS Norske Shell				
Hole size: 12 1/4 "		Geologist: Jon Basset, Oddvar Bøe				RKB: 24 meters
Run no.: 1A		Reference log: Run 1A: PEX-DSI-FMI				Date: 11-12.12.2002
Total number of shots: 60		Total recovery: 53	Empty: 1	Misfired: 4		Lost: 2

Shot no.	Depth (m RKB)	Rec. (mm)	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.
18	1608	34	Sltst: olv gry, frm, non calc, occ slily calc, lig/C strks, sdy i.p, grad Clst	
17	1616.5	19	Boundary Sst/Clst: Sst: lt brnsh gry, v f, wl srt, sbang, arg lam, non calc, frm – fri, fr vis por, pyr Clst: olv gry, frm, non calc, slily slty/sdy, micropyr	No shows
16	1634	34	Sst: med lt gry, v f, wl srt, sbang, arg lam, non calc, frm – fri, fr vis por	No shows
15	1645	34	Sst: lt olv gry – med gry, v f – f, mod srt, sbrndd, frm – lse, slily mic i.p., arg, Tr lig/C, pr vis por	No shows
14	1688	Lost		
13	1728.5	38	Sst: lt olv gry – med gry, v f – f, mod srt, sbrndd, frm – lse, slily mic i.p., arg, loc abd C/lig, pr vis por	No shows
12	1785	Misfire		
11	1814	Lost		
10	1836	50	Clst: olv gry – gnsh blk, frm – mod hd, non calc, lig	
9	1860	37	Clst: pa yelsh brn – lt olv gry, frm, non calc, swells in water, micromic, pyr nod	
8	1877	21	Clst: olv blk, frm, stky, non calc, slily micromic	
7	1902.5	20	Sst: med lt gry – med gry, v f, Tr f, mod srt, sbrndd – sbang, v arg, slty, grad slty & sdy Clst, pyr nod, no vis por	No shows
6	1915	49	Clst: olv gry, sft – frm, stky, sol, non calc, swells in HCl, micromic, carb Spkls	
5	1919	23	Sst: lt olv gry – med gry, v f – f, pr – mod srt, sbrndd, lse, arg, mic, freq crs Mic Gr, C frags, no vis por	No shows
4	1935	45	Clst: brnsh gry, frm, stky, sol, non calc, swells in HCL	
3	1949	ca 10 (uncons)	Sst: med lt gry – med gry, f – med, pred f, mod srt, sbrndd – sbang, v lse, slily arg, loc pyr, fr vis por	No shows
2	1954	15	Clst: lt olv gry – med gry, sft – frm, sol, non calc, mic, Tr C frags	
1	1955	31	Clst: olv gry – med dk gry, frm, sol, non calc, Tr pyr nod, abd C frags	

A.7 NPD standard sheet for reporting shallow gas

<u>NPD standard form for reporting shallow gas</u>

WELL DATA:

1.	**Distance from drill floor to sea level:**	24 m
2.	**Water depth (MSL):**	374 m
3a.	**Setting depth for conductor (m RKB):**	458 m MD
3b.	**Leak Off/Formation Integrity Test (g/cc).**	N/A
4a.	**Setting depth for casing on which BOP is installed:**	725 m MD
4b.	**Leak Off/Formation Integrity Test (g/cc):**	1.34 g/cm^3

5. Depth (m TVD RKB and two-way time) to formation/section/layer tops:

Sea Floor:	398 m / 0.460 sec
Top Nordland Group (Naust Fm):	663 m / 0.754 sec
Top Kai Fm:	1240 m / 1.258 sec
Top Hordaland Group (Brygge Fm):	1297 m / 1.303 sec
Top Rogaland Group (Tare Fm):	1363 m / 1.367 sec

6. Depth interval (m RKB & TWT) and age of sand layers shallower than 1000 m below seabed. State which layers if any contain gas:

The well was classified with a Class 2 gas warning with potential gas bearing sands identified in the interval from 750 – 950 m RKB within the Naust Formation. Four potential shallow gas sands were identified in this interval with a maximum potential hydrocarbon column of 35 m.

The well was drilled with seawater down to 725 m where the 13 $^3/_8$" casing was set and the BOP run. The potential shallow gas interval was drilled with 1.20 g/cm^3 water-based mud and using controlled drilling parameters. MWD data, cuttings descriptions and gas levels were used to evaluate the interval.

No sand intervals were identified and no shallow gas was detected in this well.

7. How was presence of gas proven?

No shallow gas observed.

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

9. **Describe all measurements performed in gas bearing layers:**
In the potential gas bearing layers realtime/memory MWD gamma ray and resistivity sensors were used combined with a limited ROP of 20 m/hr to record sufficient real time data points. Samples were collected every 3m throughout this section to evaluate sand content.

10. **Indicate the depths (m RKB & TWT) of unconformities in the well bore:**
Base Quaternary is interpreted to be at: 663 m TVD RKB / 0.754 sec
Base Tertiary is interpreted to be at: 1443.5 m TVD RKB / 1.448 sec

11. **Indicate depth and extension of sand layers (communication, continuity, truncation etc.):**
No distinct sand layers were observed in the Quaternary or Upper Tertiary sections of this well. In the lowermost part of the Tertiary section in the Tare Formation a 1 m thick probably hydrocarbon bearing sand is seen at a depth of 1418 m TVD RKB beneath a limestone stringer. This sand is below seismic resolution and its extent is unknown, though it appears to be possible to correlate the limestone and sand stringers to neighbouring wells.

12. **Indicate depth and extension of any gas blanking, seismic anomalies etc:**
Seismic anomalies interpreted to be gas 'bright spots' are seen in the Naust Formation in the interval classified as Class 2 gas warning. These anomalies extend over a large area of the Blåmeis prospect and terminate against a fault in the east and conform to structure in the west. These anomalies are represented by low density sections on the wireline logs. No significant lithology change is described in the well site descriptions for these intervals.

13. **State possible seismic indications that the gas originates from deeper levels. Description if gas originates from deeper levels:**
N/A

14. **How does the interpretation of the site survey correspond with well data with respect to (depths are m TVD RKB)?**
Shallow gas:
Four sands predicted to be potentially gas bearing.
No sand layers or shallow gas observed.
Sand layers:
Four sand layers predicted at 839 m, 877 m, 923 m and 937 m.
No sand layers observed.
Unconformities:
Unconformities at base Quaternary and base Tertiary predicted.
Unconformities observed at per prognosis.
Correlation with adjacent wells:
The nearest wells, 6808/11-2 and 6608/11-1 are 6.9 and 11.3 km away respectively. The correlation is acceptable.

A.8 Listing of other reports

WELL LOG INVENTORY

STATOIL

COMPANY:STATOIL **WELL: 6608/11-3 "BLÅMEIS"** **LICENCE: 128**

Appendix H: Listing of other reports

File nr.	Tittel	Merknader
1	Site Survey Report at Location 6608/11-3 – Blåmeis (ST0097) + CD NR. 30	FUGRO SURVEY
2	6608/11-3, PL 128 Well programme	STATOIL
3	Bridging Document, Emergency Preparedness Systems, Statoil ASA and Stena Don AS	
4	End of Well Report Surface Data Logging Well no.: 6608/11-3 Nordland II	HALLIBURTON
5	Kjerneboringsrapport – Brønn nr. 6608/11-3	HALLIBURTON
6	Core Photographs well 6608/11-3 Core no.1 Scale 1 : 4 White light and UV light	STATOIL
Kun CD	Data: (1):CST-PGGT,FMI-GR-ECRD,MDT Pretests;MDT Sampling;PEX-ECRD,DSI-GR-ECRD, (2)☺ DSI-GR-ECRD	STATOIL
7	Conventional Core Analysis, Well 6608/11-3	RESLAB
8	Statoil – 6608/11-3 – Zero Offset VSP	REED
9	Definitive Survey Blåmeis	BAKER HUGHES
10	Biostratigraphy of Well N6608/11-3 (1200m-2031m)	BIOSTRAT
----	Conventional Core Analysis, well 6608/11-3 (kun CD-rom) Nyere versjon av nr. 7. CD-rom nr. 348	RESLAB
11	Navigation and Positioning Report " Stena Don " at 6608/11-3	THALES GEOSOLUTIONS
12	Analysis of Water Samples from 6608/11-3, Blåmeis Field	STATOIL
13	End of Well Report + CD containing Final Data	BAKER HUGHES
14	Drilling fluids summary	MI NORGE AS
15	Cementing services recap	HALLIBURTON

7 Enclosures

Composite log

Formation evaluation log

Pressure evaluation log

Formation Evaluation Log

Sperry-Sun Drilling Services — INSITE

Well : 6608/11-3

Scale 1:500

Sand | Sandstone | Siltstone | Clay | Claystone | Coal | Limestone | Dolomite | Marl

Coring

Sperry-Sun Crew:

Data Engineers: T.Mo, W.Starreveld, Z.Bilgrami, M.Welch
Logging Geologists: H.Bendiksen, A.K.Aune, T. Stenersen

COMMENTS	Drilling Rate 200 m/hr 0 / RPM Total Avg 0 RPM 400 / WOB average 0 tonne 40	DEPTH - m MD	Cuttings Lithology	Cored Interval	Gamma Ray api 20 120	Phase Resistivity ohmm Shallow 0.2 2 20 / Deep 0.2 2 20	Gas Hydrcbn Avg 0 % 10	C-1 10 ppm 100K / C-2 10 ppm 100K / C-3 10 ppm 100K / C-4 10 ppm 100K	Oil Shows 1 2 3	Interpreted Lithology	SAMPLE DESCRIPTION AND REMARKS

NB1 17.5", Security DBS, TFA: 0.750, in at 398m MD, made 62m in 21.0 HOB, ran w/26"/36" HO.

36" section drilled with seawater plus Hi Vis sweeps
Returnes to seabed

26/11/02 - 28/11/02
436m MD

30" Conductor set at 458m

NB2 17.5", Security DBS XT1C, TFA: 1.169, in at 460m MD, made 270m in 6.5 HOB. Graded: 1-2-WT-A-E-0-NO-TD

MD 481.0 m
INC 0.14, AZI 130.41
TVD 481.00 m

SD: lse Qtz Gr, trnsp-trnsl, f-m, wl srt, sbang-sbrndd.
Tr Mic, Rk Frags.
r Ls.

CL: m gry-olv gry, sft, amor, sol, stky, slty/sdy, silty-occ mod calc.

SD: clr-trnsl-op Qtz, vf-crs, pr srt, ang-sbrndd.
Tr: Pyr, Shl Frags, Microfos, Rk Frags, Glauc.

Tr SD: clr-trnsl Qtz, occ op Qtz, f-med, mod srt, ang-sbrndd.
Tr: Rk Frags, Glauc, Microfos (forams), Mic.

CL/CLST: m gry-olv gry, sft, amor, sol, stky, slty/sdy, non-occ silty calc.
SD: clr-trnsl-op Qtz, f-v crs, pr srt, ang-rndd.
Tr: Rk Frags.

CL/CLST: m gry-m dk gry-olv gry, sft, amor, sol, stky/sdy, non-occ calc-occ silty calc.
Tr SD: clr-trnsl Qtz, occ op Qtz, f-m, occ crs, mod srt, sbang-sbrndd.
Tr: Rk Frags, Shl Frags, Microfos.
SD: clr-trnsl Qtz, vf-f, wl srt, sbang-sbrndd.
Tr: Shl Frags, Microfos.

CL/CLST: m gry-m dk gry-olv gry, sft, amor, sol, stky, slty/sdy, non-silty calc.
Tr SD: clr-trnsl Qtz, vf-f, wl srt, sbang-sbrndd.
Tr: Microfos, Rk Frags.

Gd Tr SD: clr-trnsl-op Qtz, pred vf-f, occ crs-v crs, wl srt, sbang-rndd.
Tr: Shl Frags, Rk Frags, Glauc.

CL/CLST: m dk gry-olv gry, sft, amor, sol, stky, slty/sdy, non-occ calc.
SD: clr-trnsl-op Qtz, f-m, occ crs, mod srt, sbang-sbrndd.
Tr: Rk Frags, Shl Frags

CL/CLST: m dk gry-olv gry, sft, amor, sol, stky, slty/sdy, non calc.

Tr SD: clr-trnsl-op Qtz, f-v crs, pr srt, sbang-sbrndd.
Tr: Microfos (forams), Rk Frags, Shl Frags.

CL/CLST: m dk gry-olv gry, sft, amor, sol, stky, slty/sdy, non calc.

SD: clr-trnsl-op Qtz, f-v crs, pr srt, sbang-sbrndd.
Tr: Microfos, Rk Frags, Shl Frags.

CL/CLST: m dk gry-olv gry, sft, amor, sol, stky, slty/sdy, non calc.
gd Tr SD: clr-trnsl-op Qtz, f-v crs, pr srt, sbang-sbrndd.
Tr: Microfos, Rk Frags, Shl Frags.

CL/CLST: m dk gry-olv gry, sft, amor, sol, stky, slty/sdy, non calc.

SD: clr-trnsl Qtz, f-v crs, pr srt, sbang-sbrndd.
Tr: Microfos, Rk Frags, Shl Frags.

SD: clr-trnsl Qtz, f-v crs, pr srt, sbang-sbrndd.
Tr: Microfos, Rk Frags, Shl Frags.
CL/CLST: m dk gry-olv gry, sft, amor, sol, stky, slty/sdy, non calc.

CL/CLST: m dk gry-olv gry, sft, amor, sol, stky, slty/sdy, non calc.

SD: clr-trnsl Qtz, f-v crs, pr srt, sbang-sbrndd.
Tr: Microfos, Rk Frags, Shl Frags.

CL/CLST: m dk gry-olv gry, sft, amor, sol, stky, slty/sdy, non calc.
SD: clr-trnsl Qtz, f-v crs, pr srt, sbang-sbrndd.
Tr: Microfos, Rk Frags, Shl Frags.

CL/CLST: m dk gry-olv gry, sft, amor, sol, stky, slty/sdy, non calc.

SD: clr-trnsl Qtz, f-v crs, pr srt, sbang-sbrndd.
Tr: Microfos, Rk Frags, Shl Frags.

Top Kai Fm. 1244m MD

CL/CLST: m dk gry-olv gry, sft, amor, sol, stky, slty/sdy, non calc.

SD: clr-trnsl Qtz, f-v crs, pr srt, sbang-sbrndd.
Tr: Microfos, Rk Frags, Shl Frags.

CL/CLST: m dk gry-olv gry, sft, amor, sol, silty stky, slty/sdy, non calc.
SD: clr-trnsl Qtz, vf-m, occ crs, pr srt, sbang-sbrndd.
Top Brygge Fm. 1300.5m MD
Tr: Rk Frags.
r Pyr.

CL/CLST: varic, m dk gry, brnsh gry, pl yelsh brn, dk gnsh gry, sft-frm, slty, occ sdy, amor-blky, non calc. I.P. glauc.

CL/CLST: brnsh gry, sft-frm, silty slty, silly micromic, I.P. micropyr, r glauc.
Tr SD: clr-trnsl Qtz, vf-m, occ crs, pr srt, sbang-sbrndd.

CL/CLST: brnsh gry, sft-frm, silty slty, silly micromic, I.P.
Tr SD: clr-trnsl Qtz, vf-m, occ crs, pr srt, sbang-sbrndd.
Tr Pyr.

Top Tare Fm. 1377m MD

CL/CLST: brnsh gry-olv gry, brnsh blk-blk, sft-frm, blky, I.P. slty, micromic, I.P. micropyr, I.P. glauc, I.P. v carb, non calc.
Tr SD: clr-trnsl Qtz, vf-m, occ crs, pr srt, sbang-sbrndd.
Tr Pyr, Glauc.

CLST: olv gry-olv blk, brnsh gry-brnsh blk, blky, frm-mod hd, occ sft, occ slty, non calc.
Tr SD, Glauc, Dol.

CLST: grysh bl gn-dsky bl gn, sft-frm, blky, glauc.
DOL: olv gry-olv blk, blky, hd-v hd.
Tr Pyr, Qtz, Kaol.

Top Melke Fm. 1443.5m MD
SD: clr-trnsl, f-m, occ crs, mod srt, sbang-sbrndd
Tr Dol.

SLTST: m gry-m dk gry, sft, amor-sbblky, v arg.

SD: lse, clr-trnsl, f-crs, occ v crs, pr-mod srt, ang-sbrndd.
Top Not Fm. 1473m MD
gd Tr Pyr, Lst.
MRL: brnsh gry, mod hd.

CLST: m gry-m dk gry, sft, amor-sbblky, v slty, calc.
LST: off wh-pl yel gry, microxln, mrly I.P.

CLST: m dk gry, sft, amor-sbblky, v slty, non-slly calc.
Tr Pyr, Sd.

SLST: m dk gry, sft, amor-sbblky, v arg, non-slly calc.

Top Åre Fm. 1529m MD
Tr CLST: grysh bl, gn-dsky bl gn, occ mod brn, occ m gry, sft-frm, blky, non calc. glauc.
SD: lse, clr-trnsl, f-crs, occ v crs, pr srt, ang-sbrndd.
Tr Pyr.

SD/SST: Qtz, clr-trnsl, mlky, brnsh, vf-v crs, ang-sbrndd, occ kaol Mtrx.

gd Tr Pyr.

C: brnsh blk-blk, blky, brit, shny.

Tr LST: off wh-clr, microxln.

LST: m lt gry-off wh, frm, arg & mic lam.

CLST: brnsh gry-olv gry, dsky yel I.P., sft-mod hd, amor-sbblky, silty, non calc-calc.

SLTST: m dk gry-brnsh gry, sft, amor, calc, arg..

SD: lse Qtz, clr-trnsl, vf-v crs, pr srt, ang-sbrndd.

CLST 1: dom brnsh gry, sft, amor, sol, v slty, silly calc.
CLST 2: also gnsh gry, blky, frm-mod hd, non calc.

LS: v lt gry-lt gry, blky, mod hd, occ hd-v hd, slty-arg, micro cryptoxln.
CLST: dom brnsh gry, occ brnsh blk, sft, amor, sol, v slty, silly calc,also gnsh gry, blky, frm-mod hd, non calc.

SD: clr-trnsl Qtz, f-m, occ crs, mod srt, sbang-sbrndd.
CLST: dom brnsh gry, sft, amor, sol, v slty, silly calc, also gnsh gry, blky, frm-mod hd, non calc.

SST/SD: v lt gry-yelsh gry, vf-f, hd, occ v hd, calc Cmt, p vis Por

LS: v lt gry-lt gry, blky, mod hd, occ hd-v hd, v slty-arg, micro-cryptoxln, I.P sdy.
C: blk, wxy-lstr, frm-brit, occ mod hd, blky, I.P. grad carb Clst.

SD: clr-trnsl Qtz, f-m, occ crs, mod-p srt, sbang-sbrndd.

Tr: Mic, Pyr, Ls.

CLST: dom brnsh gry, sft, amor, sol, v slty, silly calc.

SD: clr-trnsl Qtz, f, occ m, wl srt, sbang-sbrndd.

CLST: dom brnsh gry, sft, amor, sol, v slty, silly calc.
Tr: C, Mic, Pyr, Ls.

CLST: brnsh gry, sft, amor, sol, v slty, silly calc, pyr.
Tr C: blk, wxy-lstr, frm-brt, occ mod hd, blky-sbblky, arg I.P.

SD: clr-trnsl Qtz , f-m, occ crs, mod srt, sbang-sbrndd.

SD: clr-trnsl Qtz, vf-crs, pred f-m, occ crs-v crs, p srt, sbang-sbrndd.
CLST: brnsh gry, sft, amor, sol, v slty, silly calc, pyr.
Tr: C, Ls, Glauc, Pyr.

SD: clr-trnsl, f-m, mod srt, sbang-sbrndd.

C: blk, frm-brit, occ mod hd, ang, blky-sbblky.
SD: clr- trnsl Qtz, f-m, occ crs, mod srt, sbang-sbrndd.
CLST: brnsh gry, sft, amor, sol, v slty, silly calc.
SD: clr-trnsl Qtz, f-m, occ crs-v crs, mod srt, sbang-sbrndd.
CLST: brnsh gry, sft, amor, sol, slty, silly calc.
gd Tr C: blk, sft-frm, occ mod hd, blky, silly pyr I.P.

SD: clr-trnsp Qtz, pred m, occ f-crs, wl srt, sbrndd, occ grad SST, wh Mtrx (Kaol ?).

CLST: brnsh gry, sft, amor, v slty, sol, non calc.
Tr C, Pyr.
SD: clr-trnsl Qtz, pred f-m, occ crs, mod srt, sbang, occ carb & pyr cotd.

Shly C: brnsh blk-blk, frm-mod hd, pred brit, grad C, non calc.

CLST: brnsh gry-m dk gry, sft, amor, v slty, sdy, sol, carb Mat.

Top Grey Beds Fm. 1940m MD

SD: clr-trnsp Qtz, f-m, occ crs, wl srt, sbrndd, pred lse, occ grad SST, Sil & Calc Cmt.
CLST: brnsh gry-m dk gry, sft, amor, v slty, sdy, sol, carb Mat.
Tr C Frags, Pyr.

SD: clr-trnsp Qtz, f-m, wl srt, sbrndd, pred lse Gr, occ clay Mtrx.

CLST: brnsh gry-m dk gry, occ grysh gn, sft, amor, v slty, sdy, sol, carb Mat.

gd Tr LS: v lt gry, lt gry, frm, blky, microxln.
Core # 1, cut 1985m to 1995m MD. Recovery 61%
SST: lt olv gry-pa yelsh brn, trnsp ind Gr, frm, f-vf, mod-wl srt, sbang-sbrndd, silly-mod Sil Cmt, silly mic, loc Lam w/ abd Mic, fr-mod vis Por.

CLST: m dk gry, occ grysh bl grn-dsky bl grn, sft-frm, amor, slty, non-silly calc. Tr Mic.

SD: cl-trnsp Qtz, f-m, mod srt, sbang-sbrndd, pred lse Gr, loc Cl Mtrx.

Tr LS: off wh-v lt gry, sft, amor.

COMMENTS	Drilling Rate / RPM Total Avg / WOB average	DEPTH - m MD	Cuttings Lithology	Cored Interval	Gamma Ray	Phase Resistivity Shallow / Deep	Gas Hydrcbn Avg	C-1 / C-2 / C-3 / C-4	Oil Shows 1 2 3	Interpreted Lithology	SAMPLE DESCRIPTION AND REMARKS

Pressure Evaluation Log

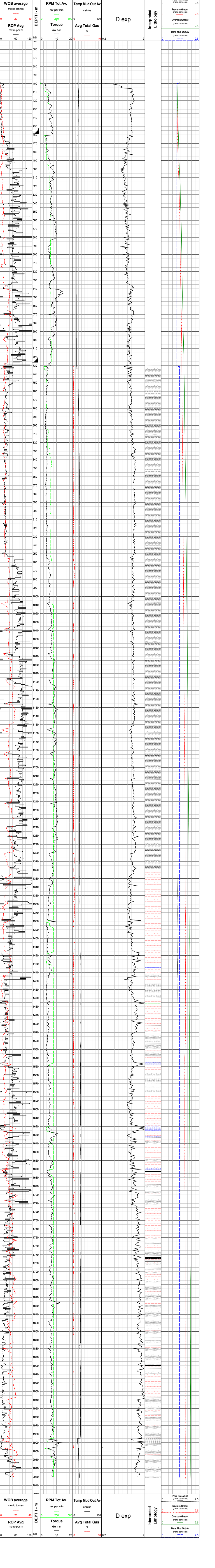
Well : 6608/11-3 Blåmeis

Scale 1:1000

Sandstone | Silt | Claystone | Limestone | Tuff

ADT Engineers: Mike Welch, Zain Bilgrami, Wim Starreveld, Tore Mo.

COMMENTS	WOB average (metric tonnes) 0 – 20 – 40 / ROP Avg (metre per hr) 0 – 60 – 120	DEPTH - m (MD)	RPM Tot Av. (rev per min) 0 – 250 – 500 / Torque (kilo n-m) 0 – 10 – 20	Temp Mud Out Av (celsius) 0 – 100 / Avg Total Gas (%) 0 – 10	D exp 0.2 – 2	Interpreted Lithology	Pore Press Est (grams per cc eq) 0 – 2.5 / Fracture Gradnt (grams per cc eq) 0 – 2.5 / Overbdn Gradnt (grams per cc eq) 0 – 2.5 / Dens Mud Out Av (grams per cc eq) 0 – 2.5



Well 6608/11-3 was spudded at 05:52 hrs, 26 Nov 2002
NB1 17.5", Security DBS, TFA: 0.750, in at 398m MD, made 62m in 21.0 HOB, ran w/26"/36" HO.

30" Conductor set at 458m MD.

NB2 17.5", Security DBS XT1C, TFA: 1.169, in at 460m MD, made 270m in 6.5 HOB. Graded: 1-2-WT-A-E-0-NO-TD

MD 481.0 m
INC 0.14, AZI 130.41
TVD 481.00 m

MD 510.0 m
INC 0.28, AZI 69.54
TVD 510.00 m

MD 568.0 m
INC 0.28, AZI 41.38
TVD 568.00 m

MD 597.0 m
INC 0.22, AZI 90.57
TVD 597.00 m

MD 684.0 m
INC 0.49, AZI 49.33
TVD 684.00 m

MD 714.0 m
INC 0.31, AZI 91.1
TVD 714.00 m
13 3/8" Casing Set at 725m MD
Perform LOT to 1.34sg

NB3 12.25" Security DBS EBXLC1, TFA: 0.884, in at 730m made 1255m in 51.4 HOB Graded: 8-6-WT-N-F-8/16-LN-CP

MD 762.9 m
INC 0.31, AZI 117.87
TVD 762.89 m
Controlled Drilling Max.20 m/hr

MW 1.20 sg, PV 13, YP 11

MD 850.1 m
INC 0.73, AZI 104.99
TVD 850.09 m

MD 908.3 m
INC 0.68, AZI 106.23
TVD 908.29 m

MD 937.4 m
INC 0.79, AZI 110.13
TVD 937.39 m

Controlled Drilling Max.60 m/hr

MD 966.4 m
INC 0.84, AZI 118.95
TVD 966.38 m

MD 995.4 m
INC 0.92, AZI 116.12
TVD 995.38 m

MD 1024.5 m
INC 0.88, AZI 110.51
TVD 1024.48 m

MD 1052.9 m
INC 0.87, AZI 102.62
TVD 1052.87 m

MD 1082.7 m
INC 0.93, AZI 99.30
TVD 1082.67 m

MD 1111.7 m
INC 1.01, AZI 92.10
TVD 1111.66 m

MD 1140.8 m
INC 1.05, AZI 87.60
TVD 1140.76 m

MD 1169.8 m
INC 0.96, AZI 94.21
TVD 1169.76 m

MD 1198.9 m
INC 0.98, AZI 93.36
TVD 1198.85 m

MD 1228.0 m
INC 1.03, AZI 98.64
TVD 1227.95 m

MD 1257.1 m
INC 0.92, AZI 97.85
TVD 1257.04 m

MW 1.20 sg, PV 14, YP 11.5

MD 1286.2 m
INC 0.80, AZI 126.98
TVD 1286.14 m

MD 1315.3 m
INC 0.79, AZI 121.75
TVD 1315.24 m

MD 1344.3 m
INC 0.90, AZI 124.15
TVD 1344.23 m

MD 1373.4 m
INC 0.84, AZI 121.80
TVD 1373.33 m

MD 1402.5 m
INC 0.72, AZI 118.03
TVD 1402.43 m

MD 1431.5 m
INC 1.37, AZI 144.34
TVD 1431.42 m

MD 1460.6 m
INC 1.30, AZI 139.12
TVD 1480.51 m
Controlled Drilling Max.20 m/hr

MD 1489.3 m
INC 1.72, AZI 138.46
TVD 1489.20 m

MD 1518.3 m
INC 1.72, AZI 139.00
TVD 1518.19 m
Controlled Drilling Max.60 m/hr

MD 1547.8 m
INC 1.45, AZI 136.99
TVD 1547.68 m

MD 1576.8 m
INC 1.44, AZI 133.13
TVD 1576.67 m

MD 1605.9 m
INC 1.30, AZI 130.63
TVD 1605.76 m

MD 1635.0 m
INC 1.18, AZI 126.23
TVD 1634.86 m

MD 1664.0 m
INC 1.15, AZI 122.52
TVD 1663.85 m

MD 1693.1 m
INC 1.10, AZI 126.45
TVD 1692.95 m

MD 1722.2 m
INC 1.10, AZI 124.07
TVD 1722.04 m

MW 1.22 sg, PV 13, YP 11.5

MD 1751.3 m
INC 1.14, AZI 122.68
TVD 1751.14 m

MD 1780.4 m
INC 1.13, AZI 117.78
TVD 1780.23 m

MD 1809.4 m
INC 1.21, AZI 118.38
TVD 1809.22

MD 1837.5 m
INC 1.23, AZI 117.79
TVD 1837.32 m

MD 1867.5 m
INC 1.32, AZI 114.87
TVD 1867.31 m

MD 1895.6 m
INC 1.30, AZI 112.22
TVD 1895.40 m

MD 1925.3 m
INC 1.42, AZI 108.12
TVD 1925.09 m

MW 1.22 sg, PV 13, YP 11.5
MD 1972.6 m
INC 1.41, AZI 104.41
TVD 1972.38 m

NB4 12.25" Security DBS CT103HS Core head, TFA: 1.1, in at 1985m made 10m in 2.3 HOB Graded: 2-2-CT-A-X-I-NO-FM

MW 1.22 sg, PV 14, YP 11

TD Well at 2031m MD

COMMENTS	WOB average (metric tonnes) 0 – 20 – 40 / ROP Avg (metre per hr) 0 – 60 – 120	DEPTH - m (MD)	RPM Tot Av. (rev per min) 0 – 250 – 500 / Torque (kilo n-m) 0 – 10 – 20	Temp Mud Out Av (celsius) 0 – 100 / Avg Total Gas (%) 0 – 10	D exp 0.2 – 2	Interpreted Lithology	Pore Press Est (grams per cc eq) 0 – 2.5 / Fracture Gradnt (grams per cc eq) 0 – 2.5 / Overbdn Gradnt (grams per cc eq) 0 – 2.5 / Dens Mud Out Av (grams per cc eq) 0 – 2.5