

Final Well Report

Well 6506 / 11-8, PL 134B

Morvin



UPN – LET OPR



Eni Norge



HYDRO



TOTAL

**Final Well Report
6506/11-8
Morvin PL134B
EPDS-6506/11-8-026**

Tittel:		
Final Well Report 6506/11-8 Morvin PL134B		
Document no. :	Contract no.:	Project:
EPDS-6506/11-8-026		Morvin

Classification:	Distribution:
Restricted	According to distribution list
Expiry date:	Status
	Final

Distribution date:	Rev. no.:	Copy no.:
31.05.2007	0	

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

Remarks:

Valid from:	Updated:

Responsible publisher:	Authority to approve deviations:

Recommended:	Name:	Date/Signature:
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1 Introduction

1.1 Well data record

Well name	: 6506/11-8	
Type of well	: Appraisal - HPHT	
Prospect	: Morvin	
Country	: Norway	
Area	: Haltenbanken	
License	: PL 134B	
Licencees	: Statoil ASA (Operator)	50 %
	Eni Norge AS	30 %
	Norsk Hydro Produksjon AS	14 %
	Total E&P AS	6 %

Drilling unit	: West Alpha
Type	: Semi submersible rig (DP)
Water depth	: 380 m MSL
Air gap	: 18 m
On license	: 22.03.06
Rig released	: 18.07.06
Formation at TD	: Tilje Formation
Geographical coordinates :	

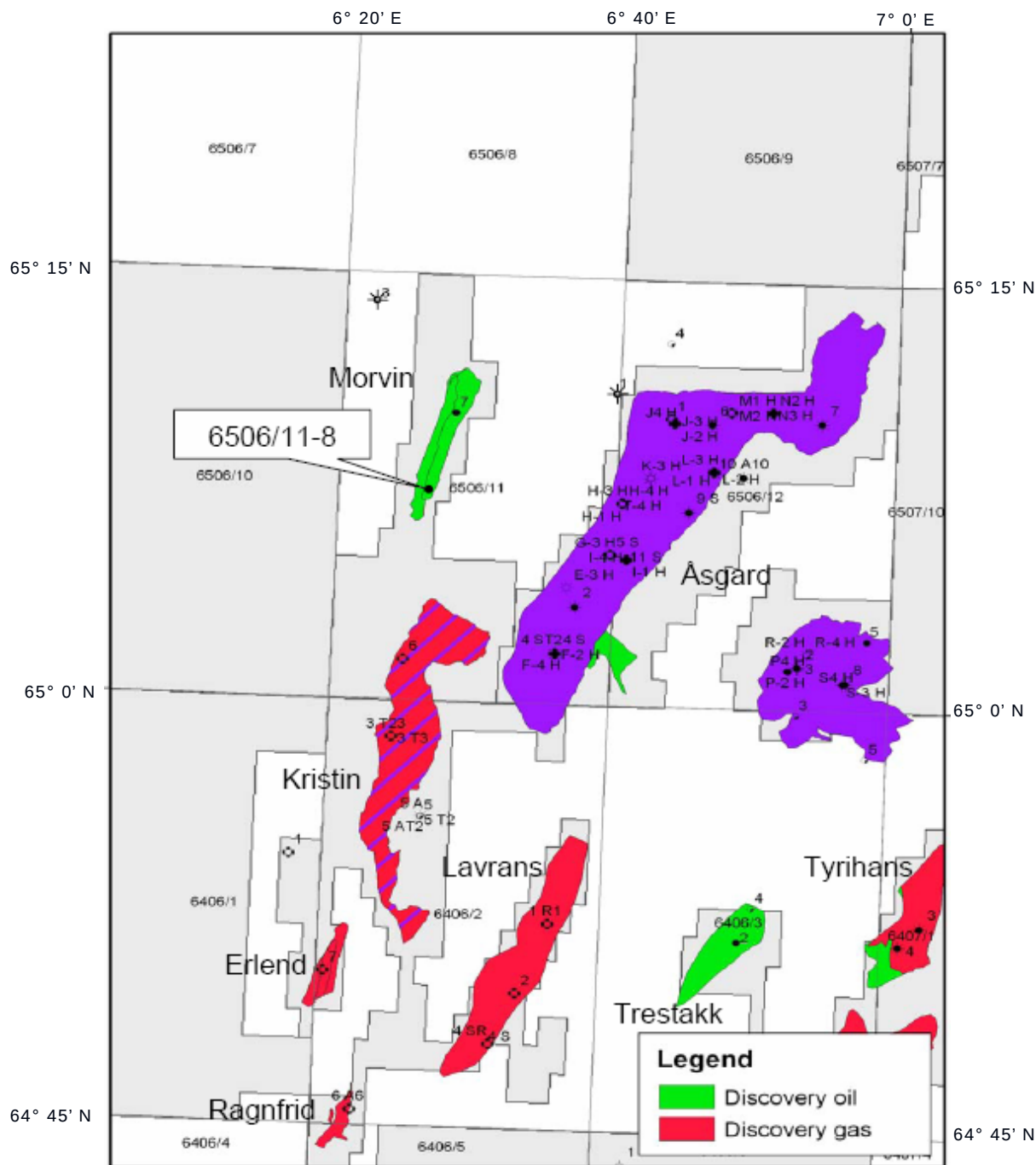
	6506/11-8
Geographic coordinates	65° 07' 13.591" N
(Surface)	06° 26' 49.286" E
Datum / Spheroid	ED50 / INT.1924
UTM coordinates	7 224 481 m N
	380 172 m E
Zone	Zone 32, CM 9°E

Seismic location :

	6506/11-8
3D survey ST02M04	Inline 2660
	Crossline 2648

All depths in this report refer to RKB (Rotary Kelly Bushing) and logger's depth unless otherwise stated. Exception to this is chapter three and five, which refers to driller's depth.

Figure 1.1 Location map



1.2 Well objectives

The primary objective of the well was to prove minimum 0.5 MSm³ extra recoverable oil in structure, explore potential better reservoir properties and reduce depth uncertainties. The primary target was Bathonian age sandstones in the Garn and Ile Formations. Potential targets in the Tofte and Tilje Formations were also investigated by this drilling.

1.3 Result of the well

Well 6506/11-8 was spudded in a water depth of 380 m MSL and drilled to a total depth of 4989.7 m MD driller's depth (extended from 4893 m MD which was the planned TD of the well). No shallow gas was observed by the ROV at the wellhead or by the MWD while drilling the 26" hole. The well penetrated rocks of Quaternary, Tertiary, Cretaceous and Jurassic age. TD of the well is in rocks of early Jurassic age in the Tilje Formation (fig. 4.6 and fig. 4.7).

The well penetrated the Garn reservoir section at 4622.9 m MD and the Ile reservoir section at 4734.8 m MD, both formations shallower than prognosed. One core was cut in the Spekk/Melke Formation and seven cores were cut in the Bathonian sandstones. MDT fluid samples were collected and 81 sidewall cores were taken with the MSCT. A HC discovery was proven both in the Garn and Ile Formations, however the results from the MDT suggests these formations to be tight. A MDT mini-DST was run in Tofte Formation and confirmed that it contains HC, but is very tight.

1.4 Drilling summary

1.4.1 Casing

Table 1.1 Casing programme summary

Casing	Shoe depth [m MD, drillers depth]	LOT / FIT [Equivalent mud weight]
30"	446	N/A
20"	1341.1	LOT: 1.72 sg
14"	2139.5	LOT: 1.86 sg
9 7/8"	4500	LOT: 2.06 sg

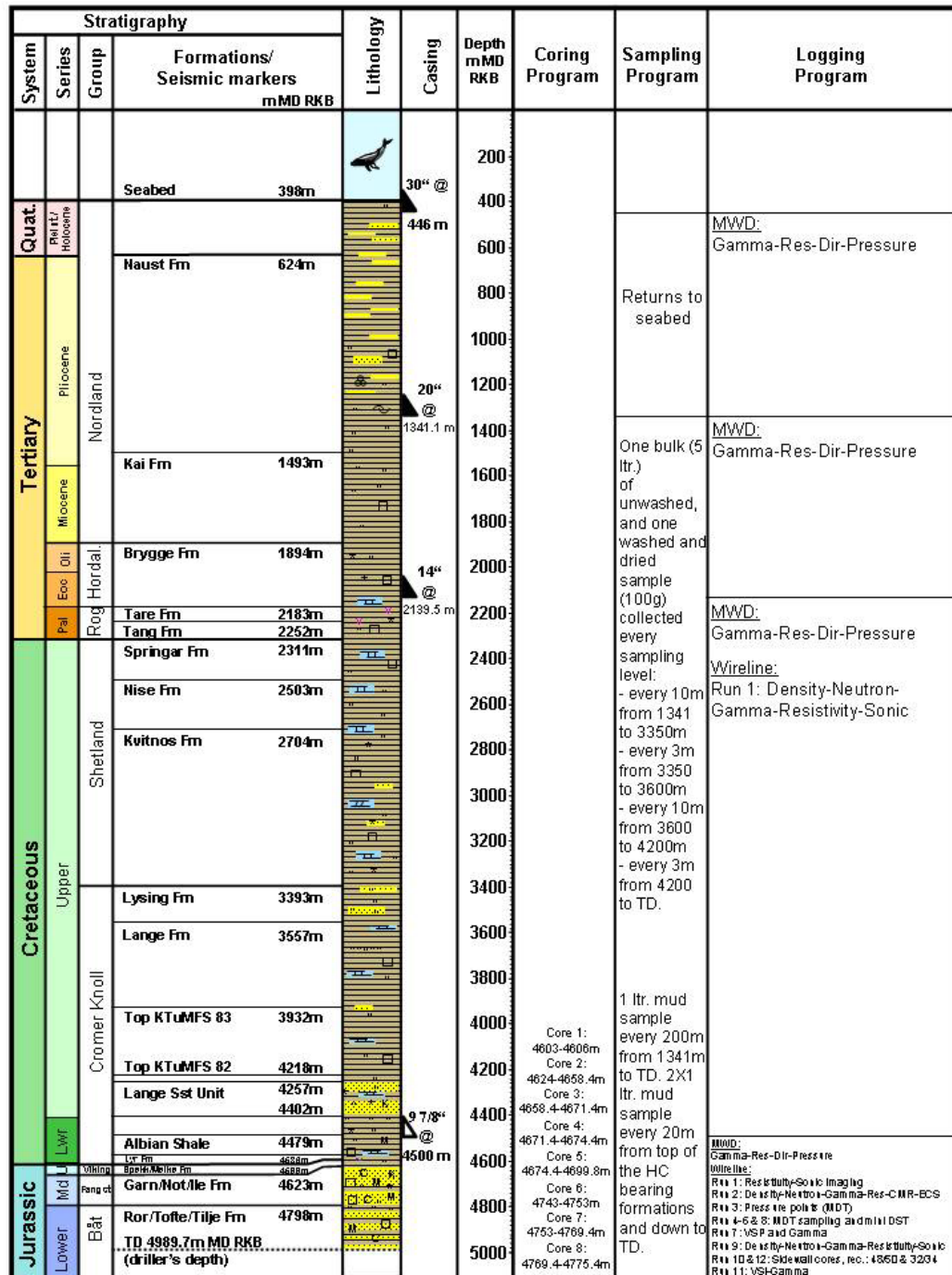
1.4.2 Drilling fluids

Table 1.2 Drilling fluids summary

Section	Section TD [m MD, drillers depth]	Max mud weight [g/cm³]	Mud type
36"	448	1.06	Seawater / Bentonite
26"	1350	1.30	Seawater / Bentonite
17 ½"	2150	1.63	Glydrill WBM
12 ¼"	4500	1.80	Paratherm OBM
8 ½"	4989.7	1.86	Paratherm OBM

1.5 Data acquisition summary

Figure 1.2 Formation evaluation



2 Exemptions

Table 2.1 Exemptions

Exception from	Report no	Date	Title
NPD	None	None	
WR0436	41087	13.04.2006	Survey interval larger than 100m
WR0445	41116	18.4.2006	Bruk av Q-125 material I 9 7/8" linerhanger (<80 degC)
WR0436	41212	30.4.2006	Dispensation from 14 day interval test BOP on West Alpha
WR1192	41220	2.5.2006	Borehullsgeolog med manglende HTHP erfaring

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

3.1 RUH

Table 3.1 Summary RUH

Type (colour code)	Synergi code	Number of
Yellow	3	3
Undefined		2
Green	5	7
Green	4	2
Sum	12	14

3.1.1 RUH details

WELLBORE: NO 6506/11-8

Table 3.2 RUH details

Synergi no	Hazard	Description
395087	3	Synergi 395087 (Closed) - 14.06.2006 - Accident - Person klemte finger på høyre hånd i dør fra slam behandlingsrom. Boredekkarbeider gikk ut av dør fra slam behandlingsrom med undertrykk. Da vedkommende kom ut, ombestemte han seg og snudde for å gå inn igjen. Tok tak i døra med høyre hånd når døra var på vei til å lukke seg. Klarte ikke å stoppe døra fra å lukke seg og vedkommende klemte hånden mellom dør og dørkarm.
395805	3	Synergi 395805 (Closed) - 18.06.2006 - Accident - Person skadet hånd med kniv ved kutting av plastikk strips. Person skadet hånd med kniv ved kutting av plastikk strips som holdt oppe slange.
398664	3	Synergi 398664 (Closed) - 03.07.2006 - Accident - Stilasmontør falt og brakk ribbein Stilasmontør skled da stag som han skulle demontere kom løs. Han landet med brystet mot et annet stag. Arbeidet foregikk på dekknivå.
388901	4	Synergi 388901 (Closed) - 10.05.2006 - Near miss - Smørenippel "skutt" ut av ventilhus I forbindelse smøring av chokemanifold ble greasenippel på en ventil skutt ut. Smøringen ble utført som del av rutinemessig preventivt vedlikehold etter trykktesting. På grunn av plassforhold stod utførende personell på baksiden av ventil da greasenippel ble skrudd ut. Ventil var treg å skru, men dette ble relatert til gjenger. Greasenippel ble etter en del omdreininger "skutt" ut. Den riksjeerte først i stålbjelke som skjermet for videre mulig ferd mot boredekk før den hadde flere andre anslag. Greasenippel ble ikke funnet igjen. Den aktuelle ventil var av fabrikat ECE og med 5000 psi rating. Ventilen er nummer 32 på ventilkartet og befinner seg på lavtrykksside av choke før en blind outlet. Denne aktuelle greasenippelens funksjon er å slippe ut grease/mud/vann når det presses grease inn gjennom den andre greasenippelen (med kuleventil)
394165	4	Synergi 394165 (Closed) - 09.06.2006 - Accident - Skadet hånd ved skifte av kutteskive på vinkelsliper. I forbindelse med skifte av kutteskive på vinkelsliper, glapp nøkkel og hånden traff kutteskiven. Vedkommende måtte til medic for behandling.

Synergi no	Hazard	Description
383323	5	Synergi 383323 (Closed) - 12.04.2006 - Condition - Tilløp til fallende gjenstand. "Sikringsfot" for matkonteinerer blei gjenglømt på lossestasjon. Da vi var ferdig med å tømme frysekonteinerer for mat, glømt vi å sette fast "elefantfoten" som vi bruker til å sikre konteineren med. Denne ble liggende igjen på matkonteinerer dekket og kunne ha blitt en fallende gjenstand. Vekt ca 6 kg, 2 m fallhøyde.
383952	5	Synergi 383952 (Closed) - 17.04.2006 - Accident - Tråkket på slange og skled. Spylte på dekk, trokket på en slange som lå over en H-bjelke. Skled på slangen og landet med venstre lår oppå hjørnet på bjelken.
384258	5	Synergi 384258 (Closed) - 19.04.2006 - Condition - 1/4" hydr. blindplugg lå løst på taket av overhead kran. Det ble oppdaget at en 1/4" hydr. blindplugg lå løst på taket av overhead kran. Denne kunne falt på dekk under kjøring av kranen. Blindpluggen ble fjernet.
388364	5	Synergi 388364 (Closed) - 02.05.2006 - Near miss - Mistet sjakkell. Da jeg var oppe i ridebelte for å montere cement slangen på cement hode mistet jeg en liten sjakkell på dørken fra ca 6 m, området var sperret av og hullet var dekket til. Kommentar: vekt på sjakkell var 240 gram. Dette gir en anslagskraft på 14.8 joule.
389882	5	Synergi 389882 (Closed) - 17.05.2006 - Accident - Utslipp til sjø. Ved start av miksepumpe for å lage slop, det oppdaget lekkasje over hopper. Paratherm OBM slam rant ned til drain i sekkestore som ikke var skikkelig stengt. Totalt volum av OBM til sjø, ca. 15 liter brutto, netto ca 12 liter. Ventil er fikset og stengt, området er reingjort.
390101	5	Synergi 390101 (Closed) - 18.05.2006 - Condition - Potensiell fallende gjenstand. Det ble tatt en liten leterunde på toppen/taket på traverskranen. Der ble det funnet 15 objekter som låg løse. Alle disse kunne ramlet ned.
400127	5	Synergi 400127 (Closed) - 12.07.2006 - Condition - Utslett pga oljeslam Det er ca 12 pasienter som er behandlet for OBM relaterte plager i de siste 6 ukene. OBM som ble nytt i dette tidsrommet var MI Paratherm.

3.2 Experience listing

Reference is made to:

“Benchmarking Drilling Performance - Morvin 6506/11-8 “ Wayne Kotovsky, Smith

“Drilling Optimisation End Of Well Report – Morvin 6506/11-8 8 ½” section” by Arvid Orvedal, Halliburton - for presentation of Anti Stalling Tool analysis

Subject: Stabbing of 20" casing into 30" housing

Section: NO 6506/11-8, 26"

Rep date: 30.03.2006

Keywords: CASING/LINER

Downtime:

Pot time improvements:

Comp inv: Smedvig

References:

Synergi no:

Cost:

Synergi title:

Description:

When stabbing the 20" casing into the 30" housing large movements (up to 6 m) were experienced with the 20" due to sea current and rig movements. This made it difficult to center the pipe above the 30" housing. 1 hrs were spent on this operation.

Immediate solution:

None

Future recommended solution:

Use a type guide funnel or ropes which can guide the 20" when stabbing this into the 30" housing.

The guide funnel can be hooked to the guide lines by 4 shackles and wires and lowered down to the PGB together with the guidelines. It can be retrieved by ROV.

Alternatively, without a guidefunnel, by hooking 1 rope to each guideline with shackles and wrap it around the conductor.

Make sure that the ropes will cut/shear when the 20" enters the 30" conductor.

Subject: More interface than expected during displacement to 1,45 sg mud.

Section: NO 6506/11-8, 17 1/2"

Rep date: 10.04.2006

Keywords: DISPLACEMENT

Downtime:

Pot time improvements:

Comp inv: M-I Drilling Fluids

References:

Synergi no:

Cost:

Synergi title:

Description:

During displacement of the well from seawater to 1,45 sg Glydrill mud (WBM) in the 17 1/2" hole, it was experienced more interface than expected. Dumping was suspended with mud weight out at 1,40 sg, after 30 m3 interface dumped (est. mix of interface: 10 m3 seawater / 20 m3 mud).

As we was using a Vertitrack tool, the string rotation was only 30 rpm. This may have affected the flow regime, giving bigger interface than when rotating much faster as "normally" is done.

Subject: Mud pumps and liner size.
Section: NO 6506/11-8, 17 1/2"
Rep date: 11.04.2006
Keywords: RIG EQUIPMENT
Downtime:
Comp inv: Smedvig
References:
Synergi no:
Synergi title:

Pot time improvements:

Cost:

Description:

It was decided to use 6" liner in mud pumps in all sections. With 2 ea. mud pumps max pump rate was 3300 lpm, the plan was to pump 4400 lpm. With 6 1/2" liner size we could have pumped 3800 - 3900 lpm with 2 ea. pumps.

The low pump rate can result in difficulty to keep well vertical.

Subject: Mud spec & MW in 17 1/2" section
Section: NO 6506/11-8, 17 1/2"
Rep date: 15.04.2006
Keywords: DRILLING FLUID
Downtime:
Comp inv: M-I Drilling Fluids
References:
Synergi no:
Synergi title:

Pot time improvements:

Cost:

Description:

Based on Kristin experiences, the mud spec. was optimised from start of section with 160 kg/m³ KCl and 6% Glycol. No indications of tight hole were observed during drilling and casing running through the reactive Kai and Brygge Formations.

Future recommended solution:

Copy mud spec for future wells in area.

Subject: Reduced drill-out time of float with PDC (Sharkbite installed in 14" csg)
Section: NO 6506/11-8, 17 1/2"
Rep date: 17.04.2006
Keywords: CASING/LINER
Downtime:
Comp inv: Halliburton
References:
Synergi no:
Synergi title:

Pot time improvements: 5

Cost:

Description:

A Sharkbite was installed in 14" csg to reduce drilling time of floats with PDC bit (to reduce the potential for the float to start spinning). This operation occasionally takes long time (up to 8-10 hrs) as it is difficult to drill through a spinning float with a PDC. It has also been observed that PDC bits might be damaged when working on and drilling through floats for a long period.

1 hr and 20 min was used to drill through the float.

Note : After the cement was pumped and the plug was landed, the plug did not hold pressure. There is a possibility that this might be caused by the float not landing properly due to the Sharkbite, but this is not conclusive. Anyway that had no influence as the plan was to pressure test the shoetrack to 545 Bar after the cement had set up.

Future recommended solution:

Use Sharkbite for future 14" casing jobs (also successful on the Gudrun well), at least on wells where the casing shall be pressure tested after the cmt has set up (typically HPHT wells).

Evaluate if this shall be done if the plan is to pressure test on floats (check former experiences if this has been observed on other jobs).

Subject: Lost circulation while circulating BU from 14" shoe while POOH 12 1/4" BHA.

Section: NO 6506/11-8, 12 1/4"

Rep date: 05.05.2006

Keywords: CIRCULATION LOSS

Downtime: 126,50

Comp inv: Smedvig

References:

Synergi no: 386767

Pot time improvements:

Cost: 15306500

Synergi title:

Tapt sirkulasjon nedenfor 14" foringsrør

Description:

Synergi 386767 (Closed) - 28.04.2006 - Other non-conformities - Tapt sirkulasjon nedenfor 14" foringsrør

Hadde fullført boring av 12 1/4" seksjon (OBM, MW 1,80S sg) og trukket oss ut av åpent hull og 100m opp i 14" foringsrør.

Mens vi sirkulerte bunn-opp begynte vi å miste boreslam til formasjonen. Maks ECD observert når vi gikk på tap var 1,858 sg. med 2600 l/min. Stoppet pumpene og observerte brønnen. Hadde avtagende statisk tap (totalt 24,5 m3) til formasjon de neste 8 timene til vi fylte 0,87 sg baseolje i riser (korresponderer til 1,795 sg EMW ved sko). Brønn stabil i 2 timer. Pumpet LCM pille for å prøve å kurere brønn, og tapte ytterligere 36,5m3 i prosessen. Observerte brønn i 9 timer til den ble stabil (totalt tap: 74,5 m3). Begynte å fylle riser med 1,76 sg. boreslam og mistet da 8,5 m3, men måtte avbryte prosessen da vi fikk økning i aktiv pit. Observeret brønn i 2,5 timer og registrerte at vi fikk tilbake (i avtagende trend) 2,3 m3 fra brønnen. Fullførte displacing av riser til 1,76 sg. med 4 m3 tap.

Observerte brønn i halvannen time og fikk 0,9m3 tilbake fra brønn. Trakk oss ut til 1800 m mens vi hadde økning i retur på 3,5 m3 fra brønn. Når vi her prøvde med rolig sirkulasjon oppdager vi at strengen var plagget og måtte trykke opp til 118 bar for å få tilbake sirkulasjon. Små tap av boreslam. Trakk videre ut til 1500 m, denne gangen med 3,6 m3 i gain. For å minske risiko for å gå på nye store slaptap ble det besluttet å redusere slamvekt fra 1500 m og opp til 1,76 (korresponderer til 1,786 sg EMW på bunn). I denne prosessen fikk vi gain på 20 m3. Observerte brønn i 1,5 timer med relativt lite og avtagende gain. Utarbeidet plan for å displace hele brønn til 1,78 sg. ved å gå rolig ned og displace forsiktig til 1,76 sg på 4 dybde-intervaller. Første etappe var å gå til 2340 m (200 m nedenfor skoen). Flowcheck i 30 min viste stabil brønn. Displacet til 1,78 sg boreslam ved å gå trinnvis og svært rolig opp til 500 lpm (boostet riser med 300-500 lpm). Brønn stabil, men vi observerte en maks gass på 1,8 %, og fikk noe LCM i retur. Retur av LCM og det faktum at gassen inneholdt lette komponenter (C1 og litt C2) gir oss ganske klare indikasjoner på at tapssonen ligger over oss (altså en plass under sko ned til 2340 m). Denne teorien styrkes når vi observerer ingen gass ved samme displacement prosedyre på 3000 m, 3700m og på TD. Brønn er stabil gjennom hele prosessen ned til TD.

Total nedetid for hendelsen er 126,5 timer.

Immediate solution:

Beskrevet under description.

Future recommended solution:

Avoid circulation with BHA in shoe without ECD management

Subject: Problems to MU / handle different 9 7/8" liner joints in the BX elevator.

Section: NO 6506/11-8, 12 1/4"

Rep date: 07.05.2006

Keywords: CASING/LINER

Downtime:

Comp inv: Statoil

References:

Synergi no:

Synergi title:

Pot time improvements:

Cost:

Description:

It was difficult to make the 9 7/8" insert elevator to fit different types casing joints. When the joints were made up, extra torque was generated from friction between the BX elevators and the tubular. Especially releasing the elevator from the casing after make up was a problem at the start of running casing, this improved by increasing string weight. The BX elevator inserts was changed several times. The 9 7/8" liner on well 6506/11-8 consisted of tree different casing types:

-66.4#, SM125S, Vam Top.

-66.4#, Q-125, Vam Top.

-62,8#, Q-125, Vam Ace.

Immediate solution:

None.

Future recommended solution:

Run one type casing string ?

Run 9 7/8" with 10" inserts in BX-elevator ?

Use other type elevator ?

Subject: Were not able to get suction on cement pump with either OBM nor premix.

Section: NO 6506/11-8, 12 1/4"

Rep date: 07.05.2006

Keywords: PUMPING

Downtime:

Pot time improvements:

Comp inv: Halliburton

References:

Synergi no: 387618

Cost: 726000

Synergi title:

Unable to get suction on cement pump at low pump rate.

Description:

Synergi 387618 (Closed) - 04.05.2006 - Unable to get suction on cement pump at low pump rate.

Unable to get suction on cement pump when attempting to pressure up with mud for BOP test. Not able to get suction with unweighted premix as well.

Did not have problem with suction when flushing prior to pressure test.

Changed to water and had no problem to get suction. Stripped down cement pump - no problems encountered.

Total D-time: 6.0 hrs.

Immediate solution:

Switch the fluid from OBM to water. Experience from Halliburton show that this maintain a good suction pressure on the pump.

Future recommended solution:

Halliburton have distributed a "Service Quality Alert" to make sure all their engineers are aware of the problem.

Advise in this alert to use water when applicable. Root cause of problem not solved.

Subject: Not able to shear out ball from seat after setting 9 7/8" liner hanger.

Section: NO 6506/11-8, 12 1/4"

Rep date: 09.05.2006

Keywords: CASING/LINER

Downtime:

Pot time improvements:

Comp inv: Drill Quip

References: ref synergi 387894 and 388088.

Synergi no: 387931

Cost: 423500

Synergi title:

Not able to shear out ball from seat after setting liner hanger.

Description:

Synergi 387931 (Closed) - 08.05.2006 - Not able to shear out ball from seat after setting liner hanger.

Set 9 7/8" liner hanger according to procedure. Attempted to shear out ball from seat to circulate well prior to cement liner - no go.

Initailly applied 245 bars, increased i steps to 340 bars - no go.

Made up high pressure hose to cement stand and pressured up, ball sheared out at 376 bars.

Total D-time: 3.5 hrs.

Immediate solution:

Changed over to high pressure (10.000 psi) hose from cement manifold to cement stand.
Pressured up to 376 bars (excess of 50%) and sheared out ball.

Future recommended solution:

Recommend pressure range to indicate maximum expected shear pressure.

Subject: Unsuit centralizers for 9 7/8" liner

Section: NO 6506/11-8, 12 1/4"

Rep date: 10.05.2006

Keywords: CASING/LINER

Downtime:

Comp inv: Halliburton

References:

Synergi no:

Synergi title:

Pot time improvements:

Cost:

Description:

When running liner, severe restrictions had to be passed, and the liner was just barely run to TD. Upforce exceeded 90% of yield for 5 7/8" string. The cause of the restrictions is unknown. However, it is highly unlikely that the problems were related to unstable formation for the following reasons:

1. No problems had been noticed during drilling and tripping.
2. When passing restriction, downweight and upweight were back to normal (No drag).
3. There were no losses when circulating.

Hence, the problem seems to be mechanical. The most likely cause appears to be the bow type centralizers with stop collars mounted on each side. With this configuration, the centralizer will, if restriction is met, expand and the problem will get worse until the centralizer finally brakes.

Suggested solution is to run no centralizers for casing/liners which is not through reservoir. Alternatively, solid centralizers should be run.

Another possible contributor to problems to get liner down was the almost flat profile of the liner shoe. Lipstick type shoes are preferred.

Subject: Fishing operations - Mini DST tool on DP.

Section: NO 6506/11-8, 8 1/2"

Rep date: 01.07.2006

Keywords: WIRELINE ELECTRICAL

Downtime:

Comp inv: Schlumberger

References:

Synergi no:

Synergi title:

Pot time improvements:

Cost:

Description:

Decided to use sideentry sub on overshot with grapple to fish mini DST tool. Cut the wire and pulled thru overshot, 5" DP and sideentry sub. This worked very well and was time saving compared to cut and thread (+/- 2 days saved). A float and dart sub was included in fishing string, not possible when doing cut and thread.

The wireline was kept in tension 7000 lbs when RIH with DP.

Fishing operations were a success.

Future recommended solution:

Develop a grapple/finishing tool that can be split, to avoid cutting the wire.

Subject:	Bremser på capstan winch.
Section:	NO 6506/11-8, 8 1/2"
Rep date:	05.07.2006
Keywords:	WIRELINE ELECTRICAL
Downtime:	
Comp inv:	Schlumberger
References:	
Synergi no:	
Synergi title:	

Pot time improvements:

Cost:

Description:

Etter opprigging av tools kom en ikke videre i operasjonen da det var umulig å få løs bremser på capstan winch. Det er mulig å få frigjort bremsene mekanisk, men da er det fortsatt en sperrefunksjon elektronisk som gjør at vinsjen ikke kan kjøres.

Future recommended solution:

Se på mulighet til å få installert override funksjon på bremser på capstan winch.

Subject:	Pre-made assembly
Section:	NO 6506/11-8, 8 1/2"
Rep date:	15.05.2006
Keywords:	CORING
Downtime:	
Comp inv:	Security DBS
References:	
Synergi no:	
Synergi title:	

Pot time improvements:

Cost:

Description:

First coring assembly should have been pre-made with bit etc. onshore. Time saving offshore and less handling.

Future recommended solution:

Premake assembly

Subject:	Gas migration
Section:	NO 6506/11-8, 8 1/2"
Rep date:	15.06.2006
Keywords:	FLUID SAMPLING
Downtime:	
Comp inv:	Statoil
References:	
Synergi no:	
Synergi title:	

Pot time improvements:

Cost:

Description:

Got stuck with WL toolstring after fluid sampling and pressure build-up test in Garn Fm. RIH with fishing assy and washed down from shoe at 4500 m to 15 m above top of fish at 4620 m. Circulated BU. Started to get gas at surface from approximately 3700 m. Backcalculating to the sampling depth (4637 m) and the time since fluid sampling (29 hrs), the gas has theoretically migrated with +/- 30 m/hr.

Had max 18% gas in shaker and 24% in poorboy degasser. Liquid seal had to be drained several times to vent the gas out of the poorboy degasser.

Subject: Capstan damaged the wireline
Section: NO 6506/11-8, 8 1/2"
Rep date: 23.06.2006
Keywords: WIRELINE ELECTRICAL
Downtime: **Pot time improvements:**
Comp inv: Schlumberger
References:
Synergi no: **Cost:**
Synergi title:

Description:

When rigging up the wireline tools the tension on the wireline cable was most likely to low. This led to the wireline jumped out its guiding wheel on the capstan. This resultet in a kink on the wire and it had to be cut and a new logging head to be terminated. 2 hours downtime on this operation.

Subject: Cutting core barrel on drill-floor.
Section: NO 6506/11-8, 8 1/2"
Rep date: 25.05.2006
Keywords: CORING
Downtime: **Pot time improvements:**
Comp inv: Security DBS
References:
Synergi no: **Cost:**
Synergi title:

Description:

Cutting the core barrel (core) on drill-floor is not performed in a efficient/professional way. It takes time to adjust the cutting equipment and the cutting it self has to be done manually. The cutting equipment is not "stable" during cutting and has to be supported by wood beam's and slings.

Immediate solution:

Used extra time on cutting the core.

Future recommended solution:

Technical solution and equipment has to be improved.

Subject: Release stuck MDT tool Dual packer mini DST.
Section: NO 6506/11-8, 8 1/2"
Rep date: 27.06.2006
Keywords: WIRELINE ELECTRICAL
Downtime: **Pot time improvements:**
Comp inv: Schlumberger
References:
Synergi no: **Cost:**
Synergi title:

Description:

On several occations the MDT tool was stuck after the mini DST was completed. When reenergizing the packer elements it was discovered that pumped volume was less than initially pumped, indicating that volume was not suficciently bled off when the packers were deenergized, and that the tool was hanging on the packer elements. When the pump was reversed to pump fluid out of the packers the tool came free.

Subject: Cleaning/wiping casing when pulling.

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Section: NO 6506/11-8, PERM P&A
Rep date: 11.07.2006
Keywords: CASING/LINER
Downtime:
Comp inv: Weatherford Norge AS
References:
Synergi no:
Synergi title:

Pot time improvements:

Cost:

Description:

When pulling 14" casing a standard wiper was modified. This wiper did not clean the outside of casing properly and all casing joints had to be washed on deck before backloading.
A proper wiper should be included in Weatherford casing package.
Had same problem on Lawrans were both 9 5/8 and 13 3/8 casing were pulled and OBM was used.

Ref Seadrill OBS 3190: Under uttrekking av 14" csg, manglet riktig type pipe wiper. Dette medførte at delvis skitten csg ble lagt ned til dekk. Ekstra tid/mannskap måtte til for vaske csg før backload.// Weatherford må supplere riktig type wiper i utstyrspakke for csg jobb.

Future recommended solution:

Seadrill/Weatherford to mobilize a proper wiper for the 14" casing.

Subject: Cutting casing with motor
Section: NO 6506/11-8, PERM P&A
Rep date: 11.07.2006
Keywords: CUTTING/PATCHING
Downtime:
Comp inv: Statoil
References:
Synergi no: 399708
Synergi title: Misrun med casing cutter

Pot time improvements:

Cost: 500000

Description:

Cutting and pulling wear bushing in the same run is not recommended for future P&A operations. Use of motor gives poor indication of cutting and the risk for misrun or for damaging the next casing therefore increases. Furthermore, wellcontrol gets very difficult as flowrate required to get proper motor action prevents use closed annular when cutting. With prolonged cutting time as when cutting heavy wall 14" casing, it gets impossible to close annular before potential gas reaches BOP.

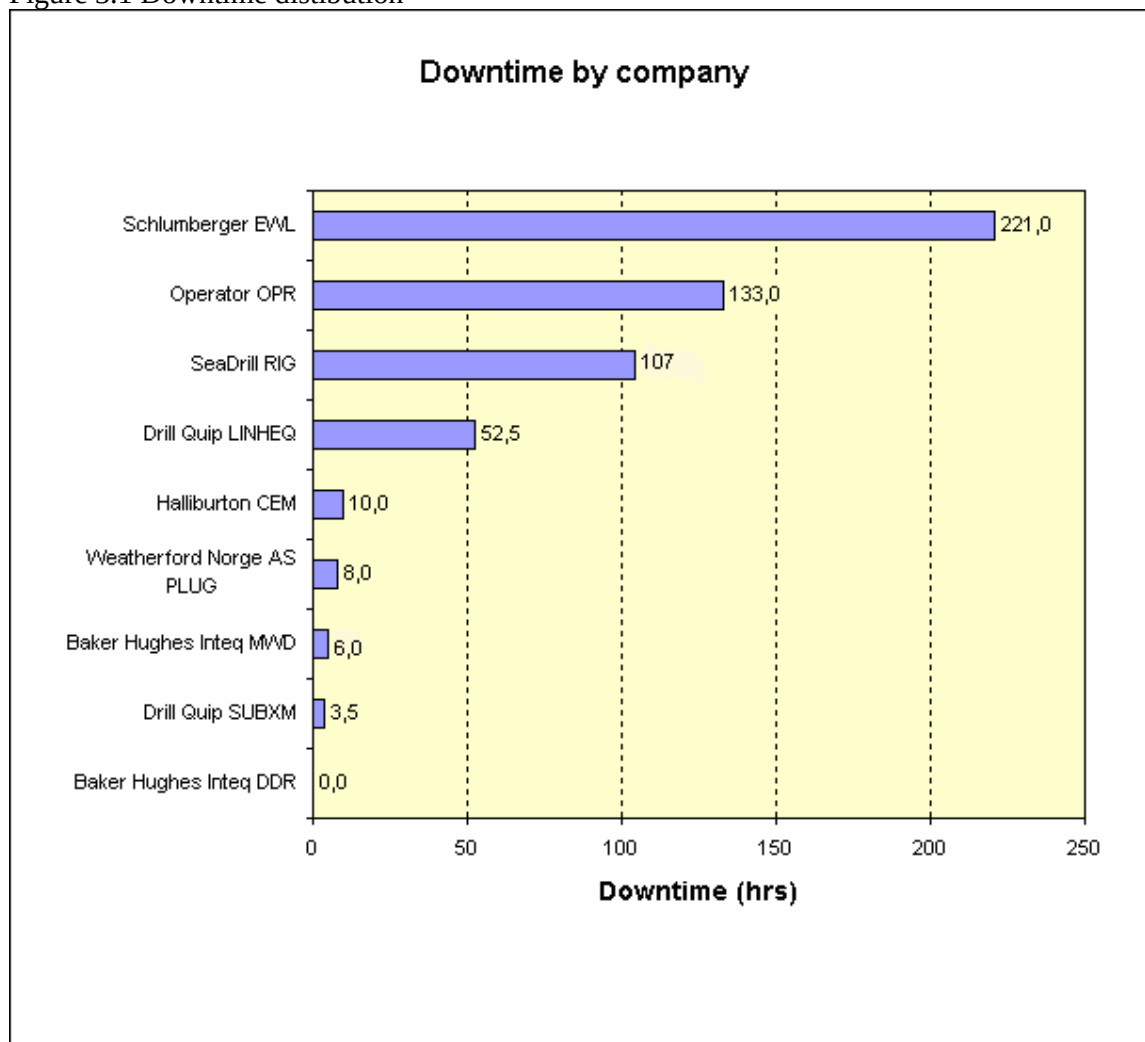
Immediate solution:

Future recommended solution:

Use Marine Svivel and Annular Swivel sub for cutting casing even if it is more timeconsuming than to cut casing and pull wearbushing in one run.
Use of Annular Svivel Sub is much safer and will work every time!

3.3 Incidents by service and company

Figure 3.1 Downtime distribution



SERVICE COMPANY: Cementing CEM Halliburton
WELLBORE: NO 6506/11-8

Incident start time	Failure code	Synergi no	Title	Quality cost		Downtime		
				NOK	NOK/d	Total hrs	Comp share %	Comp share hrs
04.05.2006 06:00:00	CEM-E01 Equipment functions	387618	Unable to get suction on cement pump at low pump rate.	726000	2904000	6,0	100	6,0
03.07.2006 04:30:00	CEM-20 Other failures	398483	Cmt. unit problems with suction valve.	60976	2926848	0,5	100	0,5
03.07.2006 06:00:00	CEM-E01 Equipment functions	398656	Lekkasje i sementunit	70000	1680000	1,0	100	1,0
08.07.2006 11:00:00	CEM-E01 Equipment functions	399380	Lekk ventil - sementunit	60000	2880000	0,5	100	0,5
12.07.2006 19:30:00	CEM-04 Cement slurry density	400180	Leak on cement plug	280000	3360000	2,0	100	2,0
			Total	1196976				10,0

SERVICE COMPANY: Directional Drilling DDR Baker Hughes Inteq
WELLBORE: NO 6506/11-8

Incident start time	Failure code	Synergi no	Title	Quality cost		Downtime		
				NOK	NOK/d	Total hrs	Comp share %	Comp share hrs
25.04.2006 06:00:00	DDR-08 Other	385734	Trip out of hole to change Vertitrak and bit	3000	0	0,0	100	0,0
			Total	3000				0,0

SERVICE COMPANY: Electric Wireline Logging EWL Schlumberger
WELLBORE: NO 6506/11-8

Incident start time	Failure code	Synergi no	Title	Quality cost		Downtime		
				NOK	NOK/d	Total hrs	Comp share %	Comp share hrs
09.06.2006 21:00:00	EWL-E05 Downhole electronic	394673	Problems with communication to Quick Silver Probe.	1040000	3120000	8,0	100	8,0
10.06.2006 11:00:00	EWL-E03 Acquisition/Computers	394674	Problem to inflate packer, error on 50 volt line.	260000	2496000	2,5	100	2,5
10.06.2006 23:30:00	EWL-02 Doc./Spec.	397377	Failed to deflated packer and pull Mini DST string free.	8048832	2926848	66,0	100	66,0

Incident start time	Failure code	Synergi no	Title	Quality cost		Downtime		
				NOK	NOK/d	Total hrs	Comp share %	Comp share hrs
15.06.2006 16:00:00	EWL-E05 Downhole electronic	396107	Gauge reading on Dual packer was jumping.	1560000	2340000	16,0	100	16,0
16.06.2006 06:00:00	EWL-E05 Downhole electronic	396110	Did not manage to inflate dual packer.	1235000	1976000	15,0	100	15,0
24.06.2006 06:00:00	EWL-02 Doc./Spec.	397186	Problems deflating packer on mini DST tool. Stuck logging tool due to packer elements not retracted.	1219520	2439040	12,0	100	12,0
25.06.2006 12:30:00	EWL-E05 Downhole electronic	397285	Lost signals from the VSP logging tools at 4250 m.	853664	1862540	11,0	100	11,0
26.06.2006 05:00:00	EWL-E05 Downhole electronic	397562	Lost communication with MDT logging tools.	2073184	2926848	17,0	100	17,0
28.06.2006 00:00:00	EWL-E05 Downhole electronic	397730	Lost communication with MDT tool. MDT tool stuck in the well.	7439072	2951037	60,5	100	60,5
03.07.2006 22:30:00	EWL-E02 Auxiliary mechanical	398659	Problemer med frigjøring av bremsar på capstan winch	1560000	2880000	13,0	100	13,0
			Total	2528927 2				221,0

SERVICE COMPANY: Liner Hanger Equipment LINHEQ Drill Quip
WELLBORE: NO 6506/11-8

Liner Hanger Equipment LINHEQ Drill Quip	Liner Hanger Equipment LINHEQ Drill Quip	Liner Hanger Equipment LINHEQ Drill Quip	Liner Hanger Equipment LINHEQ Drill Quip	Liner Hanger Equipment LINHEQ Drill Quip		Liner Hanger Equipment LINHEQ Drill Quip		
				NOK	NOK/d	Total hrs	Comp share %	Comp share hrs
08.05.2006 11:00:00	LINHEQ-E01 Other equipment	387894	Lo-torque valve on cement stand was leaking.	121000	2904000	1,0	100	1,0
08.05.2006 15:00:00	LINHEQ-E01 Other equipment	387931	Not able to shear out ball from seat after setting liner hanger.	423500	2904000	3,5	100	3,5
10.05.2006 00:30:00	LINHEQ-E01 Other equipment	388290	Not able to achieve pressure test on 9 7/8" liner.	6402480	3201240	48,0	100	48,0
			Total	6946980				52,5

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SERVICE COMPANY: Measurement While Drilling MWD Baker Hughes Inteq
WELLBORE: NO 6506/11-8

Incident start time	Failure code	Synergi no	Title	Quality cost		Downtime		
				NOK	NOK/d	Total hrs	Comp share %	Comp share hrs
26.03.2006 17:30:00	MWD-E01 Transmission	379645	MWD software problems.	121000	2904000	1,0	100	1,0
11.04.2006 09:30:00	MWD-E02 Decoding	383042	MWD decoding problems due to Veritrac start up/setting procedure.	60000	2880000	0,5	100	0,5
12.04.2006 06:00:00	MWD-E28 Other downhole euipment/sensor	383146	MWD tool fail in 17 1/2" BHA.	60000	2880000	0,5	100	0,5
27.04.2006 06:00:00	MWD-E07 Resistivity	386141	Resistivitets-failure fra MWD tool	60000	2880000	0,5	100	0,5
30.06.2006 14:30:00	MWD-E30 Other	398214	Incompatibility of threads between MWD components.	121952	2926848	1,0	100	1,0
30.06.2006 16:30:00	MWD-E30 Other	398215	Had problems to get contact with BCPM.	182928	2926848	1,5	100	1,5
01.07.2006 10:00:00	MWD-E01 Transmission	398290	Attempted to get pulsing from MWD tool by starting and stopping mud pumps and varying pump rate.	121952	2926848	1,0	100	1,0
			Total	606832				6,0

SERVICE COMPANY: Operator OPR Operator
WELLBORE: NO 6506/11-8

Incident start time	Failure code	Synergi no	Title	Quality cost		Downtime		
				NOK	NOK/d	Total hrs	Comp share %	Comp share hrs
20.04.2006 06:00:00	RIG-E09 Electric power system	384599	SCR falt ut under boring	363000	2904000	3,0	100	3,0
28.04.2006 17:00:00	RIG-06 Lost circulation	386767	Tapt sirkulasjon nedenfor 14" foringsrør	1530650 0	2904000	126,5	100	126,5
15.07.2006 10:30:00	RIG-03 Procedure not followed	400429	Guidelines around cutting assembly	425000	2914286	3,5	100	3,5
			Total	1609450 0				133,0

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SERVICE COMPANY: Plug PLUG Weatherford Norge AS
WELLBORE: NO 6506/11-8

Incident start time	Failure code	Synergi no	Title	Quality cost		Downtime		
				NOK	NOK/d	Total hrs	Comp share %	Comp share hrs
15.07.2006 19:00:00	PLUG-E07 Other equipment	400430	Feilet på kutting av 20x30" casing	975000	2925000	8,0	100	8,0
			Total	975000				8,0

SERVICE COMPANY: Rig Operations RIG SeaDrill
WELLBORE: NO 6506/11-8

Incident start time	Failure code	Synergi no	Title	Quality cost		Downtime		
				NOK	NOK/d	Total hrs	Comp share %	Comp share hrs
23.03.2006 07:00:00	RIG-E388 General	379352	Maintenance work in derrick / topdrive during transit and anchor handling	181000	2896000	1,5	100	1,5
23.03.2006 13:00:00	RIG-E07 Top drive	379355	Electrical fault on DDM blower filter.	240000	2880000	2,0	100	2,0
24.03.2006 06:00:00	RIG-E10 Drawwork	379358	Repaired hi-clutch on draw work.	121000	2904000	1,0	100	1,0
25.03.2006 00:00:00	RIG-E341 Vert pipe handling system	379360	Hydraulic leak on stand-lift.	60000	2880000	0,5	100	0,5
25.03.2006 16:30:00	RIG-E345 Elevator	379513	Broken fittings on elevator.	60000	2880000	0,5	100	0,5
27.03.2006 06:00:00	RIG-E07 Top drive	380171	Sprengt hyd motor for smøreolje på DDM.	305000	2928000	2,5	100	2,5
09.04.2006 12:00:00	RIG-E10 Drawwork	382581	Drawwork slipped on brakes which full weight of BOP-riser and slipjoint.	907500	2904000	7,5	100	7,5
10.04.2006 13:30:00	RIG-E07 Top drive	382910	Changing Washpipe	52213	1253112	1,0	100	1,0
13.04.2006 09:00:00	RIG-E388 General	383247	Misrun pulling Boreprotector.	240000	2880000	2,0	100	2,0
14.04.2006 00:00:00	RIG-E388 General	383250	Unable to get draw-work brake off due to overheated rig air compressor.	130000	3120000	1,0	100	1,0
15.04.2006 09:30:00	RIG-E342 Drillfloor tub handl system	383938	Under kjøring av 14" casing ble det funnet at nedre kjeft på Jernroughnecken var sprukket i hoved feste.	840000	2880000	7,0	100	7,0

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Incident start time	Failure code	Synergi no	Title	Quality cost		Downtime		
				NOK	NOK/d	Total hrs	Comp share %	Comp share hrs
19.04.2006 06:00:00	RIG-E07 Top drive	384598	Utvasking av washpipe	243000	2916000	2,0	100	2,0
20.04.2006 15:00:00	RIG-E07 Top drive	384600	Høyt diff. trykk på DDM gir lube oil filter	183000	2928000	1,5	100	1,5
21.04.2006 01:00:00	RIG-E348 Slips	384682	Problem med slips ramme	60000	2880000	0,5	100	0,5
23.04.2006 00:00:00	RIG-E304 Drillstring compensator	385399	Ødelagt Bondura bolt til heave kompensator	5583000	2881548	46,5	100	46,5
28.04.2006 00:00:00	RIG-08 Unscheduled maintenance	386104	Mistet strøm til MWD computer	63000	3024000	0,5	100	0,5
30.04.2006 14:30:00	RIG-E10 Drawwork	386648	Skade på drill-line	180000	2880000	1,5	100	1,5
11.05.2006 12:00:00	RIG-E10 Drawwork	388661	Back latch on drawwork drum	150000	2400000	1,5	100	1,5
03.06.2006 10:30:00	RIG-E07 Top drive	393121	Høy temperatur på svivel DDM	1149500	3065333	9,0	100	9,0
06.06.2006 00:00:00	RIG-E14 Mud pumps	393745	Lekkasje i sikkerhetsventil (popoff) på slampumpe	61000	2928000	0,5	100	0,5
15.06.2006 10:30:00	RIG-E07 Top drive	395312	Brukket dies til torque wrench funnet på boredekk.			0,5	100	0,5
18.06.2006 15:30:00	RIG-E329 Mud and bulk systems other	396083	Feil på triptank nivåmåler.	60000	2880000	0,5	100	0,5
19.06.2006 06:30:00	RIG-E305 Hoisting equipment other	396441	Feil opptrekking av bolter DDM boggy trolley.	325000	2600000	3,0	100	3,0
19.06.2006 11:00:00	RIG-E07 Top drive	396443	Problemer å brette DDM saver sub.	585000	3510000	4,0	100	4,0
29.06.2006 03:00:00	RIG-E342 Drillfloor tub handl system	397882	Hydraulikk lekkasje på jernroughneck	60000	2880000	0,5	100	0,5
08.07.2006 07:00:00	RIG-E321 Bulk storage	399379	Tett ventil i lufttilførsel til surge tank	180000	2880000	1,5	100	1,5
09.07.2006 23:30:00	RIG-E10 Drawwork	399490	Defekt crownsaver	240000	2880000	2,0	100	2,0
13.07.2006 04:30:00	RIG-E07 Top drive	400181	Ødelagt slange på "link tilt"	60000	1440000	1,0	100	1,0
18.07.2006 00:00:00	RIG-E388 General	400947	Whipline sluttet å fungere på babord kran	485000	2910000	4,0	100	4,0
			Total	1249921 3				104,5

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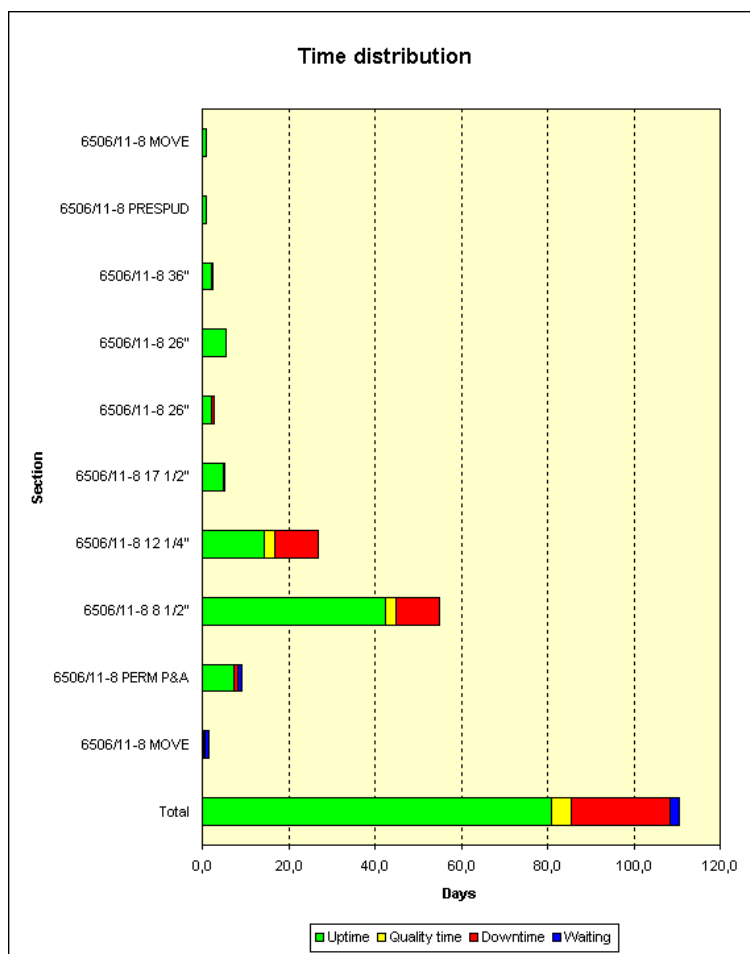
SERVICE COMPANY: Subsea WH/X-mas tree SUBXM Drill Quip
WELLBORE: NO 6506/11-8

Incident start time	Failure code	Synergi no	Title	Quality cost		Downtime		
				NOK	NOK/d	Total hrs	Comp share %	Comp share hrs
10.07.2006 07:00:00	SUBXM-01 Procedure	399708	Misrun med casing cutter	500000	3428571	3,5	100	3,5
			Total	500000				3,5

3.4 Time distribution

Section	Start time	Length m	Budget		TL		Actual		Ops (f)
			hrs	days	hrs	days	hrs	days	
NO 6506/11-8 MOVE	22.03.2006 06:00	0,0	80,0	3,3	42,0	1,8	25,0	1,0	100,0
NO 6506/11-8 PRESPUD	23.03.2006 07:00	0,0	43,0	1,8	22,0	0,9	25,5	1,1	82,4
NO 6506/11-8 36"	24.03.2006 08:30	50,0	111,0	4,6	53,0	2,2	56,0	2,3	98,2
NO 6506/11-8 26"	26.03.2006 17:30	907,0	193,0	8,0	118,0	4,9	135,0	5,6	97,0
NO 6506/11-8 26"	08.04.2006 15:00	0,0	64,0	2,7	43,0	1,8	62,5	2,6	86,4
NO 6506/11-8 17 1/2"	11.04.2006 05:30	795,0	258,0	10,8	116,0	4,8	124,5	5,2	94,4
NO 6506/11-8 12 1/4"	16.04.2006 10:00	2350,0	722,0	30,1	391,0	16,3	647,5	27,0	61,9
NO 6506/11-8 8 1/2"	13.05.2006 09:30	486,0	1613,0	67,2	1327,0	55,3	1322,5	55,1	81,4
NO 6506/11-8 PERM P&A	07.07.2006 12:00	0,0	304,0	12,7	211,0	8,8	218,5	9,1	89,0
NO 6506/11-8 MOVE	16.07.2006 14:30		37,0	1,5	30,0	1,3	39,5	1,6	69,2
Sum			3425,0	142,7	2353,0	98,1	2656,5	110,6	

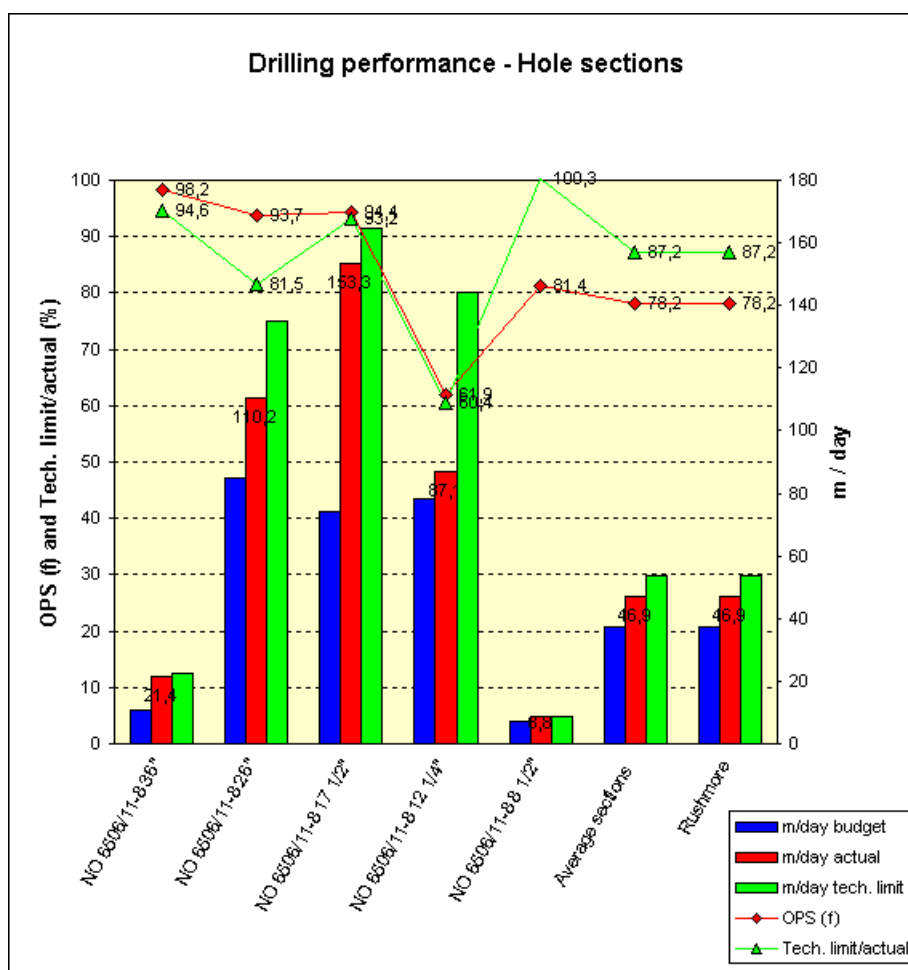
Figure 3.2 Time distribution



The graph above is based on the following details:

Section	Downtime	Uptime	Quality time	Waiting time	Total time
6506/11-8 MOVE	0,0	0,8	0,0	0,2	1,0
6506/11-8 PRESPUD	0,2	0,9	0,0	0,0	1,1
6506/11-8 36"	0,0	2,1	0,0	0,2	2,3
6506/11-8 26"	0,2	5,5	0,0	0,0	5,6
6506/11-8 26"	0,4	2,3	0,0	0,0	2,6
6506/11-8 17 1/2"	0,3	4,8	0,0	0,1	5,2
6506/11-8 12 1/4"	10,3	14,3	2,4	0,0	27,0
6506/11-8 8 1/2"	10,3	42,4	2,5	0,0	55,1
6506/11-8 PERM P&A	0,9	7,4	0,0	0,8	9,1
6506/11-8 MOVE	0,2	0,4	0,0	1,1	1,6
Total	22,6	80,8	4,8	2,4	110,7

Figure 3.3 Drilling performance



3.5 Cost

Project kind	Currency	Budget	Actual cost
Drilling	NOK	461 513 000	351 301 000
Move	NOK	Incl. in drlg budget	25 190 000
Planning	NOK	15 359 000	17 411 000
Total	NOK	476 872 000	393 902 000

4 Geology and formation evaluation report

4.1 Geological setting

Block 6506/11 is situated on the north-western part of the Halten Terrace, approximately 10 km north of the Kristin field. The water depth at the well location is 380 m MSL. The seabed sediments comprise of soft silty clay with a veneer of sand overlaying glacial sandy clay.

The Morvin structure represents a tilted truncation-trap resembling the Kristin structure and is a northward continuation of the Kristin NNE-SSW trend, but is structurally separated from Kristin by an east-west graben. The Morvin Prospect of Bathonian (middle Jurassic) age is defined by a combination of truncation of the Fangst and Upper Båt Group by the Base Cretaceous Unconformity, by downfaulting to the north and west, and structural dip-closure towards east and with spillpoint in the northern part of the structure.

4.2 Shallow gas results

No shallow gas was predicted anywhere within the site survey area for the well. The well was therefore classified as Shallow Gas Class 0.

No shallow gas was observed, neither with the ROV at the wellhead or from the MWD while drilling the 26" hole.

The standard NPD shallow gas form is presented in appendix E.

4.3 Stratigraphy

The stratigraphical zonation is based on interpretation of the biostratigraphic report, log curves and on correlation with nearby wells. The stratigraphy of the entire well is shown in table 4.2 and in figures 4.6 and 4.7.

4.3.1 Table of chronostratigraphy

Table 4.1 Chronostratigraphy

Stratigraphic succession		Interval (m MD) (drillers depth)	
Studied interval 1350 – 4926.5m		From	To
Tertiary	Pleistocene/Pliocene-Late Miocene	1350	1610
	Late Miocene	1610	1910
	Middle Miocene	1910	1940
	Early Miocene	1940	1960
	Late Oligocene	1960	2030
	Early Oligocene	2030	2070
	Middle Eocene	2070	2150
	Early Eocene	2150	2210
	Late Palaeocene	2210	2310
Cretaceous	Early Maastrichtian	2310	2350
	Late Campanian	2350	2450
	Middle Campanian	2450	2550
	Early Campanian	2550	2750
	Late Santonian	2750	2830
	Early Santonian	2830	3030
	Late Coniacian	3030	3350
	Middle Coniacian	3350	3428
	Early Coniacian	3428	3540
	Late – Middle Turonian	3540	3960
	Early Turonian	3960	4200
	Late Cenomanian	4200	4272
	Early Cenomanian	4272	4467
	Late Albian	4467	4557
	Aptian	4557	4599
Jurassic	Base Middle Bathonian	4599	4602
	Early Bathonian	4602	4618
	Late Bajocian	4618	4674
	Early Bajocian	4674	4699.8
	Late Aalenian	4699.8	4722
	Middle Aalenian	4722	4829
	Early Aalenian	4829	4926.5
	Late Pliensbachian	4926.5	-

4.3.2 Table of lithostratigraphy

Table 4.2 Lithostratigraphy

Table of lithostratigraphy					
Period	Group / Formation	Observed depth			TWT sec.
		m MD	m TVD	m MSL	(From VSP)
QUATERNARY	NORDLAND GROUP (Sea Bed)	398.0	398.0	380.0	0.5139
TERTIARY	Naust Fm.	624.3	624.3	606.3	0.65357
	Kai Fm.	1493.0	1493.0	1475.0	1.54753
	HORDALAND GROUP	1893.7	1893.7	1875.7	1.91064
	Brygge Formation	1893.7	1893.7	1875.7	1.91064
	ROGALAND GROUP	2182.6	2182.5	2164.5	2.19463
	Tare Fm.	2182.6	2182.5	2164.5	2.19463
	Tang Fm.	2252.2	2252.1	2234.1	2.26366
CRETACEOUS	SHETLAND GROUP	2310.9	2310.8	2292.8	2.32453
	Springar Fm.	2310.9	2310.8	2292.8	2.324.3
	Nise Fm.	2503.4	2503.3	2485.3	2.50795
	Kvitnos Fm.	2704.4	2704.3	2686.3	2.67670
	CROMER KNOLL GROUP	3392.9	3392.8	3374.8	3.17694
	Lysing Fm.	3392.9	3392.8	3374.8	3.17694
	Lange Fm.	3557.2	3557.1	3539.1	3.28444
	KTuMFS83 Top	3932.0	3931.8	3913.8	3.52565
	KTuMFS82 Top	4218.0	4217.8	4199.8	3.70609
	Lange Sandstone Unit	4256.8	4256.6	4238.6	3.73018
	Base Lange Sandstone Unit	4401.7	4401.4	4383.4	3.81551
	Top Albian shale	4479.0	4478.6	4460.6	3.86168
	Lyr Fm.	4586.2	4585.7	4567.7	3.92872
	VIKING GROUP	4599.0	4598.5	4580.5	3.93612
JURASSIC	Spekk Fm.	4599.0	4598.5	4580.5	3.93612
	Melke Fm.	4600.0	4599.5	4581.5	3.93669
	FANGST GROUP	4622.9	4622.4	4604.4	3.94938
	Garn Fm.	4622.9	4622.4	4604.4	3.94938
	Not Fm.	4701.5	4701.0	4683.0	3.98507
	Ile Fm.	4734.8	4734.2	4716.2	4.00039
	BÅT GROUP	4797.7	4797.0	4779.0	4.02898

Period	Group / Formation	Observed depth			TWT sec. (From VSP)
		m MD	m TVD	m MSL	
JURASSIC	Upper Ror Fm.	4797.7	4797.0	4779.0	4.02898
	Tofte Fm.	4838.6	4837.9	4819.9	4.04711
	TD planned	4893.0	4892.3	4874.3	
	Lower Ror Fm.	4922.5	4921.4	4903.4	4.08407
	Tilje Fm.	4928.0	4926.9	4908.9	4.08659
	TD (extension)	4989.7	4988.3	4970.3	4.11878

4.4 Lithostratigraphic description

The description of the lithology is based on the cuttings and core descriptions. See enclosures.

NORDLAND GROUP **398 – 1893.7 m MD RKB (380 – 1875.7 m TVD MSL)**

System: Tertiary – Quaternary

Stage: Late Miocene – Middle Holocene

Depositional environment: Glacial and Marine, inner to mid shelf

The top part of the Nordland Group penetrated in the 36" and the 26" section was drilled with all returns to the sea floor and with MWD service from 446 m MD only. From 1350 m MD returns to the rig was established

The Nordland Group comprises the Naust and the Kai Formations.

QUATERNARY **398 – 624.3 m MD RKB (380 – 606.3 m TVD MSL)**

System: Quaternary

Stage: Holocene

Depositional environment: Glacial

The hole of the Quaternary section was drilled with returns to the seafloor. The basal part of the Quaternary was drilled with MWD indicating a mainly clayly lithology with occasional stringers of silt/sandstone.

Naust Formation **624.3 – 1493 m MD RKB (606.3 – 1475 m TVD MSL)**

System: Tertiary

Stage: Pliocene - Pleistocene

Depositional environment: Marine, inner to outer shelf

The top of the Naust Formation is picked on the MWD logs where there is a slight shift to higher GR and resistivity values compared to the overlying quaternary sediments. The upper part of the Naust Formation down to 1350 m MD was drilled with returns to the seafloor. However, MWD readings indicate a predominantly clay lithology with a few sandstone stringers especially towards the base of the 26" hole section. First sample were taken at 1360 m MD.

Below 1360 m MD the Naust Formation is dominated by silty claystone. The claystone is light to medium gray, soft and silty. It is none calcareous. Traces of medium to fine sand grains, pyrite, rock fragments, fossil fragments and shell fragments are seen throughout the section.

Kai Formation **1493 – 1893.7 m MD RKB (1475 – 1875.7 m TVD MSL)**

System: Tertiary

Stage: Late Miocene - Pliocene

Depositional environment: Marine, inner to mid shelf

Top Kai Formation was penetrated at approximately 1493 m MD. This was based on a regional MWD resistivity marker as commonly described in the Kristin field wells. Two main gas peaks occurred between 1500 m MD and 1520 m MD.

The claystone of the Kai Formation was described as medium grey to medium dark grey, generally soft and sticky in the upper part, becoming generally greenish tinted casts of grey towards the lower section. The section is generally firming up through calcareous enriched laminae and zones of illite, acting as vertical barriers for water from the compaction process. Some silty and sandy layers were observed, but this section is generally not horizontally permeable enough to expel enough compaction water to maintain a normal compaction trend. As a general phenomenon in the Kai Formation between these illite zones, it was observed soft and very sticky clay with excess water (very low RES values). The challenge has been not to exceed the low formation fracturing levels in these zones.

HORDALAND GROUP **1893.7 – 2182.6 m MD RKB (1875.7 – 2164.5 m TVD MSL)**

System: Tertiary

Stage: Early Eocene – Late Miocene

Depositional environment: Marine, outer shelf to upper bathyal

The Hordaland Group comprises the Brygge Formation.

Brygge Formation **1893.7 – 2182.6 m MD RKB (1875.7 – 2164.5 m TVD MSL)**

System: Tertiary

Stage: Early Eocene – Late Miocene

Depositional environment: Marine, outer shelf to upper bathyal

A significant change in the the color palette in the clay was observed at first in the 1880 m MD sample. The common GR response associated with this was also identified just before a total failure of the MWD tool. The intra Brygge dolomitic limestone marker was penetrated at 2176 m MD.

The Brygge Formation claystone was described as brown grey – brown black, later also olive shades, before the very typical glauconitic green clay strata appeared approximately 100 m lower. The clays are variable soft to firm as above, with a very significant dolomitic marker at 2176 m MD. The dolomite is dusky yellow to orange colored and cryptocrystalline (Dolomicrite), hard to apparently very hard. Further below this tight zone, another soft sticky clay formation with excess water was observed. However, as observed from the Kristin area, the zone approximately 250 m into the Brygge is locally firming up again for a short interval.

ROGALAND GROUP **2182.6 – 2310.9 m MD RKB (2164.5 – 2292.8 m TVD MSL)**

System: Tertiary

Stage: Late Paleocene – Early Eocene

Depositional environment: Marine, outer shelf to upper bathyal

The Rogaland Group comprises the Tare and Tang Formations.

Tare Formation **2182.6 – 2252.2 m MD RKB (2164.5 – 2234.1 m TVD MSL)**

System: Tertiary

Stage: Late Paleocene - Early Eocene

Depositional environment: Marine, outer shelf to upper bathyal

The Tare Formation was dominated by tuffaceous claystones of a dark green grey, olive black, occasionally light blue grey, light grey colour being soft to firm and amorphous to blocky in nature. Occasional thin limestones of an off white to yellowish grey colour and firm to moderate hard, predominantly micritic nature.

Tang Formation **2252.2 – 2310.9 m MD RKB (2234.1 – 2292.8 m TVD MSL)**

System: Tertiary

Stage: Late Paleocene

Depositional environment: Marine, outer shelf to upper bathyal

The Tang Formation was dominated by dark greenish grey, olive grey, medium dark grey to greyish black colour, claystones of soft to firm, amorphous, sticky to occasionally subblocky, none calcareous and pyritic in nature. These become firmer and blocky (Illite rich?) and occasional slightly calcareous with depth. Occasional tuffaceous material and glauconite was also observed throughout.

Thin limestone stringers of an off white to yellowish grey colour and firm to moderate hard, predominantly micritic nature were also observed with thin dolomites of a dark brown to grey brown, hard angular break. Occasionally the limestones and dolomites graded into each other.

SHETLAND GROUP **2310.9 – 3392.9 m MD RKB (2292.8 – 3374.8 m TVD MSL)**

System: Cretaceous

Series: Upper Cretaceous

Stage: Middle Coniacian – Early Maastrichtian

Depositional environment: Marine, outer shelf to upper bathyal

The Shetland Group comprises the Springar, Nise and Kvitnose Formations. These formations are predominantly claystone with stringers of limestone/dolomite. The top Shetland Group was recognized with a slight increase in the resistivity.

Springar Formation **2310.9 – 2503.4 m MD RKB (2292.8 – 2485.3 m TVD MSL)**

System: Cretaceous

Series: Upper Cretaceous

Stage: Middle Campanian – Early Maastrichtian

Depositional environment: Marine, outer shelf to upper bathyal

The upper part of the Shetland Group consisted of tight, competent claystones with minor limestones, sand and dolomite stringers. The claystones were of a light greenish grey to dark green grey, olive grey, medium dark grey to grey black colour and were generally soft to firm, amorphous to subblocky, rarely blocky, none to slightly calcareous, occasionally micropyrritic and glauconitic. No silt was observed in the upper parts of the unit, but became more predominate towards the base.

In the upper sections of the Springar Formation the occurrences of volcanics gives the claystones a slight waxy appearance. There was also observed to be a higher CaCO₃ content in the clay itself in this interval.

The claystones in the middle part of the formation were not as competent as the overlying section, containing increasing quantities of compaction water. The limestone were of a grey white, firm to moderate hard, micritic nature, whilst the dolomites were observed as dark brown to grey brown, occasionally light yellow orange, hard to very hard and angular in nature. No occurrences of sand or silt were observed.

Nise Formation **2503.4 – 2704.4 m MD RKB (2485.3 – 2686.3 m TVD MSL)**

System: Cretaceous

Series: Upper Cretaceous

Stage: Early – Middle Campanian

Depositional environment: Marine, outer shelf to upper bathyal

The Nise Formation was dominated by claystones that occasionally graded into siltstones, with thin limestone and dolomite stringers.

The claystones were predominately dark green grey, olive grey, olive black or medium dark grey in colour and of a soft to firm, amorphous to blocky appearance. Occasional moderately calcareous units where sometimes observed as were siltier units that graded to siltstones. These thin siltstone laminations were of a medium grey, brown grey, firm, glauconitic nature with abundant silt or very fine quartz grains.

Occasional thin limestones were observed throughout of a yellow grey to dark yellow grey colour and soft to moderately hard, amorphous to blocky, argillaceous cryptocrystalline nature.

Kvitnos Formation **2704.4 – 3392.9 m MD RKB (2686.3 – 3374.8 m TVD MSL)**

System: Cretaceous

Series: Upper Cretaceous

Stage: Middle Coniacian – Early Campanian

Depositional environment: Marine, outer shelf to upper bathyal

The Kvitnos Formation was dominated by relatively homogenous claystones units, with an increased frequency of minor limestone and dolomitic limestone stringers.

The claystones were of an olive grey to dark green grey, medium dark grey to dark grey colour. They were generally soft to firm, amorphous to subblocky, occasionally blocky, generally none calcareous, with occasionally micropyrrite and glauconite.

Occasional moderately calcareous claystone units were sometimes observed, especially below 2900 m MD. These are occasionally grading to marl, especially towards the base. Occasional loose, predominately very fine to occasionally medium, very rarely coarse quartz grains were also observed.

The softer, amorphous, sticky, units were thought to be especially associated with permeable and semi-permeable siltier units where CaCO₃ was absent.

The occasional limestone stringers were again observed to be of a light grey, yellow grey, occasionally brown grey colour and of a soft to occasionally moderately hard, amorphous to occasionally angular micritic nature, whilst the dolomites were of a dark brown to grey brown, occasionally light yellow orange, hard to very hard angular nature. Towards the base of the unit these limestones grade to light grey, light brown, firm to moderately hard marls.

Very occasional thin sandstones/siltstones intervals were observed of a medium grey, brown grey colour and firm, blocky nature with a possibly illite rich matrix. Occasional glauconite was also observed with predominately silt to very fine, very occasionally medium grained, subangular to subrounded quartz.

CROMER KNOLL GROUP 3392.9 – 4599 m MD RKB (3374.8 – 4580.5 m TVD MSL)

System: Cretaceous

Series: Lower – Upper Cretaceous

Stage: Aptian – Middle Coniacian

Depositional environment: Marine, outer shelf to upper bathyal

The Cromer Knoll Group comprises the Lysing, Lange and Lyr Formations. The top Cromer Knoll Group was recognized by a distinct drop in GR and a slight increase in resistivity.

Lysing Formation 3392.9 – 3557.2 m MD RKB (3374.8 – 3539.1 m TVD MSL)

System: Cretaceous

Series: Upper Cretaceous

Stage: Late - Middle Turonian – Middle Coniacian

Depositional environment: Bathyal

The upper part of Cromer Knoll Group is comprised of the Lysing Formation. This formation was observed as interbedded claystones, siltstones with thin sandstones, although occasional quite thick and blocky units were observed at the top of the section.

The claystones were of a medium dark grey to olive grey, grading to olive black colour and soft to moderate hard, amorphous to blocky, predominantly none calcareous in nature, with

occasionally silty units that graded into siltstones or very fine sandstones especially in the lower parts of the unit.

The siltstones were observed as brownish grey to olive grey in colour, firm to hard, subblocky and predominantly moderate to very calcareous.

The sandstones were dominated by argillaceous quartz petrology with clear, transparent, very fine to fine, occasionally medium, subangular to subrounded, loose quartz grains with an occasional light to medium pale grey matrix, occasional calcareous cement and with occasional glauconite and muscovite. Often they graded into siltstones, but occasionally medium to coarse grained laminations were sometimes observed. These sandstones were generally presumed to be tight with no inferred visible porosity.

Occasional thin light grey, light brown, soft to firm, locally moderately hard, argillaceous occasionally arenaceous limestones were observed throughout that may have originally comprised part of the calcareous cement to the sandstones.

Lange Formation 3557.2 – 4586.2 m MD RKB (3539.1 – 4567.7 m TVD MSL)

System: Cretaceous

Series: Lower – Upper Cretaceous

Stage: Aptian – Late - Middle Turonian

Depositional environment: Marine, outer shelf to upper bathyal

The upper part of the Lange Formation consists mainly of claystones with sandstone, limestone and minor siltstone stringers.

The Lange claystones were less silty than seen in the reference well, with the siltstone and sandstone stringers being notable less arkosic and dominated by sparry calcite cement and a micritic “marly” matrix.

The upper section was dominated by thick homogenous claystones with thin limestones. The claystones were observed as light grey, olive grey to olive black, grading to brown grey in colour, firm, subblocky to blocky, slightly silty nature. These became brown grey olive black, soft to firm, amorphous to blocky, slightly calcareous, micropyrritic, silty to occasionally sandy in nature with depth from 3700 m MD.

Occasionally silty units were observed towards the base comprising of light grey to medium grey, soft to firm, blocky siltstones with clear, milky white, very fine subangular to subrounded, well sorted quartz with a weak silica cement.

Thin limestones of light yellow brown to yellow brown, brown grey colour and firm to moderately hard, micritic, cryptocrystalline and argillaceous nature that graded into calcareous claystones or occasionally dolomites were noted throughout.

Intra Lange Sandstone Unit

4256.8 – 4401.7 m MD RKB
(4238.6 – 4383.4 m TVD MSL)

System: Cretaceous

Series: Lower – Upper Cretaceous

Stage: Early – Late Cenomanian

Depositional environment: Marine, outer shelf to upper bathyal

The intra Lange Sandstone Unit consisted of interbedded thin sandstones and claystones.

The claystones were of a medium dark grey to dark grey and brownish grey as well as olive black to brownish black colour and of a soft, predominately firm to moderate hard, amorphous to blocky nature with occasional micropyrrite, micromica and carbonaceous material. They were often silty, occasionally grading to siltstone.

The sandstones in the upper parts were principally none arkosic arenites, composed of clear, transparent, milky white, bimodal very fine to fine and medium to coarse, subangular to subrounded, moderate well sorted quartz grains with occasional light to medium yellow grey, green grey kaolinitic clay matrixes and occasional calcareous cement. Some of these sands were glauconite rich and often graded to siltstone. The micritic matrix made most of these sands tight with poor to no significant inferred porosity.

The lower sands were observed to be dirtier in composition, being light green grey, brown grey, pale olive in colour and of a soft to firm, crumbly, siliceous to calcareous and kaolinitic rock flours, with occasional loose very fine to very coarse, subangular to subrounded, moderate to poor sorted quartz with occasional to abundant argillaceous matrix and moderately calcitic and siliceous cements and poor or no visible porosity.

Lyr Formation

4586.2 – 4599 m MD RKB (4567.7 – 4580.5 m TVD MSL)

System: Cretaceous

Series: Lower Cretaceous

Stage: Aptian

Depositional environment: Marine, outer shelf to upper bathyal

The top of the Lyr Formation was picked where a slight increasing trend in the resistivity starts. This coincides with the start of increasing calcareous content and the sediments become gradually predominantly reddish.

The formation is dominated by claystones becoming increasingly calcareous downwards. Limestones are common in the very bottom part.

The claystones are medium dark grey to greyish black in the very top, but soon red brown to greyish red becomes the dominant color. They are firm to moderate hard, blocky to

subfissile, slightly silty and are becoming increasingly calcareous downwards. In the lower part they are grading into marl. The limestone logged in the basal part is yellow grey to olive grey, occasionally pale reddish grey, moderate hard, micritic to microcrystalline and varies from slightly too moderate argillaceous.

VIKING GROUP 4599 – 4622.9 m MD RKB (4580.5 – 4604.4 m TVD MSL)

System: Jurassic
Series: Middle - Upper Jurassic
Stage: Late Bajocian – Base middle Bathonian
Depositional environment: Marine, outer shelf

The Viking Group comprises Spekk and Melke Formations. The top of the Viking Group is defined by a distinct increase in GR and resistivity.

Spekk Formation 4599 – 4600 m MD RKB (4580.5 – 4581.5 m TVD MSL)

System: Jurassic
Series: Middle Jurassic
Stage: Base middle Bathonian
Depositional environment: Marine, outer shelf

The Spekk Formation sediments are claystones with olive black to greyish black to brownish black in colour, common with a metallic luster in the cuttings, firm to moderate hard, blocky, silty in part, commonly carbonaceous and micropyrritic and only rarely slightly calcareous.

Melke Formation 4600 – 4622.9 m MD RKB (4581.5 – 4604.4 m TVD MSL)

System: Jurassic
Series: Middle Jurassic
Stage: Late Bajocian - Base middle Bathonian
Depositional environment: Marine, outer shelf

The top of the Melke Formation was picked right below the high GR peak of the Spekk Formation.

The formation consists of claystones which are olive black, grey black to brown black, common metallic luster, firm to moderate hard, blocky, partly silty and partly common carbonaceous.

FANGST GROUP 4622.9 – 4797.7 m MD RKB (4604.4 – 4779 m TVD MSL)

System: Jurassic
Series: Middle Jurassic
Stage: Middle Aalenian – Late Bajocian
Depositional environment: Marine, inner shelf

The top of the Fangst Group is defined by a decrease in GR and increase in resistivity readings, marking the second appearance of a sandstone package. The Fangst Group comprises Garn, Not and Ile Formations.

Garn Formation 4622.9 – 4701.5 m MD RKB (4604.4 – 4683 m TVD MSL)

System: Jurassic
Series: Middle Jurassic
Stage: Late Aalenian – Late Bajocian
Depositional environment: Marine, inner shelf

The Garn Formation was cored and observed as a massive sandstone unit. The upper part of the unit down to 4650 m MD was dominated by brown black to olive black coloured sandstones with predominated clear, transparent, occasionally light green grey, blue white, translucent quartz grains. In the upper part the unit was dominated by fine to occasionally coarse, predominately medium grained, subangular to subrounded, subspherical grains with very good, hard translucent secondary siliceous cement infilling the pore spaces. Calcareous cement was occasionally observed, as was a brown black or olive grey clay/argillaceous matrix. Occasionally abundant coarse muscovite 'sheaves/packages' were observed, sometimes in such abundance to form laminations within the main unit. Micropyrrite was occasionally observed either coating grains or as part of the cement or matrix as where occasional black exotic rock fragments. Light green grey / blue white, soft Kaolonite? was also noted, sometimes forming a rim or 'Halo' around a Feldspar or other relic mineral. The unit was very tight with no visible porosity.

Below 4650 m MD the unit became coarser in nature, being predominately medium to coarsely grained occasionally grading to very coarse/pebbly. The unit was again very well cemented with good hard siliceous cement with an increase in the argillaceous matrix content with depth. Carbonaceous material was also observed to occupy the porespace and constituted part of the matrix. Abundant muscovite was again observed, often as discrete laminations along which the core fractured. Very occasional poor visible porosity was observed through this section.

At around 4671 m MD a thin unit of friable cement was observed, corresponding with an improvement of the visible porosity. The interval from 4671 to 4685 m MD showed the best reservoir properties with fair porosity, good shows and an increase in permeability, observed as light HC release from core chips and occasional signs of filtrate invasion.

The bottom part became increasingly carbonaceous and occasional wood fragments were observed. A medium dark grey shale stringer was observed at 4691 m MD.

Not Formation **4701.5 – 4734.8 m MD RKB (4683 – 4716.2 m TVD MSL)**

System: Jurassic
Series: Middle Jurassic
Stage: Middle - Late Aalenian
Depositional environment: Marine, inner shelf

The top of the Not Formation is defined by a distinct increase in GR and a decrease in resistivity. This is associated with the siltstones and claystones in the Not Formation.

The siltstones were predominantly observed as varicoloured brown grey, dark green grey, grading to green grey, olive grey, soft to firm, amorphous to crumbly occasionally sucrosic siliceous rock flour. Abundant very fine to occasionally medium grained, clear, loose as well as shattered quartz grains were also observed.

With depth the formation became very argillaceous and graded into dark grey, grey brown, brown black, firm to hard, crumbly to blocky, micromicaeous, occasionally carbonaceous claystones. These were occasionally silty where they graded into the siltstones in the upper part of the formation, but became 'cleaner' and firmer towards the base.

Occasional thin stringers of yellow grey, light brown, firm, crumbly microcrystalline limestones and moderately brown, firm crumbly dolomites were also observed in the lower claystone dominated part of the formation.

Ile Formation **4734.8 – 4797.7 m MD RKB (4716.2 – 4779 m TVD MSL)**

System: Jurassic
Series: Middle Jurassic
Stage: Middle Aalenian
Depositional environment: Marine, inner shelf

The top of the Ile Formation was observed as a distinct decrease in gamma readings, and the appearance of interbedded sandstones and thin claystones. Resistivity increase from the overlying Not Formation indicated the presence of hydrocarbons within the sandstones.

The upper sandstones were observed as brown black, olive black, with clear, translucent, occasionally blue white quartz, grading from silt to very occasional pebble size, but predominantly of coarse nature. The grains were angular to occasionally rounded in the coarse fraction (indicative of reworking) of subelongate to subspherical shape. Good hard dark grey, translucent silica cement, occasionally micropyrritic cement was observed

throughout, with none to abundant carbonaceous matrix and grain coatings. Occasionally abundant coarse muscovite mica was observed, often forming 1 mm thick, silty laminar defining parallel and lenticular bedding. Occasional rounded rock and carbonaceous fragments were observed, especially in the coarser units. Porosity appeared reasonable grading from none to locally good visible porosity.

A number of finer units that graded into siltstones were interbedded into the sandstones. These were of a brown black, brown grey colour and of a hard, fissile nature with abundant fine to coarse grained, current orientated muscovite/biotite sheaves again defining bedding. Abundant micropyrritic carbonaceous material was also incorporated into the laminar, with occasional very fine to fine quartz. Units were again very well cemented with good hard dark grey translucent silica cement.

Båt GROUP 4797.7 – 4989.7 m MD RKB (4779 – 4970.3 m TVD MSL)

System: Jurassic

Series: Lower - Middle Jurassic

Stage: Late Pliensbachian – Middle Aalenian

Depositional environment: Marine, inner shelf

The Båt Group comprises Ror, Tofte and Tilje Formations.

Ror Formation 4797.7 – 4838.6 m MD RKB (4779 – 4819.9 m TVD MSL)

System: Jurassic

Series: Middle Jurassic

Stage: Early - Middle Aalenian

Depositional environment: Marine, inner shelf

The top of the Ror Formation was observed as a distinct spike in gamma reading and a rapid decrease in resistivity readings, indicating waterwet sandstone. The cuttings became more argillaceous and the sandstone intergraded to siltstone.

The sandstones were observed as light grey, firm, very fine to fine, commonly silty and graded to siltstone which was firm to moderately hard, well cemented, sub round, very argillaceous matrix, pyretic, micaceous (Biotite masses) and no visible porosity.

From 4800 m MD the cuttings changed to 100% siltstone which became subordinate to, and intergraded to sandstone, percentages being from 20% - 40% siltstone and 60% - 80% sandstone. The sandstone was light olive grey to olive grey, firm, blocky, very fine to fine, commonly grading to a similarly coloured siltstone that was firm to moderately hard, well cemented, sub round, very argillaceous matrix, accessories present were pyrite, mica and micro carbonaceous material, there was no visible porosity.

From 4812 m MD to 4815 m MD, siltstone was the dominant lithology with 60% and subordinate sandstone at 40%. Both lithology descriptions were as previously with the siltstone now becoming locally sub fissile and more argillaceous and graded to shale.

From 4815 m MD to 4835 m MD, the lithology was 100% siltstone which was light olive grey, dark grey, brown grey to brown black, firm to moderately hard, blocky, none to slightly calcareous, none to slightly dolomitic, none carbonaceous, slightly pyritic, with a very argillaceous matrix.

Tofte Formation 4838.6 – 4928 m MD RKB (4819.9 – 4908.9 m TVD MSL)

System: Jurassic

Series: Lower - Middle Jurassic

Stage: Late Pliensbachian – Early Aalenian

Depositional environment: Marine, inner shelf

The top of the Tofte Formation was observed as a distinct drop in gamma reading and a rapid increase in resistivity readings.

Between 4835 m MD and 4851 m MD the lithology changed to sandstone as light grey clear to translucent quartz, very fine to coarse, sub angular to angular, generally loose, trace firm, poorly sorted, locally with silica cement, loose kaolin matrix, trace mica, trace micropyrrite, trace mica, rare carbonaceous material, on aggregate cuttings no visible porosity.

Siltstone was light grey to olive grey, firm to moderately hard, blocky, none calcareous, slightly dolomitic, none carbonaceous, very pyritic in parts and very argillaceous matrix.

From 4851 m MD to 4865 m MD the lithology was claystone which was dark grey to grey black, dark brown grey, becoming very dark grey, speckled with light grey, firm, crumbly to sub blocky, very calcareous, very finely disseminated pyrite also medium sized pyrite masses, with calcite crystals and it was slightly sandy.

The abrupt drop in GR values from the overlying claystones of 90 to 30API and a general rise and continued separation of the resistivity, denoted the passage into a massive sandstone. The cuttings returned were sandstone, which were light brown grey, brown grey becoming light grey, predominantly loose quartz, initially clear to yellow grey, becoming clear to translucent, light grey in parts, fine to medium, occasionally fine to coarse to very coarse in parts, well to poorly sorted, sub angular to sub round, firm to soft as cuttings, crumbly to sub blocky, calcareous, trace pyrite, low to no visible porosity.

The lithology changed to sandstone with minor claystone at the end of the interval.

Tilje Formation **4928 – 4989.7 m MD RKB (4908.9 – 4970.3 m TVD MSL)**

System: Jurassic

Series: Lower Jurassic

Stage: Late Pliensbachian

Depositional environment: Marine, inner shelf

Tilje Formation consists of sandstone interbedded with claystone. The sandstone consists of predominantly loose quartz, milky white to translucent in colour, very fine to fine, occasionally coarse in parts, poorly to moderate sorted, sub angular to sub rounded and rare mica.

The claystone in Tilje Formation is olive black to dark grey, firm to hard, sub blocky to blocky and none calcareous.

TD of the well was set at 4989.7 m MD RKB driller's depth.

4.5 Hydrocarbon indications

All cuttings were returned to seabed while drilling down to 1350 m MD. No indications of hydrocarbons were observed by the ROV.

In the Tertiary section the gas level was generally low, except for the upper part of the Kai Formation where the gas level peaked at 11.01% (mainly C1), see figure 4.1. No shows were observed in the cuttings.

The gas level was also low when drilling the Cretaceous section. The recorded gas composition was C1 to nC5. Small gas peaks of up to 3.67% were observed in the lower Lange Sandstone Unit, similar to those observed in the original 6506/11-7 well, indicating slight hydrocarbon charging. In the lower Lange Sandstones from 4449 m MD to 4479 m MD, very weak shows were observed. This corresponds with the gas peaks of 1.3-3.7% observed between 4343 m MD and 4469 m MD.

Cuttings from the Spekk claystones gave no fluorescence, but a weak blooming blue white to pale yellow white cut fluorescence could be observed.

Poor shows were observed from the first core in the Garn Formation (Core 2) from 4624 – 4658.4 m MD. A poor HC odour becoming moderate with depth was noted from 4650 m MD. Traces of a spotty/pinprick to very occasionally uniform blue white natural fluorescence were noted throughout, with moderate instantaneous streaming blue white cut from chips above 4650 m MD grading to a very slow streaming to diffuse cut below 4650 m MD in the 'more porous' units. This gives the impression that the 'tighter' zones retain more hydrocarbons than the more porous zones.

Shows were not much better through core # 3 (4658.4 – 4671.4 m MD) consisting of fair to good HC odour, none to weak dull yellow natural fluorescence and instantaneous streaming to slow cloudy/blooming blue white to yellow cut fluorescence and pale brown residual ring.

Shows in core # 4 and upper part of core #5 (4671.4 – 4685.5 m MD) were noted to be significantly better, with good HC odour and releasing a film of very light / volatile HC on the surface of freshly cut core chips along with occasional dark brown residual oil staining, or carbonaceous material on grains. A uniform to occasionally spotty dull yellow /straw natural fluorescence with an instantaneous streaming dull yellow to slow diffuse blue white cut and pale residual ring were also observed. A small dark brown / black oil bleed from the core onto the deck was also observed after cutting the core #4.

The bottom of core #5 (4685.5 – 4699.8 m MD) showed less intense natural fluorescence and mainly slow, cloudy, blue/white or dull yellow cut fluorescence. Weak to moderate HC odour was observed towards the bottom of the core.

Moderate shows were observed from the first core (Core 6) in the Ile Formation (4743-4753 m MD). Poor HC odour, uniform/pinpointed dull yellow direct fluorescence and slow cloudy/streaming blue/white cut fluorescence were observed from the core chips. At 4745 m MD, a minor light HC and gas was released.

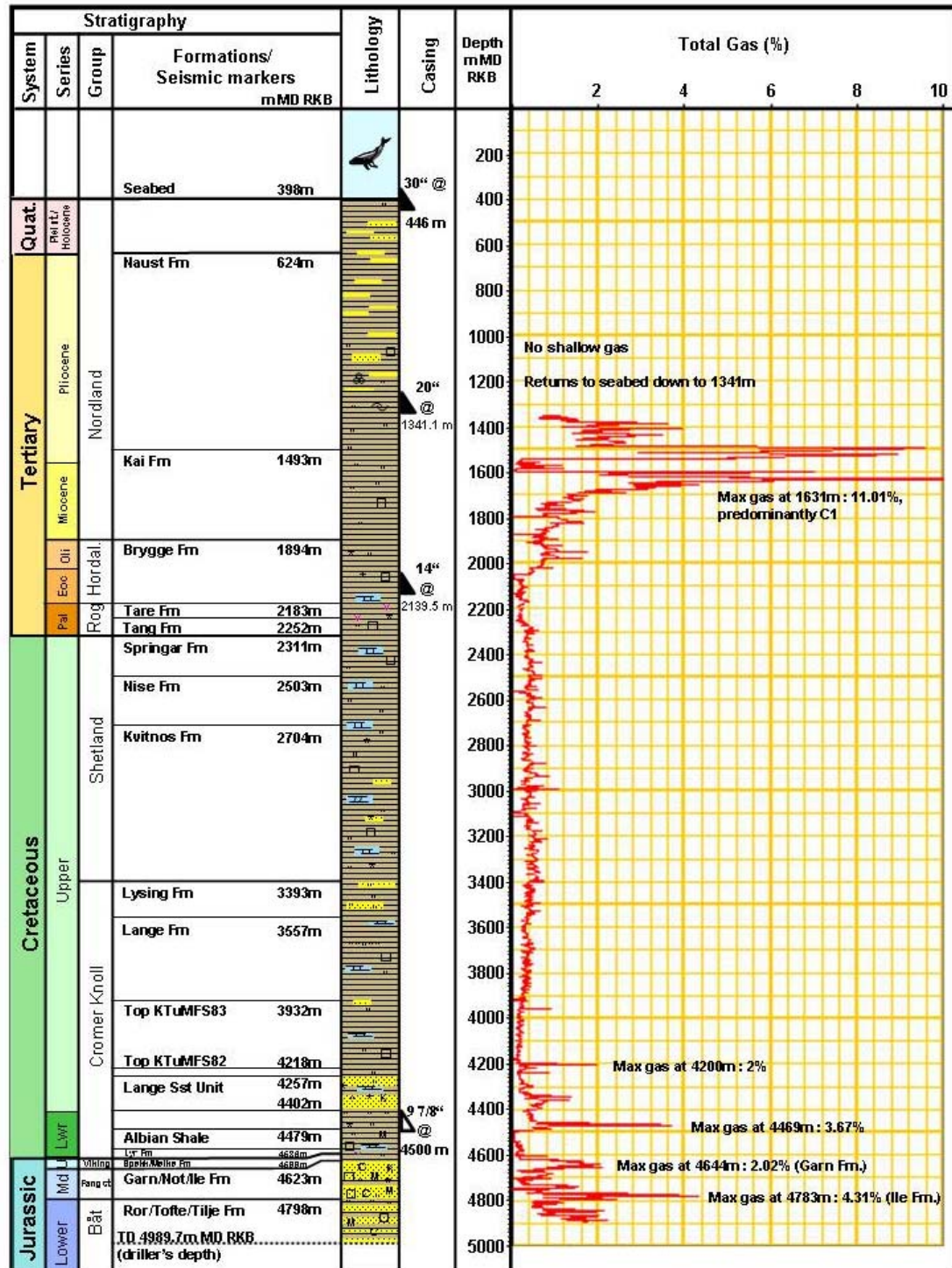
Core #7 shows were observed to be slightly better. On opening the barrells, HC gas was observed as it 'bubbled' up from the core. Moderate to good, local poor HC odour was observed with a very strong very good sulphurous odour in the coarse sandstones that had jammed in the core catcher (#7). None to occasionally good spotty bright blue white direct fluorescence was observed, predominantly of a uniform dull yellow direct natural fluorescence. The cut varied, but was observed to become weaker towards the base, becoming very weak from 4766 m MD. Generally it was observed as a moderate instantaneous streaming blue white, to occasional very slow diffuse cloudy, milky white fluorescence cut. A very pale, light brown residual ring was only observed from the 'sulphurous' sandstones at the base of the core (4769 m MD).

Core # 8 was very tight and with generally very weak shows. The direct fluorescence was none to spotty blue white direct fluorescence. The cut was weaker than for core 3 to 7, and faded out to none cut. The shows could also have been generated from the OBM. The same weak shows were experienced from the Ror and Tofte Formation in cuttings.

Table 4.3 Gas peaks (drillers depth)

Depth	Depth	Peak	Type	Formation	Background	Chromatographic analysis (ppm)						
m MD	m TVD	%			%	C1	C2	C3	i-C4	n-C4	i-C5	n-C5
1340	1340	5.10	Formation gas	Naust	0.08	49000						
1435	1435	2.82	Formation gas	Naust	1.4	16503						
1465	1465	2.48	Formation gas	Naust	1.4	14122						
1500	1500	8.87	Formation gas	Kai	2.2	53066						
1520	1520	8.83	Formation gas	Kai	2.2	57731						
1631	1631	11.01	Formation gas	Kai		69996		10	3,6	6,7	6,3	0,4
1690	1690	1.98	Formation gas	Kai	1.2	11757						
2992	2991.9	1.07	Formation gas	Kvitnos	0.3	9793	45	4	2	2	1	1
3955	3954.8	0.91	Trip gas	Lange	0.15	8680	117	46	5	11	3	1
4200	4199.8	2.00	Trip gas	Lange	0.13	20512	332	86	7	6	2	1
4239	4238.8	0.83	Trip gas	Lange	0.14	8217	160	45	4	5	2	1
4343	4342.7	1.33	Formation gas	Lange	0.1	10125	385	117	10	17	5	5
4358	4357.7	1.31	Formation gas	Lange	0.1	9987	465	152	13	23	5	2
4460	4459.6	1.75	Formation gas	Lange	0.1	13488	708	178	13	27	5	2
4463	4462.6	3.08	Formation gas	Lange	0.1	25294	1125	281	28	39	9	3
4469	4468.6	3.67	Formation gas	Lange	0.1	30117	1350	334	34	48	11	5
4620	4619.5	1.10	Formation gas	Garn	0.20	9200	560	140	12	20	6	
4624	4623.5	0.89	Formation gas	Garn	0.20	7500	560	135	9	20	5	
4644	4643.5	2.03	Formation gas	Garn	1.09	13577	1275	336	19	52	8	3
4658	4657.5	1.20	Trip gas	Garn	0.80	7264	979	267	10	48	11	3
4665	4664.5	1.20	Formation gas	Garn	0.80	7231	981	267	11	48	11	2
4671	4670.5	0.45	Trip gas	Garn	0.20	3087	450	122	5	24	8	2
4684	4683.5	0.93	Formation gas	Garn	0.70	6400	934	229	8	41	8	2
4696	4695.5	0.64	Formation gas	Garn	0.10	4244	865	227	7	46	11	2
4733	4732.4	1.29	Formation gas	Ile	0.10	10380	1092	278	14	44	7	2
4739	4738.4	1.54	Formation gas	Ile	0.10	13134	1262	327	19	52	8	3
4755	4754.4	0.84	Formation gas	Ile	0.10	6860	791	232	12	40	7	2
4775	4774.3	0.56	Trip gas	Ile	0.10	3399	538	148	4	33	5	1
4783	4782.3	4.31	Formation gas	Ile	1.20	34485	2409	562	30	82	12	6
4793	4792.3	2.43	Formation gas	Ile	1.20	18111	1729	364	14	52	12	3
4837	4836.2	1.40	Formation gas	Ile	0.50	9062	1512	300	6	53	11	2
4845	4844.2	2.02	Formation gas	Tofte	0.24	14680	1660	355	8	66	13	2
4848	4847.2	2.10	Formation gas	Tofte	0.24	15123	1874	380	8	68	13	
4869	4868.2	1.99	Formation gas	Tofte	0.69	13566	2012	443	9	85	15	2
4876	4875.1	1.93	Formation gas	Tofte	0.69	12743	2035	464	9	91	16	2
4881	4880.1	1.57	Formation gas	Tofte	0.69	9813	1754	428	10	87	17	2
4886	4885.1	2.21	Formation gas	Tofte	1.13	15860	1933	453	9	89	17	2
4890	4889.1	1.95	Formation gas	Tofte	1.13	12839	2085	476	9	89	17	2
4895	4894.0	1.60	Formation gas	Tofte		11420	1168	347	33	69	18	6
4940	4938.9	1.58	Formation gas	Tilje		9869	1750	393	15	75	12	4
4974	4972.8	1.26	Formation gas	Tilje		7450	1485	344	9	75	16	2

Figure 4.1 Hydrocarbon indications



4.6 Geophysical results

Throughout the drilling of well 6506/11-8 most of the formation tops came in slightly shallower than prognosed (-5 to -15 m). See figures 4.2 and 4.9.

A slight overestimation of interval velocities in the original velocity model was the reason for this. This caused no operational problem due to continuous updating of the prognosis during the operation based on MWD logs. The casings were set as planned according to the pore pressure prognosis.

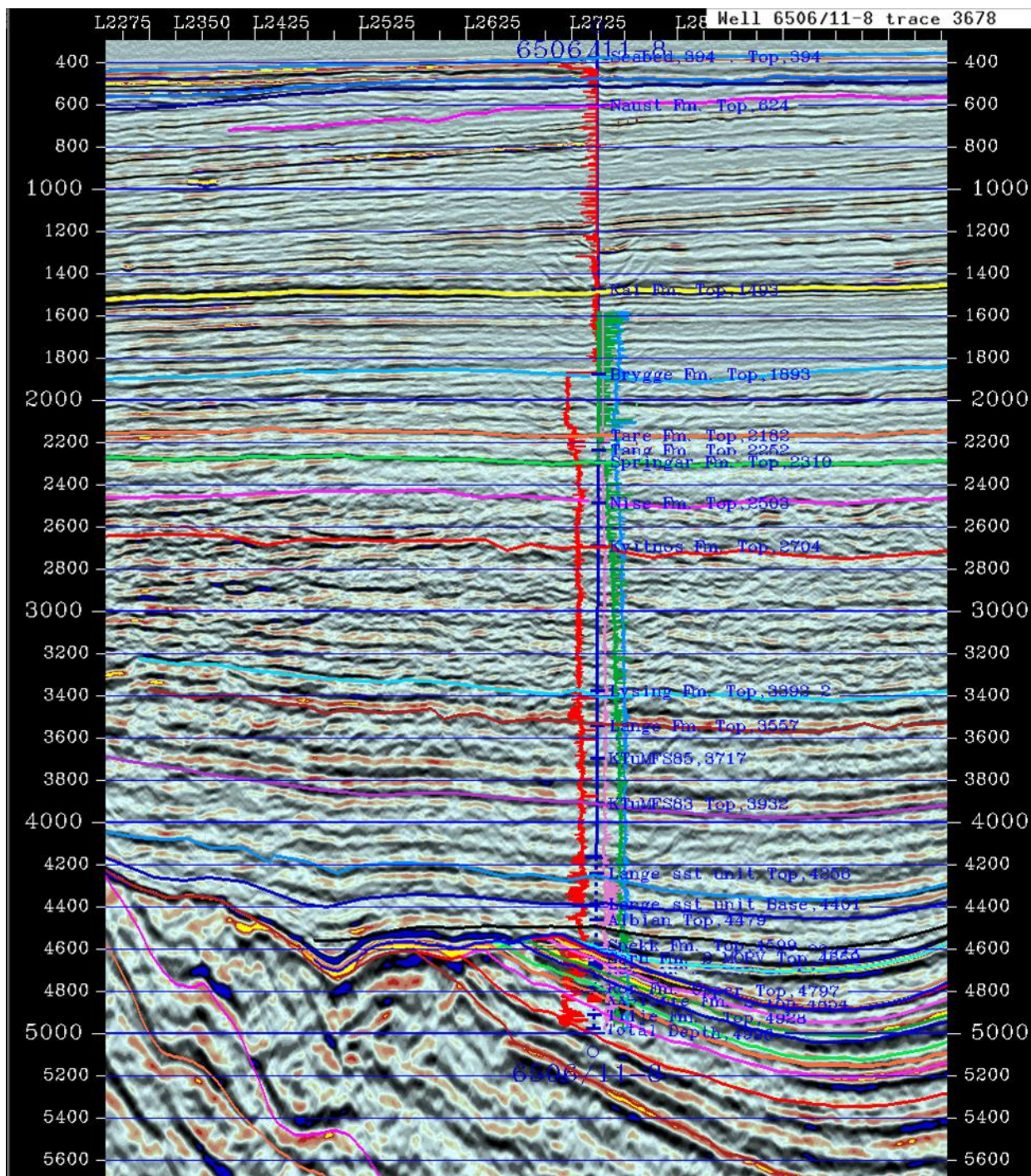
All horizons except the Top Naust Formation is within the prognosed +/- 1% error range (+/- 45 m at 4500 m MD). The Top Naust Formation is moved to a weak horizon above the prognosed horizon marked with three brown dots in figure 4.2. Most of the formation tops are encountered within +/-15 m of the prognosed value, except Top Naust, Top Lange sandstone and Top Albion shale. For these horizons the actual pick of the horizon is slightly wrong and thereby giving a larger error than the depth conversion error alone.

The Top Tang, Top Kvitnos, Top Nise and Top Lyr horizons are not interpreted horizons, but just tied along a randomline from well 6506/11-7 to well 6506/11-8.

Well 6506/11-8 is located in the merge zone between two seismic surveys. This might in some cases give a slight mispicking of the time to a seismic horizon due to noise in the merge zone.

The noise is strongest in the intervals Seabed to Top Kai Formation, Top Nise to Top Lange Formation and Top Intra Lange sandstone (see figure 4.2).

Figure 4.2 Seismic line



4.7 Data acquisition

4.7.1 Cuttings and mud samples

A standard North Sea Mudlogging unit was used for the well including RESERVAL gas chromatograph (details in Final Well Reports, Geoservices).

Table 4.4 Cuttings and mud sampling

Depth/intervall (driller depth)	Cuttings intervall	Mud/Geochemical
1350 – 3350	10m	200
3350 – 3600	3m	200
3600 – 4200	10m	200
4200 – 4989.7	3m	200/20

4.7.2 Conventional and sidewall coring

Table 4.5 Coring summary (driller's depth)

Core#	Bit#	Depth intervall m MD	Rec. m	Rec. %	Barrel type/length	Barrel util. %	Spec. Preserv.	Tracer	Comment
1	9	4603 – 4606	2.1	70	Al / 9	23.3	Oil	N	Jammed
2	11RR	4624 – 4658.4	34.39	100	Al / 54	63.7	No	N	Jammed
3	12	4658.4 – 4671.4	13.0	100	Al / 54	24.1	No	N	Jammed
4	13	4671.4 – 4674.4	2.82	94	Al / 54	5.2	No	N	Jammed
5	14	4674.4 – 4699.84	25.44	100	Al / 27	94.1	No	N	Erratic trq
6	16	4743 – 4753.04	10.04	100	Al / 27	37.0	No	N	Jammed
7	17	4753.04 – 4769.38	16.34	100	Al / 27	59.3	No	N	Jammed
8	18	4769.38 – 4775.4	6.02	100	Al / 27	22.2	No	N	Jammed

The coring was done using conventional coring equipment, see figure 4.3 for further coring statistic.

The cutting of cores and handling on drill floor and pipe deck went according to plan. Further handling as marking and 1-meter cutting was also done on the rig.

Core #1 was cut from 4603 to 4606 m MD. A 9 m core barrel was run. The core jammed off after three meters. ROP during coring was less than 1 m/hr, probably due to aluminium junk in the hole. The general lithology was claystone and the total gas during coring was between 0.08%-0.24%.

Core #2 was cut from 4624 to 4658.4 m MD. A 54 m core barrel was run. The core jammed off before filling the barrel. ROP during coring was between 5-10 m/hr. This core contained massive sandstones.

Core #3 was cut from 4658.4 to 4671.4 m MD. A 54 m core barrel was run. The ROP was considerable slower than for the previous core and was between 1-4 m/hr. The core jammed off when attempting to restart coring after an alarm on the top drive had been investigated. The general lithology was massive sandstones. Bottoms-up was not completely circulated.

Core #4 was cored with ROP between 1-4 m/hr from 4671.4 to 4674.4 m MD. A 54 m core barrel was run. The upper 2 m of the core started well in the more friable sands, but ROP then died off as the formation became firmer. The core jammed off after changing rotary gear on the top drive, which was set to the wrong gear when coring started. The last meter cored very slowly, which caused the core within the catcher to be washed and become undergauge. When bringing the core to surface, the core was found to be hanging approximately 5-6 cm out of the end of the catcher. This was due to washing of the lower bit of the core during the slow coring which caused it's diameter to become small enough to allow it to fall through the catcher. Bottoms-up was not completely circulated so gas data could not be collected.

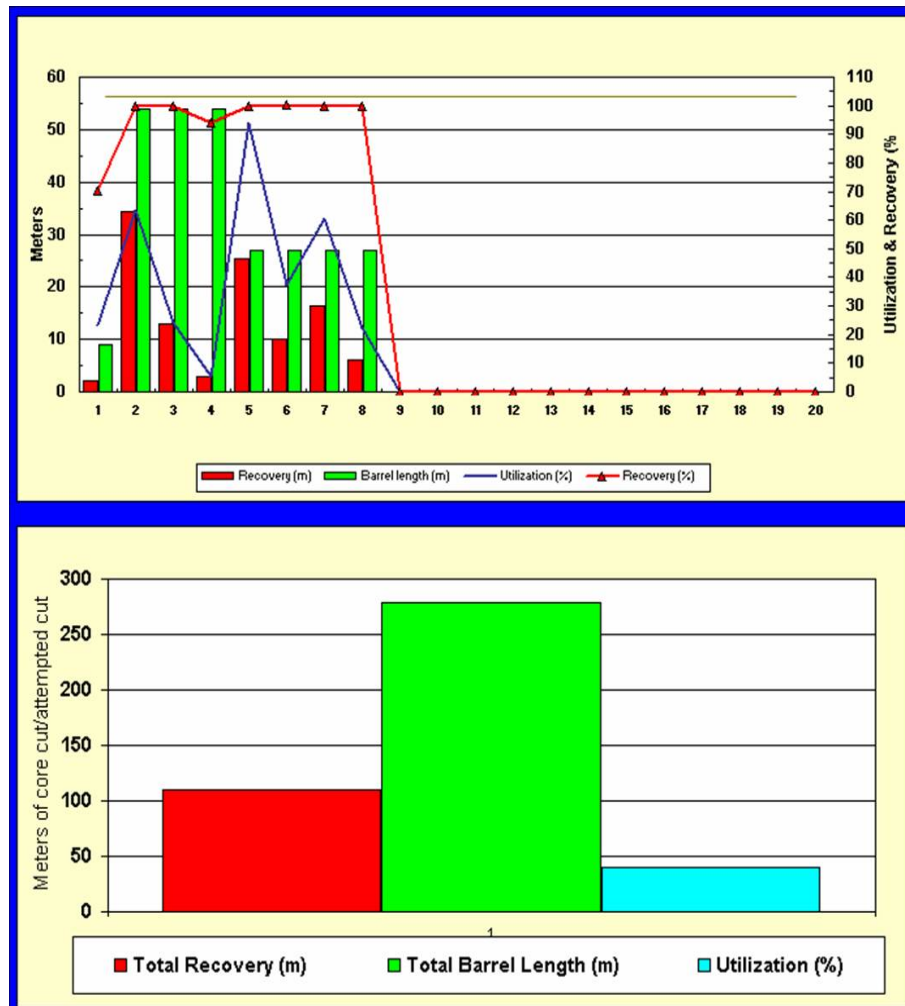
Core #5 was cored with good ROP between 2 and 10 m/hr from 4674.4 to 4699.84 m MD. Because of the lack of progress with the previous 54 m core barrel, it was decided to utilize a 27 m stiffer core barrel to try and improve the core length. The upper part of the core down to 4691 m MD cored faster with ROP between 3 to 10 m/hr. A significant smoothing and reduction in torque occurred at 4691 m MD associated with a negative drilling break caused by a shale layer. Below, ROP varied between 2 to 3 m/hr. At 4699 m MD erratic torque readings were observed and coring was halted for operational safety since it was maximum 2 m empty space left in the barrel. At that point it was assumed that the bottom of the Garn Formation was reached. It was found not necessary to circulate bottoms-up. The general lithology was massive sandstones.

Core #6 was cut from 4743 to 4753.04 m MD. A 27 m core barrel was run. The ROP was between 5 and 10 m/hr however the torque and ROP suddenly vanished due to jamming. The bit was found with two cutters broken off. The general lithology was interbedded sandstone, siltstones and claystones. Bottoms-up were not circulated, formation gas and cuttings not retrieved.

Core #7 was cut from 4753.04 to 4769.38 m MD. A 27 m core barrel was run. The ROP was between 2 and 5 m/hr. The BHA was pulled due to jamming. The bit was found to have 3 plugged flow jets and with the core head plugged with jammed core. This had to be physically removed with a sledge hammer so the bottom of this core was much damaged. The general lithology was massive sandstones grading to siltstones in parts with abundant micaceous lamina. HC gas was observed as it "bubbled up" from the core when opening the barrel.

Core #8 was cut from 4769.38 to 4775.4 m MD. A 27 m core barrel was run. The ROP was just above 2 m/hr and the BHA was pulled due to jamming. The bit was found to have been completely worn out. The general lithology was massive sandstones. Bottoms up were not circulated, formation gas and cuttings not retrieved.

Figure 4.3 Coring statistic



2 MSCT (mechanical sidewall coring tool) runs were performed in addition to the conventional coring. The drilled sidewall cores were taken in the 8 ½" section both in the reservoirs and in the organic rich shales (for biostratigraphic use). Depth correlations during coring were performed at regular intervals and only minor depth adjustments were necessary. The coring recovery was very good and in the first run 48 of 50 cores were recovered whereas 33 out of 34 cores were recovered in the second run. There was not performed any descriptions of the sidewall cores at rigsite, but in the laboratory onshore. For

core depths, descriptions and porosity/permeability measurements see “Final Report Conventional Core Analysis” from Reslab.

4.7.3 MWD

Table 4.6 MWD logging

RUN no.	Depth interval (m driller depth)	COLLAR DIAM.	TOOL TYPE	COMMENTS
1	440 - 1350	8 ¼"	OnTrack	Minor problems, had to ream.
2	1350 – 2150	8 ¼"	OnTrack	Decoding problems when starting to slide. Lost all signals from OnTrack at 1911m MD.
3	2150 – 3955	8 ¼"	OnTrack	Decoding problems. Memory data partially lost.
4	3955 – 4239	8 ¼"	OnTrack	Some decoding problems.
5	4239 – 4500	8 ¼"	OnTrack	Some decoding problems, resistivity failure.
6	4500 – 4603	6 ¾"	OnTrack	Good RT and Memory data.
7	4606 – 4624	6 ¾"	OnTrack	Good RT and Memory data.
8	4669 – 4743	6 ¾"	OnTrack	Good RT and Memory data.
9	4775 – 4843	6 ¾"	OnTrack	Good RT and Memory data.
10	4843 – 4893	6 ¾"	OnTrack	Resistivity failed in RT.
11	4893 – 4989.7	6 ¾"	OnTrack	Partially loss of RT and memory resistivity data

**Note: The run numbers are related to BHI MWD reports.*

Comments:

Run #1: Minor problems between 1257 – 1220 m MD when pulling out. Had to ream over this section, but otherwise no problems were observed while drilling this section.

Run #2: Problems with decoding OnTrack when sliding from 1375 m MD to 1459 m MD related to VertiTrack start-up/setting procedure. Lost all communication with OnTrack tool at 1911 m MD. However, it was decided to continue drilling without FE logs. Last survey was recorded at 1859 m MD. Dumped memory at rig surface OK, but logs only recorded down to 1892 m MD to MWD downhole memory.

Run #3: Decoding problems were occasionally encountered when sliding in the Lysing and Lange Formations. The memory was dumped at the rig, but good data was only recorded down to 3955 m MD.

Run #4: POOH at 4200 m MD, but re-ran MWD without downloading memory.

Run #5: Resistivity decoding problems observed from 4320 m MD. Resistivity failed at 4402 m MD. The same log gaps on the resistivity logs were seen on the memory data.

Gamma decoding problems observed from 4475 m MD until 4500 m MD.

Run #6: Good RT and memory data.

Run #7: Good RT and memory data.

Run #8: Good RT and memory data. A downlog was recorded from 4610 to 4699 m MD while reaming the cored section at 40 m/hr.

Run #9: Good RT and memory data.

Run #10: At 4878 m MD the resistivity tool failed to give Real Time data. This problem was later fixed and values from the short spaced resistivity tool were read in real time. Memory data was good.

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Run #11: The LWD gave no Real Time response in the interval 4893-4938 m MD. At 4938 m MD data started to come to surface and the tool worked OK from there down to well TD at 4989.7 m MD. Memory data were also not recorded between 4893-4938 m MD.

4.7.4 Wireline logging

Schlumberger performed open hole wireline logging in the 12 ¼" and 8 ½" hole sections. Totally 12 successful runs and 3 misruns were performed. Further the HPHT dual packer tools from Schlumberger gave several stuck situations, which resulted in two fishing jobs. After the miniDST main objectives were achieved, the decision was made to deepen the well. Another 96 m was drilled and a new driller's depth at 4989.7 m MD was set. Complete overview over the logging runs are in table 4.7 and table 4.8.

Table 4.7 Wireline logging 12 ¼" section

LOGGING PROGRAM			
#	TOOL COMBINATION	RUN	INTERVAL m MD RKB
1	DSI/AIT/IPLT/ACTS/ECRD	1A	1413m – 4505m

Table 4.8 Wireline logging 8 1/2" section

LOGGING PROGRAM			
#	TOOL COMBINATION	RUN	INTERVAL m MD RKB
1	PPC-MSIP-PPC-IS-AIT-ACTS-ECRD	2A/B	4504m – 4897m
2	CMR-IPLT-ESC-ACTS-ECRD	2A/B	4504m – 4897m
3	MDT-pressurepoints	2A	4623m – 4870m
N/A	Misrun: Sampling with quicksilver probe. Tool not working in final test	N/A	N/A
4	MDT sampling and mini DST with dual packer.	2B	4679 m (dual packer depth)
N/A	Misrun: miniDST and sampling with dual packer	N/A	4500m-4800m
5	MDT-PQ-sampling	2C	4500m-4830m
6	MDT mini-DST and sampling with dual packer	2D	4782.5-4692.5 m
7	VSP-GR	2A	3011-1322m & 3554-3448 m
N/A	Misrun: mini-DST and sampling with dual packer	N/A	4845.2
8	MDT mini-DST and sampling with dual packer	2E	4845.2 m
9	AIT-IPLT-DSI-GR-ECRD	3C	4989 - 4758
10	MSCT-GR	3A	4623 - 4877
11	VSI-GR	3B	4985 -2859,2
12	MSCT-GR	3B	4599.5 - 4981

4.7.5 Data quality

Even though severe operational problems with wireline equipment were encountered, high quality data was acquired for all planned main objectives. But a disappointing high level of contamination from the oil sampling was registered.

The MDT pretest, sampling and minDST service struggled with tight formation properties. The MDT equipment was run on the limits of its capabilities when it came to differential pressures on the probe and dual-packer elements. Due to the difficulties of finding reservoir intervals with good mobility, the pumping time for cleaning up the fluids became very long and increased the risk of a tool failure considerable.

The miniDST achieved in the Garn and Ile Formations did all cover the objectives of investigating the production properties and make it possible to draw comparisons to the DST's performed in the 6506/11-7 well. There is still work to be done to improve the HPHT miniDST data quality. The data quality is influenced by noise, probably caused by operational procedures and quality of equipment. For further information about results from miniDST see the separate miniDST report "Summary and Interpretation of miniDST"

After the deepening of the well a new suite of formation evaluation logs were run. All of good quality except the neutron porosity logs that suffered from a wrong sized bowspring.

In the re-run of the zero offset VSP high quality data was collected for the remaining interval.

Totally two run with sidewall cores (MSCT) were performed, both with very high success rate.

4.8 Formation pressure

A good pore pressure follow up was performed in this well. Available real time data, drilling parameter and MWD were used in combination with the reference data to estimate the pore pressure during drilling. An integrated operation was setup to stream real-time data from the rigsite to the porepressure analysis software Predict. Predict was used both onshore and offshore. The pore pressure gradient, mud weight, overburden and relevant drilling and log data are presented in the figures 4.13a and 4.13b. A separate pressure profile is presented in figure 4.11. The pore pressure evaluation is based on drilling experience and drilling parameters from the Kristin project and interpretation of formation evaluation logs like sonic and resistivity.

From seabed down to the Kai Formation a normal pore pressure trend has been applied. From top of the Kai Formation and into the Hordaland Group the drilling experience and parameters from the Haltenbank Area and especially the Kristin project has been adopted. An interpretation of the resistivity and sonic logs would give higher pore pressure in this interval. This probably due to the ooze content in these formations which gives to high sonic and to low density values and can be interpreted as pore pressure increase. Allowing for a

trend shift based due to lithology in the Kai and Brygge Formations will lower the pore pressure prognosis. The experience from this well did not challenge the methodology. Neither gas values or hole stability indicated that the pore pressure should be other than the prognosed. The maximum pore pressure of 1.63 sg in the Tang/Springar Formation from the prognosis was never challenged by using mud weight not below 1.70 sg in this section. There was no other indication of differing from the prognosis throughout the overburden section. When drilling and logging the Lange Sst Formation, there was no indication of developed sandstones of reservoir quality and no proofes for higher pressures in these sands than the base case in the prognosis. Due to a loss after fracturing the casing shoe area after finished drilling the 12 ¼" section the entire Createous system experienced a mudweight of 1.76 sg. The mudweight was lowered from 1.80 to 1.76 sg to regain well control from losses. The MDT pressure points in the Garn and Ile Formations confirmed the prognosis and the model with communication to the 11-7 well.

4.8.1 Reservoir pressure summary

The reservoir sandstones were in general of very low mobility, which caused problems to find intervals with sufficient properties to get good quality pressure readings from the MDT probe. But this was expected based on the experience from the 6506/11-7 well, and a systematic appoache using all the offset logs and por/perme results from drilled core plugs made it possible to locate some good pressure point intervals.

A single pressure only run was made to optimaze this task. 8 good pressure points were achieved out of 35 attempts. This gave enough data to conclude that this well was in the same pressure regime as the 6506/11-7 well for both the Garn and Ile Formation, but for gradient and fluid contacts this data set is lacking the resolution.

The formation pressure measurements are plotted in figure 4.12. A hydrocarbon gradient of 0.545 g/cc gives a good fit between both the Garn and Ile Formation in this well and previous M-prospect well.

Table 4.9 with pressure points are enclosed

No	FORMATION	DEPTHS			Hydrostatic Formation pressure			Hydrostatic	Temp.	Mobility	Comments
					press.before		(ref. RKB)				
		m MD	m TVD RT	m TVD MSL	bar	bar	sg	press.after			
1	Melke	4628.5	4628.1	4610.1	851.08					0.03	Tight
2	Melke	4630.8	4630.4	4612.4	851.10				147.4	0.01	Tight
3	Garn 5	4646.0	4645.6	4627.6	853.70						Tight
4	Garn 2	4660.5	4660.1	4642.1	856.50				150.4	0.3.	Two drawndowns, thight
5	Garn 2	4664.1	4663.7	4645.7	856.76				151.3	0.01	Tight
6	Garn 2	4666.0	4665.6	4647.6	856.67						Lost power,new test.Tight
7	Garn 1	4679.0	4678.6	4660.6	859.30	816.482	1.779	859.06	152.1		ok
8	Garn 1	4681.0	4680.6	4662.6	859.50	816.89	1.779		152.5	10?	Lost seal, reset probe. Test??

9	Garn 1	4687.0	4686.6	4668.6	860.65			860.39	153	0.01	Tight
10	Garn 1	4698.0	4697.6	4679.6	862.90				153		Tight
11	Ile 3	4735.2	4734.8	4716.8	870.70				152.3	0.07	Tight
12	Ile 2	4770.5	4770.0	4752.0	877.29	823.581	1.760	876.56	154.7	1.1	Two drawdowns, good test
13	Ile 2	4780.5	4780.0	4762.0	878.77	824.152	1.758	878.44	155.3	2.2	Build down, good test
14	Ile 2	4786.0	4785.5	4767.5	879.71				155.8	0.2	Tight
15	Ile 1	4795.2	4794.7	4776.7	881.44			880.90	156.7	0.02	Tight
16	Ile 1	4799.0	4798.5	4780.5	881.83			881.61	157.1	0.03	Tight
17	Ile 1	4802.5	4802.0	4784.0	882.51				157.4	0.9	Tight
18	Tofte 3	4839.5	4839.0	4821.0	890.55				158.3	0.03	Tight
19	Tofte 3	4843.0	4842.5	4824.5	890.70			890.07	159		Lost seal
20	Tofte 3	4845.0	4844.5	4826.5	889.60	865.72	1.822		159.4		Tight/supercharged
21	Tofte 1	4870.5	4870.0	4852.0	896.00				161.3		Tight/superscharged
22	Ile 1	4806.0	4805.5	4787.5	880.48				160.4		Tight-2 attempt
23	Ile 1	4799.5	4799.0	4781.0	879.523				160.2		Lost seal- 3 attempt
24	Ile 2	4785.5	4785.0	4767.0	877.025	831.00	1.770		159.2		Tight/superscharged-3 attempt
25	Ile 2	4780.5	4780.0	4762.0	876.49				159.3		No seal
26	Ile 2	4780.0	4779.5	4761.5	876.34	844.10	1.800		159.2	16?	Supercharged
27	Ile 2	4770.5	4770.0	4752.0	874.54				159.2		Supercharged
28	Ile 3	4749.5	4749.1	4731.1	871.11				157.1		Tight
29	Ile 3	4733.0	4732.6	4714.6							Tight
30	Garn 1	4681.0	4680.6	4662.6	858.4	827.97	1.803		155.1	3.9	Supercharged 3 attempt
31	Garn 1	4682.8	4682.4	4664.4		818.18	1.781		154.9	2.5	Good, but slightly increasing
32	Garn 1	4679.0	4678.6	4660.6	858.223	816.44	1.779		154.9	60.9	Good
33	Garn 2	4677.5	4677.1	4659.1	857.89	816.37	1.779		154.9	39.8	Good
34	Garn 5	4647.0	4646.6	4628.6	852.38				154.6		Tight - 2 attempt
35	Melke	4623.8	4623.4	4605.4	847.95	750.70	1.655		153.6		Very poor, Pressure not stable. Increasing very slowly (0.019 Bar/min)

4.9 Reservoir fluid sampling

Samples were collected in the Garn, Ile and some rescued fluids trapped in the MDT fluidline from the Tofte Formation. The first samples were collected with the dual packer from the oil zone in the Garn Formation. Sampling with dual packer gave very high contamination levels. Later the QuickSilver probe was used to obtain high quality samples. This was not to be fulfilled. In the Garn Formation the sampling depth finally chosen had low mobility and gave high differential pressure on the guard line when trying to take the advantage from the Quicksilver probe. After a long clean up period the contamination still was 14%. In the Ile Formation the pump on the guard line failed and one had to use the probe as a standard probe. But due to a good mobility strike was found in the Ile Formation a

contamination level of 10% was achieved. The Garn waterzone and Tofte scanning station was both done with dual packer solution. Table 4.10 gives the overview of the samples.

Table 4.10 Reservoir fluid samples

Sample depth (m MD)	Run No.	Chamber #	Chamber (volume)	Sample Type	Opening pressure (bar)	DFA Conta %	Rigsite Cont %	Formation	Remarks
4679	2B	MRSC 133	2 3/4 Gal	Oil	210	20	23	Garn 2	Dual Packer
4679	2B	MRSC 96	1 Gal	Oil	250	20	23	Garn 2	Dual Packer
4679	2B	MPSR 770	420 cc	Oil	50	20	23	Garn 2	Dual Packer
4679	2B	MPSR 719	420 cc	Oil	150	20	23	Garn 2	Dual Packer
4679	2B	MPSR 785	420 cc	Oil	35	20	23	Garn 2	Dual Packer
4679	2B	MPSR 677	420 cc	Oil	110	20	23	Garn 2	Dual Packer
4679	2B	SPMC4361	250 cc	Oil	826	20	23	Garn 2	SPMC Dual Packer
4679	2B	SPMC2627	250 cc	Oil	826	20	23	Garn 2	SPMC Dual Packer
4773	2C	MRSC 170	1 Gal	Oil	210	15	10	Ile 2	Quicksilver function broken
4773	2C	MPSR 643	420 cc	Oil	60	20		Ile 2	Backup sample
4680.7	2C	MPSR 768	420 cc	Oil	250	7	17	Ile 2	Quicksilver sampling
4680.7	2C	MPSR2520	420 cc	Oil	250	6.5		Ile 2	Quicksilver sampling
4680.7	2C	MPSR 73	420 cc	Oil	230	5.8		Ile 2	Quicksilver sampling
4680.7	2C	MPSR1720	420 cc	Oil	250	5.6	14	Ile 2	Quicksilver sampling
4680.7	2C	MPSR 189	420 cc	Oil	260	5.6		Ile 2	2.5 ppm H2S. Quicksilver sampling
4680.7	2C	MRSC 200	1 Gal	Oil	0	6		Ile 2	Quicksilver sampling
4680.7	2C	SPMC 138	250 cc	Oil	829	5.6		Ile 2	Quicksilver sampling
4680.7	2C	SPMC 148	250 cc	Oil	0	5.6		Ile 2	SPMC failed at surface. Quicksilver sampling
4692.5	2D	MPSR 770	420 cc	Water	16	75		Garn 1	Dual Packer
4692.5	2D	MPSR 779	420 cc	Water	12	75		Garn 1	Dual Packer
4692.5	2D	MPSR 835	420 cc	Water	16	75		Garn 1	Dual Packer
4692.5	2D	MPSR 719	420 cc	Water	10	60		Garn 1	Empty. Dual Packer
4692.5	2D	MPSR 750	420 cc	Water	14			Garn 1	Distilled water. Dual Packer
4692.5	2D	MPSR 710	420 cc	Water	10	60		Garn 1	Empty. Dual Packer
4692.5	2D	MPSR 650	420 cc	Water	10	60		Garn 1	Distilled water. Dual Packer
4845.2	2E	N/A	60cc	Oil	Atm			Tofte	Oil taken from sample line. Dual Packer

4.10 Leak off test

There were three leak-off tests (LOT), at 1341.1 m MD (below 20" csg), at 2139.5 m MD (below 14" csg) and at 4500 m MD (below 9 7/8" liner), performed in this well. The LOT below the 20" casing and 9 5/8" liner were interpreted to 1.72 sg and 2.06 sg equivalent mud weight (EMW) respectively. The LOT below the 14" shoe had initially been intended to be a

FIT (formation integrity test) to an anticipated 1.88 sg EMW. However, the pressure leaked off before reaching this point, possibly indicating that the formation at this depth was not as competent as anticipated. The pressure leaked off at 1.86 sg EMW.

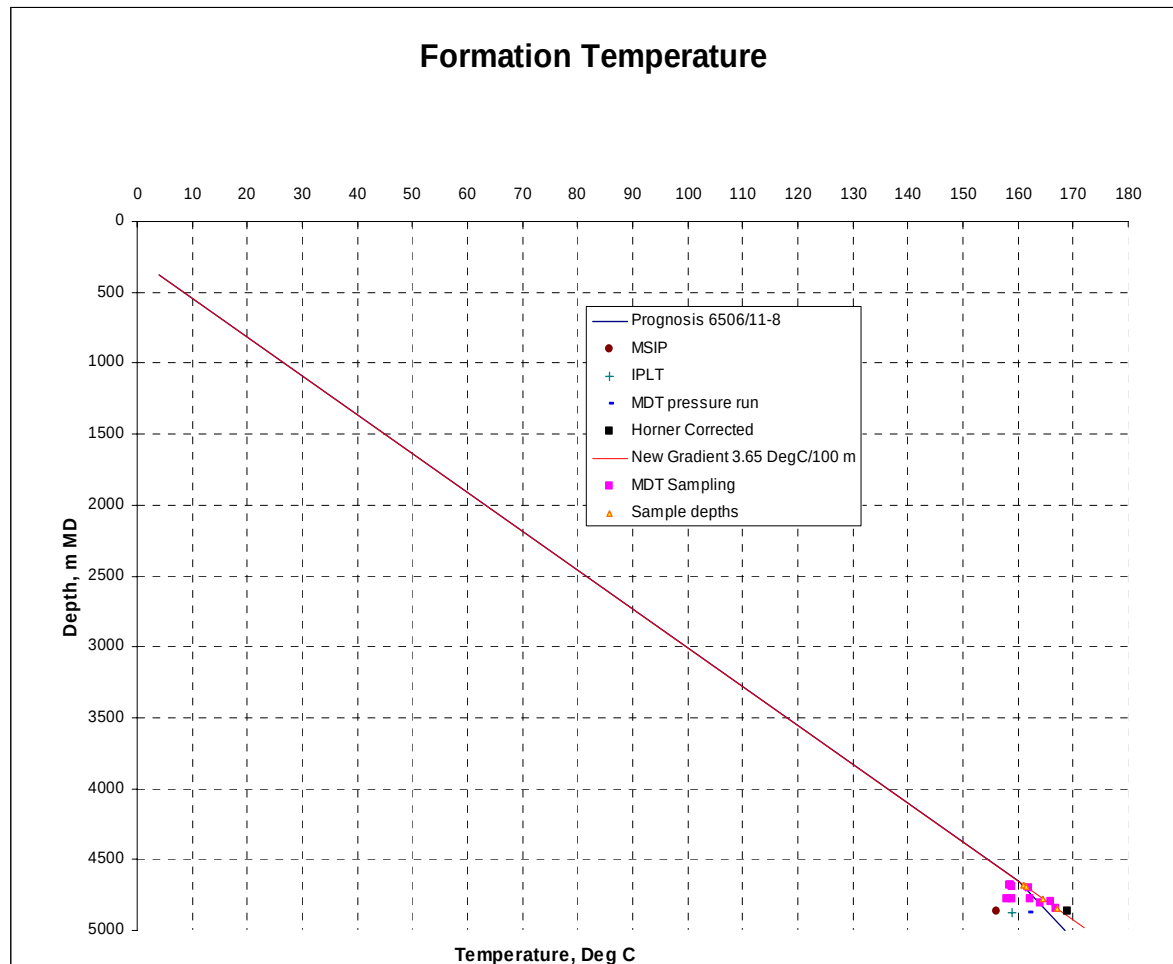
4.11 Formation temperature

The maximum temperature readings from the different logging runs have been evaluated. The continuous running logging runs have been Horner corrected. The maximum readings from the fluid sampling and miniDST temperatures have been plotted to evaluate against the Horner corrected temperatures.

Table 4.11 Measured and corrected formation temperatures from the wireline logging head and the MDT quartz gauge.

Source		Ref. Depth m RKB	Time since circ. (hrs)	Circ. Time (hrs)	Measured temp. °C	Extrapolated temperature Horner method °C
<i>Drilled to TD=4893 m MD. Circulation stopped .06.06.06 15:00 hrs. Circulation time approx. 30 hrs</i>						
MSIP-AIT	2A	4897	31	30	156	169
IPLT	2A	4897	45	30	159	169
MDT pressure points	2A	4870	65	30	162	169
MDT PA	2B	4679	99	30	156	
<i>Wipertripp. Circulation stopped 15.06.06 at 00:00 hrs. Circulation time . 6 hrs.</i>						
MDT QS sampling	2C	4800			166	
<i>Wipertripp. Circulation stopped 23.06.06 at 03:00 hrs. Circulation time . 6 hrs.</i>						
MDT PA	2D	4782			159	
MDT PA	2E	4845			167	
<i>Drilled to new TD at 4993m. Circulation stopped 02.07.06 at 16:00. Circulation time 4 hrs.</i>						
DSI-IPLT	3C	4920	49	4	164	
VSI	3B	4975	85	4	165	
MSCT	3B	4970	100	4	172	

Figure 4.4 Temperature from wireline logs, Horner corrected and new temperature gradient



As can be seen in figure 4.4 there is no evidence of a different gradient in the reservoir in this well as was the conclusion after the previous Morvin well. The new gradient achieved from these readings is 3.65 DegC/100m using 4 DegC at the seabed.

4.12 Experiences / recommendations

Drilling mud

- Based on Kristin experiences, the mud spec. was optimised from start of section with 160 kg/m³ KCl and 6% Glycol. No indications of tight hole were observed during drilling and casing running through the reactive Kai and Brygge Formations. Mud spec recommended for future wells.

- Reference is made to “Final Well Report Drilling - Well 6506/11-8, Morvin PL134B” for additional experiences

Realtime data transmission:

- All data were displayed realtime in RigLink, Baker Hughes INTEQ system. The mudlog data from Geoservice was transferred in WITS format to RigLink, hence no realtime update possible. This gave the possibility to refresh MWD data which can be prone to decoding problems, noise, etc. and the mudlog data came in steady as mudlog data is not affected by the same challenges as MWD data.
- Baker also transmitted WITSML data to Statoil real-time support center. This functioned as planned and data was directed from Statoil RT center to the OpenWorks application
- Predict offshore and onshore was also fed by data from the WITSML link. But this did not work properly, since the data stream from Statoil RT center stopped several times. Solution to this problem was to restart the main Predict control program, which on the Morvin well was controlled from the Statoil RT center. Statoil RT center is not operated 24/7, so this solution was not good enough for the offshore workers.

Data acquisition

- Decided to use sideentry sub on overshot with grapple to fish mini DST tool. Cut the wire and pulled thru overshot, 5" DP and sideentry sub. This worked very well and was time saving compared to cut and thread (+/- 2 days saved). A float and dart sub was included in fishing string, not possible when doing cut and thread.
- MWD logs
 - Resistivity failure in the end of all hole sections of 17 ½", 12 ¼" and 8 ½".
- Good VSP data collected from the whole well.
- The Dual packer design ENG7 used on this well did not perform at all as planned. On all inflations we had a stuck situation when deflating. As found from troubleshooting, the packers did not empty the mud inside and the mud had to be pumped out. The ENG7 was immediately revised to a ENG8 version.
- MSCT
 - Totally 2 wireline runs for sidewall cores were performed. Exceptionally good core recovery.
- The contamination level of hydrocarbon samples was higher than expected. Those sampled dual packer was as expected very high contamination, but the results we got with the new Quicksilver probe were very disappointing. The use of an expensive technology as Quicksilver need to be carefully examined before use in tight formations like on the Morvin well.
- First VSP run failed due a failure in the electronics. The failure should have been avoided if the upgrades of the tool had been done as planned in the maintenance program of Schlumberger.

Pore pressure estimation.

-
- The Predict software was used onshore and offshore for real-time pore pressure prediction. Except the above mentioned problem with real-time transfer of MWD and mudlog data, the software functioned as expected.

Figure 4.5 Regional structural setting

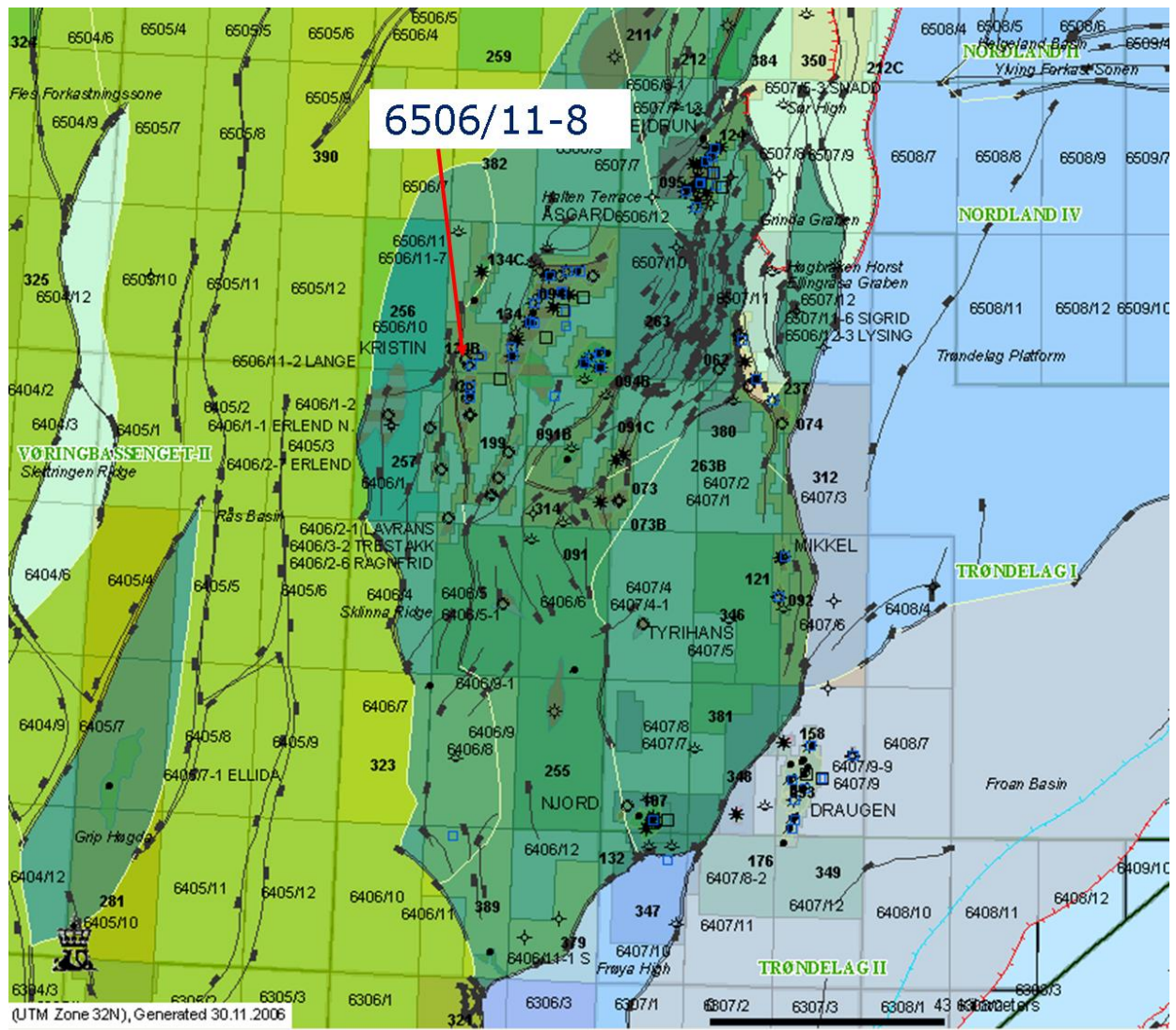


Figure 4.6 Well stratigraphy

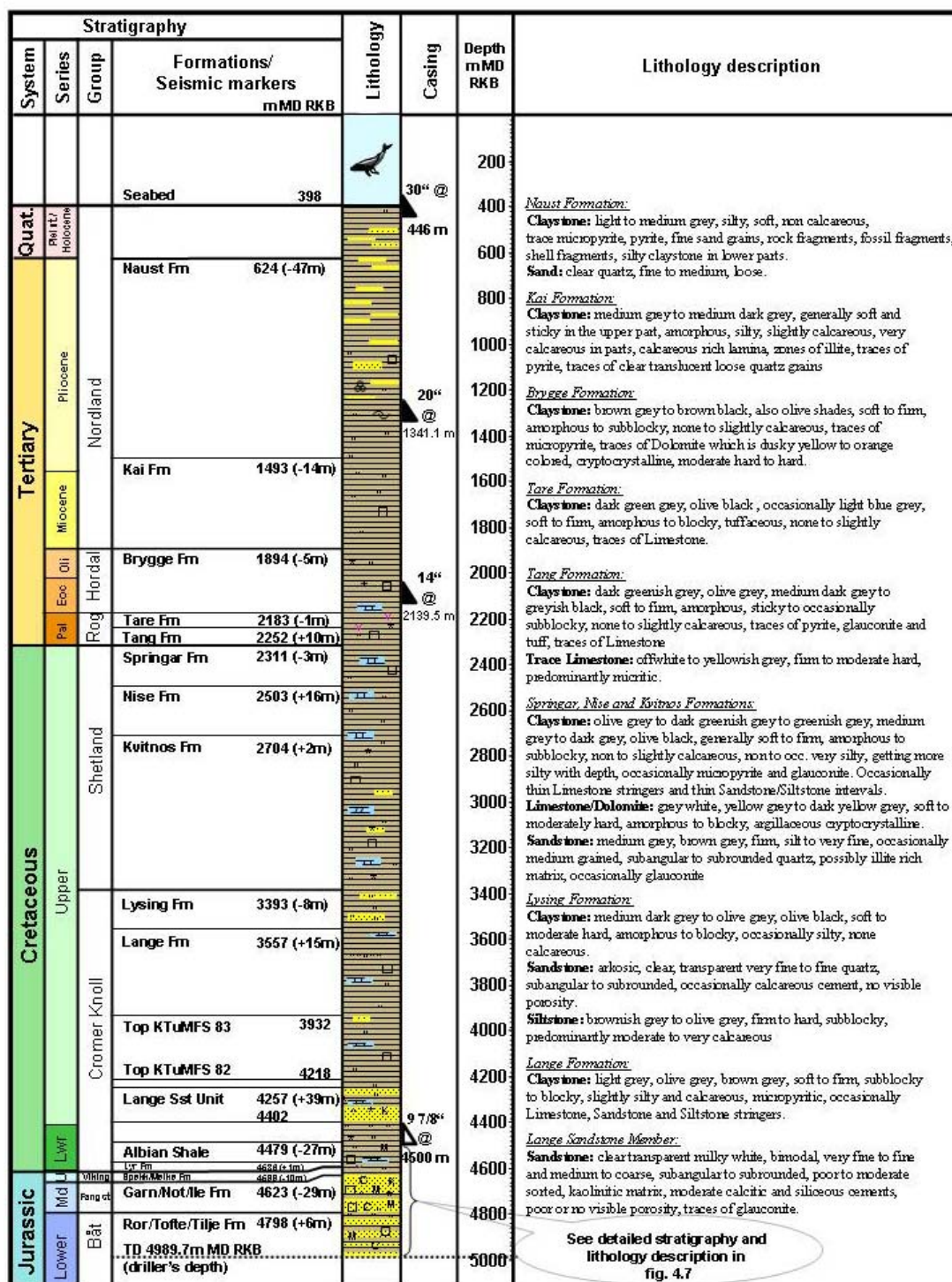


Figure 4.7 Well stratigraphy, reservoir section

Stratigraphy				Lithology	Casing	Depth m MD RKB	Lithology description
System	Series	Group	Formations/ Seismic markers mMD RKB				
Cretaceous	Lower	Cromer Knoll	Albian shale			4500	<u>Albian shale:</u> Claystone: medium dark grey to dark grey and brownish grey, olive black to brownish black, predominately firm to moderate hard, amorphous to blocky, occasional micropyrite, micromica and carbonaceous material. Occasionally grading to Siltstone.
			Lyr Fm 4586 (+1m)			4550	<u>Lyr Formation:</u> Claystone: medium dark grey to greyish black, firm to moderate hard, blocky to subfissile, slightly silty, slightly calcareous in upper part, becoming mainly red brown to greyish red and very calcareous to marly in the lower part.
Jurassic	Upper	Viking	Spekk Fm 4599 (-10 m)			4600	<u>Spekk Formation:</u> Claystone: olive black to greyish black to brownish black, firm to moderate hard, blocky, silty in parts, carbonaceous, micropyritic and slightly calcareous in parts
			Melke Fm 4600 (-14m)			4650	<u>Melke Formation:</u> Claystone: predominantly dark grey, hard, micromicaceous and partly calcareous.
	Middle	Fangst	Garn Fm 4623 (-29m)			4700	<u>Garn Formation:</u> Sandstone: brown black to olive black with predominantly clear, transparent, translucent quartz grains. Fine to medium, or medium to coarse, subangular to subrounded, moderately sorted, well silica cement, occasionally calcareous cement, argillaceous matrix, muscovite, traces of micropyrite, traces of Kaolinite, no to poor visible porosity, fair porosity in lower parts.
			Not Fm 4702 (-13m)			4750	<u>Not Formation:</u> Claystone: varicoloured brown grey, dark green grey, olive grey, silty to very silty grading siltstone in upper parts, firm to moderately hard, blocky, micromicaceous, traces pyrite, occasionally carbonaceous, non calcareous.
			Ile Fm 4735 (-7m)			4800	<u>Ile Formation:</u> Sandstone: interbedded sandstones and thin claystones in the upper part, brown black, olive black, with clear translucent occasionally blue white quartz, angular to occasionally rounded, subelongate to subspherical, hard dark grey silica cement, occasionally micropyritic cement, mica in parts, carbonaceous fragments observed, none to locally good visible porosity.
			Ror Fm 4798 (+6m)			4850	<u>Ror Formation:</u> Sandstone: light olive grey to olive grey, very fine to fine, commonly silty, subrounded. Siltstone: light olive grey, dark grey, brown grey to brown black, firm to moderate hard, blocky, non to slightly calcareous, well cemented, very argillaceous matrix, slightly pyritic, traces of mica and micro carbonaceous material, no visible porosity.
			Tofte Fm 4839 (+9m)			4900	<u>Tofte Formation:</u> Sandstone: light grey, light brown grey, predominately clear to translucent loose quartz, very fine to coarse, very coarse in parts, well to poorly sorted, subangular to subrounded, locally silica cement, loose kaoline matrix, trace of mica, micropyrite and carbonaceous material, no visible porosity.
			Tilje Fm 4928			4950	<u>Tilje Formation:</u> Sandstone: milky white to translucent quartz, very fine to fine, moderately sorted and subangular to subrounded, silica cemented, occasionally mica. Claystone: olive black to dark grey, blocky, firm to hard, none calcareous
Lower	Båt	TD 4989.7m MD RKB (driller's depth)					

Figure 4.8 Log responses in reservoir section

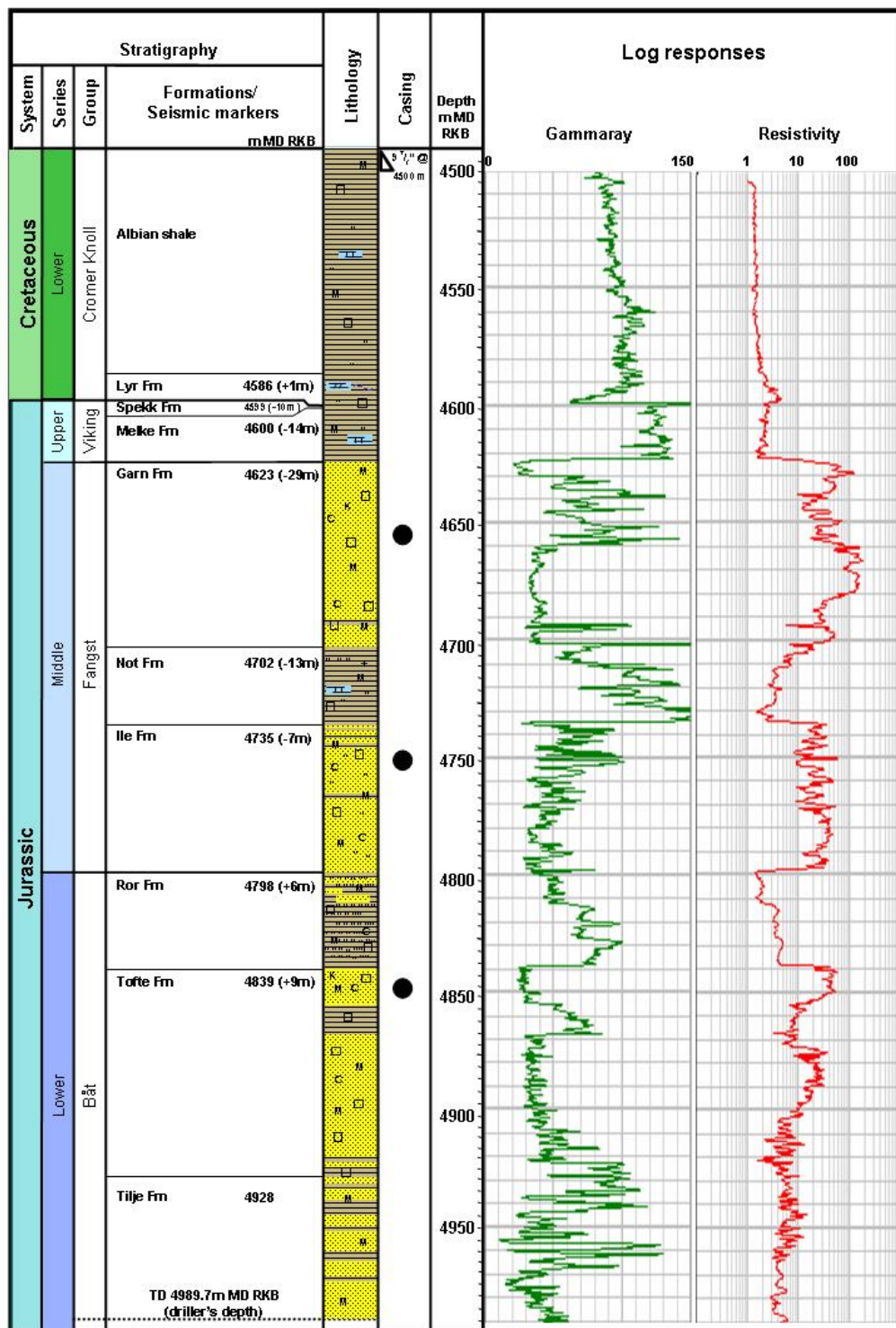


Figure 4.9 Prognosed vs. actual

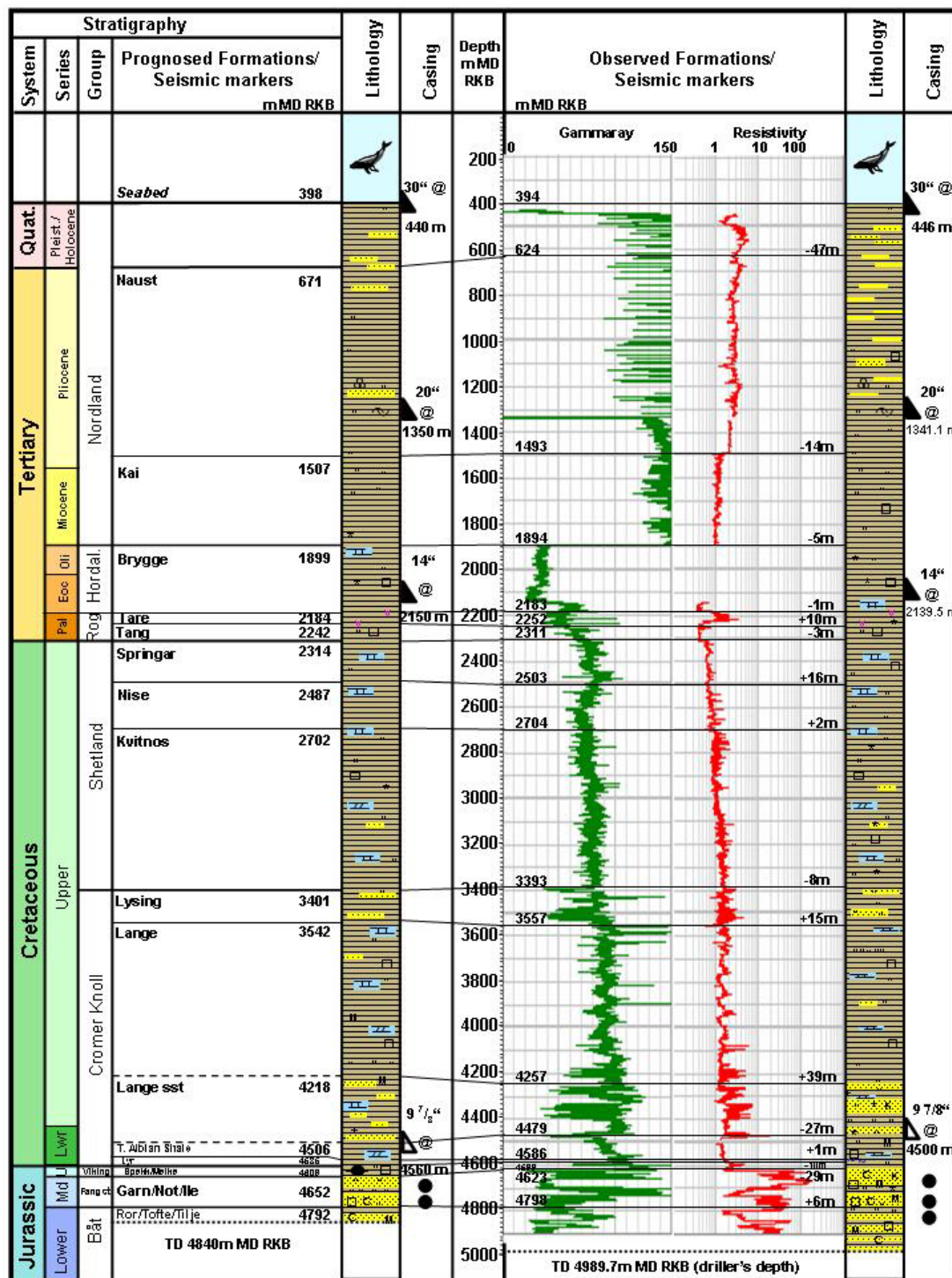


Figure 4.10 Prognosed vs. actual, reservoir section

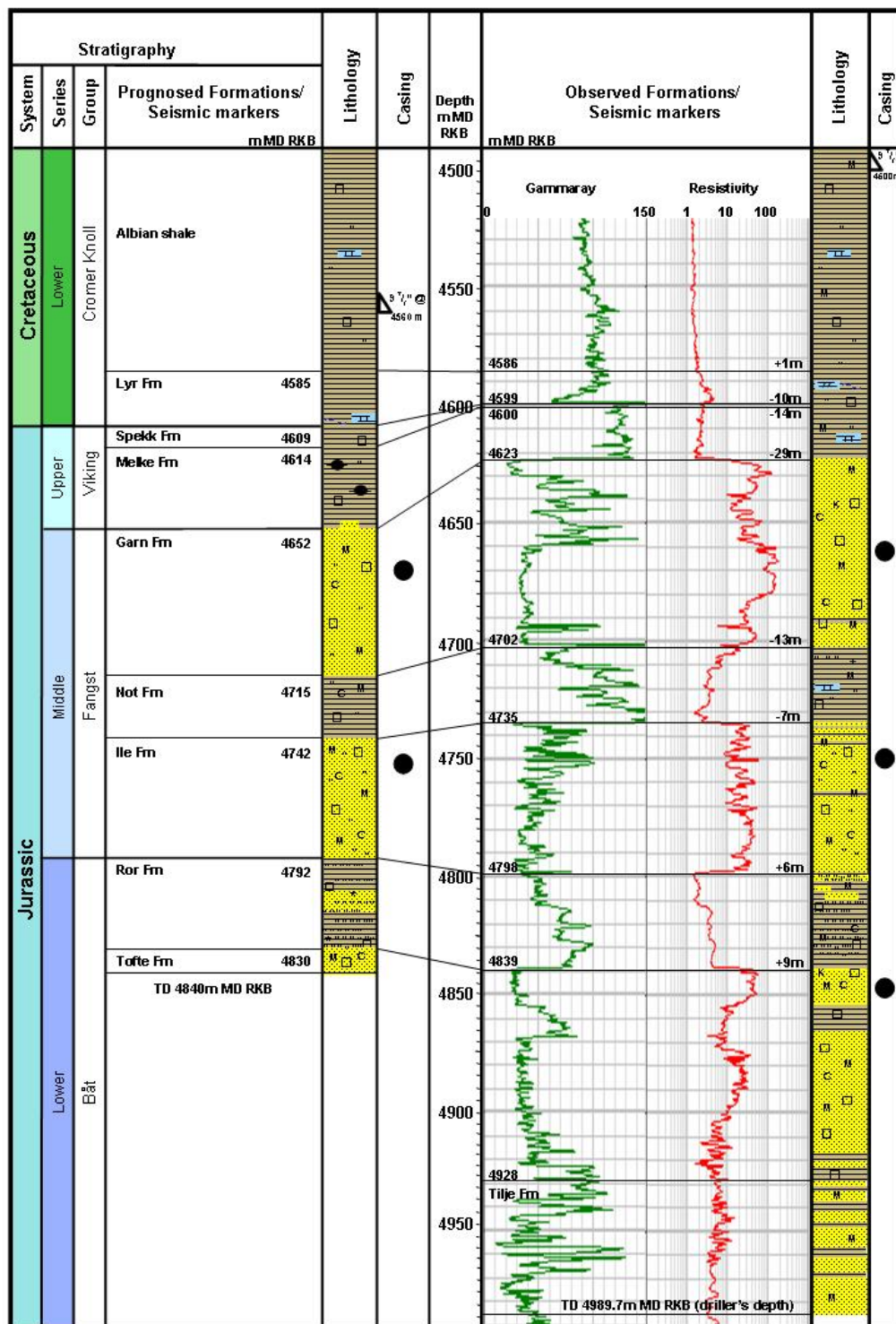


Figure 4.11 Pressure plot

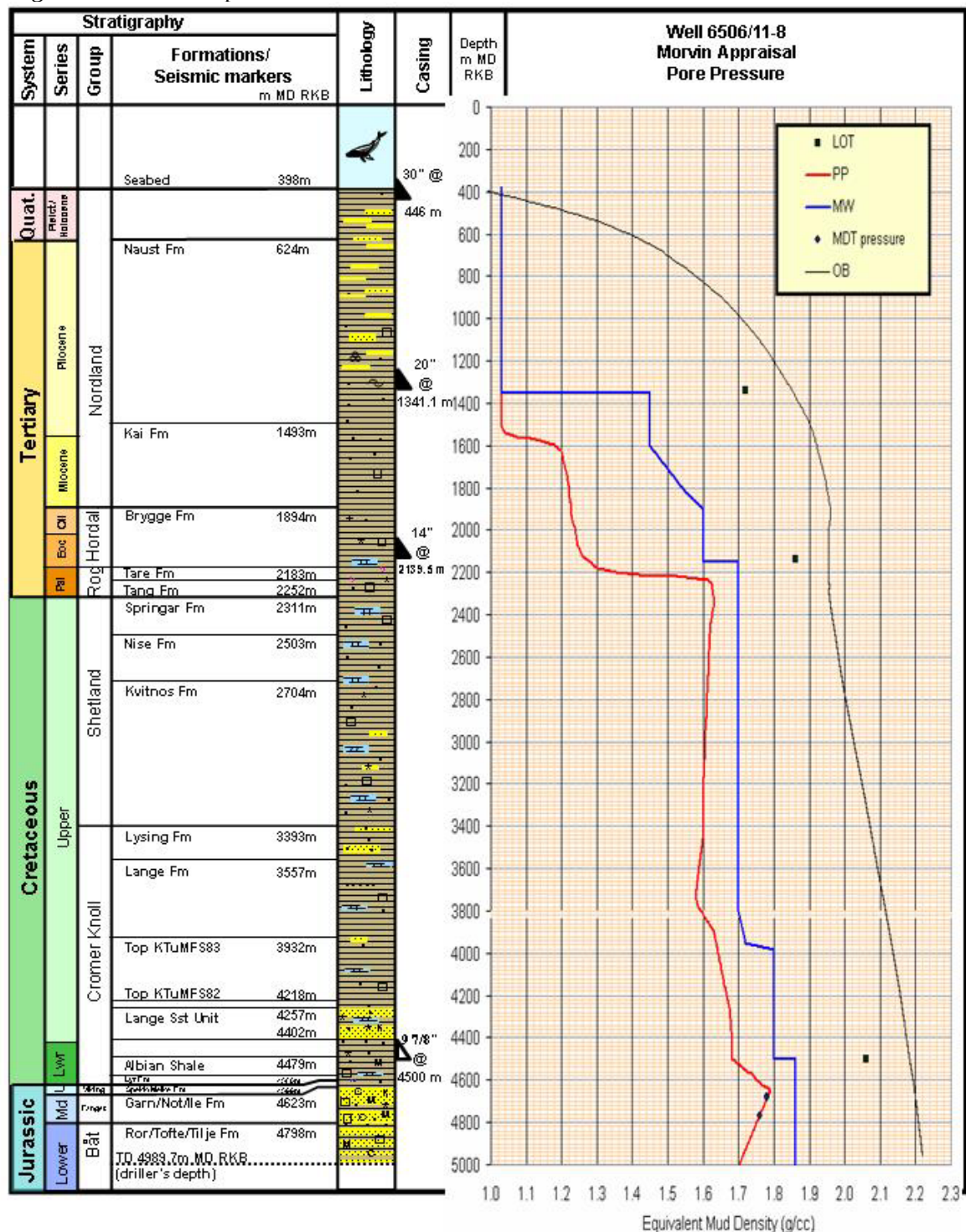


Figure 4.12 MDT plot

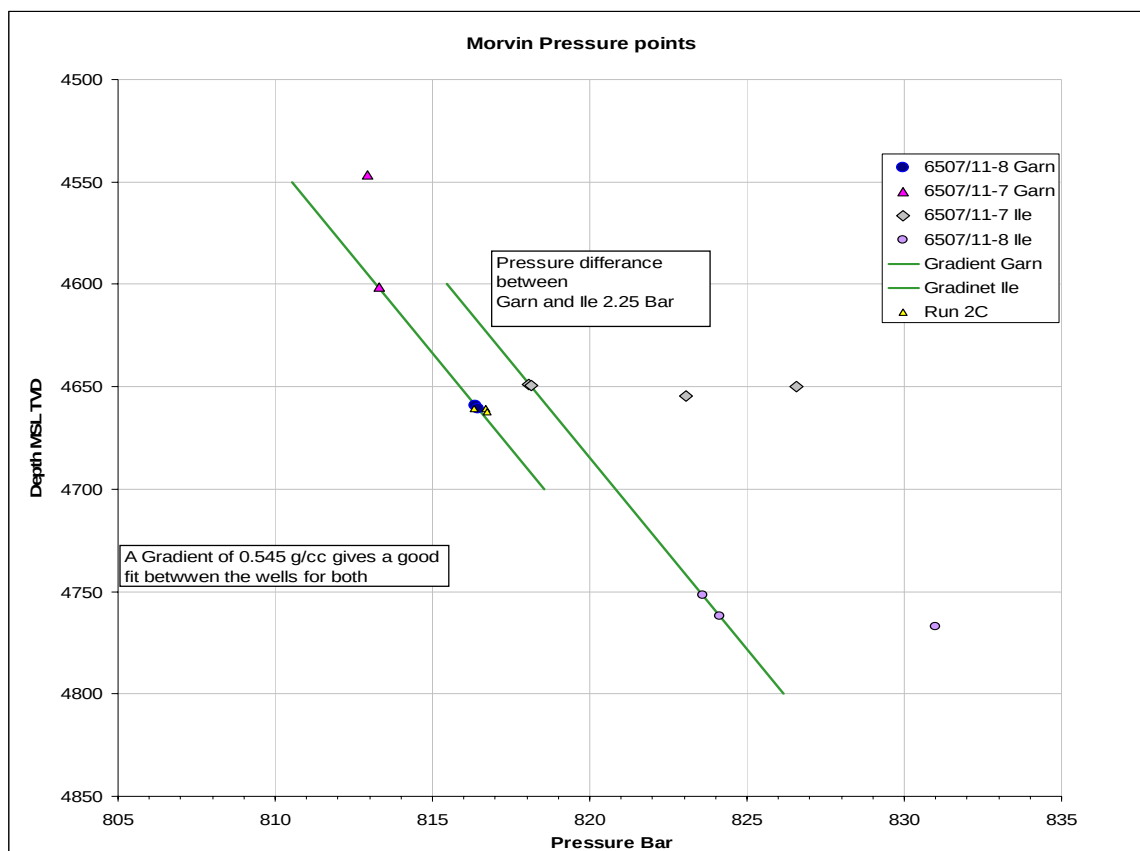


Figure 4.13a Composite data

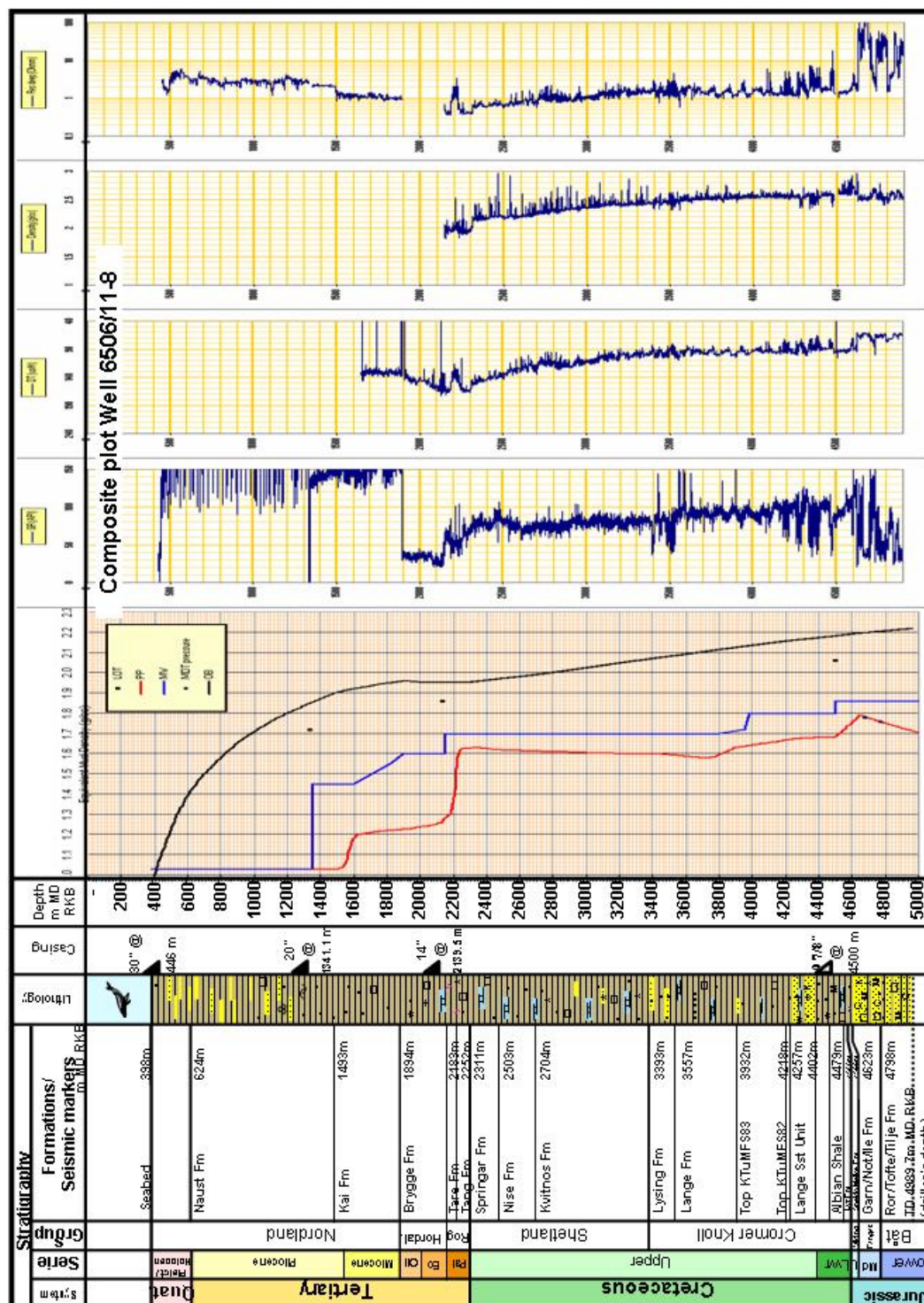


Figure 4.13b Composite plot

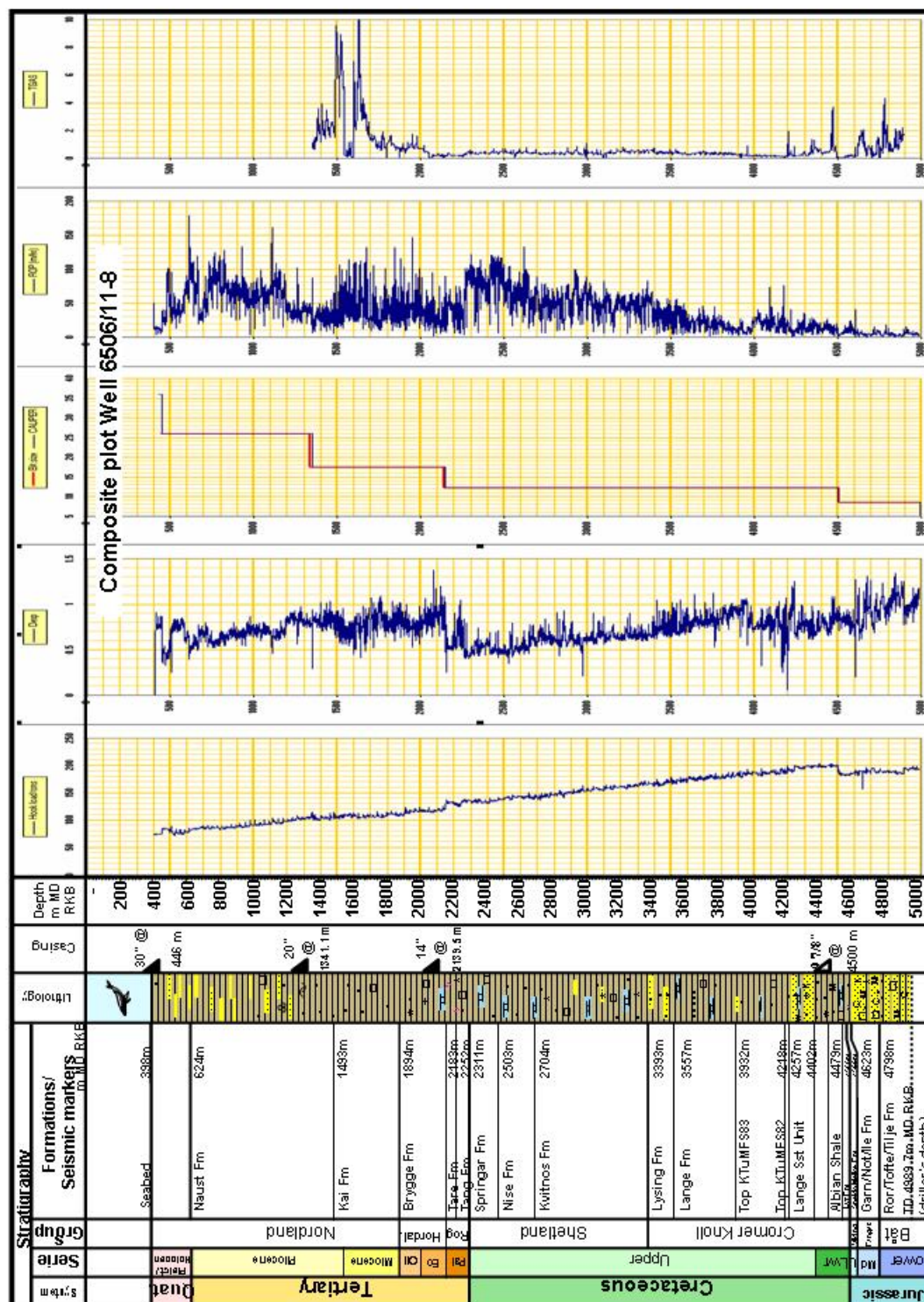
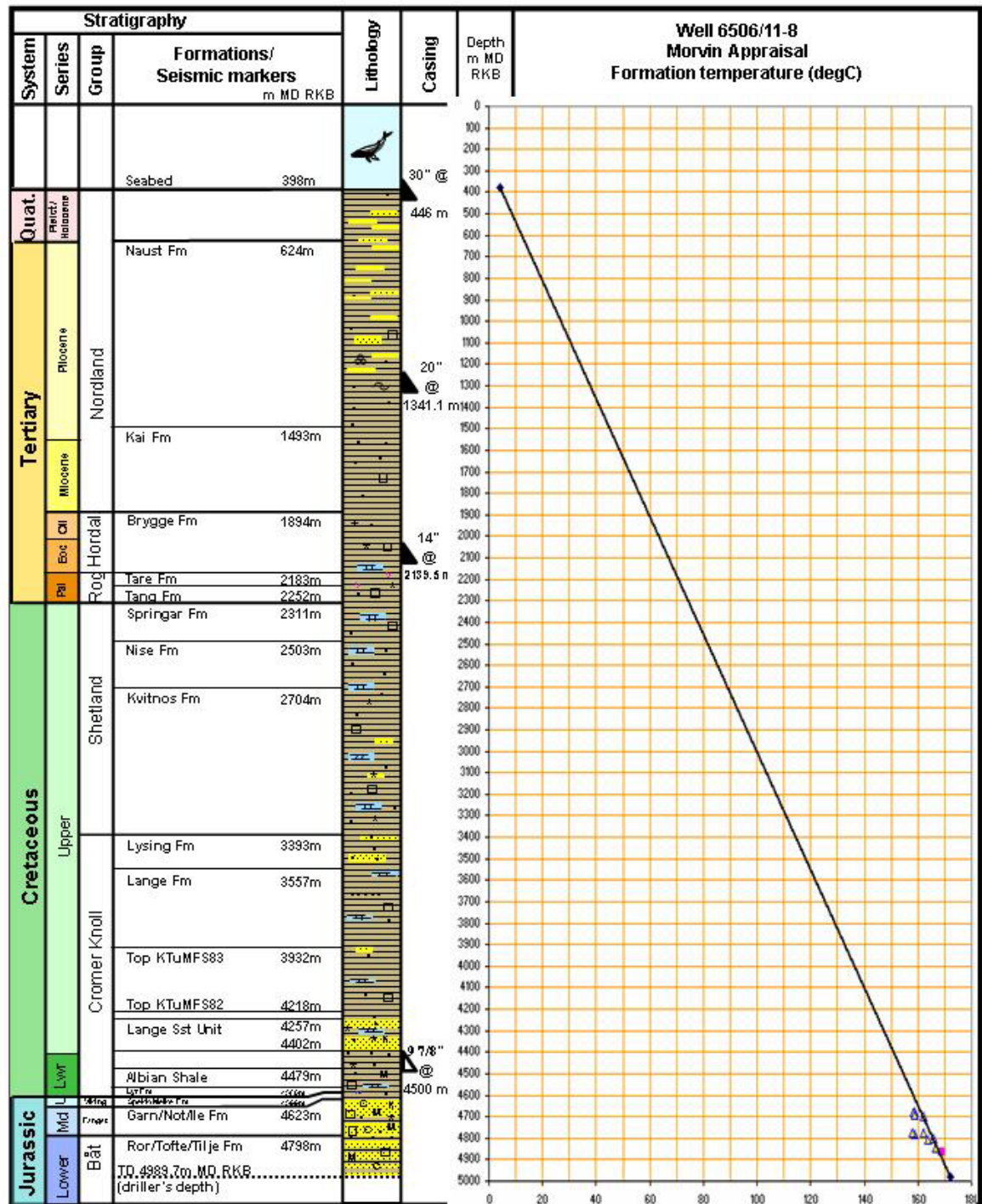


Figure 4.14 Temperature gradient



5 Drilling operations report

5.1 NO 6506/11-8, MOVE (22.03.2006 06:00)

START: 22.03.2006 06:00 398 m MD

END : 23.03.2006 07:00 398 m MD

OBJECTIVE

Move rig from Lavrans to Morvin and set anchors.

SUMMARY

West Alpha was towed from Lavrans to Morvin location on the 22.3.2006 06:00 hours. The tow was assisted by two supply vessels and took 8 hrs. The tow distance was approximately 18 NM (33) km. West Alpha arrived on Morvin at 22.03.2006 14:00 hrs and it had to WOW for 5 hrs due to heavy wind (40 knots) before anchor handling could start. The anchor handling (8 anchors) was assisted by 3 supply vessels and in 15 hours the anchors were set and pretensioned (180 mt).

5.2 NO 6506/11-8, PRESPUD (23.03.2006 07:00)

START: 23.03.2006 07:00 398 m MD

END : 24.03.2006 08:30 398 m MD

OBJECTIVE

Prepare for spud. Make up initial BHA. Run BHA to seabed.

SUMMARY

A total of 36 joints of 5 7/8" drill pipe were picked up (8-9 stand per hr) and racked back in the derrick, sufficient to drill the 36" section. Meanwhile the ROV performed seabed survey and placed out marker buoys and took seabed samples.

The cement stand, running tool and 36" BHA was made up. The 36" BHA was then run to seabed where the Anderdrift was tested OK.

5.3 NO 6506/11-8, 36" (24.03.2006 08:30)

START: 24.03.2006 08:30 398 m MD

END : 26.03.2006 17:30 448 m MD

OBJECTIVE

Drill 36" hole from seabed (398 m) to 440 m. TD should be based on conductor length and planned stick-up (3m). Inclination of well bore should be less than 1.5 degrees.

Cement conductor using Tuned Light Slurry (1.52 sg) with 300% excess. If inclination and stick-up were acceptable, the conductor running tool should be released directly after the cement job.

SUMMARY

It was possible to wash down the first 6 meters before rotation with the string was started. The flow rate was increased in steps from 500 lpm up to 3500 lpm to prevent washout at the top of the hole. The hole was drilled from 404 to 448 m in 4 hours. No boulders were experienced. The 36" BHA consisted of Anderdrift, 26"/36" hole opener and a 17 1/2" bit. At TD the survey showed 0,25 deg, well within the requirement of the well.

BIT RUNS

The 36" section was drilled in one bit run.

DRILLING FLUID

The section was drilled with seawater and HiVis pills of 12 m³ where pumped twice pr. stand. 60 m³ of kill mud fluid was prepared for the section (total of 200 m³ for the top hole sections 36" & 26"). The hole was displaced to 1.40 sg mud to prepare for running 30" conductor.

CASING

It was attempted to set the conductor at the 26" shoulder at 446 meter, but the PGB started to sink downwards, so it had to be tensioned up by the guide wires and cemented.

5.4 NO 6506/11-8, 26" (26.03.2006 17:30)

START: 26.03.2006 17:30 448 m MD
END : 11.04.2006 05:30 1355 m MD

OBJECTIVE

Drill 26" hole into the lower part of the Naust Formation. Run and cement 18 3/4" wellhead with a 20" casing. Install Riser and BOP.

SUMMARY

The 26" hole was drilled to TD at 1350 m with ROP of 35-85 m/hrs. Very few boulders were experience during the section. The cement job went according to plan and cement was displaced at a rate of 3100 lpm.

When the BOP was acceptance tested it was identified several issues that had to be troubleshooted and repaired before the BOP could be run. This included leakage from the yellow pod, leakage from valves and reassembling of ST locks for the rams. The repairs lasted for 8 days (01.04.2006 08:30 - 08.04.2006 15:00). The time spent on repair of BOP in connection to acceptance testing is not included in the performance estimate for this well.

Ran BOP and landed same. Pressure tested 20" casing and WH connector to 180 bar. RIH with 17 1/2" BHA and drilled out 1/2 shoe track with SW and displaced to 1,45 sg WBM prior to drill out of shoe. After drilling 3 m of new formation the bit was pulled into 20" csg. shoe and a LOT was performed to 1,72 sg. EMW.

BIT RUNS

The section was drilled in one bit run.

DRILLING FLUID

This section was drilled with seawater at 4600 lpm and HiVis pills which were pumped every 15 meters drilled. At TD the well were displaced to 1.30 sg.

CASING

When running the 20" casing it took weight on the last 10 meters due to packing tendency. The casing was washed down with 1000 lpm and max 60 mt down weight, and after 3 hrs the casing was landed in the wellhead.

5.5 NO 6506/11-8, 17 1/2" (11.04.2006 05:30)

START: 11.04.2006 05:30 1355 m MD

END : 16.04.2006 10:00 2150 m MD

OBJECTIVE

Drill the 17 1/2" section from 20" casing shoe and 250 meter into the Brygge Formation. Run and cement 14" casing.

SUMMARY

The 17 1/2" hole was drilled from 20" casing shoe at 1351 m down to 2150 m. Due to a small drilling target and casing wear limitations it was important to keep the well at an vertical angle and a VertiTrak tool was included in the assembly. The VertiTrak system is an automated vertical drilling system which combines inclination measurements and a motor to ensure straight hole drilling. The section was drilled switching between sliding mode and rotary mode and ROP varied from 10-50 m/hr. In rotary mode the string was rotated with 60 RPM giving a rotation on the bit of 223 RPM. Hole cleaning was good both in rotary and sliding mode.

The 14" casing was run and cemented as planned.

BIT RUNS

The section was drilled in one bit run.

DRILLING FLUID

The mud weight used for this section was from 1.45 up to 1.60 sg at TD. Started increase MW from 1600 m. At 1900 m MW was equal to 1.60 with ECD: 1,58-1,62. At TD the MW was increased to 1.63 sg prior to set 14" liner as per "Kristin Best Practice". To improve efficiency a project called "Optimal Drilling Fluid Solids Control" from Statoil head quarters were utilized for the 17 1/2" and 12 1/4" sections. The goal for the initiative was to improve the efficiency and downtime for the drilling process by optimizing the use of shaker screens. A representative from Statoil HQ went 2 trips to the rig and briefed/trained the drill crews on theoretical and practical issues relevant to the project. The initiative was well received by the

drill crew. The results from the project (improved hole cleaning or reduced wear on surface system) were difficult to measure from this well alone.

5.6 NO 6506/11-8, 12 1/4" (16.04.2006 10:00)

START: 16.04.2006 10:00 2150 m MD

END : 13.05.2006 09:30 4500 m MD

OBJECTIVE

Drill 12 1/4" hole into the Albian shale, below the Lange sst, and install 9 7/8" liner. Cement the liner to 200 m above Lange sst and provide sufficient seal around the 9 7/8" liner shoe.

SUMMARY

The 12 1/4" assembly included a Vertritrak to ensure straight hole. After 3 meter of new formation was drilled it was attempted to take a FIT to 1,88 sg, but a LOT to 1,86 sg was performed. The section was drilled in three bit runs. In the second bit run a Bondura bolt for the heave compensator was bent and had to be replaced. This resulted in two days of downtime.

When POOH at the end of the section severe losses were experienced. The 12 1/4" BHA was back reamed/pulled 100 m into the 14" shoe and it was circulated BU by increasing the pump rate in steps. Started to loose returns with 2600 lpm while washing/reaming interval with 25 RPM. The MWD screen on the drill floor was not functioning and ECD real-time data was not available. From MWD memory logs the maximum ECD seen was equal to the LOT (1,86 SG). To cure the lost circulation situation a LCM pill was pumped and the MW was initially reduced from 1,80 to 1,76 sg, then up to 1,78. The incident resulted in 5,5 days downtime.

When attempting to pressure test the 9 7/8" liner, liner lap and 14 " casing after the cement job the pressure broke off at a value corresponding to formation LOT (2,10 sg). This leakage was due to poor cement job at the 9 7/8" shoe. A clean out assembly was run to drill out remaining cement and 3 m of new formation. No resistance was experienced in the shoe track. A RTTS packer was then run to 4450 m and a new successful system casing test was performed.

BIT RUNS

Bit run 1 for the 12 1/4" section was drilled/slided with good hole cleaning. More erratic torque were experienced after entering Lysing Formation. This allowed less sliding. The BHA was pulled to change bit due to ROP, 5-10 m/hr on the last stand.

Bit run 2 was drilled/slided from 3955 m to 4200 m, when the Bondura bolt for the Heave compensator was bent and stuck and the BHA was pulled above the BOP. To replace the bolt and bearing took two days. When drilling commenced, torque was lost after 3 9m of drilling and rubber from the motor were observed on the drill floor. The string was then pulled due to no torque difference and low ROP.

Bit run 3 was drilled/oriented with a new bit and VertiTrak tool. The resistivity sensor failed during this run but there was no need to POOH as the TD criteria for the section, top Albain shale, was picked by biostratigraphy.

DRILLING FLUID

During circulating BU at the 14" shoe, the ECD value was equal to the LOT resulting in lost returns. The initial static loss was 24,6 m³. A 15 m³ LCM pill was pumped and displaced which resulted in partial returns (36,5 m³ lost, 39,5 m³ pumped). To reduce the risk of additional losses it was decided to displace the well from 1500 m and up from 1,80 to 1,76 sg MW. After this the entire well was displaced to 1,78 sg to establish a stable well. This was done in steps by running the BHA down to selected depth intervals (1990 m, 2340 m, 3000 m, 3696 m, 4487 m, 4500 m) and perform a flowcheck before the interval was displaced to 1,78 sg mud. Total loss when well was stable was 55,2 M³ of OBM. (see also synergis 386767)

CASING

Rigged up and ran 9 7/8" liner. Only minor losses (4.3 m³) were observed during the liner running. Had problems to make up string due to tight clearance between liner joint and BX-elevator, especially with low weight in string. Made up liner hanger and ran in on DP. Observed increasingly tighter hole and several tight spots running in. From 3128-3647 m the tight spots were generally passed by setting down 20-30 tons, then pulling up 20 tons to get free. From 3647 m more the tight spots came more frequently (up to 6 spots pr. Stand) and it got increasingly difficult to pass them. Had to pump and work string down towards the end by applying maximum down weight (160 ton). No losses running in on landing string.

Installed cement head, ran in and tagged bottom at 4500 m. Attempted to pull liner 1 m off bottom with 340 ton, no go. Broke circulation and established loss free rate at 1000 lpm / 30 bars. Dropped ball, pressured up to 87 bars and set hanger. Pressured up to 140 bars and released liner hanger running tool. Attempted to shear out ball with 240 bars / 300 bars, no go. Lined over to cement unit and pressured up to 345 bar, no go. Rigged over to kill hose (15.000 psi) and pressured up, ball sheared out at 376 bars. Changed back to cement host on cement stand and cemented liner. Set liner packer after cementing.

CEMENTING

Cemented 9 7/8" liner by pumping 20 m³ 1.87 sg spacer, 21 m³ 1.96 sg slurry followed by 1.0 m³ spacer. Displaced cement at 955 lpm, increased to 2000 lpm when spacer at the shoe. Did not observe wiper dart shear out, did not bump. Displaced ½ shoe track. No losses during the cement operation.

Set liner packer, set back cement stand and POOH. When the DQ running tool (RT) was stripped onshore it was found that ball in the liner running tool was sheared out but had not entered into the tool ball pocket as intended. The ball had wedged itself inside the ball diverter element leaving a limited passage for flow inside the running tool. During the cement job the wiper plug had not passed this area but landed on top of the ball resulting in a poor cement job. The poor cement job resulted in an extra clean out run and a RTTS run to perform a new pressure test on the 9 7/8" liner.

LOGGING

Rigged up and performed one wire line logging run (AIT-IPLT-DSI-HNGS).

5.7 NO 6506/11-8, 8 1/2" (13.05.2006 09:30)

START: 13.05.2006 09:30 4503 m MD
END : 07.07.2006 12:00 4989.7 m MD

OBJECTIVE

Drilling 8 1/2" section 4560 - 4840 m. Perform coring and logging according to program. Use HPHT procedures.

SUMMARY

According to HPHT procedures the 8 1/2" section was drilled with a 5 7/8" kick joint. For coring two kick joints were used to reduce the potential of jamming. Fingerprint tests were performed prior to drilling the section.

Drilled down to first coring point in Melke and cored 2,1 m of shale. Melke was cored for rock mechanic purposes (for future development of the field). After core was recovered ,continued to drill with the drilling assembly down to top reservoir in Garn Formation. RIH with 180 ft core barrel. Garn Formation was cored in 4 coring runs. The first two runs had good recovery but poor ROP due to hard formations. Tried with a more durable bit in third core run without success, cored only 2.8 m.

Made up drilling BHA, with AST(Anti Stalling Tool) in string, and drilled from 4610 – 4743 m, down to top Ile fm. RIH with core assembly to core Ile Formation. Made 3 coring runs with following results: Core # 6: 10 m core, 100% recovery. Core # 7: 16,3 m core, 102 % recovery. Core # 8: 6 m core, 100% recovery. Made up drilling BHA and drilled hole from 4775 – 4893 m in two runs (bit worn out on both runs).

BIT RUNS

Bit run #8:

Drilled down to first coring point in Melke with 8 1/2" packed core point finder assembly. The BHA included roller reamers to reduce stick slip tendency. Drilled down to first coring point in Melke with average ROP 6 m/hr. Drilled with controlled ROP due to only one connection gas in annulus allowed (HPHT procedures).

Core run #9:

Cored from 4603 to 4606 m in Melke Formation before pressure dropped and torque flattened out. The plan was to cut 9 m core in Spekk/Melke at 4603 m, cut 2,1 m core (70%) recovery. Aluminium junk was found between blades on core head.

Bit Run#10:

The Lyng bit used in run#1 was rerun for drilling down to top Garn Formation. RIH with same BHA as previously but including additional Anti Stalling Tool(AST) above MWD.

Drilled 1 8 1/2" hole from 4606 m down to top reservoir (Garn Formation). When entering the Garn Formation the ROP dropped totally (bit was selected to drill shale fm above Garn).

Core run#11:

Cored from 4624 to 4658.4 m in Garn Formation. Core jammed. Cut 34,4 m core, 100% recovery.

Core run#12:

Cored from 4658.4 to 4671.4 m. Core jammed. Core bit 60% worn. Cut 13 m core, 103 % recovery. AST included. The torque variation was smoother as compared to the previous run without AST (ranged from 10.5 - 11.5 kNm instead of 8-13 kNm in previous run). No increase in ROP as compared to previous run was observed (due to AST tool).

Core run#13:

A more durable bit was selected for this bit run, but it proved to be wrong selection. Cored from 4671.4 to 4674.4 m. AST included. Core jammed. High torque were experienced throughout the run (25 kNm). Cut 2,8 m core, 94% recovery.

Core run#14:

Cored from 4674.4 to 4699.84 m. Coring started off with high torque but smoothed out gradually. Coring was terminated when a sudden drill break indicated formation change. Cut 25,4 m core, 100% recovery.

Bit run#15:

Ream and logged cored interval. Drilled to 4743, 10 m into Ile Formation. AST included. At first high stick-slip was experienced when increasing WOB, but once entering the operating window for the AST tool the torque smoothed out to a high constant level.

Core run #16:

Cored from 4743 to 4753.04 m. High torque where experienced at start followed by a decreasing trend. Severe bit damage. Cut 10,02 m, 100% recovery.

Core run#17:

Cored from 4753.04 to 4769.38 m. AST included. Torque variations, not able to establish stable parameters. Core jammed. Cut 25,4 m, 100% recovery.

Core run#18:

Cored 4769.38 to 4775.4 m. Observed pressure increase and reduced torque, indicating that the bit was packing off. Core jammed off. Cut 6 m, 100% recovery.

Bit run #19:

Reamed and logged cored interval before drilled down to 4843 m. Interval was drilled with high RPM (160) to reduce stick slip tendency. POOH to change bit. AST included.

Bit run#20:

Drilled well to TD at 4893 m. AST included. Drilled with 160 RPM, at reduced RPM stick-slip increased.

DRILLING FLUID

Increased MW from 1,78 sg. to 1,86 sg. prior to start drilling 8 1/2" hole.

MWD/BHA

Had problems with pulser on MWD tool at start of section but worked OK when BHA was out of casing.

LOGGING

Performed extensive Wireline logging:

Three first runs went as planned. The following logs were run: First a Sonic Scanner with AIT, then a CMR-IPLT-ECS run before a formation pressure only run was performed. Tight and supercharged formation was experienced. 8 good pressure measurements were made, all in the Garn and Ile Formations.

On WL run # 4 it was experienced tight hole, and tool got stuck during MDT sampling and MiniDST at 4746 m. Cut cable with electrical release mechanism and RIH with fishing string and retrieved fish at 4838 m. Max gas reading of 18% during fishing operation. Made a wiper trip with 8 1/2" BHA to circulate out hydrocarbons from the first miniDST and clean the hole for the following wire line program.

After 2 more WL runs with MDT/MiniDST & MDT Quicksilver Sampling, another wiper trip with 8 1/2" BHA was performed. Max gas of 19% during wiper trip. Installed Kelly Kock and Gray valve, hung off tool string and closed BOP. Tool string hung off for 2 days during welding operations for DST deck. After test deck was finished a wiper trip back to bottom was performed.

RIH for WL run # 7; MiniDST. Got stuck two times during sampling (at 4782 and 4692 m), but worked logging tool free both times. The reason for the stuck tools was solved by pumping out of the dual packers. This finding proved that the dual packers were not working as suspected when retracting the packers.

WL run # 8; VSP, was unsuccessful due to cable bridles not upgraded to new maintenance procedures. A failure in the Schlumberger follow up of the internal technical system.

WL run # 9; MDT. Got stuck during MiniDST in Tofte 2 fm at 4850 m. Tried to cut cable with electrical release mechanism without success. RIH with overshot and caught stuck miniDST with wire attached through side-entry sub. Pulled fish free with 11 ton over pull.

In order to have well control capability during fishing, a Schlumberger overshot was used together with a side entry sub to allow for floats in the string above side entry. Also avoided cut&thread of cable (during fishing operation in HPHT wells cut & thread of cable is not accepted due to lack of well control)

Made up 8 1/2" BHA and RIH drilled into the Tilje and Tofte Formation. Performed another four wire line runs to investigate Tofte and Tilje. The tool combinations that were run were, AIT-IPLT-DSI-HNGS, two MSCT runs and one VSP run.

A Capstan system and high tension cable was utilized for this logging job. This was used since the simulation of tension in the string showed that the weight of the MDT strings were on the limit for running a normal tension cable. The Capstan gave the extra force to easily pull free from any of the sticking zones. When stuck with the dual packer tool, however, the system was limited by the 8000lbs safe pull on the ECRD cable head. As a consequence the limit on the high tension cable was not reached and full benefit of the Capstan system was not achieved.

5.8 NO 6506/11-8, PERM P&A (07.07.2006 12:00)

START: 07.07.2006 12:00 4989.7 m MD

END : 16.07.2006 14:30 4989.7 m MD

OBJECTIVE

Permanently P&A the well.

SUMMARY

First operation was to plug 8 1/2" open hole and up into 9 7/8" liner with 2 cement plugs: Plug # 1 from TD at 4989.7 to 4691 m. Plug # 2 from 4691-4361 m. Set EZSV inside 14" casing at 2026m, displaced to 1,63 sg WBM and placed cement plug # 3 from 2026-1906 m. RIH with casing cutter, motor and MPT tool. Plan was to cut 14" casing and retrieve wear bushing in same operation, but cutting operation did not succeed due to ported sub was included in the BHA above the motor by mistake. Pulled out with wear bushing and lay down MPT tool. Cut casing and pulled seal assembly in two separate runs. Then gas was circulated out (max 38 %) and the 14" casing was pulled free with a casing spear.

Pumped down CST tool to 650 m and placed cement plug # 4 across 14" casing cut, from 855-656 m. Laid down pipe from derrick during 11 hour WOC. Pressure tested plug which had a small leak (pressure drop of 4bar/10min). Displaced to seawater, and pumped surface cement plug # 5 ,from 656-456 m. Squeezed cement until pressure drop was below 1bar/10min. Placed a soap pill in BOP, washed and pulled BOP. Engaged 2 guidelines and RIH with cutting assembly and MOST tool, to cut 20x30# casing and retrieve WH in same operation. At 349 m guidelines was observed to be tangled around cutting assembly. POOH to 20 m and pulled guidelines to surface. RIH without guidelines, and used ROV to help stabbing cutting assembly into WH. Attempted to cut 20x30" casing but with no success. When tool came to surface it showed to be missing the nozzle above knives. Installed a blind nozzle and RIH again. Cut 20x30" casing at 403 m, engaged MOST tool and pulled casing/conductor/PGB free with 40 T overpull. POOH with WH. Observed seabed with ROV.

This concluded the permanent P&A of the well.

5.9 Figures and tables

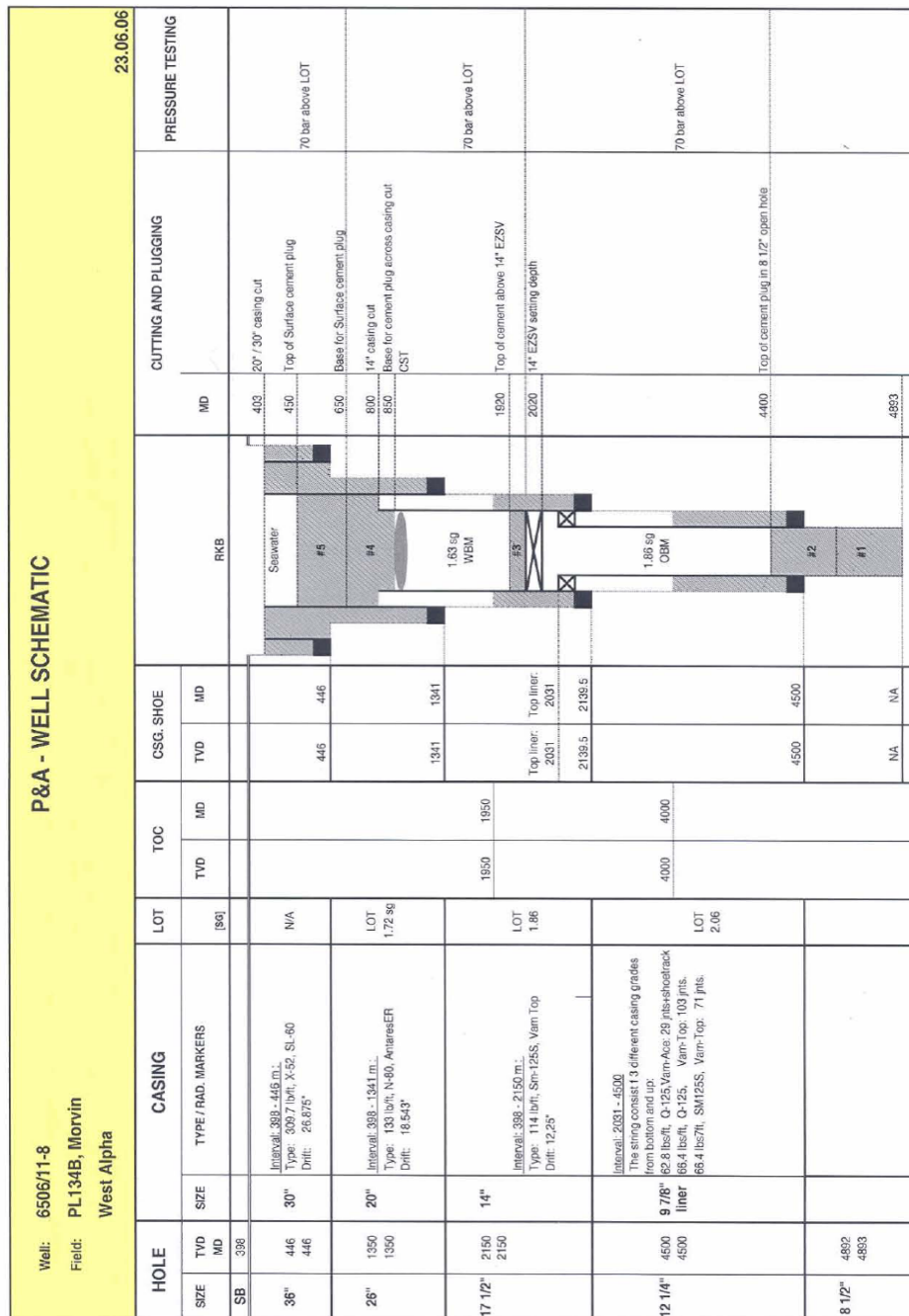
5.9.1 Well schematic

Figure 5.1 Well schematic

WELL SCHEMATIC									
Well: 6506/11-8 Field: PL 134B Morvin Rig: West Alpha									
HOLE SIZE	TVD MD	SIZE	Casing		LOT/ FIT	TOC		CSQ. SHOE	
			TYPE / I.D.	MARKERS		TVD	MD	TVD	MD
SB	300								
36"	446	30"	Interval 390 - 450 m. Type: 303.7 B/L, X-52, SL-40 C/P: 26.875"		N/A			446	446
28"	1350	20"	Interval 390 - 1350 m. Type: 133 B/L, 144.0, Antares C/P: 18.54"	1 x Blow type / 5 first joints Type: MN-ST A4	N/A			1341	1341
17 1/2"	2150	14"	Interval 390 - 2150 m. Type: 114 B/L, 5m-1255, Van Top	1 x Blow type / 5 first joints Type: MN-ST A4	LOT	1950	1950	2139.5	2139.5
12 1/4"	4600	9 7/8"	Interval 390 - 4600 m. Type: 114 B/L, 5m-1255, Van Top C/P: 8.900"	1 x Blow type / 5 first joints	FIT	4000	4000	Top Line 4600	4600
8 1/2"	4818	7"	Interval 4600 - 4818 m. Type: 32 B/L, P-110, Van Top C/P: 6.004"	1 x Spindle / heavy 2. joint COMMENT: An XLOT will be performed during the plug operation	FIT			4900	4900

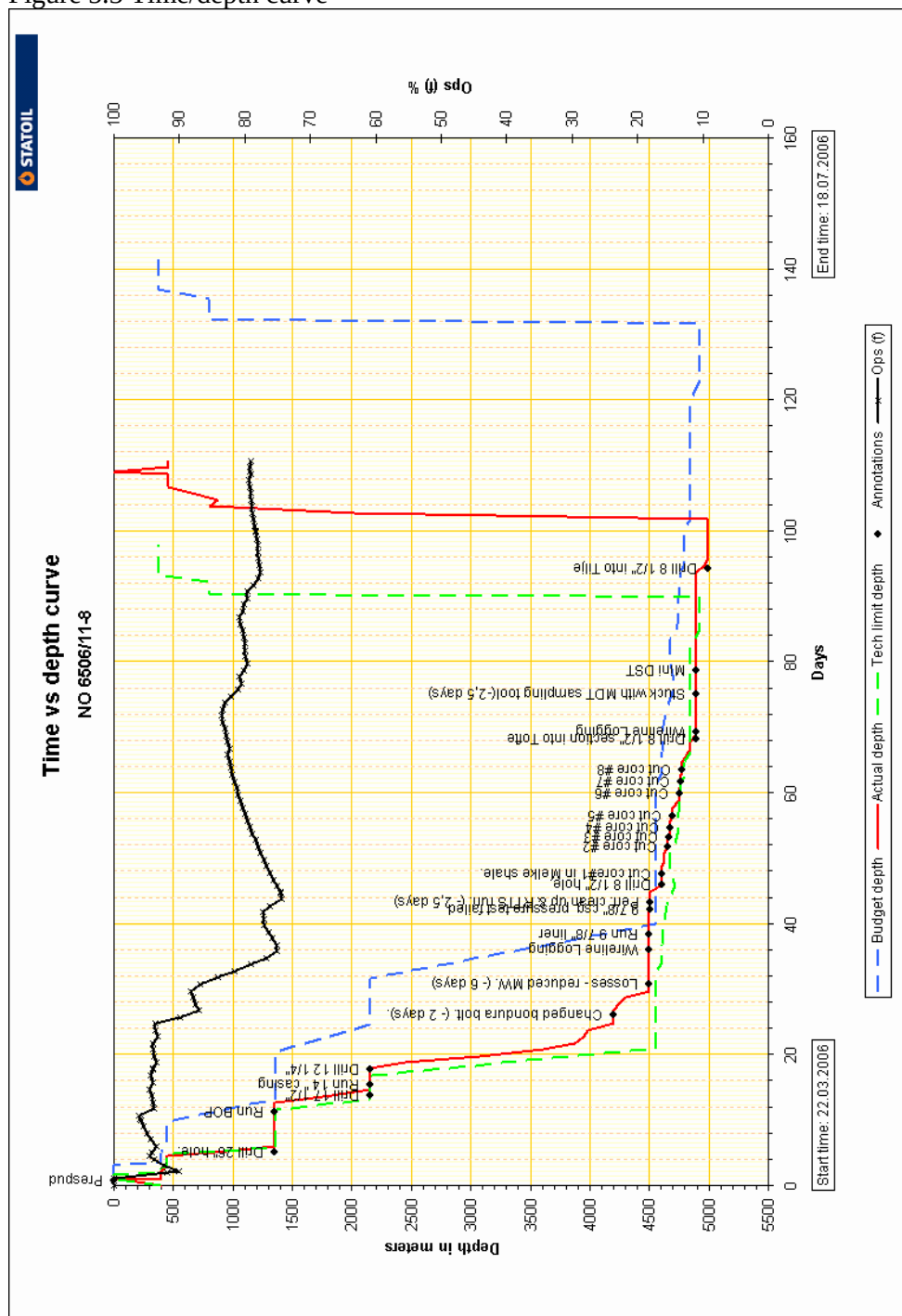
5.9.2 P&A wellbore schematic

Figure 5.2 P&A schematic



5.9.3 Time/depth curve

Figure 5.3 Time/depth curve



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5.9.4 Timeplanner

Table 5.1 Timeplanner

PROJECT NAME: 6506/11-8, Morvin (HPHT)
PROJECT NUMBER: T.O134A.AP.20700_MAIN

Start time	End time	Budget time hrs	Acc budget days	Tech limit hrs	Acc tech days	Plan time hrs	Act time hrs	Acc actual days	Down time	Description	Companies
22.03.2006 06:00	23.03.2006 07:00	80,0	3,3	42,0	1,8	37,0	25,0	1,0	0,0	MOVE [NO 6506/11-8]	
22.03.2006 06:00	22.03.2006 19:30	24,0	1,0	20,0	0,8	12,0	13,5	0,6	0,0	Rig in transit from Lavrans to Morvin	SeaDrill
22.03.2006 19:29	22.03.2006 19:30	8,0	1,3	7,0	1,1	6,0	0,0	0,6	0,0	Ballasting of rig	SeaDrill
22.03.2006 19:30	23.03.2006 07:00	48,0	3,3	15,0	1,8	19,0	11,5	1,0	0,0	Anchorhandling at location (coralls => extra care)	SeaDrill
23.03.2006 07:00	24.03.2006 08:30	43,0	1,8	22,0	0,9	24,0	25,5	1,1	4,5	PRESUPD [NO 6506/11-8]	
23.03.2006 07:00	23.03.2006 16:00	6,0	3,6	4,0	1,9	4,0	9,0	1,4	3,5	PU 5 7/8" HWDP dedicated landing string and R/B	SeaDrill,Geo
23.03.2006 16:00	23.03.2006 19:30	6,0	3,8	4,0	2,1	4,0	3,5	1,6	0,0	PU +/- 300 m(36 jnts) 5 7/8" DP and RB	Geo,SeaDrill
23.03.2006 19:30	24.03.2006 01:00	8,0	4,2	3,0	2,2	5,0	5,5	1,8	0,0	PU and MU cmt stand & DQ RT and RB same	SeaDrill,Geo
24.03.2006 01:00	24.03.2006 03:00	14,0	4,7	5,0	2,4	5,0	2,0	1,9	0,0	PU and MU 36" BHA (incl. 9 1/2" / 8" DC) and RIH	SeaDrill,Geo
24.03.2006 03:00	24.03.2006 08:30	9,0	5,1	6,0	2,7	6,0	5,5	2,1	1,0	PU and MU 5 7/8" DP (depending of ROV seabed survey)	SeaDrill,Geo,Ocean
24.03.2006 08:30	24.03.2006 15:00	24,0	6,1	5,0	2,9	6,0	6,5	2,4	0,0	Drill 36" hole to TD at 440m. Circulate hole clean. Displace to 1.40 SG mud.	SeaDrill,MI,Geo
24.03.2006 08:30	26.03.2006 17:30	111,0	4,6	53,0	2,2	62,0	57,0	2,4	1,0	36" [NO 6506/11-8]	
24.03.2006 15:00	24.03.2006 15:30	2,0	6,2	1,0	2,9	1,0	0,5	2,4	0,0	Drop check TDS	SeaDrill
24.03.2006 15:29	24.03.2006 15:30	7,0	6,5	3,0	3,0	3,0	0,0	2,4	0,0	POOH with 36" BHA.	SeaDrill,Geo
24.03.2006 15:30	24.03.2006 20:30	8,0	6,8	5,0	3,3	5,0	5,0	2,6	0,0	POOH and LD 36" HO module. Rack back DC and HWDP.	Geo,SeaDrill
24.03.2006 20:30	25.03.2006 03:00	25,0	7,9	10,0	3,7	12,0	6,5	2,9	0,5	Move PGB to moonpool. RU and RIH 30" conductor, WH and cement stinger.	SeaDrill,DQ,Geo,Weath
25.03.2006 03:00	25.03.2006 07:30	8,0	8,2	4,0	3,8	4,0	4,5	3,1	0,0	Run 30" conductor on 5 7/8" landing string. MU cmt stand.	DQ,Geo,SeaDrill,Weath
25.03.2006 07:30	25.03.2006 10:00	8,0	8,5	4,0	4,0	4,0	2,5	3,2	0,0	Circulate and pump and displace tuned light cement.	Hall,SeaDrill,Geo,DQ
25.03.2006 10:00	25.03.2006 15:30	6,0	8,8	6,0	4,3	6,0	5,5	3,4	0,0	WOC (not able to set conductor on bottom).	Geo,SeaDrill,Hall,DQ
25.03.2006 15:30	26.03.2006 06:00	6,0	9,0	4,0	4,4	4,0	14,5	4,0	0,5	Release RT and POOH with landing string.	Geo,Hall,DQ,SeaDrill

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Start time	End time	Budget time hrs	Acc budget days	Tech limit hrs	Acc tech days	Plan time hrs	Act time hrs	Acc actual days	Down time	Description	Companies
26.03.2006 05:59	26.03.2006 06:00	1,0	9,1	1,0	4,5	1,0	0,0	4,0	0,0	Make up remote cement head for 20" csg.	Hall,SeaDrill
26.03.2006 06:00	26.03.2006 14:30	8,0	9,4	5,0	4,7	6,0	8,5	4,4	0,0	MU and RIH with 26" BHA (MWD and motor).	BHI,BHI,Geo,SeaDrill
26.03.2006 14:30	26.03.2006 15:00	2,0	9,5	1,0	4,7	1,0	0,5	4,4	0,0	Held pre section/shallow gas meeting.	
26.03.2006 15:00	26.03.2006 15:30	3,0	9,6	2,0	4,8	8,0	0,5	4,4	0,0	RIH and MU 5 7/8" DP as required.(49 stands in derrick)	SeaDrill,Geo
26.03.2006 15:30	26.03.2006 17:30	3,0	9,7	2,0	4,9	1,0	2,0	4,5	0,0	Drill out cement and 30" shoe.	Geo,MI,SeaDrill,BHI,BHI
26.03.2006 17:30	01.04.2006 08:30	193,0	8,0	118,0	4,9	118,0	135,0	5,6	4,0	26" [NO 6506/11-8]	
26.03.2006 17:30	28.03.2006 00:30	81,0	13,1	20,0	5,7	20,0	31,0	5,8	3,5	Drill 26" hole to TD at +/- 1360 m with SW and Hi-vis pills.	Geo,MI,SeaDrill,BHI,BHI
28.03.2006 00:30	28.03.2006 05:30	6,0	13,4	4,0	5,9	4,0	5,0	6,0	0,0	Circulate hole clean. Displace to 1.3 SG mud. Drop check TDS.	BHI,Geo,MI,SeaDrill
28.03.2006 05:30	28.03.2006 14:30	15,0	14,0	8,0	6,2	8,0	9,0	6,4	0,0	POOH. R/B DC and HWD. L/D Motor and MWD.	SeaDrill,BHI,BHI,Geo
28.03.2006 14:30	28.03.2006 15:00	1,0	14,0	1,0	6,3	1,0	0,5	6,4	0,0	Pre job meeting	SeaDrill
28.03.2006 15:00	29.03.2006 23:00	31,0	15,3	25,0	7,3	25,0	32,0	7,7	0,5	RU and run 20" casing and 18 3/4" WH housing on 5 7/8" landing string.	DQ,Geo,SeaDrill,Weath
29.03.2006 23:00	30.03.2006 05:00	12,0	15,8	6,0	7,5	6,0	6,0	8,0	0,0	Circulate, pump and displace cement.	Geo,Hall,MI,SeaDrill
30.03.2006 05:00	30.03.2006 06:00	1,0	15,9	1,0	7,6	1,0	1,0	8,0	0,0	Release RT and rack cement head in derrick	Weath,SeaDrill,Hall,Geo,DQ
30.03.2006 06:00	30.03.2006 10:30	6,0	16,1	5,0	7,8	5,0	4,5	8,2	0,0	POOH. LD 18 3/4" RT and remote cement head.	SeaDrill,Weath,DQ,Geo
30.03.2006 10:30	01.04.2006 08:30	40,0	17,8	48,0	9,8	48,0	46,0	10,1	0,0	L/D 5" DP from derrick(10 hrs, 60 jnts). P/U 5 7/8" DP(24 hrs, 196 jnts). Prepare BOP.	Geo,SeaDrill,Weath,DQ
08.04.2006 15:00	11.04.2006 05:30	64,0	2,7	43,0	1,8	45,0	62,5	2,6	8,5	26" [NO 6506/11-8]	
08.04.2006 15:00	10.04.2006 12:00	44,0	19,6	30,0	11,0	30,0	45,0	12,0	7,5	RU and run BOP and riser. Land BOP. Ptest csg to 180 bar.	SeaDrill,Geo
10.04.2006 12:00	10.04.2006 20:00	10,0	20,0	6,0	11,3	6,0	8,0	12,3	1,0	RIH W/ BHA + 5 7/8" DP	Geo,SeaDrill
10.04.2006 20:00	11.04.2006 04:00	7,0	20,3	5,0	11,5	5,0	8,0	12,6	0,0	Drill out shoe track and 3 m new formation while displacing to 1.45 g/cm3 mud.	BHI,BHI,Geo,MI,SeaDrill
11.04.2006 04:00	11.04.2006 05:30	3,0	20,5	2,0	11,6	4,0	1,5	12,7	0,0	Perform LOT to 1.77 sg. Min req. 1.60 sg.	Hall,MI,BHI,BHI,Geo,SeaDrill
11.04.2006 05:30	16.04.2006 10:00	258,0	10,8	116,0	4,8	149,0	124,5	5,2	7,0	17 1/2" [NO 6506/11-8]	
11.04.2006 05:30	12.04.2006 22:30	100,0	24,6	40,0	13,3	40,0	41,0	14,4	1,0	Drill 17 1/2" hole to 2150 m (wipertrip in between if required)	BHI,BHI,Geo,MI,SeaDrill
12.04.2006 22:30	13.04.2006 02:00	43,0	26,4	10,0	13,7	10,0	3,5	14,6	0,0	Circ. hole clean. BU 3 times. POOH. Drop check TDS.	Geo,MI,SeaDrill
13.04.2006 02:00	13.04.2006 09:00	10,0	26,8	6,0	13,9	12,0	7,0	14,9	0,0	POOH. Dump MWD and rack back Vertitrak and MWD.	BHI,BHI,Geo,MI,SeaDrill
13.04.2006 09:00	13.04.2006 13:30	8,0	27,2	5,0	14,1	4,0	4,5	15,0	2,0	RIH with MPT and pulled bore protector (1 misrun). MU cmt stand and rack back.	DQ,Geo,SeaDrill
13.04.2006 13:30	13.04.2006 19:30	1,0	27,2	1,0	14,2	1,0	6,0	15,3	0,0	Waited for csg crew. RU to run 14" casing.	
13.04.2006 19:30	14.04.2006 16:30	33,0	28,6	20,0	15,0	35,0	21,0	16,2	1,0	RIH with 14" csg on 5 7/8" landing string.	Geo,SeaDrill,Weath

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14.04.2006 16:30	14.04.2006 17:30	2,0	28,7	1,0	15,0	1,0	1,0	16,2	0,0	Change handling equipment and MU 14" csg hanger.	Geo,SeaDrill,Weath
14.04.2006 17:30	14.04.2006 21:00	5,0	28,9	4,0	15,2	4,0	3,5	16,4	0,0	Continue RIH on 5 7/8" HWDP landing string. PU cmt stand and land csg.	DQ,Geo,Hall,SeaDrill,Weath
14.04.2006 21:00	15.04.2006 01:30	6,0	29,1	4,0	15,4	5,0	4,5	16,5	0,0	Circulate BU. Pump and displace spacer and cement.	Hall,Geo,SeaDrill
15.04.2006 01:30	15.04.2006 07:00	8,0	29,5	4,0	15,5	7,0	5,5	16,8	0,0	Set & pressure test seal assy to 545 bar. Pressure test BOP.	Geo,SeaDrill
15.04.2006 07:00	15.04.2006 09:30	3,0	29,6	2,0	15,6	3,0	2,5	16,9	0,0	POOH with landing string and LD cmt stand.	Geo,SeaDrill
15.04.2006 09:30	15.04.2006 15:00	6,0	29,8	5,0	15,8	4,0	5,5	17,1	3,0	RIH and set wear bushing. POOH.	Geo,SeaDrill
15.04.2006 15:00	15.04.2006 18:30	16,0	30,5	3,0	16,0	10,0	3,5	17,3	0,0	LD 17 1/2" BHA and MU 12 1/4" BHA.	BHI,BHI,Geo,Hall,SeaDrill
15.04.2006 18:30	16.04.2006 04:00	10,0	30,9	6,0	16,2	6,0	9,5	17,6	0,0	RIH with 12 1/4" BHA (press. test 14" csg to 545 Bar against SR). Perform kick exercises.	BHI,BHI,Geo,SeaDrill
16.04.2006 04:00	16.04.2006 07:30	4,0	31,1	3,0	16,3	4,0	3,5	17,8	0,0	Drill out cmt/shoetrack and 3 m new formation.	BHI,BHI,Geo,MI,SeaDrill
16.04.2006 07:30	16.04.2006 10:00	3,0	31,2	2,0	16,4	3,0	2,5	17,9	0,0	Circulate hole clean and perform FIT (1.87 sg).	BHI,BHI,Geo,MI,SeaDrill
16.04.2006 10:00	13.05.2006 09:30	722,0	30,1	391,0	16,3	577,0	647,5	27,0	246,5	12 1/4" [NO 6506/11-8]	
16.04.2006 10:00	17.04.2006 01:00	10,0	31,6	8,0	16,8	8,0	15,0	18,5	4,0	Displace the well to 1,70 sg. OBM.	SeaDrill,BHI,BHI,Geo,MI
17.04.2006 01:00	20.04.2006 22:30	200,0	40,0	100,0	20,9	100,0	93,5	22,4	6,5	Drill 12 1/4" hole to 3955 m.	BHI,BHI,Geo,MI,SeaDrill
20.04.2006 22:30	22.04.2006 03:00	0,0	40,0	20,0	21,8	26,0	28,5	23,6	0,5	POOH to change bit. RIH.	MI,Geo,BHI,SeaDrill,BHI
22.04.2006 03:00	23.04.2006 04:30	65,0	42,7	0,0	21,8	60,0	25,5	24,7	0,0	Continue drill 12 1/4" hole to 4200 m.	SeaDrill,BHI,BHI,Geo,MI
23.04.2006 04:30	25.04.2006 06:00	0,0	42,7	0,0	21,8	24,0	49,5	26,7	46,5	Circulate hole clean. POOH to shoe. Change Bondura bolt. RIH to TD.	SeaDrill
25.04.2006 06:00	26.04.2006 21:00	0,0	42,7	25,0	22,8	30,0	39,0	28,4	0,0	POOH and change bit and Vertitrak. RIH.	MI,Geo,BHI,SeaDrill,BHI
26.04.2006 20:59	26.04.2006 21:00	13,0	43,2	0,0	22,8	13,0	0,0	28,4	0,0	Continue drill 12 1/4" hole to 4239 m.	BHI,BHI,Geo,MI,SeaDrill
26.04.2006 21:00	28.04.2006 04:30	87,0	46,8	0,0	22,8	36,0	31,5	29,7	1,0	Continue drill 12 1/4" hole to +/- 4560 m (12 1/4" TD).	BHI,BHI,Geo,MI,SeaDrill
28.04.2006 04:30	28.04.2006 17:30	20,0	47,7	15,0	23,4	20,0	13,0	30,2	0,0	Circulate hole clean and POOH. Rack back Vertitrak and MWD.	MI,SeaDrill,Geo,BHI,BHI
28.04.2006 17:30	30.04.2006 00:00	0,0	47,7	0,0	23,4	12,0	30,5	31,5	30,5	Static mud loss. Fill baseoil in riser. Pump LCM pill. Reduce MW.	MI,Geo,BHI,SeaDrill,BHI
30.04.2006 00:00	30.04.2006 14:30	10,0	48,1	8,0	23,8	13,0	14,5	32,1	14,5	POOH to 1500 m. Reduce MW to 1,76 sg.	SeaDrill,DQ
30.04.2006 14:30	05.05.2006 02:30	0,0	48,1	0,0	23,8	60,0	108,0	36,6	89,0	RIH and displace well to 1,78 sg in steps. POOH and L/D BHA. Test BOP.	SeaDrill,DQ,Hall
05.05.2006 02:30	05.05.2006 05:00	1,0	48,1	1,0	23,8	1,0	2,5	36,7	0,0	Rig up for WL.	Schlum,Geo,SeaDrill
05.05.2006 05:00	05.05.2006 18:30	19,0	48,9	12,0	24,3	13,0	13,5	37,3	0,0	Run WL run #1 : AIT-IPLT-DSI	MI,Schlum,Geo,SeaDrill,Hall
05.05.2006 18:30	05.05.2006 20:30	1,0	49,0	1,0	24,3	1,0	2,0	37,3	0,0	Rig down WL equipment.	MI,Geo,BHI,SeaDrill,BHI,Hall
05.05.2006 20:30	05.05.2006 22:00	2,0	49,0	1,0	24,4	1,0	1,5	37,4	0,0	MU cmt stand for liner hanger.	Schlum,Geo,SeaDrill

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05.05.2006 22:00	06.05.2006 01:30	4,0	49,2	2,0	24,5	3,0	3,5	37,5	0,0	RU to RIH with 9 7/8" liner.	DQ,Geo,SeaDrill,Weath,MI, Hall
06.05.2006 01:30	07.05.2006 13:00	80,0	52,5	20,0	25,3	40,0	35,5	39,0	0,0	RIH with +/- 2500 m 9 7/8" liner.	Geo,DQ,MI,SeaDrill,Weath
07.05.2006 13:00	07.05.2006 14:30	4,0	52,7	2,0	25,4	3,0	1,5	39,1	0,0	Change handling equipment and PU DQ liner hanger.	MI,Geo,SeaDrill,Weath,DQ
07.05.2006 14:30	08.05.2006 11:00	25,0	53,8	21,0	26,3	8,0	20,5	39,9	0,0	Continue RIH with 9 7/8" liner on 5 7/8" landing string.	Geo,SeaDrill,Weath,MI
08.05.2006 11:00	08.05.2006 20:00	5,0	54,0	1,0	26,3	3,0	9,0	40,3	4,5	PU cmt stand. Circulate, drop ball and set liner hanger slips.	MI,Geo,SeaDrill,Weath,Hall, DQ
08.05.2006 20:00	08.05.2006 23:30	7,0	54,3	6,0	26,5	3,0	3,5	40,5	0,0	Pump and displace cmt.	Hall,SeaDrill,Geo
08.05.2006 23:30	09.05.2006 08:00	17,0	55,0	14,0	27,1	10,0	8,5	40,8	0,0	Set linerhanger packer. POOH and LD cmt stand and RT.	SeaDrill,Geo,DQ
09.05.2006 08:00	10.05.2006 03:30	17,0	55,7	14,0	27,7	18,0	19,5	41,6	1,0	L/D BHA and cmt stand. Perform DROPS. Maintenance. MU kick assy's w/ KC. Pressure test well control equipment.	Geo,SeaDrill,DQ
10.05.2006 03:30	11.05.2006 09:00	0,0	55,7	0,0	27,7	20,0	29,5	42,9	24,0	RIH 8 1/2" clean out BHA. Drill out shoe and perform FIT to 2.10 sg. POOH.	Geo,SeaDrill
11.05.2006 09:00	12.05.2006 09:30	0,0	55,7	24,0	28,7	24,0	24,5	43,9	24,5	RIH w/ 9 7/8" RTTS and pressure test liner packer and csg. POOH.	Geo,SeaDrill
12.05.2006 09:29	12.05.2006 09:30	15,0	56,3	1,0	28,8	0,0	0,0	43,9	0,0	RIH with BOP test tool and pressure test BOP/surface system. POOH.	Geo,SeaDrill
12.05.2006 09:30	12.05.2006 22:30	47,0	58,3	35,0	30,2	15,0	13,0	44,4	0,0	MU & RIH with 8 1/2" BHA.	BHI,BHI,Geo,SeaDrill
12.05.2006 22:30	13.05.2006 04:30	25,0	59,3	21,0	31,1	6,0	6,0	44,7	0,0	Displace well to +/- 1.86 SG at TD.	BHI,BHI,Geo,MI,SeaDrill
13.05.2006 04:30	13.05.2006 09:30	30,0	60,5	25,0	32,1	6,0	5,0	44,9	0,0	Perform well control exercises and fingerprinting.	BHI,Geo,SeaDrill,MI
13.05.2006 09:29	13.05.2006 09:29	15,0	61,2	12,0	32,6	0,0	0,0	44,9	0,0	Drill shoe and 3 m fm. Circulate and adjust MW. (Already done)	BHI,BHI,Geo,MI,SeaDrill
13.05.2006 09:29	13.05.2006 09:30	3,0	61,3	2,0	32,7	0,0	0,0	44,9	0,0	Perform FIT to 2.10 SG. (Already done)	Geo,SeaDrill,Hall
13.05.2006 09:30	07.07.2006 12:00	1613,0	67,2	1327,0	55,3	1007,0	1322,5	55,1	246,0	8 1/2" [NO 6506/11-8]	
13.05.2006 09:30	15.05.2006 02:30	37,0	62,8	30,0	34,0	35,0	41,0	46,6	0,0	Drill 8 1/2" into top Melke/Spekk formation. POOH.	BHI,BHI,Geo,MI,SeaDrill
15.05.2006 02:30	16.05.2006 19:00	84,0	66,3	69,0	36,8	30,0	40,5	48,3	0,0	RIH with 30 ft core barrel. PU 5 7/8" 5 7/8" sinlges. Cut Core#1. Trip out w/core.	Geo,Hall,MI,SeaDrill
16.05.2006 19:00	17.05.2006 06:00	15,0	67,0	12,0	37,3	18,0	11,0	48,7	0,0	Rack back core assy. RIH w/8 1/2" drilling BHA (w/AST tool).	BHI,BHI,Geo,MI,Hall,SeaDrill
17.05.2006 06:00	18.05.2006 11:30	60,0	69,5	49,0	39,4	35,0	29,5	50,0	0,0	Drill 8 1/2" into top Garn formation, top reservoir. POOH.	BHI,BHI,Geo,MI,SeaDrill
18.05.2006 11:30	18.05.2006 17:00	10,0	69,9	8,0	39,7	8,0	5,5	50,2	0,0	M/U and RIH with 180 ft core barrel to approx. 2000 m.	MI,Geo,BHI,SeaDrill,BHI
18.05.2006 17:00	19.05.2006 00:30	10,0	70,3	8,0	40,0	8,0	7,5	50,5	0,0	Test BOP and surface equipment on the way in.	Geo,BHI,MI,BHI,SeaDrill

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19.05.2006 00:30	20.05.2006 22:30	64,0	73,0	69,0	42,9	50,0	46,0	52,4	0,0	Continue RIH with 180 ft core barrel. Cut Core#2. Trip out w/core.	Geo,Hall,MI,SeaDrill
20.05.2006 22:30	22.05.2006 11:30	84,0	76,5	69,0	45,8	50,0	37,0	54,0	0,0	RIH with 180 ft core barrel. Cut Core#3. Trip out w/ core.	SeaDrill,MI,Hall,Geo
22.05.2006 11:30	23.05.2006 22:00	84,0	80,0	69,0	48,7	50,0	34,5	55,4	0,0	RIH with 180 ft core barrel. Cut Core#4. Trip out w/ core.	SeaDrill,MI,Hall,Geo
23.05.2006 22:00	25.05.2006 15:30	84,0	83,5	69,0	51,5	0,0	41,5	57,1	0,0	RIH with 90 ft core barrel. Cut Core#5. Trip out w/ core.	SeaDrill,MI,Hall,Geo
25.05.2006 15:30	26.05.2006 08:30	19,0	84,3	16,0	52,2	12,0	17,0	57,8	0,0	Rack back core BHA. RIH 8 1/2" drilling BHA.	BHI,BHI,Geo,MI,SeaDrill
26.05.2006 08:30	27.05.2006 14:30	60,0	86,8	49,0	54,3	25,0	30,0	59,1	0,0	Drill 8 1/2" hole to next Core point (top Ile). POOH.	BHI,BHI,Geo,MI,SeaDrill
27.05.2006 14:30	29.05.2006 03:30	84,0	90,3	69,0	57,1	45,0	37,0	60,6	0,0	RIH with 90 ft core barrel. Cut Core#6. Trip out w/ core.	Geo,Hall,MI,SeaDrill
29.05.2006 03:30	30.05.2006 22:30	84,0	93,8	69,0	60,0	45,0	43,0	62,4	0,0	RIH with 90 ft core barrel. Cut Core #7. Trip out w/ core.	Geo,Hall,MI,SeaDrill
30.05.2006 22:30	01.06.2006 17:30	0,0	93,8	45,0	61,9	45,0	43,0	64,2	0,0	RIH with 90 ft core barrel. Cut Core #8. Trip out w/ core.	MI,Geo,Hall,SeaDrill
01.06.2006 17:30	02.06.2006 21:30	22,0	94,7	8,0	62,2	19,0	28,0	65,4	0,0	RIH with 8 1/2" BHA. Test BOP and surface equipment.	BHI,Geo,MI,SeaDrill,BHI
02.06.2006 21:30	06.06.2006 09:00	138,0	100,4	61,0	64,8	40,0	83,5	68,9	9,5	Drill 8 1/2" hole to section TD at approx 4896 m, including bit trip.	BHI,BHI,Geo,MI,SeaDrill
06.06.2006 09:00	07.06.2006 10:30	27,0	101,5	30,0	66,0	20,0	25,5	69,9	0,0	Circulate well clean and POOH.	BHI,BHI,Geo,MI,SeaDrill
07.06.2006 10:30	07.06.2006 15:30	1,0	101,6	1,0	66,0	8,0	5,0	70,1	0,0	Rig up for wireline logging.	Geo,Schlum,SeaDrill
07.06.2006 15:30	08.06.2006 04:30	10,0	102,0	10,0	66,5	10,0	13,0	70,7	0,0	WL run #1 :MSIP-AIT-GR	Geo,Schlum,SeaDrill
08.06.2006 04:30	08.06.2006 20:00	16,0	102,7	10,0	66,9	10,0	15,5	71,3	0,0	WL run #2 : IPLT-CMR (BVF Mode)	SeaDrill,Schlum,Geo
08.06.2006 20:00	09.06.2006 21:00	19,0	103,5	12,0	67,4	12,0	25,0	72,4	0,0	WL run #3 : MDT trykk	SeaDrill,Schlum,Geo
09.06.2006 21:00	13.06.2006 06:00	35,0	104,9	16,0	68,0	22,0	81,0	75,7	63,5	WL run #4: MDT sampling. Tool stuck. Pull cable.	Geo,Schlum,SeaDrill
13.06.2006 06:00	14.06.2006 00:00	0,0	104,9	0,0	68,0	0,0	18,0	76,5	13,0	Perform fishing run.	Geo,SeaDrill,Schlum
14.06.2006 00:00	15.06.2006 13:30	36,0	106,4	36,0	69,5	36,0	37,5	78,0	0,5	Wiper trip.	Geo,SeaDrill
15.06.2006 13:30	16.06.2006 21:00	153,0	112,8	20,0	70,4	26,0	31,5	79,4	31,0	WL run #5: MDT Mini DST (unable to set packer)	Geo,Schlum,SeaDrill
16.06.2006 21:00	18.06.2006 13:30	35,0	114,3	30,0	71,6	25,0	40,5	81,0	2,0	WL run #6. MDT Quick Silver sampling	SeaDrill,Geo,Schlum
18.06.2006 13:30	20.06.2006 13:00	10,0	114,7	36,0	73,1	18,0	47,5	83,0	7,5	RIH with BHA. Test BOP. Perform wiper trip to TD. Pull inside csg.	Geo,SeaDrill
20.06.2006 13:00	22.06.2006 13:00	48,0	116,7	48,0	75,1	48,0	48,0	85,0	0,0	Test deck preparations.	SeaDrill,Geo
22.06.2006 13:00	23.06.2006 17:00	36,0	118,2	12,0	75,6	28,0	28,0	86,2	0,0	Wipertrip.	Geo,SeaDrill
23.06.2006 17:00	25.06.2006 11:00	0,0	118,2	16,0	76,3	26,0	42,0	87,9	12,0	WL run #7: Mini DST + HC samples	Geo,Schlum,SeaDrill
25.06.2006 11:00	26.06.2006 01:00	15,0	118,8	10,0	76,7	10,0	14,0	88,5	10,0	WL run #8: VSP (Zero Offset)	Schlum,Geo,SeaDrill
26.06.2006 01:00	28.06.2006 22:00	0,0	118,8	10,0	77,1	30,0	69,0	91,4	38,5	WL run #9 : MiniDST (infill). Stuck tool - not able to release EL weak point.	Geo,Schlum,SeaDrill
28.06.2006 22:00	30.06.2006 14:30	0,0	118,8	36,0	78,6	18,0	40,5	93,1	40,5	RIH and fish mini-DST tool on DP. POOH with DP and WL.	Geo,SeaDrill,Schlum
30.06.2006 14:30	01.07.2006 11:30	23,0	119,8	84,0	82,1	20,0	21,0	94,0	3,5	MU 8 1/2" BHA and RIH.	Geo,SeaDrill,BHI
01.07.2006 11:30	02.07.2006 13:00	80,0	123,1	70,0	85,0	50,0	25,5	95,0	0,0	Drill 8 1/2" hole into Tilje Fm. (approx. 100 m)	Geo,SeaDrill,BHI

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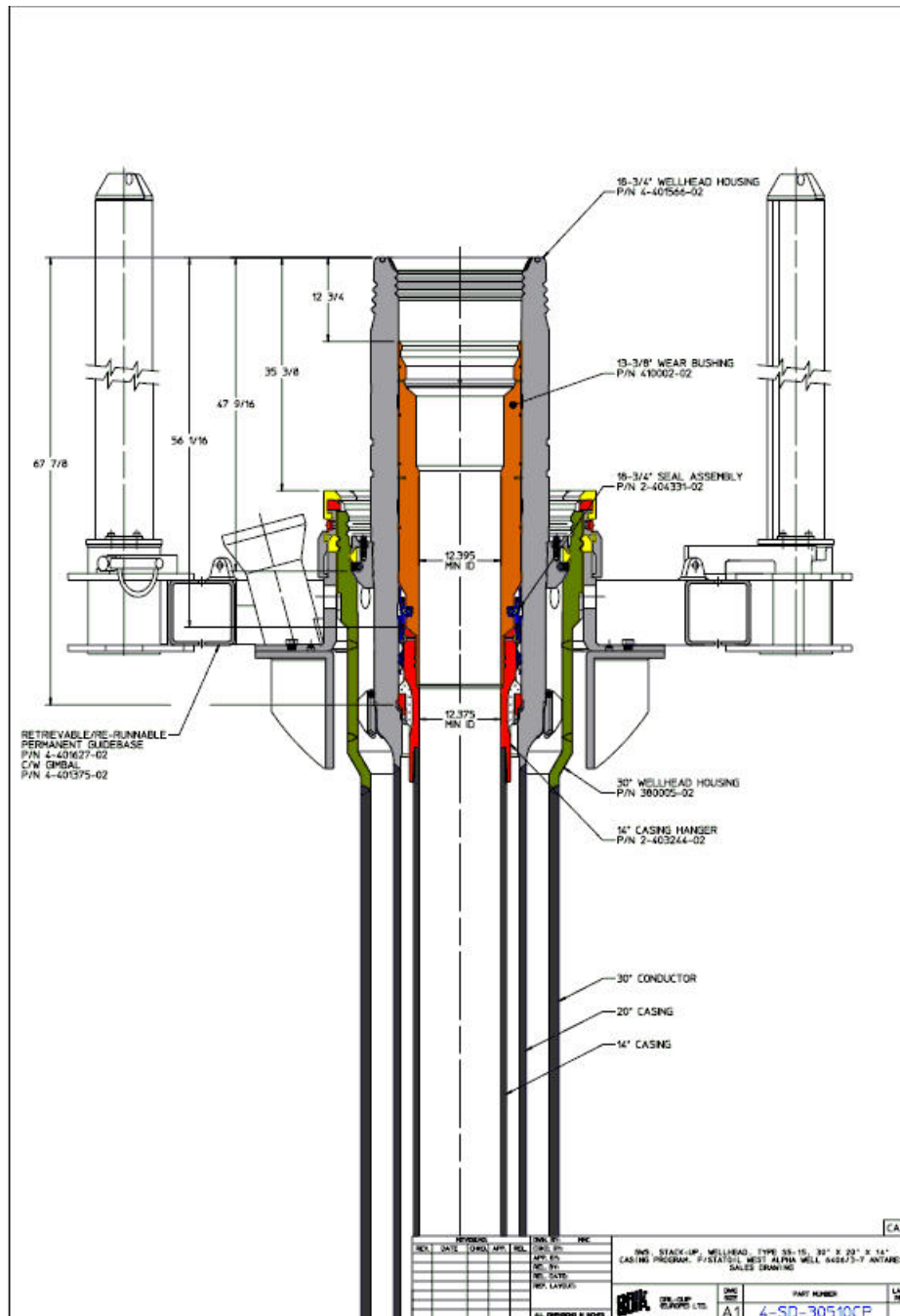
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02.07.2006 13:00	03.07.2006 21:00	17,0	123,8	17,0	85,8	17,0	32,0	96,4	1,5	POOH and LD 8 1/2" BHA. Test BOP.	Geo,BHI,Hall
03.07.2006 21:00	04.07.2006 23:00	12,0	124,3	12,0	86,3	12,0	26,0	97,4	13,0	WL run #10 : AIT-IPLT-DSI-GR-ECRD	Geo,SeaDrill,Schlum
04.07.2006 23:00	05.07.2006 23:00	36,0	125,8	16,0	86,9	16,0	24,0	98,4	0,0	WL run #11 : MSCT	Schlum,Geo,SeaDrill
05.07.2006 23:00	06.07.2006 13:30	12,0	126,3	12,0	87,4	12,0	14,5	99,0	0,0	WL run #12 : VSI-GR	Geo,Schlum
06.07.2006 13:29	06.07.2006 13:30	14,0	126,9	0,0	87,4	0,0	0,0	99,0	0,0	WL run #13 : Optional MDT Dual packer	Geo,Schlum
06.07.2006 13:29	06.07.2006 13:30	24,0	127,9	10,0	87,8	0,0	0,0	99,0	0,0	Fishing run - Mini-DST tool (optional)	Geo,SeaDrill,Schlum
06.07.2006 13:30	07.07.2006 08:00	15,0	128,5	0,0	87,8	14,0	18,5	99,8	0,0	WL run #12A: MSCT	Schlum,Geo
07.07.2006 08:00	07.07.2006 12:00	0,0	128,5	4,0	88,0	4,0	4,0	100,0	0,0	RD WL equipment and capstan unit.	Geo,SeaDrill,Schlum
07.07.2006 12:00	16.07.2006 14:30	304,0	12,7	211,0	8,8	171,0	218,5	9,1	22,0	PERM P&A [NO 6506/11-8]	
07.07.2006 12:00	08.07.2006 09:00	20,0	129,3	12,0	88,5	20,0	21,0	100,9	0,0	PU and RIH with 3 1/2" cmt stinger to TD. Circulate BU and condition mud.	Geo,SeaDrill
08.07.2006 09:00	09.07.2006 08:00	31,0	130,6	25,0	89,5	15,0	23,0	101,8	2,0	Plug back open hole with cement. POOH. LD 3 1/2" DP.	SeaDrill,Hall,Geo
09.07.2006 08:00	09.07.2006 13:30	15,0	131,3	10,0	90,0	10,0	5,5	102,0	0,0	RIH with 14" EZSV on 5 7/8" DP / press. test cement plug.	Hall,SeaDrill,Geo
09.07.2006 13:30	10.07.2006 07:00	12,0	131,8	1,0	90,0	10,0	17,5	102,8	2,0	Set 14" EZSV. Press. test same. Displace well to 1.60 SG WBM. Place 100m cmt plug . POOH.	Hall,MI,SeaDrill,Geo
10.07.2006 07:00	11.07.2006 00:00	15,0	132,4	10,0	90,4	10,0	17,0	103,5	3,5	RIH with cutting assy and MPT. Engage WB. Cut 14" csg. POOH with assy anfd WB.	DQ,SeaDrill,Weath,Geo
11.07.2006 00:00	11.07.2006 04:00	9,0	132,8	6,0	90,7	6,0	4,0	103,6	0,0	RIH. Pull seal ass. POOH.	SeaDrill,DQ,Geo
11.07.2006 04:00	11.07.2006 12:30	9,0	133,1	6,0	90,9	6,0	8,5	104,0	0,0	RIH with spear assembly. Engage spear and pick up casing..	SeaDrill,Weath,Weath,Geo
11.07.2006 12:30	12.07.2006 01:00	15,0	133,8	10,0	91,3	10,0	12,5	104,5	0,0	POOH and LD 14" csg.	SeaDrill,Weath,Weath,Geo
12.07.2006 01:00	12.07.2006 20:00	23,0	134,7	19,0	92,1	18,0	19,0	105,3	0,0	RIH and and drop CST. Set cmt plug. WOC. Pressure test.	Hall,SeaDrill,Geo
12.07.2006 20:00	13.07.2006 04:30	18,0	135,5	1,0	92,2	10,0	8,5	105,7	2,0	Displace well to SW. Place surface cement plug.	Hall,MI,SeaDrill,Geo
13.07.2006 04:30	15.07.2006 10:00	33,0	136,8	25,0	93,2	30,0	53,5	107,9	1,0	Wash BOP. WOW. Pull Riser/BOP.	SeaDrill,Ocean
15.07.2006 09:59	15.07.2006 10:00	74,0	139,9	61,0	95,8	2,0	0,0	107,9	0,0	L/D remaining DP, DC and cutting assembly	SeaDrill,Weath
15.07.2006 10:00	16.07.2006 08:00	25,0	141,0	21,0	96,6	20,0	22,0	108,8	11,5	RIH with MOST cutting assy. Cut 20"x30" csg. Pull WH and PGB. POOH.	DQ,SeaDrill,Weath,Ocean
16.07.2006 08:00	16.07.2006 14:30	5,0	141,2	4,0	96,8	4,0	6,5	109,1	0,0	L/D WH, PGB and cutting assembly	DQ,SeaDrill,Weath
16.07.2006 14:30	18.07.2006 06:00	37,0	1,5	30,0	1,2	30,0	39,5	1,6	4,0	MOVE [NO 6506/11-8]	
16.07.2006 14:30	18.07.2006 06:00	37,0	142,7	30,0	98,0	30,0	39,5	110,7	4,0	Anchor handling.	Ocean,SeaDrill
18.07.2006 15:30	18.07.2006 15:30		142,7	0,0	98,0	0,0	0,0	110,7	0,0	END OF OPERATIONS	

5.9.5 Wellhead system

Figure 5.4 Wellhead system schematic



5.9.6 Drilling fluids

Figure 5.5 Summary of drilling fluids program

DRILLING FLUIDS PROGRAMME

Well: 6506/11-8
Field: PL 134B Morvin
Rig: West Alpha

HOLE	SIZE	CASING	MUD TYPE	MW	LGS	10 sec.	10 min.	Flow 100 gpm	Flow 3 gpm	O/W ratio	PV [mPa]	APV [Pa]	H/TP [Pa]	MBF [Pa/s]	pH	Kd [Pa/s]	Glyc. [%]	ES	Rheol. Visc. [Pa]	Usage Volume [m³]	
SIZE	MD	100 MD	MD	MD	[Pa]	[Pa]	[Pa]	[Pa]	[Pa]	[Pa]	[Pa]	[Pa]	[Pa]	[Pa]	[Pa]	[Pa]	[Pa]	[Pa]	[Pa]	[Pa]	
30"	448	30"	448	30"	448	448	448	30"	448	30"	448	30"	448	30"	448	30"	448	30"	448	30"	448
COMMENTS: Ref. M. Operational Procedures - Rev. 9 - 15.11.02 This section will be drilled using seawater based fluids. 200 m³ of 1.40 g/l fluid must be prepared for the top hole sections. At least 60 m³ must be ready prior to start drilling 30" section. Mix hole bentonite mud according to programme specifications. Pump 8 - 10 m³ hole fluid every 15 m. ATTD the hole will be displaced by pumping 1.3 - 1.5 times the hole volume. Add 3 - 5 kg/m³ of CMC-BHV to the displacement fluid in order to provide extra fluid loss control. If a viscosity is performed, a 30 m³ hole bentonite fluid will be swept around the hole, before the hole is displaced to 1.40 g/l mud.	26"	1341	1341	26"	1341	1341	1341	26"	1341	26"	1341	26"	1341	26"	1341	26"	1341	26"	1341	26"	1341
COMMENTS: Ref. M. Operational Procedures - Rev. 9 - 15.11.02 This section will be drilled using seawater based fluids. 300 m³ of 1.40 g/l fluid must be prepared for the top hole sections. At least 60 m³ must be ready prior to start drilling 26" section. Mix hole bentonite mud according to programme specifications. Pump 8 - 10 m³ hole fluid every 15 m. ATTD the hole will be displaced by pumping 1.3 - 1.5 times the hole volume. At this stage the 1st mud will be drilled back for this purpose. Add 3 - 5 kg/m³ of CMC-BHV to the displacement fluid in order to provide extra fluid loss control. If a viscosity is performed, a 30 m³ hole bentonite fluid will be swept around the hole, before the hole is displaced to 1.30 g/l mud. As a contingency in case bulk Bentonite can not be used, or time do not allow to mix Bentonite mud, 14-15 kg/m³ CMC-BHV is a suitable viscosity alternative.	17 1/2"	2130.0	2130.0	17 1/2"	2130.0	2130.0	2130.0	17 1/2"	2130.0	17 1/2"	2130.0	17 1/2"	2130.0	17 1/2"	2130.0	17 1/2"	2130.0	17 1/2"	2130.0	17 1/2"	2130.0

COMMENTS: Ref. M. Operational Procedures - Rev. 9 - 15.11.02
The Glycol VSM will be used on this section. Drill out cement using seawater based fluids. Sweep from previous section and displace to Glycol prior to drilling out the show. Prepare the surface volume with Sodium Bicarbonate and treat returns with Citric Acid and Sodium Bicarbonate to counteract cement contamination. Adjust KOH concentration to upper part of specification and Glycol content to 4 - 4.5 % before drilling into Borehole formation. Ensure good circulation while drilling to prevent solids build up in the system. Permit a minimum of 30 min on KOH content to counteract degradation from cuttings drilled. Rheology and APV fluid loss will be kept in the mid range of the programmed specs. during drilling. Optimize the solids equipment at all times for the same purpose.
If losses occur, pump LCM material according to separate contingency plan. LCM material on the rig will be reported on the CER.
NOTE: LGS concentration, Glycol content and weight and volume of slips will be reported on the CER.

DRILLING FLUIDS PROGRAMME																					
6506/11-8 PL 134B Morvin West Alpha																					
SIZE	HOLE TD MD	CASING		MUD TYPE	MW [kg]	LOS [K/gal]	10 sec. [Pa]	10 min. P/H	RPM 100 rpm	RPM 3 rpm	O/W ratio	PV [mPa]	API PL [m]	H-THP PL [m]	MBE [K/gal]	pH	Kd [K/gal]	Glys. [%]	ES	Rumel Visc. [Pa]	Usage Volume [m³]
		SIZE	MD																		
12 1/4"	4500	9 7/8"	4000	Perforation COM	1.30 1.60	<200	<5	<15	<30	9 -	75:25 -	stop		<3					<600		627
COMMENTS: Ref. M: Operational Procedures - Rev. 9 - 15.11.05; Drill out cement and take RTT with Glydri mud from last section. Displace to 1.70 gal Perforation COM and drill 12 1/4" hole. Condition the mud according to programmed properties. The mud should be sheared when possible in the surface pits to optimize the effect of the chemicals added, emulsion and density stability. The action is also essential to maintain a low HTHP fluid loss. Optimize the solids removal equipment at all time in order to reduce dilution volume hence reducing the mud cost. Avoid dilution >5% of base oil and/or prefill. Monitor and evaluate cuttings quality regarding condition, texture and amount. Maintain a stable C- level and avoid fluctuations. Monitor ECD data, up & down weights, torque and drag data for signs of poor hole cleaning. LSRV may be elevated to improve hole cleaning. Monitor the CWP in the upper range to buffer out any undesired water addition. Increase the weight in steps according to specification in the DCH/DCR. Add prefill to achieve when weighting up to maintain desired fluid properties. The discolours will be a contamination of VC-Supernova and Benton 42. Store 10 litre Sponges on the rig as a contingency for H2S																					
8 1/2"	4500 4500	7"	0 0	Perforation COM	1.06	<100	<5	<15	stop	7 -	60:20 -	stop		<2					<600		126
COMMENTS: Ref. M: Operational Procedures - Rev. 9 - 15.11.05; Condition the surface volume according to programmed properties. Drill out cement & sheardack and 3 information with with one active pit. Perform the RTT. If RTT is OK, displace the hole to 1.05 gal mud before drilling commences. The mud should be sheared when possible in the surface pits to optimize the effect of the chemicals added, emulsion and density stability. This action is also essential to maintain a low HTHP fluid loss. Optimize the solids removal equipment at all time in order to reduce dilution volume hence reducing the mud cost. Avoid dilution >5% of base oil and/or prefill. Monitor and evaluate cuttings quality regarding condition, texture and amount. Maintain a stable C- level and avoid fluctuations. Monitor ECD data, up & down weights, torque and drag data for signs of poor hole cleaning. LSRV may be elevated to improve hole cleaning. Monitor the CWP in the upper range to buffer out any undesired water addition. Perform an end point daily static aging test at 80°F + 5°C during this interval. Regular mud samples to be sent to lab at Focus for HTHP analysis (min. once a week). As the temperature reaches 100°C, the system increase the concentration of Benton 42, which is a HT stabilizer. When drilling into the new rock consider a addition of G-Sol Fine and CaCO3. In order to minimize fluid loss, and to act as a loss contingency. Store 10 litre Sponges on the rig as a contingency for H2S																					

5.9.7 Cementing data

Figure 5.6 Summary of cementing data

CEMENT PROGRAMME													
Well: 6506/11-8 Field: PL 134B Morvin Rig: West Alpha													
HOLE	CASING SHOE	TOC	VOLUME excess	Components	Load [kN]	Tail [mm]	Density [g/cc]	Yield [mm]	Circ. Thrust [N]	Thickening Time [min]	API Flow Rate [l/min]	AR Fluid Loss [cc/min]	24 hrs C.R. [mm]
36"	445	445	445	Slurry 10 - DMV-SP Tuned Light Cement COC-liquid NF-6 Sea water	±36 m3 Ind 300% excess	4.00 0.10 55.84	1.06	100.06	5.7	3-4	n/a	n/a	±500
26"	1330	1341	1341	Slurry 10 - DMV-SP Tuned Light Cement COC-liquid NF-6 Sea water	±36 m3 Ind 300% excess	4.00 0.10 55.84	1.06	100.06	5.7	3-4	n/a	n/a	±500
17 1/2"	2190	2190	2190	Slurry 25 - DMV-SP Tuned Light Cement COC-liquid NF-6 Sea water	±24 m3 Ind 100% excess	4.00 0.10 55.84	1.06	100.06	5.7	3-4	n/a	n/a	±500
12 1/4"	4500	4500	4500	Slurry 10C - H1040 Microsilica Liquid NF-6 Fresh water	±21 m3 Ind 30% excess	4.00 0.10 55.84	1.06	100.06	5.7	3-4	n/a	n/a	±500
8 1/2"	4899	4899	4899	Slurry 10C - H1040 Microsilica Liquid NF-6 Fresh water	±21 m3 Ind 30% excess	4.00 0.10 55.84	1.06	100.06	5.7	3-4	n/a	n/a	±500

5.9.8 Bottom hole assemblies

Table 5.2 Bottom hole assemblies

WELLBORE: NO 6506/11-8
BHA NO: 1
BHA KIND:
DESCRIPTION: 36" Tophole BHA
BHA NAME: 1

String component	OD in	ID in	Length m	Acc length m
BIT	17,500		0,42	0,42
HO TWO STAGE 26" X 36"	36,000		8,81	9,23
9 1/2" DRILL COLLAR	9,500	3,125	26,46	35,69
X-OVER	7,938	3,125	0,77	36,46
8" DRILL COLLAR	8,000	2,500	26,99	63,45
X-OVER	8,000	3,000	1,12	64,57
5 7/8" HWDP	5,875	4,000	29,11	93,68

BHA NO: 2
BHA KIND:
DESCRIPTION: 26" Tophole BHA
BHA NAME: 2

String component	OD in	ID in	Length m	Acc length m
BIT	26,000		0,57	0,57
MOTOR	25,750	3,000	12,02	12,59
STAB STRING	25,750	3,000	1,55	14,14
ON TRAK	8,380		10,92	25,06
STAB STRING	23,750		2,28	27,34
8" DRILL COLLAR	8,000	2,750	71,80	99,14
JAR	8,130	2,810	10,17	109,31
8" DRILL COLLAR	8,000	2,750	27,62	136,93
X-OVER,	8,000	3,000	1,12	138,05
5 7/8" HWDP	5,100	4,000	84,28	222,33
5 7/8" DRILL PIPE				222,33

BHA NO: 3
BHA KIND:
DESCRIPTION: 17 1/2" BHA w/ Vertittrak
BHA NAME: 3

String component	OD in	ID in	Length m	Acc length m
BIT, TRI CONE	17,500		0,44	0,44
10-1/8" VERTITRAK	17,500		9,40	9,84
XO SUB	9,500	3,000	0,83	10,67
STAB STRING	17,375	2,183	1,82	12,49
ON TRAK	8,750		10,92	23,41
STAB STRING	17,375	2,183	1,96	25,37
FLOAT SUB	7,906	2,750	0,88	26,25

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String component	OD in	ID in	Length m	Acc length m
DRILL COL	8,000	2,750	72,02	98,27
JAR	8,125	2,813	10,17	108,44
DRILL COLLAR	8,000	2,750	27,40	135,84
XO SUB	7,000	3,000	1,12	136,96
H W DRILL PIPE	5,875	4,000	84,28	221,24

BHA NO: 4

BHA KIND:

DESCRIPTION: 12 1/4" BHA w/ Vertitrak (0,046 rev/ltrs) / Ontrac MWD

BHA NAME: 4

String component	OD in	ID in	Length m	Acc length m
HCM507Z~12 1/4"	12,250		0,37	0,37
10-1/8" VERTITRAK	10,000		10,12	10,49
XO SUB	9,375	3,000	1,08	11,57
STAB STRING	12,125	2,813	1,48	13,05
STOP SUB	8,250	3,000	0,71	13,76
ON TRAK	8,250	2,000	5,78	19,54
BCPM	8,250	2,000	3,57	23,11
STOP SUB	8,250	3,000	0,85	23,96
FLOAT SUB,	7,906	2,750	0,88	24,84
STAB STRING	12,125	2,813	1,72	26,56
FLOAT SUB,	8,000	2,813	0,95	27,51
8 1/4" DRILL COLLAR	8,250	2,813	72,02	99,53
JAR	8,000	3,000	10,17	109,70
8 1/4" DRILL COLLAR	8,250	2,813	27,40	137,10
XO SUB	8,000	3,000	1,12	138,22
5 7/8" HWDP	5,875	4,000	84,28	222,50
5 7/8" DRILL PIPE	5,875	4,000	4337,46	4559,96

BHA NO: 5

BHA KIND:

DESCRIPTION: 12 1/4" BHA w/Vertitrak (0.046 rev/ltrs) / Ontrac MWD

BHA NAME: 5

String component	OD in	ID in	Length m	Acc length m
HCM507Z~12 1/4"	12,250		0,35	0,35
VERTITRAK	10,000		10,12	10,47
X-OVER	9,375	3,000	1,08	11,55
STRING STAB	12,125	2,813	2,19	13,74
ONTRAK	8,250	2,000	10,75	24,49
FLOAT SUB	7,906	2,750	0,88	25,37
STRING STAB	12,000	2,813	2,42	27,79
FLOAT SUB,	8,000	2,813	0,95	28,74
DRILL COLLAR	8,000	2,750	72,02	100,76
JAR	8,000	2,750	10,14	110,90
DRILL COLLAR	8,000	2,750	27,40	138,30
X-OVER	8,000	3,000	1,12	139,42
HW DRILL PIPE, 5"	5,875	4,000	84,28	223,70
DRILL PIPE	5,875	4,000	3731,30	3955,00

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BHA NO: 6

BHA KIND:

DESCRIPTION: 12 1/4" BHA w/Vertitrak (0.046 rev/ltrs) / Ontrak MWD

BHA NAME: 6

String component	OD in	ID in	Length m	Acc length m
HCM507Z~12 1/4"	12,250		0,35	0,35
VERTITRAK	10,000		10,14	10,49
X-OVER	9,375	3,000	0,63	11,12
STRING STAB	12,000	2,813	2,19	13,31
ONTRAK	8,250	2,000	10,75	24,06
FLOAT SUB	7,906	2,750	0,88	24,94
STRING STAB	12,000	2,813	2,42	27,36
FLOAT SUB,	8,000	2,813	0,95	28,31
DRILL COLLAR	8,000	2,750	72,02	100,33
JAR	8,000	2,750	10,14	110,47
DRILL COLLAR	8,000	2,750	27,40	137,87
X-OVER	8,000	3,000	1,12	138,99
HW DRILL PIPE, 5"	5,875	4,000	84,28	223,27
DRILL PIPE	5,875	4,000	3731,30	3954,57

BHA NO: 7

BHA KIND:

DESCRIPTION: 8 1/2" BHA to clean out casing prior to running RTTS to test liner

BHA NAME: 7

String component	OD in	ID in	Length m	Acc length m
MGR741BEPX~8 1/2"	8,500	0,000	0,27	0,27
STABILIZER, NB	8,500	2,500	1,84	2,11
DRILL COLLAR	6,500	2,810	80,30	82,41
HYDRAULIC JAR	6,625	2,250	10,13	92,54
DRILL COLLAR	6,500	2,810	17,87	110,41
X-OVER	7,000	3,000	0,61	111,02
HW DRILL PIPE, 5"	5,810	4,000	84,20	195,22

BHA NO: 8

BHA KIND:

DESCRIPTION: 8 1/2" packed corepoint finder BHA.

BHA NAME: 8

String component	OD in	ID in	Length m	Acc length m
LD360AHG~8 1/2"	8,500	0,000	0,30	0,30
STABILIZER, NB	6,750	2,000	1,43	1,73
ONTRAK	7,000	2,250	5,12	6,85
BCPM	7,000	2,000	3,21	10,06
STOP SUB MWD	6,750	2,250	1,02	11,08
FLOAT SUB	6,750	2,750	1,22	12,30
ROLLER SUB	8,125	2,250	1,82	14,12
FLOAT SUB	6,750	2,750	1,22	15,34
DRILL COLLAR	6,500	2,875	8,93	24,27

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String component	OD in	ID in	Length m	Acc length m
ROLLER SUB	8,125	2,250	1,81	26,08
DRILL COLLAR	6,500	2,875	44,69	70,77
HYDRAULIC JAR	6,625	2,250	10,13	80,90
DRILL COLLAR	6,500	2,875	17,87	98,77
X-OVER	7,000	3,000	0,61	99,38
HW DRILL PIPE, 5"	5,875	4,000	84,20	183,58
DART SUB	7,125	2,500	0,65	184,23

BHA NO: 9

BHA KIND:

DESCRIPTION: Security DBS Coring assembly No. 1

BHA NAME: 9

String component	OD in	ID in	Length m	Acc length m
FC204DRLI~NA	8,500	0,000	0,36	0,36
COREBARREL	8,250	0,000	10,39	10,75
SAFETY SUB	7,000	2,250	1,40	12,15
FLOAT SUB	6,500	2,815	0,68	12,83
DRILL COLLAR	6,500	2,875	8,93	21,76
FLOAT SUB	6,500	2,815	0,90	22,66
STRING STAB	8,375	2,800	2,26	24,92
DRILL COLLAR	6,500	2,875	71,37	96,29
HYDRAULIC JAR	6,625	2,250	10,13	106,42
DRILL COLLAR	6,500	2,815	17,87	124,29
X-OVER	7,000	3,000	0,61	124,90
HW DRILL PIPE, 5"	5,875	4,000	84,20	209,10
DART SUB	7,125	2,500	0,65	209,75
COREBARREL	8,250	0,000	10,39	220,14
SAFETY SUB	7,000	2,250	1,40	221,54
FLOAT SUB	6,500	2,815	0,68	222,22
DRILL COLLAR	6,500	2,875	8,93	231,15
FLOAT SUB	6,500	2,815	0,90	232,05
STRING STAB	8,375	2,800	2,26	234,31
DRILL COLLAR	6,500	2,875	71,37	305,68
HYDRAULIC JAR	6,625	2,250	10,13	315,81
DRILL COLLAR	6,500	2,815	17,87	333,68
X-OVER	7,000	3,000	0,61	334,29
HW DRILL PIPE, 5"	5,875	4,000	84,20	418,49
DART SUB	7,125	2,500	0,65	419,14

BHA NO: 10

BHA KIND:

DESCRIPTION: 8 1/2" packed corepoint finder BHA

BHA NAME: 10

String component	OD in	ID in	Length m	Acc length m
LD360AHG~8 1/2"	8,500	0,000	0,30	0,30
STABILIZER, NB	6,750	2,000	1,43	1,73
ONTRAK	7,000	2,250	5,12	6,85
BCPM	7,000	2,000	3,21	10,06
STOP SUB MWD	6,750	2,250	1,02	11,08

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String component	OD in	ID in	Length m	Acc length m
6 1/2" AST TOOL	6,500	2,750	1,60	12,68
FLOAT SUB	6,750	2,750	1,22	13,90
ROLLER SUB	8,125	2,250	1,82	15,72
FLOAT SUB	6,750	2,750	1,22	16,94
DRILL COLLAR	6,500	2,875	8,93	25,87
ROLLER SUB	8,125	2,250	1,81	27,68
DRILL COLLAR	6,500	2,875	44,69	72,37
HYDRAULIC JAR	6,625	2,250	10,13	82,50
DRILL COLLAR	6,500	2,875	17,87	100,37
X-OVER	7,000	3,000	0,61	100,98
HW DRILL PIPE, 5"	5,875	4,000	84,20	185,18
DART SUB	7,125	2,500	0,65	185,83

BHA NO: 11

BHA KIND:

DESCRIPTION: Security DBS Coring assembly No. 2

BHA NAME: 11

String component	OD in	ID in	Length m	Acc length m
FC204DRLI~NA	8,500	0,000	0,36	0,36
COREBARREL	8,250	0,000	56,06	56,42
SAFETY SUB	7,000	2,250	1,44	57,86
FLOAT SUB	6,500	2,815	0,68	58,54
DRILL COLLAR	6,500	2,875	8,93	67,47
FLOAT SUB	6,500	2,815	0,90	68,37
STRING STAB	8,375	2,800	2,26	70,63
DRILL COLLAR	6,500	2,875	71,37	142,00
HYDRAULIC JAR	6,625	2,250	10,13	152,13
DRILL COLLAR	6,500	2,815	17,87	170,00
X-OVER	7,000	3,000	0,61	170,61
HW DRILL PIPE, 5"	5,875	4,000	84,20	254,81
DART SUB	7,125	2,500	0,65	255,46

BHA NO: 12

BHA KIND:

DESCRIPTION: Security DBS Coring assembly No 3

BHA NAME: 12

String component	OD in	ID in	Length m	Acc length m
FC204DRLI~NA	8,500	0,000	0,36	0,36
COREBARREL	8,250	0,000	56,06	56,42
SAFETY SUB	7,000	2,250	1,44	57,86
6 1/2" AST TOOL	6,500	2,000	1,58	59,44
FLOAT SUB	6,500	2,815	0,68	60,12
DRILL COLLAR	6,500	2,875	8,93	69,05
FLOAT SUB	6,500	2,815	0,90	69,95
STRING STAB	8,375	2,800	2,26	72,21
DRILL COLLAR	6,500	2,875	71,37	143,58
HYDRAULIC JAR	6,625	2,250	10,13	153,71
DRILL COLLAR	6,500	2,815	17,87	171,58
X-OVER	7,000	3,000	0,61	172,19

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String component	OD in	ID in	Length m	Acc length m
HW DRILL PIPE, 5"	5,875	4,000	84,20	256,39
DART SUB	7,125	2,500	0,65	257,04

BHA NO: 13
BHA KIND:
DESCRIPTION: Security DBS Coring assembly No 4
BHA NAME: 13

String component	OD in	ID in	Length m	Acc length m
CT103~NA	8,500	0,000	0,36	0,36
COREBARREL	8,250	0,000	56,06	56,42
SAFETY SUB	7,000	2,250	1,44	57,86
6 1/2" AST TOOL	6,500	2,000	1,58	59,44
FLOAT SUB	6,500	2,815	0,68	60,12
DRILL COLLAR	6,500	2,875	8,93	69,05
FLOAT SUB	6,500	2,815	0,90	69,95
STRING STAB	8,375	2,800	2,26	72,21
DRILL COLLAR	6,500	2,875	71,37	143,58
HYDRAULIC JAR	6,625	2,250	10,13	153,71
DRILL COLLAR	6,500	2,815	17,87	171,58
X-OVER	7,000	3,000	0,61	172,19
HW DRILL PIPE, 5"	5,875	4,000	84,20	256,39
DART SUB	7,125	2,500	0,65	257,04

BHA NO: 14
BHA KIND:
DESCRIPTION: Security DSB Coring assembly No 5
BHA NAME: 14

String component	OD in	ID in	Length m	Acc length m
FC204DRLI~NA	8,500	0,000	0,36	0,36
COREBARREL	8,250	0,000	28,64	29,00
SAFETY SUB	7,000	2,250	1,40	30,40
FLOAT SUB	6,500	2,815	0,68	31,08
DRILL COLLAR	6,500	2,875	8,93	40,01
FLOAT SUB	6,500	2,815	0,90	40,91
STRING STAB	8,375	2,800	2,26	43,17
DRILL COLLAR	6,500	2,875	71,37	114,54
HYDRAULIC JAR	6,625	2,250	10,13	124,67
DRILL COLLAR	6,500	2,815	17,87	142,54
X-OVER	7,000	3,000	0,61	143,15
HW DRILL PIPE, 5"	5,875	4,000	84,20	227,35
DART SUB	7,125	2,500	0,65	228,00

BHA NO: 15
BHA KIND:
DESCRIPTION: 8 1/2" packed corepoint finder BHA
BHA NAME: 15

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String component	OD in	ID in	Length m	Acc length m
HCR507Z~12 1/4"	8,500	0,000	0,32	0,32
STABILIZER, NB	6,750	2,000	1,43	1,75
ONTRAK	7,000	2,250	5,12	6,87
BCPM	7,000	2,000	3,21	10,08
STOP SUB MWD	6,750	2,250	1,02	11,10
6 1/2" AST TOOL	6,500	2,750	1,58	12,68
FLOAT SUB	6,750	2,750	1,22	13,90
ROLLER SUB	8,125	2,250	1,82	15,72
FLOAT SUB	6,750	2,750	1,22	16,94
DRILL COLLAR	6,500	2,875	8,82	25,76
ROLLER SUB	8,125	2,250	1,81	27,57
DRILL COLLAR	6,500	2,875	44,62	72,19
HYDRAULIC JAR	6,625	2,250	10,13	82,32
DRILL COLLAR	6,500	2,875	17,87	100,19
X-OVER	7,000	3,000	0,61	100,80
HW DRILL PIPE, 5"	5,875	4,000	84,20	185,00
DART SUB	7,125	2,500	0,65	185,65

BHA NO: 16

BHA KIND:

DESCRIPTION: Security DSB Coring assembly No 6

BHA NAME: 16

String component	OD in	ID in	Length m	Acc length m
FC204DRLI~NA	8,500	0,000	0,36	0,36
COREBARREL	8,250	0,000	28,64	29,00
SAFETY SUB	7,000	2,250	1,40	30,40
FLOAT SUB	6,500	2,815	0,68	31,08
DRILL COLLAR	6,500	2,875	8,93	40,01
FLOAT SUB	6,500	2,815	0,90	40,91
STRING STAB	8,375	2,800	2,26	43,17
DRILL COLLAR	6,500	2,875	71,37	114,54
HYDRAULIC JAR	6,625	2,250	10,13	124,67
DRILL COLLAR	6,500	2,815	17,87	142,54
X-OVER	7,000	3,000	0,61	143,15
HW DRILL PIPE, 5"	5,875	4,000	84,20	227,35
DART SUB	7,125	2,500	0,65	228,00

BHA NO: 17

BHA KIND:

DESCRIPTION: Security DSB Coring assembly No 7

BHA NAME: 17

String component	OD in	ID in	Length m	Acc length m
FC204DRLI~NA	8,500	0,000	0,36	0,36
COREBARREL	8,250	0,000	28,64	29,00
SAFETY SUB	7,000	2,250	1,40	30,40
FLOAT SUB	6,500	2,815	0,68	31,08
DRILL COLLAR	6,500	2,875	8,93	40,01
FLOAT SUB	6,500	2,815	0,90	40,91
6 1/2" AST TOOL	6,500	2,000	1,58	42,49

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String component	OD in	ID in	Length m	Acc length m
STRING STAB	8,375	2,800	2,26	44,75
DRILL COLLAR	6,500	2,875	71,37	116,12
HYDRAULIC JAR	6,625	2,250	10,13	126,25
DRILL COLLAR	6,500	2,815	17,87	144,12
X-OVER	7,000	3,000	0,61	144,73
HW DRILL PIPE, 5"	5,875	4,000	84,20	228,93
DART SUB	7,125	2,500	0,65	229,58

BHA NO: 18

BHA KIND:

DESCRIPTION: Security DSB Coring assembly No 8

BHA NAME: 18

String component	OD in	ID in	Length m	Acc length m
TBT601IMP~NA	8,500	0,000	0,36	0,36
COREBARREL	8,250	0,000	28,64	29,00
SAFETY SUB	7,000	2,250	1,40	30,40
FLOAT SUB	6,500	2,815	0,68	31,08
DRILL COLLAR	6,500	2,875	8,93	40,01
FLOAT SUB	6,500	2,815	0,90	40,91
STRING STAB	8,375	2,800	2,26	43,17
DRILL COLLAR	6,500	2,875	71,37	114,54
HYDRAULIC JAR	6,625	2,250	10,13	124,67
DRILL COLLAR	6,500	2,815	17,87	142,54
X-OVER	7,000	3,000	0,61	143,15
HW DRILL PIPE, 5"	5,875	4,000	84,20	227,35
DART SUB	7,125	2,500	0,65	228,00

BHA NO: 19

BHA KIND:

DESCRIPTION: 8 1/2" packed rotary assy

BHA NAME: 19

String component	OD in	ID in	Length m	Acc length m
DSX816M-B8~8 1/2"	8,500	0,000	0,32	0,32
STABILIZER, NB	6,750	2,000	1,43	1,75
ONTRAK	7,000	2,250	5,12	6,87
BCPM	7,000	2,000	3,21	10,08
STOP SUB MWD	6,750	2,250	1,02	11,10
6 1/2" AST TOOL	6,500	2,750	1,58	12,68
FLOAT SUB	6,750	2,750	1,22	13,90
ROLLER SUB	8,125	2,250	1,82	15,72
FLOAT SUB	6,750	2,750	1,22	16,94
DRILL COLLAR	6,500	2,875	8,82	25,76
ROLLER SUB	8,125	2,250	1,81	27,57
DRILL COLLAR	6,500	2,875	44,62	72,19
HYDRAULIC JAR	6,625	2,250	10,13	82,32
DRILL COLLAR	6,500	2,875	17,87	100,19
X-OVER	7,000	3,000	0,61	100,80
HW DRILL PIPE, 5"	5,875	4,000	84,20	185,00
DART SUB	7,125	2,500	0,65	185,65

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BHA NO: 20
BHA KIND:
DESCRIPTION: 8 1/2" packed rotary assy
BHA NAME: 20

String component	OD in	ID in	Length m	Acc length m
M816~8 1/2"	8,500	0,000	0,23	0,23
STABILIZER, NB	6,750	2,000	1,43	1,66
ONTRAK	7,000	2,250	5,12	6,78
BCPM	7,000	2,000	3,21	9,99
STOP SUB MWD	6,750	2,250	1,02	11,01
6 1/2" AST TOOL	6,500	2,750	1,58	12,59
FLOAT SUB	6,750	2,750	1,22	13,81
ROLLER SUB	8,125	2,250	1,82	15,63
FLOAT SUB	6,750	2,750	1,22	16,85
DRILL COLLAR	6,500	2,875	8,82	25,67
ROLLER SUB	8,125	2,250	1,81	27,48
DRILL COLLAR	6,500	2,875	44,62	72,10
HYDRAULIC JAR	6,625	2,250	10,13	82,23
DRILL COLLAR	6,500	2,875	17,87	100,10
X-OVER	7,000	3,000	0,61	100,71
HW DRILL PIPE, 5"	5,875	4,000	84,20	184,91
DART SUB	7,125	2,500	0,65	185,56

BHA NO: 21
BHA KIND:
DESCRIPTION: WL run #1: PPC-MSIP-PPC-IS-AIT-ACTS-ECRD
BHA NAME: 21

String component	OD in	ID in	Length m	Acc length m
BNS-CCS			0,14	0,14
AH-880			1,22	1,36
GPIT-C			1,22	2,58
AH ADAPTOR			1,22	3,80
AIT-C			10,25	14,05
AH-107			0,61	14,66
SGT-N			1,67	16,33
AH-107			0,61	16,94
PPC1-B			1,99	18,93
MSIP			6,17	25,10
MSIP			6,41	31,51
PPC2-B			1,99	33,50
EDTC			1,98	35,48
LEH-ECRD			0,89	36,37

BHA NO: 22
BHA KIND:
DESCRIPTION: WL run #2: CMR-IPLT-ECS-ACTS-ECRD
BHA NAME: 22

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String component	OD in	ID in	Length m	Acc length m
BNS-CCS			0,14	0,14
CMRT-B			4,75	4,89
AH-107			0,61	5,50
AH-107			0,61	6,11
LDS			4,37	10,48
AH-190			0,30	10,78
APS-C			3,95	14,73
AH-191			0,30	15,03
ECS			3,09	18,12
HNGS			3,57	21,69
EDTC			1,98	23,67
LEH-QT			0,89	24,56

BHA NO: 23

BHA KIND:

DESCRIPTION: WL run #3: MDT

BHA NAME: 23

String component	OD in	ID in	Length m	Acc length m
MRPS	4,750		2,44	2,44
MRHY	4,750		2,57	5,01
MRPC	4,750		1,52	6,53
DTA-A	3,375		1,22	7,75
SGT-N	3,375		1,67	9,42
EDTC-B ENP12	3,375		1,98	11,40
LEH-QT	2,313		0,89	12,29

BHA NO: 24

BHA KIND:

DESCRIPTION: WL run #4: MDT sampling

BHA NAME: 24

String component	OD in	ID in	Length m	Acc length m
MRPC	6,750		5,09	5,09
MRPS			2,44	7,53
MRHY			2,57	10,10
LFA			1,55	11,65
MRPO			3,24	14,89
MRPO			3,24	18,13
MRSC			2,88	21,01
MRBA			0,99	22,00
MRSC			1,87	23,87
MRSC			1,87	25,74
MRMS			4,02	29,76
MRMS			4,02	33,78
MRPC			1,51	35,29
DTA-A			1,22	36,51
SGT-N			1,68	38,19
EDTC			1,98	40,17
ACTS-B1			1,22	41,39
LEH-ECRD			0,89	42,28

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BHA NO: 25
BHA KIND:
DESCRIPTION: Fishing BHA, 7" overshoot with 2 3/8" grapple.
BHA NAME: 25

String component	OD in	ID in	Length m	Acc length m
OVERSHOT SPIRAL GRAPPLE	3,500	2,375	0,61	0,61
X-OVER	6,250	2,750	0,30	0,91
FLOAT SUB	6,312	3,562	0,56	1,47
DRILL COLLAR	6,500	2,875	8,93	10,40
STAB STRING	8,375	2,875	2,26	12,66
DRILL COLLAR	6,500	2,875	17,93	30,59
BUMPER SUB	6,500	2,187	1,92	32,51
DRILL COLLAR	6,500	2,875	53,44	85,95
JAR	6,625	2,250	10,13	96,08
DRILL COLLAR	6,500	2,875	17,87	113,95
X-OVER	7,000	3,000	0,61	114,56
HW DRILL PIPE, 5"	5,875	4,000	112,26	226,82
DART SUB	7,125	2,500	0,65	227,47

BHA NO: 26
BHA KIND:
DESCRIPTION: Wiper trip, 8 1/2" BHA
BHA NAME: 26

String component	OD in	ID in	Length m	Acc length m
BIT	8,500		0,26	0,26
BIT SUB	6,437	3,500	0,82	1,08
ROLLER SUB	8,500	2,250	1,82	2,90
DRILL COLLAR	6,500	2,875	8,93	11,83
STAB STRING	8,375	2,875	2,26	14,09
DRILL COLLAR	6,500	2,875	17,93	32,02
FLOAT SUB	6,500	2,187	0,56	32,58
DRILL COLLAR	6,500	2,875	53,44	86,02
JAR	6,625	2,250	10,13	96,15
DRILL COLLAR	6,500	2,875	17,87	114,02
X-OVER	7,000	3,000	0,61	114,63
HW DRILL PIPE, 5"	5,875	4,000	112,26	226,89
DART SUB	7,125	2,500	0,65	227,54

BHA NO: 27
BHA KIND:
DESCRIPTION: WL run #5: MDT mini DST sampling
BHA NAME: 27

String component	OD in	ID in	Length m	Acc length m
MRPC	6,190		5,09	5,09
MRPS			2,44	7,53
MRHY			2,57	10,10
LFA			1,55	11,65

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String component	OD in	ID in	Length m	Acc length m
MRPO			3,24	14,89
MRPO			3,24	18,13
MRMS			4,02	22,15
MRMS			4,02	26,17
MRPC			1,52	27,69
SGT-N			1,67	29,36
DTA-A			1,22	30,58
EDTC			1,98	32,56
ACTS-B1			1,22	33,78
LEH-ECRD			0,89	34,67

BHA NO: 28

BHA KIND:

DESCRIPTION: WL run #6: MDT Quick Silver sampling

BHA NAME: 28

String component	OD in	ID in	Length m	Acc length m
MRPO	5,000		3,24	3,24
MRFA			1,55	4,79
MRPQ			2,74	7,53
MRHY			2,57	10,10
MRBA			0,99	11,09
MRPS			2,44	13,53
MRHY			2,57	16,10
LFA			1,55	17,65
MRPO			3,24	20,89
MRSC			1,86	22,75
MRSC			1,87	24,62
MRSC			1,87	26,49
MRMS			4,02	30,51
MRMS			4,02	34,53
MRPC			1,52	36,05
SGT-N			1,67	37,72
DTA-A			1,22	38,94
EDTC			1,98	40,92
ACTS-B1			1,22	42,14
LEH-ECRD			0,89	43,03

BHA NO: 29

BHA KIND:

DESCRIPTION: Wiper trip #2, 8 1/2" BHA

BHA NAME: 29

String component	OD in	ID in	Length m	Acc length m
MGR741BEPX~8 1/2"	8,500		0,26	0,26
BIT SUB	6,437	3,500	0,82	1,08
ROLLER SUB	8,500	2,250	1,82	2,90
DRILL COLLAR	6,500	2,875	8,93	11,83
STAB STRING	8,375	2,875	2,26	14,09
DRILL COLLAR	6,500	2,875	17,93	32,02
FLOAT SUB	5,625	2,750	0,55	32,57

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String component	OD in	ID in	Length m	Acc length m
DRILL COLLAR	6,500	2,875	53,44	86,01
JAR	6,625	2,250	10,13	96,14
DRILL COLLAR	6,500	2,875	17,87	114,01
X-OVER	7,000	3,000	0,61	114,62
HW DRILL PIPE, 5"	5,875	4,000	112,26	226,88
DART SUB	7,125	2,500	0,65	227,53

BHA NO: 30

BHA KIND:

DESCRIPTION: WL run #7 MDT with mini DST and sampling

BHA NAME: 30

String component	OD in	ID in	Length m	Acc length m
MRPC	6,190		5,09	5,09
MRPS			2,44	7,53
MRHY			2,57	10,10
LFA			1,55	11,65
MRPO			3,24	14,89
MRPO			3,24	18,13
LFA			11,65	29,78
MRMS			4,02	33,80
MRMS			4,02	37,82
MRPC			1,52	39,34
SGT-N			1,67	41,01
DTA-A			1,22	42,23
EDTC			1,98	44,21
ACTS-B1			1,22	45,43
LEH-ECRD			0,89	46,32

BHA NO: 32

BHA KIND:

DESCRIPTION: Wireline run # 9, mini DST in Tofte.

BHA NAME: 32

String component	OD in	ID in	Length m	Acc length m
MRPC	6,190		5,09	5,09
MRPS			2,44	7,53
MRHY			2,57	10,10
LFA			1,55	11,65
MRPO			3,24	14,89
MRPO			3,24	18,13
LFA			11,65	29,78
MRMS			4,02	33,80
MRMS			4,02	37,82
MRPC			1,52	39,34
SGT-N			1,67	41,01
DTA-A			1,22	42,23
EDTC			1,98	44,21
ACTS-B1			1,22	45,43
LEH-ECRD			0,89	46,32

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BHA NO: 33
BHA KIND:
DESCRIPTION: Fishing BHA for MDT tool.
BHA NAME: 33

String component	OD in	ID in	Length m	Acc length m
OVERSHOT SPIRAL GRAPPLE	7,000		0,61	0,61
X-OVER	6,125		0,30	0,91
DP 5"	5,000	3,438	13,30	14,21
SIDE ENTRY SUB	6,625	2,125	0,61	14,82
DP PUP JOINT	5,000	3,000	2,87	17,69
FLOAT SUB	5,625	2,750	0,55	18,24
XO SUB	7,000	3,000	0,61	18,85
HW DRILL PIPE, 5"	5,875	4,000	168,46	187,31
DART SUB	7,125	2,500	0,65	187,96

BHA NO: 34
BHA KIND:
DESCRIPTION: Rotary drilling BHA
BHA NAME: 34

String component	OD in	ID in	Length m	Acc length m
DSX94DGUW~12 1/4"	8,500	0,000	0,24	0,24
STABILIZER, NB	6,750	2,000	1,40	1,64
ONTRAK	7,000	2,250	5,16	6,80
BCPM	7,000	2,000	3,21	10,01
STOP SUB MWD	6,750	2,250	0,42	10,43
FLOAT SUB	6,750	2,750	1,48	11,91
ROLLER SUB	8,125	2,250	1,82	13,73
FLOAT SUB	6,750	2,750	0,55	14,28
DRILL COLLAR	6,500	2,875	8,93	23,21
STRING STAB	6,500	2,875	2,26	25,47
DRILL COLLAR	6,500	2,875	71,37	96,84
HYDRAULIC JAR	6,625	2,250	10,14	106,98
DRILL COLLAR	6,500	2,875	17,87	124,85
X-OVER	7,000	3,000	0,61	125,46
HW DRILL PIPE, 5"	5,875	4,000	84,20	209,66
DART SUB	7,125	2,500	0,65	210,31

BHA NO: 35
BHA KIND:
DESCRIPTION: Cement stinger
BHA NAME: 35

String component	OD in	ID in	Length m	Acc length m
DP 3 1/2"	3,500	2,430	376,00	376,00
DRILL PIPE	5,875	4,250	5613,00	5989,00

BHA NO: 36

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BHA KIND:

DESCRIPTION: Setting 14" EZSV

BHA NAME: 36

String component	OD in	ID in	Length m	Acc length m
EZSV	12,250		1,00	1,00
TC RUNNING TOOL	5,000	2,750	1,00	2,00
DRILL PIPE	5,870	4,250	2024,00	2026,00

BHA NO: 37

BHA KIND:

DESCRIPTION: Casing cutting BHA

BHA NAME: 37

String component	OD in	ID in	Length m	Acc length m
BULLNOSE			0,38	0,38
CASING CUTTER			1,83	2,21
TOP SUB			0,94	3,15
STABILIZER			1,48	4,63
SPACER SUB			0,20	4,83
SPACER SUB			2,13	6,96
MOST TOOL			0,00	6,96
X-OVER			0,24	7,20
DOWNHOLE MOTOR			8,74	15,94
DRILL COLLAR			80,42	96,36
X-OVER			0,90	97,26
HW DRILL PIPE, 5"			252,70	349,96
DRILL PIPE				349,96

5.9.9 Bit record

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Table 5.3 Bit run listing

Run no	Bit size	Bit no	BHA no	Bit type	IADC code	Bit manufacturer
1	17 1/2"	1RR1	1	442GFPT	M843	Reed-Hycalog
1	26"/36"	2	1	HOLE OPENER		Odfjell Drilling AS
2	26"	2	2	EBXT02SPLC	415	Security DBS
3	17 1/2"	3	3	GS03BDODGVCPD	415X	Smith Bits
3	17 1/2"	3	3	GS03BDODGVCPD	415X	Smith Bits
4	12 1/4"	4	4	HCM507Z	M323	Hughes Christensen
5	12 1/4"	5	5	HCM507Z	M323	Hughes Christensen
6	12 1/4"	6	6	HCM507Z	M323	Hughes Christensen
7	8 1/2"	7	7	MGR741BEPX	m222	Smith Bits
8	8 1/2"	8	8	LD360AHG	M233	Lyng
9	8 1/2"	9	9	FC204DRLI	COREHE	Security DBS
10	8 1/2"	10 RR	10	LD360AHG	M233	Lyng
11	8 1/2"	11 RR	11	FC204DRLI	COREHE	Security DBS
12	8 1/2"	12	12	FC204DRLI	COREHE	Security DBS
13	8 1/2"	13	13	CT103	M623	DIAMANT BOART S
14	8 1/2"	14	14	FC204DRLI	COREHE	Security DBS
15	8 1/2"	15	15	HCR507Z	M323	Hughes Christensen
16	8 1/2"	14	16	FC204DRLI	COREHE	Security DBS
17	8 1/2"	17	17	FC204DRLI	COREHE	Security DBS
18	8 1/2"	18	18	TBT601IMP	M843	Security DBS
19	8 1/2"	19	19	DSX816M-B8	M422	Reed-Hycalog
20	8 1/2"	20	20	M816	M323	Smith Bits
26	8 1/2"		26	MGR741BEPX	m222	Smith Bits
29	8 1/2"	21	29	MGR741BEPX	m222	Smith Bits
34	8 1/2"	19	34	DSX94DGUW	M433	Reed-Hycalog

Run no	Bit size	Bit no	BHA no	Serial no	Nozzles (n/32")				Flow area in
					no x n	no x n	no x n	no x n	
1	17 1/2"	1RR1	1		4 x 14	x	x	x	0,6020
1	26"/36"	2	1		3 x 11	3 x 14	x	x	0,73
2	26"	2	2	10662861	2 x 18	1 x 16	1 x 20	x	1,0010
3	17 1/2"	3	3	MX 1976	1 x 16	3 x 22	x	x	1,3110
3	17 1/2"	3	3	MX1976	3 x 22	1 x 16	x	x	1,3110
4	12 1/4"	4	4	7107908	7 x 18	x	x	x	1,74
5	12 1/4"	5	5	7105231	6 x 20	1 x 18	x	x	2,09
6	12 1/4"	6	6	7105232	7 x 20	x	x	x	2,1480
7	8 1/2"	7	7	SCA695	3 x 12	2 x 13	0 x 0	x	0,5910
8	8 1/2"	8	8	SN 3021	4 x 14	x	x	x	0,6020
9	8 1/2"	9	9	107584181	x	x	x	x	
10	8 1/2"	10 RR	10	SN 3021	4 x 14	x	x	x	0,6020
11	8 1/2"	11 RR	11	107584181	x	x	x	x	
12	8 1/2"	12	12	10763138	x	x	x	x	
13	8 1/2"	13	13	10754646	x	x	x	x	
14	8 1/2"	14	14	10843996	x	x	x	x	

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Run no	Bit size	Bit no	BHA no	Serial no	Nozzles (n/32")				Flow area in
					no x n	no x n	no x n	no x n	
15	8 1/2"	15	15	7105835	4 x 11	3 x 12	x	x	0,7030
16	8 1/2"	14	16	10843996	x	x	x	x	
17	8 1/2"	17	17	7971511	x	x	x	x	
18	8 1/2"	18	18	7000626	x	x	x	x	
19	8 1/2"	19	19	212449	4 x 10	4 x 12	x	x	0,7490
20	8 1/2"	20	20	JW6406	8 x 11	x	x	x	0,7430
26	8 1/2"		26	SCA695	3 x 12	3 x 13	x	x	0,7210
29	8 1/2"	21	29	SN SCA695	2 x 13	4 x 12	x	x	0,7020
34	8 1/2"	19	34	208569	4 x 10	4 x 12	x	x	0,7490

Run no	Bit size	Pump rate l/min	Pump press bar	Depth in mMD	Depth out mMD	Form drld m	Total drld m	Drld hrs	Circ hrs	ROP m/hrs
1	17 1/2"	4800	103	398,0	448,0	50,0	50,0	4,0	6,3	12,5
1	26"/36"	4800	103	398,0	446,0	48,0	48,0	4,0	6,3	12,0
2	26"			448,0	1350,0	902,0		17,8	35,4	50,7
3	17 1/2"	4250	240	1350,0	2150,0	800,0	800,0	27,7	49,1	28,9
3	17 1/2"			1350,0	2150,0	800,0		27,7	49,1	28,9
4	12 1/4"	3200	285	2150,0	3955,0	1805,0		67,7		26,7
5	12 1/4"			3955,0	4239,0	284,0	284,0	25,2	41,9	11,3
6	12 1/4"	3100	285	4239,0	4500,0	261,0	261,0	23,1	37,9	11,3
7	8 1/2"	1400	125	4500,0	4503,0	3,0	3,0	1,0	7,0	3,0
8	8 1/2"	1400	150	4503,0	4603,0	100,0	100,0	15,2	34,0	6,6
9	8 1/2"	1010	78	4603,0	4606,0	3,0	3,0	3,9	11,9	0,8
10	8 1/2"			4606,0	4624,0	18,0	18,0	6,0	11,7	3,0
11	8 1/2"	1010	109	4624,0	4658,0	34,0	37,0	7,5	15,1	4,5
12	8 1/2"	1010	105	4658,0	4671,0	13,0	13,0	13,0	7,7	1,0
13	8 1/2"	1100	134	4671,0	4674,0	3,0	3,5	3,0	6,3	1,0
14	8 1/2"	1100	103	4674,0	4699,0	25,0	25,0	7,9	11,3	3,2
15	8 1/2"			4699,0	4743,0	44,0	44,0	8,3	18,0	5,3
16	8 1/2"	1100	104	4743,0	4753,0	10,0	10,0	2,0	3,0	5,0
17	8 1/2"	1200	110	4753,0	4769,0	16,0	16,0	6,5	9,5	2,5
18	8 1/2"	1200	106	4769,0	4775,0	6,0	6,0	2,8	9,0	2,1
19	8 1/2"			4775,0	4843,0	68,0	68,0	17,3	28,5	3,9
20	8 1/2"	1400	153	4843,0	4893,0	50,0	50,0	20,0	34,5	2,5
26	8 1/2"									
29	8 1/2"									
34	8 1/2"	1580	180	4893,0	4989,7	96,0	96,0	21,2	32,3	4,5

Run no	Bit size	Min WOB ton	Max WOB ton	Min RPM	Max RPM	Torque Min Nm	Torque Max Nm	Con drag Min 1000 daN	Con drag Max 1000 daN
1	17 1/2"	0	2	100	100	3000	5000		
1	26"/36"	0	2	100	100	3000	5000		
2	26"								
3	17 1/2"	5	22	150	230	0	11		
3	17 1/2"								
4	12 1/4"	3	17	0	100	0	45	131	182
5	12 1/4"								
6	12 1/4"	5	10	0	60	0	22		
7	8 1/2"	3	5	70	70	7	14		
8	8 1/2"	8	11	135	142	11	16	188	193

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Run no	Bit size	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
9	8 1/2"	5	14	70	112	8	11	198	200
10	8 1/2"								
11	8 1/2"	8	13	80	110	10	11	195	200
12	8 1/2"	10	15	110	115	10	11	196	201
13	8 1/2"	10	16	110	130	6	20	196	201
14	8 1/2"	7	17	110	113	7	25	198	200
15	8 1/2"								
16	8 1/2"	5	12	80	100	6	17	1	2
17	8 1/2"	5	17	80	106	8	20	1	1
18	8 1/2"	5	13	80	135	8	12	1	1
19	8 1/2"								
20	8 1/2"	8	14	100	160	12	25	1	1
26	8 1/2"								
29	8 1/2"								
34	8 1/2"	10	15	95	150	10	20	205	207

Run no	Bit size	I	O	DC	L	B	G	OC	RP
1	17 1/2"	1	1	NO		E	I	NO	TD
1	26"/36"	0	0	NO	A	0		NO	TD
2	26"	1	1	WT	A	E	In	NO	TD
3	17 1/2"	1	2	WT	A	F	2	ER	TD
3	17 1/2"	1	2	WT	A	E	In	ER	TD
4	12 1/4"	1	4	LT	S	X	In	BT	PR
5	12 1/4"	1	4	RO	S	X	I	LT	PR
6	12 1/4"	0	2	WT	S	X	I	WT	TD
7	8 1/2"	1	1	NO	A	E	1	NO	TD
8	8 1/2"	1	1	NO	A	X	in	NO	CP
9	8 1/2"	1	1	RR	A	X	1	PN	TQ
10	8 1/2"	8	2	RO	N	E	1	RO	CP
11	8 1/2"	2	6	BT	A	X	I	BT	PR
12	8 1/2"	6	4	CT	A	X	I	WT	PR
13	8 1/2"	5	3	WT	A	X	I	CT	PR
14	8 1/2"	5	4	CT	A	X	I	HC	TD
15	8 1/2"	2	2	WT	N	X	I	PN	CP
16	8 1/2"	6	2	LT	A	X	I	RO	PR
17	8 1/2"	8	8	WT	A	X	1	PN	PR
18	8 1/2"	6	8	RO	A	X	I	HC	PR
19	8 1/2"	2	4	WT	A	X	I	WT	PR
20	8 1/2"	2	8	RO	G	X	2	HC	PR
26	8 1/2"	1	1	NO	A	X	In	NO	TD
29	8 1/2"								
34	8 1/2"	2	3	WT	M	X	1	NO	TD

Run no	Bit size	Remarks
1	17 1/2"	
1	26"/36"	26" HO : 2.36 m behind 17 1/2" bit 36" HO : 3.08 m behind 17 1/2" bit
2	26"	
3	17 1/2"	Vertitrack 3D tool w/ mud motor used (0,04 rev/l). String rotation: 0-60 RPM. Flow: 3300-4300. Pressure: 160-260 bar. Bit revolutions on bottom: 870 krevs. Bit drilled cmt from 1315 m to 1341m (3,5 hrs on botm/30 krevs - not incl. in bit drilling data).

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Run no	Bit size	Remarks
3	17 1/2"	
4	12 1/4"	
5	12 1/4"	
6	12 1/4"	
7	8 1/2"	Clean up run inside 9 7/8" liner.
8	8 1/2"	Drilled with controlled ROP due to only one connection gas bobble in annulus allowed.
9	8 1/2"	Aluminium junk found between corehead blades.
10	8 1/2"	Ringed out.
11	8 1/2"	4 broken cutter on outer row. Not re-runable.
12	8 1/2"	Core jammed off.
13	8 1/2"	Jammed off core.
14	8 1/2"	Recovered 25,4 m core.
15	8 1/2"	Matrix worn on nose. 1 nozzle plugged.
16	8 1/2"	5 broken cutters on inner row. 2 broken on outer row. 3 plugged jets.
17	8 1/2"	3 plugged flow jets. Corehead plugged with jammed core.
18	8 1/2"	Correct bit type CB 601 IMP.
19	8 1/2"	
20	8 1/2"	Well TD
26	8 1/2"	
29	8 1/2"	Wiper trip.
34	8 1/2"	Some rows on bit had almost no wear.

6 Appendices

App A Extract of daily activities (DBR summary of activities)

WELLBORE ID: NO 6506/11-8
INTERVAL: MOVE
START TIME: 22.03.2006 06:00
END TIME: 23.03.2006 07:00

Report date	Description
23.03.2006	Rig on tow from Lavrans to Morvin. WOW. Commenced anchor handling. Pretensioned anchors.

INTERVAL: PRESPUD
START TIME: 23.03.2006 07:00
END TIME: 24.03.2006 08:30

Report date	Description
24.03.2006	Continued to pretension anchors. Anchor #2 slipped. Reset anchor and pretensioned to 180 mt. Ok. P/U 5 7/8" DP/HWDP. M/U cmt stand and 30" RT. M/U 36" HO assembly. RIH with same while P/U 5 7/8" DP.

INTERVAL: 36"
START TIME: 24.03.2006 08:30
END TIME: 26.03.2006 17:30

Report date	Description
25.03.2006	Drilled 36" hole to TD. Circulated and displaced hole to 1,40 sg mud. POOH. LD HO assembly. Ran 30" conductor and stabbed into 36" hole.
26.03.2006	Ran 30" conductor and cemented same. Held conductor in place while WOC. Retrieved DQ RT. LD 3 x 9 1/2" DC. P/U 5 7/8" DP and built 49 stands in derrick.

INTERVAL: 26"
START TIME: 26.03.2006 17:30
END TIME: 11.04.2006 05:30

Report date	Description
27.03.2006	M/U cement stand. PU 26" BHA. RIH with same. Drill cement and shoe. Drill 26" hole to 840 m.
28.03.2006	Drilled 26" hole to TD 1350 m. Pumped 30 m3 hi-vis pill, displaced hole to 1,30 sg bentonite mud. POOH from 1350 m to 1265 m.
29.03.2006	POOH from with 26" BHA. Tight hole 1248-1220 m. R/B BHA in derrick. R/U and ran 20" csg to 395 m. Stabbed into 30" housing and ran csg to 416 m.
30.03.2006	Ran 20" casing from 416 m to 945 . P/U WH housing and ran casing on 5 7/8" landing string to 1331 m. Washed last 10 m to 1341 m and landed WH in 30" housing. Circulated and cemented casing. Bumped plug and checked float. Ok. Released WH RT.

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Report date	Description
31.03.2006	POOH with 5 7/8" HWDP landing string. L/D 18 3/4" WHRT and Halliburton stinger. L/D 5" DP. P/U hangoff tool. Rearranged 8 1/2" DC and 5 7/8" HWDP landing string in derrick. P/U 5 7/8" DP from deck and R/B in derrick.
01.04.2006	Deck crew handled supply boat and prepared deck for 5 7/8" DP, meanwhile safety checked pipe handling equipment in the derrick. Installed blower dustcover on DDM, prepared 17 1/2" BHA on deck. Prepared and installed yoke cylinder on eagle light. Performed preventive maintenance on rig floor. Change oil in gear on DDM. Cleaned underneath shakers.
08.04.2006	<i>Acceptance pressure testing of BOP. Performed repair of BOP in connection to acceptance test</i>
09.04.2006	Continued acceptance pressure testing of the BOP. Troubleshoot and repaired leak on lower outer kill failsafe tail rod. Troubleshoot and repaired leak on conduit valves. Completed the acceptance pressure testing of the BOP. Skided the BOP to the moonpool and landed same on the spider beams. Ran BOP/riser to 210 m @ 06:00
10.04.2006	Continued to run BOP on riser joints to 365 m. PU slip joint. Checked locking dogs and made up running tool. Run with BOP to 383 m. Troubleshoot on draw work and cleaned brake band for oil film. Installed kill, choke, booster and conduit lines. Pressure tested kill and choke lines. Installed rucker wires and pod saddles. Moved rig to WH position.

INTERVAL: 17 1/2"

START TIME: 11.04.2006 05:30

END TIME: 16.04.2006 10:00

Report date	Description
11.04.2006	Connected guide wires. Landed BOP on wellhead. Performed 25 ton over pull test. Tested WH connector and 20" CSG to 180 bar. RIH w/ 17 1/2" BHA. Washed down from 1273 m to 1301 m. Observed leak on wash pipe. Repaired same. Drilled plug/float and firm cement. Displaced well to 1,45 sg Glydrill. Drilled 20" casing shoe. Cleaned out rathole and drilled 3 m new. Performed LOT to 1,72 sg. Continued to drill new 17 1/2" hole.
12.04.2006	Drilled new hole from 1355 m to 1823 m.
13.04.2006	Drilled 17 1/2" hole from 1823 m to section TD at 2150 m. Circulated well clean and raised MW to 1,62/1,63 sg. POOH with the 17 1/2" BHA to 220 m at 06:00.
14.04.2006	POOH w/ 17 1/2" BHA. Retrieved bore protector (2 runs). MU cement stand and RU casing handling equipment. RIH with 14" CSG to 626 m at 06:00.
15.04.2006	Continued to RIH w/ 14" casing. RIH w/ casing on landing string from 1748 m. Landed 14" casing hanger in WH. Established circulation and circulated bottoms up with 2300 lpm. Pumped and displaced 20 m3 spacer and 24 m3 cement slurry. Bumped plug, sat seal assembly and tested same. Tested BOP.
16.04.2006	Completed BOP test. POOH with casing landing string and LD cement stand. Installed wear bushing. Repaired iron roughneck. LD 17 1/2" BHA. MU 12 1/4" BHA and RIH to above BOP. Pressure tested 14" casing to 545 bar. Continued to RIH with 12 1/4" BHA. Started to drill plugs/cement from 2113 m.

INTERVAL: 12 1/4"

START TIME: 16.04.2006 10:00

END TIME: 13.05.2006 09:30

Report date	Description
17.04.2006	Drilled out cement in shoetrack and cleaned the rat hole to 2150 m. Drilled 3 m new formation to 2153 m, and performed LOT. Displaced the well to 1,70 sg OBM. Waited while completed repair on the iron roughneck. Drilled new 12 1/4" hole to 2246 m.
18.04.2006	Continued to drill/slide new 12 1/4" hole from 2246 m to 3069 m.
19.04.2006	Continued to drill/slide new 12 1/4" hole from 3069 m to 3600 m.

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Report date	Description
20.04.2006	Continued to drill/slide new 12 1/4" hole from 3600 m to 3637 m. Changed leak washpipe. Continued to drill/slide from 3637 m to 3871 m.
21.04.2006	Drilled 12 1/4" hole from 3871 m - 3955 m. Two stops due to problems with top drive motor. Circulated hole clean and POOH to 685 m.
22.04.2006	POOH with 12 1/4" BHA from 685 m and rearranged same. RIH with new 12 1/4" BHA to 13 3/8" shoe. Function tested BOP, slipped and cut drilline. RIH to current TD at 3955 m. Oriented 12 1/4" hole from 3955 m to 3983 m.
23.04.2006	Drilled and oriented 12 1/4" hole from 3983 m - 4200 m. Found Bondura bolt for heave compensator bent and stuck. Circulated hole clean.
24.04.2006	Circulated hole clean. POOH to 335 m. Removed lower Bondura bolt for DSC cylinder. Prepared to mount new Bondura bolt.
25.04.2006	Installed new Bondura bolt. POOH and checked bit and Vertitrak. RIH with 12 1/4" BHA to current TD at 4200 m.
26.04.2006	Continued drilling 12 1/4" hole from 4200m to 4239 m. POOH.
27.04.2006	L/D Vertitrak and bit. M/U new BHA and RIH to TD. Drilled 12 1/4" hole from 4239 m to 4242 m. Flowchecked due to gain in active. Drilled 12 1/4" hole from 4242 m to 4245 m. Flowchecked due to gain in active. Drilled 12 1/4" hole from 4245 m to 4294 m.
28.04.2006	Drilled 12 1/4" hole from 4294 m to section TD at 4500 m. Circulated hole clean.
29.04.2006	Circulated 3 x BU. Flowchecked and POOH 2050 m. Flowchecked and took torque readings. Started to circulate BU and lost circulation. Observed well on triptank while filling riser with baseoil. Pumped 15 m3 1,80 sg LCM pill down string.
30.04.2006	Observed loss until stable well. Displaced riser to 1,76 sg MW until observing gain. Observed well until gain decreased. Continued to displace riser to 1,76 sg MW. Observed gain until stable well. POOH wet from 2030 m to 1800 m. Hole did not take right amount of mud. Unplugged string with 118 bar. POOH wet from 1800 m to 1500 m.
01.05.2006	Displaced well from 1500 m to 1,76 sg MW. RIH to 1990 m. Slipped and cut drilline. RIH to 2340 m. Displaced well to 1,78 sg MW.
02.05.2006	Displaced well to 1,78 sg at 2340 m. RIH to 3000 m. Displaced well to 1,78 sg. RIH to 3696 m. Started to displace well to 1,78 sg.
03.05.2006	Continued to displace well to 1,78 sg MW at 3696 m. RIH to TD at 4500 m. Displaced well to 1,78 sg MW. POOH to 4430 m.
04.05.2006	Performed 5 std shorttrip. Circulated BU at 4500 m. POOH wet to 2100 m. Took torque readings and dropped drift. POOH to 1000 m. M/U BOP test tool.
05.05.2006	Tested BOP (Had problems to get suction on cement pump when pressuring up with mud). POOH with BOP test tool and remaining 12 1/4" drilling assembly. Rigged up for logging AIT-IPLT-DSI log.
06.05.2006	Ran 2000 m of 9 7/8" liner.
07.05.2006	Ran 9 7/8" casing to 1978 m.
08.05.2006	Ran 9 7/8" liner from 1978 m to 2457 m. Made up Dril Quip liner hanger and ran liner in on 5 7/8" DP down to 4073 m. Lost 10 m3 mud total. Had to work through tight spots from 3128 m. Thight spots gradually got more frequent and increased in severity. At 4062 m was unable to pull up and had to set down entire weight of liner to get down.
09.05.2006	Ran 9 7/8" liner on 5 7/8" DP from 4073 m to 4500 m. Had several thight spots and had to work with all available force to get liner to bottom. Circulated 120 m3 at 1000 lpm without losses. Dropped ball and set liner hanger. Released liner hanger running tool. Unable to shear out ball seat within normal pressure range (design 240 bar). Pressured up to 376 bar - sheared out OK. Pumped 20 m3 1,87 sg spacer and 21 m3 1,96 sg cement. Displaced with mud (volume equivalent to half of shoetrack and 96% pump efficiency) without bumping plug. Had full returns during job. Set top packer and pressure tested same to 90 bar. Circulated B/U. POOH with 5 7/8" running string.
10.05.2006	Laid out liner hanger running tool (wiper plug still attached). Laid down cement stand. Function tested shear ram. Laid down 8" Drill Collars. Inspected derrick. Changed washpipe. Made up kick joint and 2 ea kick stands for coring. Laid out test stand pipe. Attempted to pressure test liner/casing leaked off at 142 bar (equivalent to 2,10 sg). Made up clean out assembly.
11.05.2006	Made up and RIH with 8 1/2" clean out assembly. Drilled shoe track and 3 m of new formation down to 4503 m. Circulated B/U and POOH to 700 m.
12.05.2006	POOH w/ 8 1/2" clean out assembly. M/ U and RIH w/ RTTS packer to 4450 m. Set packer and tested liner/ casing to 395 bar. POOH w/ RTTS packer to 1002 m.

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Report date	Description
13.05.2006	POOH w/ RTTS packer, laid same down on pipe deck. P/U new 8 1/2" BHA. RIH to 4493 m. Increased mudweight from 1,78 sg to 1,86 sg. Started finger printing.

INTERVAL: 8 1/2"

START TIME: 13.05.2006 09:30

END TIME: 07.07.2006 12:00

Report date	Description
14.05.2006	Performed finger printing. Drilled 8 1/2" hole from 4503 m to 4603 m.
15.05.2006	POOH w 8 1/2" BHA according to HTHP proserure. Clean and tidy drill floor. Performed TBRA meeting before P/U 30 feet core assembly No 1. PIH w/ same to 544 m.
16.05.2006	RIH w/ core to 4558 m. Washed down from 4558 m to bottom at 4603 m. Circulated bottoms up. Cut core no. 1 from 4603 to 4606 m. Core jammed. Circulated bottoms up. Flow checked 30 min. Pumped out of hole to 4390 m. Flow checked 30 min. Pulled 10 stands wet.
17.05.2006	POOH to 672 m. Flow checked 30 min, before pulling BHA through BOP. Pulled core assembly out of hole, with controlled speed. Recovered 2.1m core/ 70 % recovery. Picked up 8 1/2" drilling assembly. Run in hole with same to 3250 m.
18.05.2006	RIH with 8 1/2" drilling assambly to bottom at 4606 m. Drilled new formation from 4606 m to 4624 m. Confirmed top reservoir with MWD tool at 4620 m. Flow checked. Performed 5 stand short trip. Flow checked Pumped out to 4394 m. Flow checked. POOH from 4394 m to 1567 m.
19.05.2006	POOH with 8 1/2" drilling assembly from 690 m to surface. L/D roller reamer+ bit. Down loaded MWD. M/U core No 2 : 57 m 8 1/2" core assembly RIH with same to 956 m. P/U BOP test tool, RIH and landed same in well head. Tested BOP 35/ 483bar 5/10 min on annular, 35 545 bar 5/10 min on pipe rams. POOH with BOP test tool, layed down same on deck. Continued RIH with 8 1/2" core assembly from 956 m to 3391 m. Filled pipe every 500 m.
20.05.2006	Run in hole with core assembly No 2 from 3391 m to 4590 m. Washed down and tagged bottom at 4624 m. Circulated bottoms up. Cut core No 2 from 4624 m to 4658 m. ROP stopped, circulated bottoms up. Flow checked. Pumped out of hole from 4658 m to 4390 m, 800 l/ min. Flow checked. Pulled 10 stands wet. Flow checked. Slug pipe pulled out of hole. from 4098 m to 3680 m.
21.05.2006	POOH with core assembly No 2. Flow checked 30 min before pulling core assembly through BOP. Pulled core assembly out of hole with controlled speed. Recovered 34,39 m core & 100%. P/U new 57 m core assembly No 3, run in hole with same to 3396 m. Filled pipe every 500 m.
22.05.2006	Continued RIH with core assembly No 3 from 3678 m to 4640 m. Washed down to bottom at 4658 m. Circulated and dropped ball. Cut core No 3 from 4658 m to 4671 m. Core jammed. Flow checked. Pumped out of hole. Flow checked. Pumped 10 stand wet. Flow checked. Slug pipe pulled out of hole. Flow cheched before pulling core assembly through BOP. Simultaneously slip / cut drilline. Pulled core assembly No 3 with controlled speed to 151 m.
23.05.2006	POOH with core assembly No 3. Recovered 13,39 m core & 103 % recovery. P / U new core assembly No 4, run in hole with same to 4642 m filled pipe every 500 m. Washed down last stand and tagged bottom at 4671 m. Dropped ball. Cut core No 4 from 4671 m to 4674 m. Core jammed. Flow checked. Pumped out of hole from 4674 m to 4577m.
24.05.2006	Pumped out of hole with core assembly No 4, from 4674 m to 4406 m. Flow checked. Pumped 10 stands wet. Flow checked. Slug pipe, POOH. Flow checked before pulling BHA through BOP. Recovered 2,82 m core & 94 %. L/D anti stalling tool (AST) .P/U new core head & 27 m core assembly, assembly No 5. RIH with same to 3291m.:
25.05.2006	Continued RIH with core assembly No 5, from 3291 m to 4647 m. Washed down and tagged bottom at 4674 m. Circulated and dropped ball. Cut core No 5, from 4674 to 4699 m. Flow checked, pumped 400 m, flow checked, pulled 10 stand wet, flow checked. Slug pipe, POOH to 2054 m.

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26.05.2006	Pooh with core no 5, recovered 25,4 m core. MU new 8 1/2" rotary BHA and rih to 4610 m. Reamed and logged from 4610 m to 4645 m.
27.05.2006	Reamed and logged cored interval 4645 m to 4699 m. Drilled 8 1/2" hole to 4743 m. Circulated hole clean. Flow checked well. Pumped out to 4408 m. Flow checked well and pulled 10 stands wet. Flow checked well. Pumped slug and pooh to 2680 m.
28.05.2006	Pooh with 8 1/2" drilling assy. MU and rih with 90 ft core assy no 6. Cut core from 4743 m to 4753 m. Core jammed at 4753 m.
29.05.2006	Pooh with core no 6 and LD 10 m core. MU new corehead and rih with core assy no 7 to 528 m.
30.05.2006	Rih with 90 ft core assy no 7. Washed down last stand and dropped ball. Cut core no 7 from 4753 m to 4769 m. Core jammed off. Flow checked well. Washed out to 4400 m. Flowchecked, pulled 10 stands wet, FC and continued pooh to 3300 m.
31.05.2006	Pooh with core assy no 7 and recovered 16,38 m core. Rih with core assy no 8 to 3200 m.
01.06.2006	Rih and cut core no 8 from 4769 m to 4775 m. Core jammed off. Flow checked well. Pumped out to 4410 m. Flow checked well. Pooh to 676 m.
02.06.2006	Slipped and cut drill line. Pooh and recovered 6 m core. LD coring equipment. MU 8 1/2" rotary drilling assy and rih to 831 m. MU BOP test tool and rih with same. Pressure tested BOP and pooh with test tool.
03.06.2006	Pressure tested surface equipment. Rih. reamed and logged cored interval. Drilled 8 1/2" hole from 4775 m to 4811 m.
04.06.2006	Drilled 8 1/2" hole to 4823 m. Checked DDM due to high temp on oil. Pumped out into shoe and changed DDM oil and drilling pup. Rih and continued drilling 8 1/2" hole from 4823 m to 4843 m.
05.06.2006	Circulated hole clean. Pooh and changed bit. Rih to 3400 m.
06.06.2006	Rih and washed down last stand. Drilled 8 1/2" hole from 4843 m to 4888 m.
07.06.2006	Drilled 8 1/2" hole from 4888 m to 4893 m. Observed pressure build up with bit on bottom indicating bit worn out. Circulated hole clean for wireline logging. Pooh to 642 m.
08.06.2006	Pooh with 8 1/2" BHA. RU for wireline. Ran WL log no 1: MSIP-IS-AIT Prepared for log no 2: CMR-IPLT-EMS
09.06.2006	Ran wireline run no 2 CMR-IPLT-ECS-ACTS-ECRD. R/D toolstring. M/U and ran wireline run no 3 MDT. Started to take pressure points. Tight formations.
10.06.2006	Continued to take pressure points with toostring no 3 MDT. Tight formations. 6 good points out of 35 taken. POOH. M/U toostring no 4 MDT sampling. Trouble shoot problem with MRPQ probe. No go. Rebuilt toolstring no 3 MDT sampling.
11.06.2006	RIH with toolstring no 4 MDT sampling. Not able to pass 4746 m. Pulled up to first sample point at 4679 m. Performed sampling and mini DST. Attempted to pull toolstring free. No go. Toolstring stuck. Worked toolstring to free same. No go.
12.06.2006	Attempted to free logging toolstring. No go. Released electrical release mechanism in cable head. POOH with cable. R/D wireline equipment. M/U fishing string and RIH to casing shoe. Function tested BOP. RIH to 4620 m. Circulated btms up to 1500 m. Closed annular and continued to circulate over choke.
13.06.2006	Continued to circulate well over choke. Max gas 18%. Opened UAP and flow checked well. Established circulation and RIH. Engaged fish at 4838 m. Pumped out of hole to casing shoe. Max gas 10,5%. Flow checked well. Circulated bottoms up, last 1000 strokes over choke. POOH 10 stand wet to 4174 m.
14.06.2006	Flow checked well. POOH to 3874 m. Cut and slip drill line. POOH. Recovered logging toolstring and L/D same. M/U 8 1/2" BHA and RIH with same to 2168 m.
15.06.2006	Continued RIH to casing shoe. Reamed and washed into open hole. Tagged bottom at 4893 m. No fill. Circulated bottoms up. Flow checked. Pumped out of hole to 4400 m. Flow checked. Pulled 10 stands wet. Flow checked. POOH to 2584 m.
16.06.2006	Continued POOH with 8 1/2" BHA. Performed DROPS. R/U wireline equipment. M/U toolstring no 5 MDT mini DST sampling. Trouble shoot problem with communication signals to dual packer. Re-arranged toolstring with dual packer on bottom. Tested same. Ok. Cut cable due to kink on cable. Re-terminated cable head.
17.06.2006	RIH with toolstring no 5 MDT mini DST sampling to first station at 4782,6 m. Not able to get dual packer to seal. POOH and R/D toolstring. M/U toolstring no 6 MDT Quick Silver sampling. RIH.
18.06.2006	RIH with toolstring no 6 MDT Quick Silver sampling. Performed sampling in Garn at 4680,8 m. Moved to new sampling station in Ihle at 4780,6 m. Lost seal. Moved to sampling station at 4773 m. Started clean up/sampling. Total HC in well on run no 6 is 285 ltrs.
19.06.2006	Continued sampling at 4773 m. Lost contact with gauges. POOH with toolstring and L/D same. RIH with 8 1/2" BHA to 2079 m. M/U and RIH with BOP test plug. Tested BOP. POOH with test plug.

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Report date	Description
20.06.2006	L/D BOP test tool. RIH with 8 1/2" BHA from 2079 m to 2612 m. Rig repair. Continued RIH to TD. No fill. Circulated bottoms up, last 1500 m over choke. Max gas 19,9%. Circulated up riser, max gas 11,3%. Flow checked well. Pumped out of hole to 4637 m.
21.06.2006	Pumped out of hole to 4379 m. Flow checked well. POOH wet to 4042 m. M/U kelly cock, gray valve, one stand DP and hang off tool. RIH with same and landed in well head. Closed BOP. Monitor well. Performed welding of DST deck.
22.06.2006	Welded beams and installed new test deck.
23.06.2006	Completed work which required hot work for installation of new test deck. Opened the BOP and flow checked the well. POOH with hang off tool, and retrieved FOSV and Inside BOP. RIH with 8 1/2" BHA to the csg shoe. Reamed and washed to TD. Circulated bottoms up. Flow checked. Pumped out of hole to 4492 m.
24.06.2006	POOH with 8 1/2" wipetrip assembly. Performed derrick safety inspection. Rigged up for wireline. Tested wireline tools and RIH. Correlated depth and set packer at sampling point at 4872,6 m. Inflated packer and experienced problems with quarts gauge readings. Investigated problem. Gauge probably not reading. Started to pump for mini DST, using strain gauge data.
25.06.2006	Performed mini DST at 4782,6 m. Logging tool stuck. Worked to free logging tool. Moved to new samling depth at 4692,5 m. Performed second mini DST. logging tool stuck. Worked to free logging tool. POOH to 3 500 m.
26.06.2006	POOH with MDT logging tools. Observed the packers on the MDT tool severely damaged. Made up and RIH with VSP. VSP failed at 4250 m due to high temperature. Pulled up to cool the VSP tools. Logged VSP from 3011 m to 1322 m. RIH and attempted to log VSP from 4000 to 3000 m without success. POOH with VSP tools. Made up MDT tools. Problem to power up tool.
27.06.2006	Had problems to power up MDT tool string. Sorted failure to be non-through wire in the HD pump. Reconfigured the string. RIH with the MDT tool string. Lost 50 V and telemetry at 3700 m. Rebooted system and restarted 50 V. OK. RIH to 4850 m. Lost telemetry, system unreliable. POOH and checked the tools, and changed out the LFA module above the pump with AFA, GR and DTA (Telemetry adapter). Inspected the dual packer, OK. RIH with MDT tool string to 4850 m. Performed depth correlation and started mini DST in Tofte 2.
28.06.2006	MDT packer module not taking command. Switched off power and restarted. Tool communicating again. Pumped with low flow limited by max differential pressure accross the packer elements of 190 bar. Pumped total 37 liters, 10 liters hydrocarbons. Contamination at end 38 % and GOR 500 scf/bbl. Lost communication with MDT tool. Made several attempths to power down the tool. Changed the communication panel. No success. Pulled 7 800 lbs on cable head, 12 800 lbs on cable. No success. Prepared to release cable on electrical weak point.
29.06.2006	Attempted to release cable on electrical weak point without success. Made up fishing assembly for MDT tool. RIH with fishing assembly.
30.06.2006	RIH with overshot to catch stuck mini DST tool with wire attached through side entry sub. Latched on to fish and pulled free with 11 ton overpull. Pulled out of hole with pipe and wireline (slowly to avoid swabbing) to 1012 m.
01.07.2006	Laid out mini DST tools fished with DP, overshot and sideentry sub. Rubber elements severely torn. Made up new drilling BHA and RIH.
02.07.2006	Drilled 8 1/2" hole from 4893 m to 4968 m.
03.07.2006	Drilled 8 1/2" hole from 4968 m to TD at 4989.7 m. Circulated B/U. Pulled out according to HTHP procedures to 1000 m. Ran back in with BOP test tool. Started BOP test.
04.07.2006	Tested BOP. Pulled out of hole with test tool and drilling BHA. Rigged up for logging. Trouble shoot problem with locked brakes on capstan winch.
05.07.2006	Repaired capstan winch. Ran AIT-IPLT-DSI-GR-ECRD wireline log to 4989.7 m. Logged. POOH. Ran in with MSCT log.
06.07.2006	Drilled 50 sidewall cores with MSCT tool. POOH. RIH with VSP. Started VSP logging.
07.07.2006	Logged VSP. Cut 33 sidewall cores. Finnished logging.

INTERVAL: PERM P&A
START TIME: 07.07.2006 12:00
END TIME: 16.07.2006 14:30

Report date	Description
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Report date	Description
08.07.2006	Pulled out of hole with MSCT and 33 sidewall cores. Laid down toolstring. Rigged down capstan winch, hydraulic power pack and support frame. RIH with 376 m 3 1/2" open ended DP on 5 7/8" DP. Circulated. Had 2,5 m3 gain in active - closed in. Circulated until bottoms up over choke.
09.07.2006	Circulated bottoms up. Set two 300 m cement plugs from TD and up into 9 7/8" liner. Pulled out of hole.
10.07.2006	RIH to 2026 m with 14" EZSV. Pressure tested open hole cement plugs to 158 bar. Set EZSV and pressure tested same to 55 bar. Displaced well to 1,6 SG water based mud. Set 100 m cement plug. POOH.
11.07.2006	RIH with 14" casing cutter, motor and Multi Purpose Tool. Failed to cut casing, but retrieved wearbushing. Made new run with casing cutter. Had positive indication of cutting 14" casing at 797 m. Pulled out. RIH and pulled seal assembly. RIH with 14" casing spear.
12.07.2006	Pulled cut 14" casing free. Circulated out gas (max. 38%). Pulled out with casing. RIH with 5 7/8" open ended drill pipe to 860 m. Pumped down CST tool. Set cement plug from 855 m to 650 m. Pulled out of cement.
13.07.2006	Laid out 620 m 5 7/8" DP to deck. Laid down 6 1/2" DC's from derrick. Picked up 8" drill collars from deck. Pressure tested cement plug (850 - 650 m) to 82 bar. Pressure dropped 4 bar/10 min. RIH with cement stinger and tagged cement at 656 m. Displaced to seawater. Set cement plug from 656 m to 456 m. Squeezed cement until pressure drop was down to 1 bar/10 min. Set soap pill in BOP. Pooh.
14.07.2006	Washed BOP. WOW to pull BOP. R/U to pull BOP.
15.07.2006	Prepared to pull BOP. Disconnected BOP from WH. Undressed slip joint. Collapsed and L/D slip joint. Pulled BOP/riser. Prepared for opening drillfloor hatches.
16.07.2006	Pulled BOP from spider beams and secured same in BOP garage. M/U casing cutting assy and RIH. Entangled guide lines. Attempted to cut 20" casing/30" conductor at 403 m. POOH with cutting assy and found nozzle missing in cutting assy above knives. RIH with cutting assy. Cut casing/conductor at 403 m. Pulled casing/conductor/PGB free.

INTERVAL: MOVE

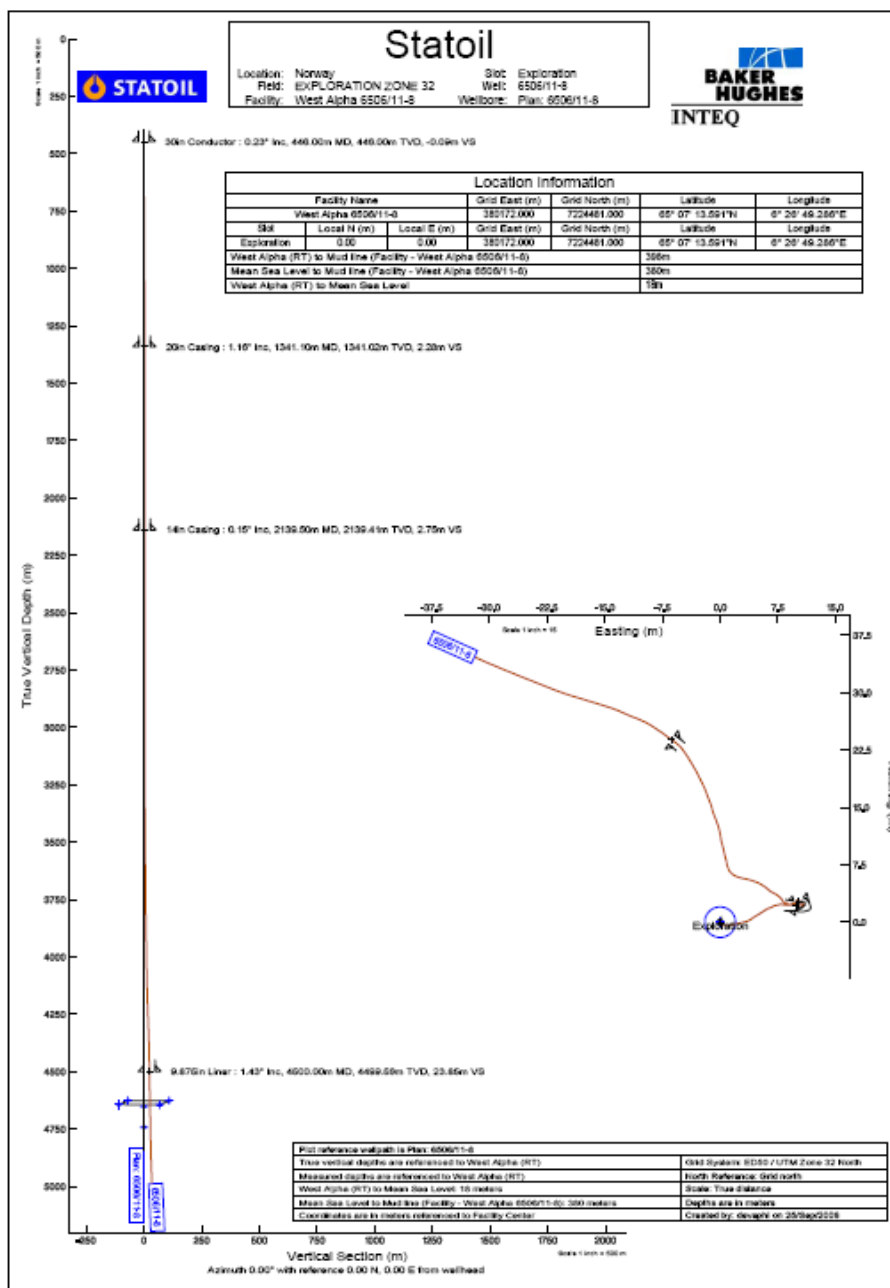
START TIME: 16.07.2006 14:30

END TIME: 18.07.2006 15:30

Report date	Description
17.07.2006	POOH and L/D cut conductor housing, WH and PGB. Deballasted rig. Waited on weather.
18.07.2006	Waited on weather. Performed planned maintenance on DDM swivel and dropped object inspection. Anchor handling. Troubleshoot problem with port crane. Anchor handling.

App B Directional data, survey listing

Well plot 6506/11-8



Baker Hughes Incorporated
Survey Report

Company:	STATOIL - Norway	Local Co-ordinate Reference:	Site 6506/11-8
Project:	EXPLORATION - UTM Zone 32	TVD Reference:	RT#1 @ 16.00m (West Alpha)
Site:	6506/11-8	MD Reference:	RT#1 @ 16.00m (West Alpha)
Well:	6506/11-8	North Reference:	Grid
Wellbore:	6506/11-8	Survey Calculation Method:	Minimum Curvature
Design:	Definitive 6506/11-8 (TD@4893m Md)	Database:	EDM R200.14 on oracle

Measured Depth (m)	Inclination (°)	Azimuth (°)	Vertical Depth (m)	+N/-S (m)	+E/-W (m)	Vertical Section (m)	Dogleg Rate (°/30m)	Build Rate (°/30m)	Turn Rate (°/30m)
811.50	0.66	56.33	811.45	1.06	5.09	5.20	0.120	-0.08	-7.03
839.50	0.56	57.66	839.45	1.23	5.34	5.48	0.108	-0.11	1.42
869.00	0.55	54.49	868.95	1.39	5.58	5.75	0.033	-0.01	-3.22
896.00	0.36	54.60	895.95	1.51	5.75	5.95	0.211	-0.21	0.12
927.00	0.42	67.81	926.95	1.61	5.94	6.15	0.104	0.06	12.78
956.00	0.39	50.32	955.94	1.71	6.11	6.34	0.131	-0.03	-18.09
983.00	0.30	67.88	982.94	1.80	6.25	6.50	0.153	-0.10	19.51
1,010.00	0.43	79.96	1,009.94	1.84	6.41	6.67	0.167	0.14	13.42
1,039.00	0.41	55.90	1,038.94	1.92	6.61	6.87	0.182	-0.02	-24.89
1,067.00	0.41	67.31	1,066.94	2.02	6.78	7.07	0.087	0.00	12.22
1,094.00	0.35	59.78	1,093.94	2.09	6.94	7.24	0.087	-0.07	-6.37
1,122.00	0.43	76.05	1,121.94	2.16	7.12	7.43	0.146	0.09	17.43
1,149.00	0.51	76.04	1,148.94	2.22	7.33	7.65	0.089	0.09	-0.01
1,175.00	0.39	84.90	1,175.94	2.25	7.54	7.86	0.154	-0.13	9.84
1,204.00	0.47	71.43	1,203.94	2.30	7.75	8.07	0.138	0.09	-14.43
1,232.00	0.48	98.13	1,231.94	2.32	7.97	8.29	0.235	0.01	28.61
1,260.00	0.83	98.11	1,259.94	2.27	8.29	8.59	0.375	0.37	-0.02
1,288.00	1.08	89.74	1,287.93	2.25	8.75	9.03	0.306	0.27	-8.97
1,317.00	1.32	86.49	1,316.93	2.27	9.36	9.63	0.256	0.25	-3.36
1,341.10	1.16	89.99	1,341.02	2.28	9.88	10.14	0.217	-0.20	4.36
20" Casing									
1,380.60	0.92	98.24	1,380.51	2.24	10.60	10.82	0.217	-0.18	6.27
1,409.60	0.05	302.67	1,409.51	2.21	10.81	11.03	0.999	-0.90	-180.93
1,438.60	0.09	317.34	1,438.51	2.24	10.79	11.01	0.045	0.04	15.18
1,463.00	0.09	220.41	1,462.91	2.23	10.73	10.96	0.074	0.00	-53.45
1,522.10	0.09	223.45	1,522.01	2.20	10.70	10.92	0.005	0.00	3.13
1,549.30	0.02	231.80	1,549.21	2.18	10.68	10.90	0.078	-0.08	9.21
1,607.50	0.05	117.16	1,607.41	2.16	10.70	10.91	0.031	0.02	-59.09
1,634.20	0.09	45.55	1,634.11	2.17	10.72	10.93	0.099	0.04	-80.46
1,664.10	0.11	115.48	1,664.01	2.18	10.77	10.98	0.116	0.02	70.16
1,720.80	0.02	72.85	1,720.71	2.16	10.82	11.03	0.051	-0.05	-22.56
1,744.60	0.06	38.50	1,744.51	2.17	10.84	11.05	0.081	0.08	-43.30
1,774.50	0.12	63.37	1,774.41	2.20	10.88	11.09	0.058	0.04	24.95
1,859.60	0.16	315.15	1,859.51	2.33	10.88	11.12	0.080	0.01	-38.15
2,139.50	0.15	293.22	2,139.41	2.75	10.26	10.62	0.006	0.00	-2.35
14" Casing									
2,169.10	0.15	290.80	2,169.01	2.78	10.19	10.56	0.006	0.00	-2.45
2,195.10	0.07	114.62	2,196.01	2.78	10.17	10.54	0.244	-0.09	-195.76
2,225.00	0.05	77.28	2,224.91	2.78	10.20	10.57	0.044	-0.02	-38.76
2,252.90	0.24	240.69	2,252.81	2.75	10.16	10.53	0.310	0.20	175.71
2,280.90	0.23	263.08	2,280.81	2.72	10.06	10.41	0.098	-0.01	23.99
2,308.80	0.29	19.37	2,308.71	2.78	10.02	10.40	0.476	0.06	125.04
2,338.30	0.08	261.97	2,338.21	2.84	10.03	10.42	0.340	-0.21	-119.39
2,366.20	0.29	28.79	2,366.11	2.90	10.04	10.44	0.370	0.23	136.37
2,395.90	0.16	157.03	2,395.81	2.93	10.10	10.50	0.413	-0.13	129.54
2,423.80	0.08	265.12	2,423.51	2.89	10.09	10.49	0.216	-0.09	117.06
2,451.40	0.20	40.19	2,451.31	2.93	10.10	10.51	0.284	0.13	145.76
2,480.10	0.75	210.38	2,480.01	2.80	10.04	10.42	0.991	0.57	177.90
2,507.70	0.93	243.73	2,507.61	2.55	9.75	10.07	0.556	0.20	36.25
2,557.00	0.76	290.22	2,556.90	2.32	9.07	9.36	0.180	-0.10	10.03
2,589.90	0.15	290.52	2,589.80	2.30	8.81	9.10	0.579	-0.56	27.63
2,617.90	0.05	42.49	2,617.80	2.32	8.79	9.08	0.187	-0.11	119.97
2,645.90	0.24	310.77	2,645.80	2.35	8.75	9.06	0.264	0.20	-98.27
2,674.20	0.33	349.07	2,674.10	2.48	8.69	9.03	0.218	0.10	40.60
2,701.80	0.08	241.37	2,701.70	2.55	8.66	9.02	0.394	-0.27	-117.07
2,726.80	0.11	202.85	2,726.70	2.52	8.63	8.98	0.083	0.04	-46.22
2,763.70	0.18	114.70	2,763.60	2.43	8.69	9.02	0.110	0.04	-46.48
2,811.60	0.14	303.09	2,811.50	2.43	8.70	9.03	0.343	-0.04	-184.53
2,841.40	0.02	162.85	2,841.30	2.45	8.68	9.01	0.157	-0.12	-141.18

Final Well Report
6506/11-8
Morvin, PL134B

Restricted

Doc. no. EPDS-6506/11-8-026



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31.05.2007

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Baker Hughes Incorporated
Survey Report

Company:	STATOIL - Norway	Local Co-ordinate Reference:	Site 6506/11-8
Project:	EXPLORATION - UTM Zone 32	TVD Reference:	RT#1 @ 16.00m (West Alpha)
Site:	6506/11-8	MD Reference:	RT#1 @ 16.00m (West Alpha)
Well:	6506/11-8	North Reference:	Grid
Wellbore:	6506/11-8	Survey Calculation Method:	Minimum Curvature
Design:	Definitive 6506/11-8 (TD@4893m Md)	Database:	EDM R200.14 on oracle

Measured Depth (m)	Inclination (°)	Azimuth (°)	Vertical Depth (m)	+N/-S (m)	+E/-W (m)	Vertical Section (m)	Dogleg Rate (°/30m)	Build Rate (°/30m)	Turn Rate (°/30m)
2,868.10	0.11	321.17	2,868.00	2.46	8.66	9.00	0.145	0.10	177.89
2,895.30	0.08	164.83	2,895.20	2.47	8.65	8.99	0.205	-0.03	-172.43
2,924.20	0.18	209.13	2,924.10	2.41	8.63	8.96	0.140	0.10	45.99
2,951.20	0.17	291.68	2,951.10	2.38	8.57	8.89	0.257	-0.01	91.72
2,981.40	0.39	306.58	2,981.30	2.46	8.45	8.79	0.228	0.22	14.80
3,009.60	0.49	310.93	3,009.50	2.60	8.28	8.66	0.112	0.11	4.63
3,036.40	0.49	320.85	3,036.30	2.76	8.12	8.55	0.095	0.00	11.10
3,069.10	0.41	346.35	3,069.00	2.98	8.01	8.49	0.196	-0.07	23.39
3,093.90	0.05	298.52	3,093.80	3.08	7.98	8.48	0.458	-0.44	-57.86
3,123.70	0.23	310.24	3,123.60	3.12	7.92	8.43	0.183	0.18	11.80
3,177.60	0.33	312.76	3,177.49	3.30	7.72	8.28	0.056	0.06	1.40
3,208.70	0.42	305.05	3,208.59	3.41	7.57	8.17	0.106	0.09	-7.95
3,235.10	0.20	317.25	3,234.99	3.51	7.46	8.07	0.241	-0.23	12.89
3,289.10	0.21	294.04	3,288.99	3.62	7.30	7.95	0.046	0.01	-12.89
3,317.10	0.36	301.09	3,316.99	3.69	7.18	7.85	0.165	0.16	7.55
3,344.40	0.49	298.32	3,344.29	3.79	7.00	7.70	0.145	0.14	-3.04
3,372.20	0.70	296.61	3,372.09	3.92	6.75	7.48	0.227	0.23	-1.85
3,399.60	0.69	308.32	3,399.49	4.10	6.47	7.25	0.156	-0.01	12.82
3,428.40	0.92	310.09	3,428.29	4.35	6.15	7.01	0.241	0.24	1.84
3,485.80	1.09	301.77	3,485.68	4.95	5.32	6.34	0.115	0.09	-4.27
3,517.60	1.18	290.75	3,517.47	5.21	4.78	5.87	0.230	0.09	-10.73
3,545.20	1.13	289.23	3,545.07	5.40	4.26	5.41	0.064	-0.05	-1.55
3,598.00	1.30	280.62	3,597.85	5.69	3.17	4.42	0.141	0.10	-4.89
3,625.60	1.15	286.31	3,625.45	5.82	2.60	3.90	0.210	-0.16	6.18
3,653.50	0.98	291.17	3,653.34	5.98	2.11	3.46	0.226	-0.20	5.23
3,682.20	0.89	305.43	3,682.04	6.20	1.71	3.12	0.251	-0.07	14.91
3,710.00	0.79	314.57	3,709.84	6.46	1.40	2.88	0.180	-0.11	9.86
3,739.10	0.74	335.42	3,738.93	6.77	1.18	2.74	0.290	-0.05	21.49
3,795.00	0.57	340.81	3,794.83	7.36	0.93	2.64	0.097	-0.09	2.89
3,823.30	0.60	352.94	3,823.13	7.64	0.87	2.64	0.135	0.03	12.86
3,877.60	0.97	343.82	3,877.42	8.37	0.71	2.66	0.215	0.20	-5.04
3,907.40	1.22	347.75	3,907.22	8.92	0.57	2.65	0.263	0.25	3.96
3,935.40	1.15	348.05	3,935.21	9.48	0.45	2.67	0.075	-0.07	0.32
3,964.20	1.05	344.60	3,964.01	10.02	0.32	2.67	0.125	-0.10	-3.59
3,990.10	1.00	344.49	3,989.90	10.47	0.19	2.65	0.058	-0.06	-0.13
4,018.00	1.11	351.37	4,017.80	10.97	0.09	2.67	0.180	0.12	7.40
4,047.70	1.19	350.20	4,047.49	11.56	-0.01	2.71	0.064	0.06	-1.18
4,076.10	1.33	345.25	4,075.88	12.17	-0.14	2.73	0.187	0.15	-5.23
4,104.60	1.40	341.23	4,104.38	12.82	-0.34	2.69	0.125	0.07	-4.23
4,132.70	1.34	338.69	4,132.47	13.45	-0.57	2.61	0.091	-0.06	-2.71
4,161.90	1.55	338.32	4,161.66	14.13	-0.84	2.51	0.216	0.22	-0.38
4,174.50	1.75	344.81	4,174.25	14.48	-0.95	2.48	0.651	0.48	15.45
4,187.70	1.83	345.21	4,187.45	14.88	-1.06	2.47	0.184	0.18	0.91
4,212.90	2.01	338.59	4,212.63	15.68	-1.32	2.41	0.340	0.21	-7.88
4,243.90	2.35	340.33	4,243.61	16.78	-1.73	2.27	0.335	0.33	1.68
4,271.80	2.14	334.58	4,271.49	17.79	-2.15	2.10	0.331	-0.23	-6.18
4,298.80	2.15	334.39	4,298.47	18.70	-2.59	1.89	0.014	0.01	-0.21
4,326.70	2.28	331.24	4,326.35	19.66	-3.08	1.64	0.191	0.14	-3.39
4,356.00	2.20	330.12	4,355.63	20.66	-3.64	1.33	0.093	-0.08	-1.15
4,383.70	2.12	326.96	4,383.31	21.55	-4.18	1.01	0.155	-0.09	-3.42
4,412.20	1.92	326.03	4,411.79	22.39	-4.74	0.67	0.213	-0.21	-0.98
4,440.10	1.26	313.85	4,439.68	22.99	-5.22	0.34	0.793	-0.71	-13.10
4,468.50	1.35	309.00	4,468.07	23.41	-5.71	-0.03	0.150	0.10	-5.12
4,480.30	1.30	306.43	4,479.87	23.58	-5.92	-0.20	0.197	-0.13	-6.53
4,500.00	1.43	304.54	4,499.56	23.85	-6.30	-0.51	0.212	0.20	-2.88
9 7/8" Liner									
4,514.60	1.53	303.35	4,514.16	24.06	-6.62	-0.77	0.212	0.20	-2.45
4,527.00	1.46	310.01	4,526.55	24.28	-6.88	-0.97	0.453	-0.17	16.11
4,554.50	1.46	304.74	4,554.04	24.68	-7.43	-1.41	0.146	0.00	-5.75
4,570.40	1.46	304.74	4,569.94	24.91	-7.77	-1.68	0.000	0.00	0.00

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Final Well Report
6506/11-8
Morvin, PL134B

Restricted

Doc. no. EPDS-6506/11-8-026



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Baker Hughes Incorporated
Survey Report

Company:	STATOIL - Norway	Local Co-ordinate Reference:	Site 6506/11-8
Project:	EXPLORATION - UTM Zone 32	TVD Reference:	RT#1 @ 18.00m (West Alpha)
Site:	6506/11-8	MD Reference:	RT#1 @ 18.00m (West Alpha)
Well:	6506/11-8	North Reference:	Grid
Wellbore:	6506/11-8	Survey Calculation Method:	Minimum Curvature
Design:	Definitive 6506/11-8 (TD@4893m Md)	Database:	EDM R200.14 on oracle

Measured Depth (m)	Inclination (°)	Azimuth (°)	Vertical Depth (m)	+N/-S (m)	+E/-W (m)	Vertical Section (m)	Dogleg Rate (°/30m)	Build Rate (°/30m)	Turn Rate (°/30m)
4,611.30	1.78	303.65	4,610.82	25.56	-8.72	-2.46	0.236	0.23	-0.80
4,668.80	2.21	293.15	4,668.29	26.49	-10.48	-3.95	0.294	0.22	-5.48
4,694.20	2.48	290.50	4,693.67	26.88	-11.45	-4.80	0.344	0.32	-3.13
4,709.70	2.56	294.32	4,709.15	27.14	-12.08	-5.35	0.360	0.15	7.39
4,725.50	2.57	294.55	4,724.94	27.43	-12.72	-5.91	0.027	0.02	0.44
4,780.80	3.62	286.69	4,780.16	28.45	-15.52	-8.39	0.613	0.57	-4.26
4,808.30	3.92	287.05	4,807.60	28.97	-17.25	-9.95	0.328	0.33	0.39
4,827.00	3.85	287.48	4,826.25	29.35	-18.46	-11.04	0.122	-0.11	0.69
4,835.50	4.10	285.99	4,835.73	29.54	-19.09	-11.60	0.854	0.79	-4.71
4,850.60	4.16	289.41	4,849.79	29.84	-20.06	-12.47	0.539	0.13	7.28
4,866.20	4.42	290.10	4,865.35	30.24	-21.18	-13.45	0.510	0.50	1.33
4,880.10	4.79	291.67	4,879.20	30.64	-22.20	-14.36	0.844	0.80	3.39
4,943.40	5.77	292.21	4,942.24	32.82	-27.60	-19.10	0.465	0.46	0.26
4,961.10	5.85	292.63	4,959.84	33.50	-29.26	-20.55	0.169	0.15	0.71
4,961.80	6.20	294.30	4,960.43	34.37	-31.26	-22.29	0.554	0.49	2.42
4,969.00	6.20	294.30	4,967.59	34.69	-31.96	-22.90	0.000	0.00	0.00

Measured Depth (m)	Vertical Depth (m)	Name	Casing Diameter (in)	Hole Diameter (in)
446.00	446.00	30" Conductor	30.000	36.000
1,341.10	1,341.02	20" Casing	20.000	26.000
2,139.50	2,139.41	14" Casing	14.000	17.500
4,500.00	4,499.56	9 7/8" Liner	9.675	12.250

Checked By: _____ Approved By: _____ Date: _____

App C List of contractors

Service	Contractor
Plug	Weatherford Norge AS
Rig operations	SeaDrill
Mud logging	Geoservices
Subsea WH/X-mas tree	Drill Quip
Liner hanger equipment	Drill Quip
Core company	Halliburton
Electric wireline logging	Schlumberger
Cementing	Halliburton
Casing crew service	Weatherford Norge AS
Directional drilling	Baker Hughes Inteq
ROV systems	Oceaneering
Drilling fluids	M-I Drilling Fluids
Measurement while drilling	Baker Hughes Inteq
Core handling and analysis	Reslab
Biostratigraphy	RPS Consultants
Rig positioning	Fugro Survey
Fluid analysis offshore	Petrotech

App D MDT pressure measurements

No	FORMATION	DEPTHS			Hydrostatic	Formation pressure		Hydrostatic	Temp.	Mobility	Comments
		m MD	m TVD RT	m TVD MSL	press.before bar	bar	(ref. RKB) g/cc	press.after bar	degr C	md/cP	
1	Melke	4628.5	4628.1	4610.1	851.08					0.03	Tight
2	Melke	4630.8	4630.4	4612.4	851.10				147.4	0.01	Tight
3	Garn 5	4646.0	4645.6	4627.6	853.70						Tight
4	Garn 2	4660.5	4660.1	4642.1	856.50				150.4	0.3	Two drawndowns, thight
5	Garn 2	4664.1	4663.7	4645.7	856.76				151.3	0.01	Tight
6	Garn 2	4666.0	4665.6	4647.6	856.67						Lost power,new test.Tight
7	Garn 1	4679.0	4678.6	4660.6	859.30	816.482	1.779	859.06	152.1		ok
8	Garn 1	4681.0	4680.6	4662.6	859.50	816.89	1.779		152.5	10?	Lost seal, reset probe. Test??
9	Garn 1	4687.0	4686.6	4668.6	860.65			860.39	153	0.01	Tight
10	Garn 1	4698.0	4697.6	4679.6	862.90				153		Tight
11	Ile 3	4735.2	4734.8	4716.8	870.70				152.3	0.07	Tight
12	Ile 2	4770.5	4770.0	4752.0	877.29	823.581	1.760	876.56	154.7	1.1	Two drawndowns, good test
13	Ile 2	4780.5	4780.0	4762.0	878.77	824.152	1.758	878.44	155.3	2.2	Build down, good test
14	Ile 2	4786.0	4785.5	4767.5	879.71				155.8	0.2	Tight
15	Ile 1	4795.2	4794.7	4776.7	881.44			880.90	156.7	0.02	Tight
16	Ile 1	4799.0	4798.5	4780.5	881.83			881.61	157.1	0.03	Tight
17	Ile 1	4802.5	4802.0	4784.0	882.51				157.4	0.9	Tight
18	Tofte 3	4839.5	4839.0	4821.0	890.55				158.3	0.03	Tight
19	Tofte 3	4843.0	4842.5	4824.5	890.70			890.07	159		Lost seal
20	Tofte 3	4845.0	4844.5	4826.5	889.60	865.72	1.822		159.4		Tight/superscharged
21	Tofte 1	4870.5	4870.0	4852.0	896.00				161.3		Tight/superscharged
22	Ile 1	4806.0	4805.5	4787.5	880.48				160.4		Tight-2 attempt
23	Ile 1	4799.5	4799.0	4781.0	879.523				160.2		Lost seal- 3 attempt
24	Ile 2	4785.5	4785.0	4767.0	877.025	831.00	1.770		159.2		Tight/superscharged-3 attempt
25	Ile 2	4780.5	4780.0	4762.0	876.49				159.3		No seal
26	Ile 2	4780.0	4779.5	4761.5	876.34	844.10	1.800		159.2	16?	Supercharged
27	Ile 2	4770.5	4770.0	4752.0	874.54				159.2		Supercharged
28	Ile 3	4749.5	4749.1	4731.1	871.11				157.1		Tight
29	Ile 3	4733.0	4732.6	4714.6							Tight
30	Garn 1	4681.0	4680.6	4662.6	858.4	827.97	1.803		155.1	3.9	Supercharged 3 attempt
31	Garn 1	4682.8	4682.4	4664.4		818.18	1.781		154.9	2.5	Good, but sligtly increasing
32	Garn 1	4679.0	4678.6	4660.6	858.223	816.44	1.779		154.9	60.9	Good
33	Garn 2	4677.5	4677.1	4659.1	857.89	816.37	1.779		154.9	39.8	Good
34	Garn 5	4647.0	4646.6	4628.6	852.38				154.6		Tight - 2 attempt
35	Melke	4623.8	4623.4	4605.4	847.95	750.70	1.655		153.6		Very poor, Pressure not stabel. Incrasing very slowly (0.019 Bar/min)

App E NPD standard sheet for reporting shallow gas

1. Avstand fra boredekk til havnivå: 18m
2. Vanndyp: 380m MSL
- 3a. Settedyp for lederør: 446m MD RT
- 3b. Evt. formasjonstyrketest (g/cc): N/A
- 4a. Settedyp for foringsrør hvorpå BOP settes: 1342m MD RT
6. *Dybdeintervall (mRKB og mTVD) og alder for sandlag grunnere enn 1000 m under havbunnen. Oppgi hvilke lag som evt. inneholder gass.*
Kvartære sandlag 501- 504mMD RT, vannvåt
Kvartære sandlag 515 - 518mMD RT, vannvåt
Kvartære sandlag 558 - 561mMD RT, vannvåt
Kvartære sandlag 616 - 620mMD RT, vannvåt
Kvartære sandlag 663 - 664mMD RT, vannvåt
Sandlag i Naust Fm. 676 - 678mMD RT, vannvåt
Sandlag i Naust Fm. 812 - 817mMD RT, vannvåt
Sandlag i Naust Fm. 840 - 842mMD RT, vannvåt
Sandlag i Naust Fm. 923 - 928mMD RT, vannvåt
Sandlag i Naust Fm. 978 - 983mMD RT, vannvåt
7. Grunn gass er ikke påvist i brønnen.
8. Sammensetning og opprinnelse til gassen: N/A
9. Beskriv alle målinger i gassførende lag: N/A
10. *Angi dyp (mRKB og TVG) til inkonformiteter i borehullsposisjonen:*
Bunn Kvartær er prognosert til 671mMD RT, og er observert på 676mMD RT på MWD loggen
11. Angi utbredelsen av sandlagene (kommunikasjon, kontinuitet, trunkering, etc.): -
12. Angi utbredelsen av evt. gass-skygging ("gas blanking"): Ingen.
13. Angi eventuelle seismiske indikasjoner på at gassen stammer fra dypere nivå.
Beskrivelse dersom gassen stammer fra dypere nivå: N/A
14. *Hvordan samsvarer tolkingen av borestedsundersøkelsen med borehullsdata mht. :*
- grunn gass

Stemmer godt. Det var ikke prognosert grunn gass og grunn gass ble heller ikke observert.

- *sandlag*

God korrelasjon fra sitesurvey.

- *inkonformiteter*

Bunn Kvartær er prognosert på 671m MD RT.

Bunn Kvartær er plukket på 676m MD RT

- *korrelasjon til nærliggende borehull*

God korrelasjon til referansebrønn 6506/11-7 som ligger 5.4 km mot sør.

App F Listing of other reports

REPORTS	COMPANY
Well Programme PL 134B, Well 6506/11-8	STATOIL
Site Survey at Morvin Planned Well Location, 6506/11-F VOL.I	FUGRO
Site Survey at Morvin Planned Well Location, 6506/11-F VOL.II	FUGRO
West Alpha to well 6506/11-8, Morvin (Navigation QC Report)	FUGRO
Plug and Abandon Program for Well 6506/11-8	STATOIL
Final well report drilling – 6506/11-8 Morvin PL134B	STATOIL
Final Well Report, Mudlogging, Well 6506/11-8 Morvin	GEOSERVICE
Transient Test Analysis of MDT Dual Packer Well 6506/11-8 PL134B	STATOIL
End of Well Report, Well 6506/11-8 – MWD & Survey	BAKER HUGHES INTEQ
Kjerneborings-rapport Statoil brønn 6506/11-8	HALLIBURTON
Geochemistry HCS of Well 6506/11-8 Morvin	APT
Validity checks and Analysis of WFS-samples	Petrotech
NOCS Well 6506/11-8, Wellsite Biostratigraphy of the Interval 3310m – 4500m	RPS Consultants
Zero Offset VSP Survey, Well 6506/11-8	Schlumberger
Characterisation of water samples from Morvin, well 6506/11-8	CoreLab
Field Operations Report, Well 6506/11-8	Schlumberger
Final Report Conventional Core Analysis, Well 6506/11-8	RESLAB
VSP Data Processing Report, Zero Offset VSP in well 6506/11-8	READ
Boresluttnotat Avgrensingsbrønn 6506/11-8 Morvin	STATOIL
Petrophysical CPI report, Well 6506/11-8	STATOIL

7 Enclosures

Wellsite sample descriptions

Conventional Core descriptions

Composite log, well 6506/11-8

Formation evaluation log, well 6506/11-8

WELLSITE SAMPLE DESCRIPTION

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Country: Norway			Area: Haltenbanken			Field: Morvin		
Well no: 6506/11-8			Company: Statoil ASA, Norsk Hydro Produksjon AS, Eni Norge AS, Total E&P AS					
RKB: 18.0 meters			Geologist: Kjell Ruud, Tor Finn Kristensen					
Hole size: 17 ½”			Cut solvent: Iso Propyl Alcohol				Date: 11.04.2005	
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.	

			Samples returned to seabed down to 1350m		
1360	100	Clst:	med gry, sft, amor, sol, stky, slty, sdy, non – occ calc		
	Gd tr	Sd:	clr – trnsl Qtz, f – crs, sbang – sbrnidd, lse sd washed out from Clst		
	Tr	Rk frags:	med – crs grns		
	Tr		Shl frags and microfoss		
1370	a.a.				
1380	100	Clst:	med gry, sft, amor, sol, stky, sdy slty, non-occ calc		
	Gd tr	Sd:	clr – trnsl Qtz, f – crs, sbang – sbrnidd		
	Tr	Rk frags:	med – crs grns		
	Tr		Shl frags and microfoss		
1390	a.a.				
1400	a.a.				
1410	a.a.				
1420	100	Clst:	occ micromic, else a.a.		
	Gd tr	Sd:	a.a.		
	Tr	Rk frags:	a.a.		
	Tr		Shl frags and microfoss		
1430	a.a.				
1440	100	Clst:	occ v slty, else a.a.		
	Gd tr	Sd:	a.a.		
	Tr	Rk frags:	a.a.		
	Tr		Shl frags and microfoss		
1450	a.a.				
1450	a.a.				
1470	a.a.				
1480	100	Clst:	lt-med gry, sft, amor, stky, slty-sdy, non-slily calc		
	Gd tr	Sd:	a.a.		
	Tr	Rk frags:	a.a.		
	Tr		Shl frags and microfoss		
1490	a.a.				
1500	a.a.				

WELLSITE SAMPLE DESCRIPTION

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Country: Norway		Area: Haltenbanken		Field: Morvin
Well no: 6506/11-8		Company: Statoil ASA, Norsk Hydro Produksjon AS, Eni Norge AS, Total E&P AS		
RKB: 18.0 meters		Geologist: Kjell Ruud		
Hole size: 17 ½"		Cut solvent: Iso Propyl Alcohol		Date: 11.04.2005
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.

1510	100	Clst:	med gry-med dk gry, sft, stky, amor, slily slty-sdy, calc i.p.	No shows
	Tr	Sd:	clr-trnsl lse Qtz gr, vf-m, sbang-sbrnndd	
1520	a.a			
1530	100	Clst:	a.a.	
	Tr	Sd:	a.a.	
	Tr		Pyr	
1540	a.a			
1550	a.a			
1560	a.a.			
1570	100	Clst:	med dk gry, sft, stky, amor, slty-v slty, sdy, calc-v calc	
1580	100	Clst:	less slty, else a.a.	
1590	a.a.			
1600	a.a.			
1610	a.a.			
1620	a.a.			
1630	100	Clst:	med dk gry-olv gry, sft, stky, amor, slty, v calc	
1640	100	Clst:	olv gry, else a.a.	
1650	a.a.			
1660	a.a.			
1670	a.a.			
1680	100	Clst:	olv gry, sft – frm, stky, amor, slty, slily calc	
1690	a.a.			
1700	100	Clst:	occ v slty, else a.a.	
1710	a.a.			
1720	100	Clst:	slily frm, else a.a.	
1730	100	Clst:	olv gry a.a.	

WELLSITE SAMPLE DESCRIPTION

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Country: Norway			Area: Haltenbanken			Field: Morvin		
Well no: 6506/11-8			Company: Statoil ASA, Norsk Hydro Produksjon AS, Eni Norge AS, Total E&P AS					
RKB: 18.0 meters			Geologist: Kjell Ruud, Olav Beyer					
Hole size: 17 ½”			Cut solvent: Iso Propyl Alcohol				Date: 12.04.2005	
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.	

1740	100	Clst:	olv gry, sft frm, stky, amor, slty, slily calc	No shows
1750	a.a.			
1760	100	Clst:	med dk gry – olv gry, stky, frm, slily calc, slty i.p.	
1770	a.a.			
1780	a.a.			
1790	a.a.			
1800	a.a.			
1810	a.a.			
1820	a.a.			
1830	100	Clst:	med gry – grnsh gry, frm, amor – sbblky, mod calc, slty-vf sdy Qtz/Glau	Ambundant contamin
1840	a.a.	Clst:	slty- sdy, pyr nods, else a.a.	of coarse Baryte
1850	a.a.	Clst:	slty- sdy, pyr, a.a.	
1860	a.a.			
1870	100	Clst:	pred v calc, pred grnsh gry, amor – sbblky, sft frm	
1880	100	Clst:	bcm also med brn gry – dk brnsh gry, frm, slily – non calc, crmbly txt,	Top Brygge fm. ident.
			slily slty, micropyr	based on cuttings
1890	100	Clst:	pred brnsh gry – brn blk, crmbly - earthy txt, frm	
1900	100	Clst:	a.a.	
1910	100	Clst:	a.a.	
1920	100	Clst:	pred brnsh gry – brn blk, earthy txt, frm, amor – sbblky, non – slily calc	
1930	100	Clst:	a.a.	
1940	100	Clst:	a.a.	
1950	Not taken			
1960	100	Clst:	bcm pred olv gry – brnsh gry, else a.a.	

WELLSITE SAMPLE DESCRIPTION

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Country: Norway		Area: Haltenbanken		Field: Morvin
Well no: 6506/11-8		Company: Statoil ASA, Norsk Hydro Produksjon AS, Eni Norge AS, Total E&P AS		
RKB: 18.0 meters		Geologist: Kjell Ruud, Olav Beyer		
Hole size: 17 ½"		Cut solvent: Iso Propyl Alcohol		Date: 12.04.2005
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.

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WELLSITE SAMPLE DESCRIPTION

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Country: Norway		Area: Haltenbanken		Field: Morvin
Well no: 6506/11-8		Company: Statoil ASA, Norsk Hydro Produksjon AS, Eni Norge AS, Total E&P AS		
RKB: 18.0 meters		Geologist: Kjell Ruud, Olav Beyer		
Hole size: 12 ¼"		Cut solvent: Iso Propyl Alcohol		Date: 17.04.2005
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.

2160	100	Clst:	dk gry gn, frm, blk, non calc. Sample contaminated of cement	Contamin from mud
				No shows
2170	100	Clst:	dom med dk gry – dk gry, slty, frm, blk, non calc	
2180	Lost			
2190	100	Clst:	gn blk, wxy text, med dk gry - dk gry, sft-frm, sbblky - blk, non calc	
2200	100	Clst:	gn blk a.a.	
2210	90	Clst:	dk gnsh gry, olv blk, frm, sbblky - blk, also lt gry, sft, tuff?	
	10	Ls:	wh - yelsh gry, arg lam, frm	
2220	90	Clst:	pred a.a.	
	10	Ls:	a.a.	
2230	90	Clst:	also i.p. bcm blu gry, tuffac?, pred a.a.	
	10	Ls:	a.a.	
2240	90	Clst:	bcm also lt brn gry, sbblky-amor, sft-frm, slily calc	
	10	Ls:	a.a.	
2250	95	Clst:	a.a.	(Bad sample)
	5	Ls:		
2260	95	Clst:	a.a.	(Bad sample)
	5	Ls:		
2270	100	Clst:	pred olv gry - dk gnsh gry, sbblky, frm	
	Gdtr	Ls:	a.a.	
2280	100	Clst:	pred a.a. + gdtr Ls, tr Glauc, tr Pyr	
2290	100	Clst:	a.a.	
2300	100	Clst:	bcm also mod brn, else gnsh gry shades a.a.	Color change marker
2310	100	Clst:	mod brn, gnsh gry shades a.a.	
2320	100	Clst:	mod brn, gnsh gry shades a.a.	
2330	100	Clst:	pred gnsh gry, sbblky-amor, sft-frm, slily calc, unif	
2340	100	Clst:	a.a.	
2350	100	Clst:	a.a.	
2360	100	Clst:	a.a.	

WELLSITE SAMPLE DESCRIPTION

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Country: Norway			Area: Haltenbanken			Field: Morvin		
Well no: 6506/11-8			Company: Statoil ASA, Norsk Hydro Produksjon AS, Eni Norge AS, Total E&P AS					
RKB: 18.0 meters			Geologist: Kjell Ruud, Olav Beyer					
Hole size: 12 ¼"			Cut solvent: Iso Propyl Alcohol				Date: 17.04.2005	
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.	

2370	100	Clst:	grnsh gry – med bl gry, sbblky-amor, sft-frm, slily calc, unif, wxy app	No Shows
	Tr	Ls/Dol:	lt brn - yel gry – dk yel gry, blkly – ang, frm – mod hd, dom micr	Contamin of mud mater.
2380	100	Clst:	a.a.	
2390	100	Clst:	a.a.	
2400	100	Clst:	a.a.	
2410	95	Clst:	a.a.	
	5	Ls/Dol:	lt brn - yel gry – dk yel gry, blkly – ang, frm – mod hd, dom micr	
2420	100	Clst:	a.a.	
2430	100	Clst:	a.a.	
2440	100	Clst:	a.a.	
2450	95	Clst:	a.a.	
	5	Ls/Dol:	yel gry – dk yel gry, dom micr, i.p. Dol	
2460	100	Clst:	pred olv gry – dk grnsh gry, sbblky-amor, sft-frm, slily calc, unif, wxy	
2470	100	Clst:	a.a., Tr Ls/Dol, a.a.	
2480	100	Clst:	a.a., Tr Ls/Dol, a.a.	
2490	100	Clst:	a.a., Tr Ls/Dol, a.a.	
2500	100	Clst:	pred a.a.	
2510	100	Clst:	a.a.	
2520	100	Clst:	a.a.	
2530	100	Clst:	a.a.	
2540	90	Clst:	pred med dk gry - dk grnsh gry, sbblky-amor, sft-frm, slily calc, unif	
	10	Ls/Dol:	yel gry – dk yel gry, dom micr, i.p. Dol	
2550	95	Clst:	a.a.	
	5	Ls/Dol:	a.a.	
2560	95	Clst:	a.a.	
	5	Ls/Dol:	a.a.	
2560	95	Clst:	med dk gr – olv gry, mod bcm slty, else pred a.a.	
	5	Ls/Dol:	a.a.	

WELLSITE SAMPLE DESCRIPTION

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Country: Norway		Area: Haltenbanken		Field: Morvin
Well no: 6506/11-8		Company: Statoil ASA, Norsk Hydro Produksjon AS, Eni Norge AS, Total E&P AS		
RKB: 18.0 meters		Geologist: Kjell Ruud, Olav Beyer		
Hole size: 12 ¼"		Cut solvent: Iso Propyl Alcohol		Date: 17.04.2005
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.

2570	70	Clst:	pred med dk gry - dk grnsh gry, sbblky-amor, sft-frm, slily calc, slty	No Shows
	25	Slst:	med gry-brnsh gry, arg-v arg, slt-f sdy, pred Qtz & Glauc, frm, non calc	Contamin of mud mat.
	5	Ls/Dol:	yel gry - dk yel gry, amor- cryptoxln, frm - mod hd, dom micr	
2580	80	Clst:	pred slty, a.a.	
	20	Slst:	arg, a.a.	
	Gdtr	Ls/Dol:	a.a. + Pyr & Glauc nods	
2590	80	Clst:	pred a.a.	
	20	Slst:	arg, a.a.	
	Gdtr	Ls/Dol:	a.a. + Pyr & Glauc nods	
2600	90	Clst:	pred less slty, else a.a.	
	10	Slst:	arg, a.a.	
	Tr	Ls/Dol:	a.a. + Pyr & Glauc nods	
2610	100	Clst:	gen only slily slty, else pred a.a.	Gen less mud contamin
	Tr	Ls/Dol:	a.a. + Pyr & Glauc nods	
2620	100	Clst:	slily slty, a.a.	
	Tr	Ls/Dol:	a.a. + Pyr & Glauc nods	
2630	95	Clst:	pred less slty, else a.a.	
	5	Ls/Dol:	yel gry - dk yel gry, dom micr, i.p. Dol	
2640	95	Clst:	slily slty, a.a.	
	5	Ls/Dol:	a.a. + Pyr & Glauc nods	
2650	100	Clst:	slily slty, a.a.	
2660	80	Clst:	pred a.a.	
	20	Slst:	med gry - brnsh gry, Qtz & Glauc, v arg, non calc	
	Tr	Ls/Dol:	a.a. + Pyr & Glauc nods	
2670	70	Clst:	pred a.a.	
	20	Slst:	arg, a.a.	
	10	Ls/Dol:	a.a. + Pyr & Glauc nods	
2680	80	Clst:	pred a.a.	
	15	Slst:	arg, a.a.	
	5	Ls/Dol:	a.a. + Pyr & Glauc nods	
2690	95	Clst:	med dk gry - olv gry, bcm olv blk, sft - frm, amor, sbblky,	
			non calc, slty i.p.	
	5	Ls:	yel gry - mod yel, frm - mod hd, amor, pyr nod, Glauc	
2700	90	Clst:	pred olv gry - olv blk, else a.a.	
	10	Ls:	yel gry - mod yel, a.a.	

WELLSITE SAMPLE DESCRIPTION

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Country: Norway		Area: Haltenbanken		Field: Morvin
Well no: 6506/11-8		Company: Statoil ASA, Norsk Hydro Produksjon AS, Eni Norge AS, Total E&P AS		
RKB: 18.0 meters		Geologist: Kjell Ruud, Olav Beyer		
Hole size: 12 ¼"		Cut solvent: Iso Propyl Alcohol		Date: 18.04.2005
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.

2710	95	Clst:	pred olv gry – olv blk, sft – frm, amor - sbblky, non calc, slty i.p.	
	5	Slst:	arg, med gry – brnsh gry, Glauc, calc cmt	
2720	100	Clst:	olv gry – olv blk, a.a., also med lt gry, wxy app, sft	
	Tr	Ls:	yel gry – mod yel a.a.	
2730	100	Clst:	a.a.	
	Tr	Ls:	yel gry – brnsh gry a.a.	
2740	90	Clst:	a.a.	
	10	Ls:	a.a.	
2750	a.a.			
2760	a.a.			
2770	60	Clst:	olv gry – olv blk, frm, amor, sbblky, earty, non calc, slty i.p.	
	30	Slst:	med gry – brnsh gry, frm, glauc rich, calc cmt	
	10	Ls:	yel gry – brnsh gry, frm, amor, arg	
2780	a.a			
2790	90	Clst:	med dk gry – olv blk, sft – frm, amor – sbblky, non calc, slty i.p.	
	10	Slst:	brnsh gry – med gry, frm, Glauc, calc	
2800	95	Clst:	a.a.	
	5	Slst:	a.a.	
2810	85	Clst:	med dk gry – olv blk a.a.	
	10	Ls:	yel gry – brnsh gry, sft, amor	
	5	Slst:	brnsh gry – med gry a.a.	
2820	85	Clst:	a.a.	
	10	Slst:	a.a.	
	5	Ls:	a.a.	
2830	90	Clst:	med dk gry – olv blk a.a.	
	5	Slst:	brnsh gry – med gry a.a.	
	5	Ls:	yel gry – brnsh gry a.a.	
2840	a.a.			
2850	a.a.			
2860	a.a.			
2870	100	Clst:	med dk gry – olv blk, sft-frm, blk, non calc, slily slty	

WELLSITE SAMPLE DESCRIPTION

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Country: Norway		Area: Haltenbanken		Field: Morvin
Well no: 6506/11-8		Company: Statoil ASA, Norsk Hydro Produksjon AS, Eni Norge AS, Total E&P AS		
RKB: 18.0 meters		Geologist: Kjell Ruud, Olav Beyer		
Hole size: 12 ¼"		Cut solvent: Iso Propyl Alcohol		Date: 18.04.2005
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.

2880	100	Clst:	med dk gry – olv blk, sft-frm, blk, non calc, slily slty,	
2890	95	Clst:	med dk gry – olv blk, a.a.	
	5	Slst:	arg, brnsh gry-med gry, sft, calc cmt, Glau	
2900	95	Clst:	a.a.	
	5	Slst:	a.a.	
2910	95	Clst:	a.a.	
	5	Slst:	a.a.	
2920	95	Clst:	a.a.	
	5	Slst:	a.a.	
2930	95	Clst:	a.a.	
	5	Slst:	a.a.	
2940	90	Clst:	med lt gry – olv gry, sft-frm, amor, blk, non calc-slily calc i.p.	
	10	Slst:	brnsh gry – mod gry, Glau, sft, arg, non – slily calc	
2950	100	Clst:	a.a.	
2960	a.a.			
2970	95	Clst:	med dk gry – olv gry, a.a.	
	5	Ls:	yel gry – brnsh gry, amor, sft-frm, arg	
2980	95	Clst:	a.a.	
	5	Ls:	a.a.	
2990	85	Clst:	med dk gry – olv gry, else a.a.	
	15	Ls:	yel gry – brnsh gry, frm – mod hd, else a.a.	
3000	a.a.			
3010	90	Clst:	a.a.	
	5	Ls:	a.a.	
	5	Slst:	brnsh gry – med gry, a.a.	
3020	a.a.			
3030/	80	Clst:	a.a.	
3040	20	Ls:	a.a.	
3050/	90	Clst:	a.a.	
3060	10	Ls:	a.a.	

WELLSITE SAMPLE DESCRIPTION

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Country: Norway		Area: Haltenbanken		Field: Morvin
Well no: 6506/11-8		Company: Statoil ASA, Norsk Hydro Produksjon AS, Eni Norge AS, Total E&P AS		
RKB: 18.0 meters		Geologist: Kjell Ruud, Olav Beyer		
Hole size: 12 ¼"		Cut solvent: Iso Propyl Alcohol		Date: 18.04.2005
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.

3070	90	Clst:	med dk gry – olv gry, sft-frm, amor, blk, non calc-sily calc i.p., unif	No Shows
	10	Ls/Dol:	yel gry – brnsh gry, frm – mod hd, amor-microxln, micr/dolomicr	
3080	95	Clst:	a.a.	
	5	Ls/Dol:	a.a.	
3090	95	Clst:	a.a.	
	5	Ls/Dol:	a.a.	
3100	100	Clst:	a.a.	
	Tr	Ls:	a.a.	
3110	100	Clst:	pred med dk gry – olv gry, frm, amor, non calc, mass, unif	
	Tr	Ls:	a.a.	
3120	100	Clst:	a.a.	
	Tr	Ls:	a.a.	
3130	100	Clst:	a.a.	
	Tr	Ls:	a.a.	
3140	100	Clst:	a.a.	
	Tr	Ls:	a.a.	
3150	95	Clst:	a.a.	
	5	Ls:	brnsh gry – dsky yel brn, amor – fn xln, mod hd – hd	
3160	100	Clst:	a.a.	
	Tr	Ls:	a.a.	
3170	90	Clst:	a.a.	
	10	Ls:	a.a.	
3180	95	Clst:	a.a.	
	5	Ls:	a.a.	
3190	95	Clst:	a.a.	
	5	Ls:	a.a.	
3200	90	Clst:	pred med gry – med dk gry, sft-frm, amor, non calc, loc mod slty & calc	
	10	Ls:	brnsh gry – dsky yel brn, also lt gry, suc/slty, amor – fn xln, mod hd	
3210	90	Clst:	a.a.	
	10	Ls:	a.a.	
3220	90	Clst:	a.a.	
	10	Ls:	a.a.	

WELLSITE SAMPLE DESCRIPTION

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Country: Norway		Area: Haltenbanken		Field: Morvin
Well no: 6506/11-8		Company: Statoil ASA, Norsk Hydro Produksjon AS, Eni Norge AS, Total E&P AS		
RKB: 18.0 meters		Geologist: Kjell Ruud, Olav Beyer		
Hole size: 12 ¼"		Cut solvent: Iso Propyl Alcohol		Date: 18.04.2005
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.

3230	90	Clst:	pred med gry – med dk gry, sft-frm, amor, non calc, loc mod slty & calc	No Shows
	10	Ls/Mrl:	brnsh gry – dsky yel brn, also lt gry, amor – fn xln, mod hd	
			arg, sucr/slty (lt gry), Glauc	
3240	90	Clst:	a.a.	
	10	Ls/Mrl:	a.a.	
3250	95	Clst:	a.a.	
	5	Ls/Mrl:	a.a.	
3260	100	Clst:	a.a.	
	Tr	Ls/Mrl:	a.a.	
3270	100	Clst:	a.a.	
	Tr	Ls/Mrl:	a.a.	
3280	95	Clst:	a.a.	
	5	Ls/Mrl:	mod brn – lt brn, frm – mod hd, dom micr	
3290	95	Clst:	a.a.	
	5	Ls:	a.a.	
3300	100	Clst:	pred med gry – med dk gry, sft-frm, pred non calc, loc v calc grad LS	
	Tr	Ls/Mrl:	a.a.	
3310	100	Clst:	a.a.	
	Tr	Ls/Mrl:	a.a.	
3320	100	Clst:	loc v calc, slty, a.a.	
	Tr	Ls/Mrl:	a.a.	
3330	100	Clst:	a.a.	
	Tr	Ls/Mrl:	a.a.	
3340	100	Clst:	dk gry - olv gry- olv blk, frm, amor, blk, non calc	
3350	70	Clst:	dom dk gry a.a.	
	30	Ls/Mrl:	dom lt gry – lt brn, frm-mod hd, grad v calc Slst	
3360	100	Clst:	pred dk gry – olv gry, a.a.	
3370	90	Clst:	a.a.	
	10	Ls/Mrl:	a.a.	
3380	50	Clst:	a.a.	
	40	Sst:	grad Slst, clr-trnsl lse Qtz gr, pred vf-f, occ med, r crs gr, sbang –	
			sbrndd, v glauc rich, Mica	

WELLSITE SAMPLE DESCRIPTION

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Country: Norway		Area: Haltenbanken		Field: Morvin	
Well no: 6506/11-8		Company: Statoil ASA, Norsk Hydro Produksjon AS, Eni Norge AS, Total E&P AS			
RKB: 18.0 meters		Geologist: Olav Giskeødegard / Nick Townley / Bjørn Paulsen			
Hole size: 12 ¼”		Cut solvent: Iso Propyl Alcohol		Date: 27.04.2005	
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.

	10	Ls:	wh – lt brn – lt gry, mod hd – hd	
3390	40	Clst:	pred dk gry - olv gry, olv blk, frm, amor, blk, non calc	
	50	Sst:	grad Slst, clr-trnsl lse Qtz gr, pred vf-f, occ med, r crs gr, sbang –	
			sbrnrd, v glauc rich, Mica	
	10	Ls:	wh – lt brn – lt gry, mod hd – hd,	
3400	25	Clst:	pred med dk gry, a.a.	
	60	Sst:	a.a.	
	15	Ls:	a.a.	
3410	40	Clst:	pred med dk gry, a.a.	
	50	Sst:	a.a.	
	10	Ls:	a.a.	
3416	80	Clst:	pred med dk gry, a.a.	
	20	Slst:	lt gry – lt brn, sft – frm, arg, calc, only tr f Glauc	
3422	75	Clst:	dk gry – olv gry, frm, blk, non calc	
	10	Ls:	lt gry – lt brn, occ lam, arg, mod hd	
	15	Slst:	med dk gry – gry brn, arg, calc, sft – frm	
3428	75	Clst:	pred dk gry, else a.a.	
	10	Ls:	a.a.	
	15	Slst:	a.a.	
3434	80	Clst:	dk gry – olv gry, bcm brn gry, else a.a.	
	5	Ls:	a.a.	
	15	Slst:	a.a.	
3440	80	Clst:	pred brnsh gry – olv gry, frm, blk, non calc	
	20	Sst:	clr trnsl Qtz gr, pred v f – med, r crs, subang – rndd, grad Slst, Glauc	
	Tr	Ls:	a.a.	
3446	a.a.			
3452	95	Clst:	brnsh gry – olv gry, blk, frm, non calc	
	5	Ls:	lt gry – lt brn, arg, frm – mod hd, lam	
3458	80	Clst:	a.a.	
	20	Sst/Slst:	clr – trnsl Qtz gr, v f – mod, r crs, grad Slst, Glauc	
	Tr	Ls:	a.a.	
3464	90	Clst:	a.a.	
	5	Sst/Slst:	clr trnl Qtz a.a.	
	5	Ls:	a.a.	
3470	a.a.			

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Country: Norway		Area: Haltenbanken		Field: Morvin
Well no: 6506/11-8		Company: Statoil ASA, Norsk Hydro Produksjon AS, Eni Norge AS, Total E&P AS		
RKB: 18.0 meters		Geologist: Olav Giskeødegard / Nick Townley / Bjørn Paulsen		
Hole size: 12 ¼"		Cut solvent: Iso Propyl Alcohol		Date: 27.04.2005
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.

3476	90	Clst:	brnsh gry – olv gry, frm, blk, non calc	No shows
	5	Ls:	lt gry – lt brn, mod hd	
	5	Sst:	clr trns Qtz gr, pred vf – f, occ med, r crs gr, sbang – sbrndd	
	Tr	Slts:	occ v hd cmt slts, lt gry, Glauc	
3482	40	Clst:	brnsh gry-olv gry, sft-frm, blk, non calc	
	40	Sst:	clr-mlky wh Qtz gr, pred v f-med, r crs, subang-rndd, Glauc	
	20	Ls:	lt brn-lt gry, occ arg, sft-frm, slily slty/sdy	
3488	50	Sst:	v Glauc, else a.a.	
	40	Clst:	a.a.	
	10	Ls:	a.a.	
3494	50	Sst:	clr-trns Qtz gr, v Glauc, pred v f-med, r crs, subang-rndd, loc grad Slst	
	40	Clst:	brnsh gry-olv gry, med dk gry, blk, sft-frm, non calc	
	10	Ls:	lt brn-lt gry, sft-frm, i.p. slily slty/sdy, occ arg	
3500	50	Sst:	sbang-sbrndd, else a.a.	
	40	Clst:	a.a.	
	10	Ls:	a.a.	
3506	a.a.			
3512	60	Sst:	pred med, else a.a.	
	35	Clst:	a.a.	
	5	Ls:	a.a.	
3518	60	Sst:	dom fn-med, else a.a.	
	35	Clst:	a.a.	
	5	Ls:	a.a.	
3524	a.a.		decr Glauc	
3530	60	Clst:	a.a.	
	40	Sst:	only gd tr Glauc	
	Tr	Ls:	a.a.	
3540	90	Clst:	dk gry-brnsh gry, olv blk, frm, blk, non calc	
	10	Sst:	clr trns Qtz gr, pred f-med, r crs, subndd-rndd	
	Tr	Ls:	lt brn-lt gry, sft-frm	
3550	95	Clst:	a.a.	
	5	Sst:	a.a.	
	Gd tr	Ls:	dom lt gry, else a.a.	
3560	90	Clst:	a.a.	
	10	Sst:	a.a.	
	Tr	Ls:	a.a.	

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Country: Norway			Area: Haltenbanken			Field: Morvin		
Well no: 6506/11-8			Company: Statoil ASA, Norsk Hydro Produksjon AS, Eni Norge AS, Total E&P AS					
RKB: 18.0 meters			Geologist: Olav Giskeødegard / Nick Townley / Bjørn Paulsen					
Hole size: 12 ¼”			Cut solvent: Iso Propyl Alcohol				Date: 27.04.2005	
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.	

3570	100	Clst:	lt gry-brnsh gry, olv gry-olv blk, frm, sbblky, slily slty, non calc, unif			No shows
		Tr	Ls: lt brn-lt gry, frm, amor-microxln, dom micr			
3580	100	Clst:	pred olv gry – olv blk, a.a.			
		Tr	Ls: a.a.			
3590	100	Clst:	a.a.			
		Tr	Ls: a.a.			
3600	80	Clst:	a.a.			
	20	Ls/Mrl:	pred gry – lt brn, arg – v arg, frm, grad Clst			
3610	100	Clst:	a.a.			
		Tr	Ls: a.a.			
3620	100	Clst:	a.a.			
		Tr	Ls: a.a.			
3630	100	Clst:	a.a.			
		Tr	Ls: a.a.			
3640	100	Clst:	a.a.			
						Severe miscoloring
3650	100	Clst:	lt gry- olv gry, frm, sbblky, slily slty, non calc, unif			olv blk contam from
		Tr	Ls/Mrl: pred a.a.			Versatrol™ additive
3660	100	Clst:	a.a.			
3670	100	Clst:	a.a.			
3680	100	Clst:	a.a.			
3690	95	Clst:	a.a.			
	5	Ls:	lt brn-lt gry, frm, amor-microxln, dom micr			
3700	95	Clst:	a.a.			
	5	Ls:	a.a.			
3710	100	Clst:	lt gry- brn gry - olv gry, frm, sbblky, pred non slty, non calc, pred unif			
3720	100	Clst:	brnsh gry-olv gry, frm, amor, sbblky, non calc			
3730	100	Clst:	a.a.			
		Tr	Ls: brnsh gry, pred frm, occ mod hd, arg, grad Clst			
3740	100	Clst:	a.a.			
		Tr	Ls: a.a.			

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Country: Norway		Area: Haltenbanken		Field: Morvin	
Well no: 6506/11-8		Company: Statoil ASA, Norsk Hydro Produksjon AS, Eni Norge AS, Total E&P AS			
RKB: 18.0 meters		Geologist: Olav Giskeødegard / Nick Townley / Bjørn Paulsen			
Hole size: 12 ¼"		Cut solvent: Iso Propyl Alcohol		Date: 27.04.2005	
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.

3750	95	Clst:	brnsh gry – olv gry, amor – sbblky, frm, non calc	
	5	Ls:	brnsh gry, pred frm, occ mod hd, arg, grad Clst	
3760	95	Clst:	a.a.	
	5	Ls:	a.a.	
3780	100	Clst:	brnsh gry olv gry, olv blk, amor-sbblky, slily slty-slty, non calc	
	Tr	Ls:	brnsh gry, frm, arg, grad calc Clst	
3790	100	Clst:	a.a.	
	Tr	Ls:	a.a.	
3800	100	Clst:	i.p. sdy, a.a.	
	Tr	Ls:	a.a.	
3810	100	Clst:	a.a.	
	Tr	Ls:	a.a.	
3820	100	Clst:	brnsh gry - olv gry, no snd, else pred a.a.	
	Tr	Ls:	brnsh gry a.a.	
3830	100	Clst:	a.a.	
	Tr	Ls:	a.a.	
3840	100	Clst:	a.a.	
	Tr	Ls:	a.a.	
3850	90	Clst:	a.a.	
	10	Ls/Mrl:	brnsh gry, frm-hd, arg, grad calc Clst, i.p. dolomicr, hd-v hd, ang	
3860	100	Clst:	a.a.	
3870	100	Clst:	a.a.	
3880	100	Clst:	a.a.	
	Tr	Ls/Mrl:		
3890	100	Clst:	a.a.	
	Tr	Ls/Mrl:		
3900	100	Clst:	a.a.	
3910	100	Clst:	brn gry – olv gry, frm – mod hd, amor – sbblky, non – slily calc, loc slty, Tr micropyr, r vf sdy	
3920	100	Clst:	a.a.	
	Tr	Ls/Mrl:	brn gry, frm-hd, arg, grad calc Clst, i.p. dol, hd-v hd, ang	

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Country: Norway		Area: Haltenbanken		Field: Morvin
Well no: 6506/11-8		Company: Statoil ASA, Norsk Hydro Produksjon AS, Eni Norge AS, Total E&P AS		
RKB: 18.0 meters		Geologist: Olav Giskeødegard / Nick Townley / Bjørn Paulsen		
Hole size: 12 ¼"		Cut solvent: Iso Propyl Alcohol		Date: 27.04.2005
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.

3930	100	Clst:	brn gry – olv gry, frm – mod hd, amor – sbblky, non – slily calc, loc slty, Tr micropyr, r vf sdy	
		Tr	Ls/Mrl: brn gry, frm-hd, arg, grad calc Clst, i.p. dol, hd-v hd, ang	
3940	100	Clst:	a.a.	
3950	100	Clst:	a.a.	
3960	100	Clst:	a.a.	
3970	100	Clst:	a.a.	
		Tr	Ls: loc grad Dol else a.a.	
3980	100	Clst:	a.a.	
		Tr	Ls: a.a.	
3990	100	Clst:	a.a.	
		Tr	Ls: a.a.	
4000	100	Clst:	a.a.	
		Tr	Ls: a.a.	
4010	100	Clst:	a.a.	
4020	90	Clst:	a.a.	
	10	Ls/Dol:	lt brn – brn gry, ang, hd, i.p. Dol	
4030	85	Clst:	a.a.	
	15	Ls/Dol:	a.a.	
4040	95	Clst:	a.a.	
	5	Ls/Dol:	a.a.	
4050	100	Clst:	a.a.	
		Tr	Ls/Dol: a.a.	
4060	100	Clst:	pred med dk gry – olv gry – olv blk, Tr a.a.	
4070	95	Clst:	a.a.	
	5	Slst:	med gry, mott blk, carb, frm, sbblky, calc – v calc, grad Ls	
		Ls/Dol:	lt brn – brn gry, ang, hd, i.p. Dol, v hd	
4080	100	Clst:	a.a.	
		Tr	Ls/Dol: a.a.	
4090	100	Clst:	a.a.	

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Country: Norway		Area: Haltenbanken		Field: Morvin
Well no: 6506/11-8		Company: Statoil ASA, Norsk Hydro Produksjon AS, Eni Norge AS, Total E&P AS		
RKB: 18.0 meters		Geologist: Olav Giskeødegard / Nick Townley / Bjørn Paulsen		
Hole size: 12 1/4"		Cut solvent: Iso Propyl Alcohol		Date: 27.04.2005
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.

4100	100	Clst:	pred olv gry – olv blk, min grnsh gry, blk-sbblky, frm, pred non calc	No Shows
	Tr	Ls/Dol:	lt brn – brn gry, ang, hd, i.p. Dol, v hd, also sucr/slty, lt gry, Glauc, sbblky,frm	
4110	100	Clst:	a.a.	
	Tr	Ls/Dol:	incr sucr, a.a.	
4120	100	Clst:	unif, a.a.	
	Tr	Ls/Dol:	dom lt dk brn gry, i.p. Dol, a.a.	
4130	100	Clst:	a.a.	
	Tr	Ls/Dol:	a.a.	
4140	100	Clst:	a.a.	
	Tr	Ls/Dol:	a.a.	
	Tr	Sst:	lt gry – m gry, clr – milky Qtz, vf, sbang – sbrnnd, firm, w srtd, slily sil cmt, loc arg, slty i.p.	
4150	100	Clst:	a.a.	
	Tr	Ls/Dol:	a.a.	
4160	100	Clst:	olv gry – brn gry – dusky yel brn a.a.	
	R	Ls:	a.a.	
4170	100	Clst:	a.a.	
	Tr	Ls/Dol:	a.a.	
4180	90	Clst:	a.a. loc vf sdy	
	10	Sst:	vf – f, also Tr Glauc, else a.a.	
	Tr	Ls/Dol:	a.a.	
4190	90	Clst:	a.a.	
	10	Sst:	also Tr dk gry, loc hd and calc cmt, else a.a.	
	Tr	Ls/Dol:	a.a.	
4200	90	Clst:	a.a.	
	10	Sst:	a.a.	
	Tr	Ls/Dol:	a.a.	
4203			Bad sample due to trip	
4206	80	Clst:	a.a.	
	20	Ls/Dol:	off wh-lt gry, lt –med brn, frm, amor, micr, also ang-blky, mod hd-hd (Dol)	
	Tr	Sst:	clr- transl Qtz, vf-f, lse grns in Ls	
4209	80	Clst:	a.a.	
	20	Ls:	a.a.	
	Tr	Sst:	a.a.	

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Country: Norway			Area: Haltenbanken			Field: Morvin		
Well no: 6506/11-8			Company: Statoil ASA, Norsk Hydro Produksjon AS, Eni Norge AS, Total E&P AS					
RKB: 18.0 meters			Geologist: Olav Giskeødegard / Nick Townley / Bjørn Paulsen					
Hole size: 12 ¼”			Cut solvent: Iso Propyl Alcohol				Date: 27.04.2005	
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.	

4212	95	Clst:	pred olv gry – dk gry, pred blk, frm-mod hd, pred non calc, unif	No Shows
	Tr	Ls/Dol:	lt brn – brn gry, off wh, ang, hd, i.p. Dol, v hd, also frm, sucrlsly, Glauc	
	Tr	Sst:	clr- transl Qtz, vf-f, pred as lse grns in Ls	
4215	100	Clst:	i.p. slily – mod calc, else a.a.	Tr Ls fused by bit
	Tr	Ls/Dol:	a.a.	(Low ROP)
	Tr	Sst:	a.a.	
4218	100	Clst:	a.a.	
	Tr	Ls/Dol:	a.a.	
4221	70	Clst:	a.a.	
	30	Ls/Dol:	a.a.	
4224	60	Clst:	i.p. slily – mod calc, else a.a.	Samples not credible?
	30	Ls/Dol:	a.a.	(v.low ROP)
	10	Sst:	clr- transl Qtz, vf-f, wl srt, sbrnd-rnd, pred as lse grns in Ls mtx (Calcilutite)	
4227	90	Clst:	a.a.	
	10	Ls/Dol:	a.a.	
	Tr	Sst:	a.a.	
4230	100	Clst:	a.a.	
	Tr	Ls/Dol:	a.a.	
4233	100	Clst:	a.a.	
	Tr	Ls/Dol:	a.a.	
4236	100	Clst:	a.a.	Samples not credible?
	Sstr	Ls/Dol:	a.a.	(v.low ROP)
4239	100	Clst:	a.a.	
4242	100	Clst:	a.a.	
4245	100	Clst:	olv gry – dk gry, non calc, Tr micropyr, r slty else a.a.	
4248	100	Clst:	a.a.	
	Tr	Sst:	vf a.a.	
4251	90	Clst:	olv gry – m gry – dk gry, sft – frm, sbblky, non calc, slily slty, r micropyr	
	10	Sst:	med gry, clr – trnsd Qtz, vf, frm – sft, loc lse, sbang – sbrndd, w srtd, arg Mtrx, Carb, n.v.p	No Shows
	Tr	Ls:	pl yel brn, hd – mod hd, blk, suc, loc grad Dol	
4254	40	Clst:	a.a.	
	60	Sst:	lt gry – m gry, clr Qtz, vf – f, r m, frm, loc lse, sbang – ang, mod srtd, Kao Mtrx, mtrx supp, loc arg, r calc cmt, Tr Chlor, pr vis por	No Shows

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Country: Norway			Area: Haltenbanken			Field: Morvin		
Well no: 6506/11-8			Company: Statoil ASA, Norsk Hydro Produksjon AS, Eni Norge AS, Total E&P AS					
RKB: 18.0 meters			Geologist: Olav Giskeødegard / Nick Townley / Bjørn Paulsen					
Hole size: 12 ¼"			Cut solvent: Iso Propyl Alcohol				Date: 27.04.2005	
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.	

4257	70	Clst:	olv gry – m gry – dk gry, sft – frm, sbblky, non calc, slily slty, r micropyr	
	30	Sst:	lt gry – m gry, clr Qtz, vf – f, r m, firm, loc lse, sbang – ang, mod srtd, Kao Mtrx, mtrx supp, loc arg, r calc cmt, Tr Chlor, pr vis por	No Shows
4260	80	Clst:	a.a.	
	20	Sst:	a.a.	No shows
	Tr	Ls:	pl yel brn, hd – mod hd, blky, suc, loc grad Dol	
4263	80	Clst:	a.a.	
	20	Sst:	a.a.	No shows
	Tr	Ls:	a.a.	
4266	80	Clst:	a.a.	
	20	Sst:	a.a.	No shows
4269	50	Clst:	a.a.	
	50	Sst:	bimodale; vf – f and m – crs, else a.a.	No shows
4272	40	Clst:	a.a.	
	60	Sst:	a.a.	
4275	40	Clst:	a.a.	
	60	Sst:	a.a.	No shows
4278	50	Sst:	bimodale; vf – f and m – crs, Qtz bcm lse, argil/kao cmt, else a.a	No shows
	50	Clst:	a.a.	
4281	80	Sst:	a.a.	
	20	Clst:	a.a.	
4284	50	Sst:	a.a.	
	40	Clst:	a.a.	
	10	Ls:	a.a.	
4287	10	Sst:	a.a.	
	60	Clst:	a.a.	
	30	Ls:	a.a.	
4290	15	Sst:	a.a.	
	80	Clst:	a.a.	
	10	Ls:	a.a.	
4293	20	Sst:	v arg, grad sdy Clst	
	60	Clst:	a.a.	
	20	Ls:	a.a.	
4296	80	Clst:	slightly sdy, a.a.	
	20	Ls:	a.a.	

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Country: Norway		Area: Haltenbanken		Field: Morvin	
Well no: 6506/11-8		Company: Statoil ASA, Norsk Hydro Produksjon AS, Eni Norge AS, Total E&P AS			
RKB: 18.0 meters		Geologist: Olav Giskeødegard / Nick Townley / Bjørn Paulsen			
Hole size: 12 ¼”		Cut solvent: Iso Propyl Alcohol		Date: 27.04.2005	
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.

4299	80	Clst:	olv gry – m dk gry frm, sbblky -blky, non calc, slily slty - vf sdy, tr micromic	No Shows
	20	Ls:	pl yel brn – brnsh gry, hd – mod hd, ang - blky, loc grad xln Dol	
	Tr	Sst:	lt gry – m gry, clr Qtz, vf – f, r m, firm, loc lse, sbang – ang, mod srted, gen Kao Mtrx supp, r calc cmt, Tr Chlor, pr vis por	No shows
4302	90	Clst:	a.a.	
	10	Ls:	a.a.	
4305	90	Clst:	a.a.	
	10	Ls:	a.a.	
4308	a.a.			
4311	60	Clst:	a.a.	
	25	Sst:	clr – trnsd Qtz, vf – f, firm – fri, arg Mtrx, micromic, sli calc cmt	No shows
	15	Ls:	a.a.	
4314	80	Clst:	a.a.	
	5	Sst:	a.a.	No shows
	15	Ls:	a.a.	
4317	a.a.			
4320	80	Clst:	a.a.	
	20	Sst:	a.a.	No shows
	Tr	Ls:	a.a.	
4323	90	Clst:	olv gry – m dk gry – lt gry, frm – loc sft, blky – sbblky, loc amor, non calc, Tr slty, r micromic, loc vf sdy	
	10	Sst:	v lt gry – m gry, clr – trnsd Qtz, vf – f, sbang – sbrndd, frm – fri, loc lse, w srted, Gen kao Mtrx, loc arg, sli calc cmt, Tr micromic/mic, i.p. slty, n.v.p.	No Shows
	Tr	Ls:	pl yel brn – brnsh gry, hd – mod hd, ang - blky, loc grad xln Dol	
4326	80	Clst:	a.a.	
	20	Sst:	a.a.	No shows
	Tr	Ls:	a.a.	
4329	a.a.			
4332	70	Clst:	a.a.	
	25	Sst:	a.a.	No shows
	5	Ls:	a.a.	
4335	90	Clst:	a.a.	
	10	Sst:	a.a.	No shows
	Tr	Ls:	a.a.	
4338	80	Clst:	a.a.	
	20	Sst:	a.a.	No shows

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Country: Norway		Area: Haltenbanken		Field: Morvin	
Well no: 6506/11-8		Company: Statoil ASA, Norsk Hydro Produksjon AS, Eni Norge AS, Total E&P AS			
RKB: 18.0 meters		Geologist: Olav Giskeødegard / Nick Townley / Bjørn Paulsen			
Hole size: 12 ¼"		Cut solvent: Iso Propyl Alcohol		Date: 27.04.2005	
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.

4341	60	Clst:	olv gry – m dk gry – lt gry, frm – loc sft, blk – sbblk, loc amor, non calc, Tr slty, r micromic, loc vf sdy	
	40	Sst:	v lt gry – m gry, clr – trns Qtz, vf – f, sbang – sbrndd, frm – fri, loc lse, w srt, Gen kao Mtrx, loc arg, sli calc cmt, Tr micromic/mic, i.p. slty, n.v.p.	No shows
4344	50	Clst:	a.a.	
	50	Sst:	a.a.	No shows
4350	60	Clst:	a.a.	
	40	Sst:	a.a.	No shows
	Tr	Ls:	pl yel brn – brnsh gry, hd – mod hd, ang - blk, loc grad xln Dol	
4353	a.a.			
4356	80	Clst:	a.a.	
	20	Sst:	a.a.	No shows
	Tr	Ls:	a.a.	
4359	a.a.			
4362	90	Clst:	a.a.	
	10	Sst:	a.a.	No shows
	Tr	Ls:	a.a.	
4365	60	Clst:	Oov gry – dk gry – brn gry, frm, blk – sbblk, non calc, loc slty, r micromic, i.p. vf sdy	
	40	Sst:	vf – f, pred vf, a.a.	No shows
4368	70	Clst:	a.a.	
	30	Sst:	a.a.	
4371	40	Clst:	a.a.	
	60	Sst:	bimodale vf – f, m – crs, a.a.	No shows
4374	70	Clst:	a.a. also bcm brn blk	
	30	Sst:	pred vf – f, Tr m – crs, a.a.	No shows
4377	20	Clst:	a.a.	
	80	Sst:	bimodale vf – f, m – crs, a.a.	No shows
4380	40	Clst:	a.a.	
	60	Sst:	a.a.	
4383	90	Clst:	pred dk gry – brn blk, also olv gry – brn gry, frm, sbblk – blk, non calc, loc slty, Tr micropyr, r micromic	
	10	Sst:	a.a.	
4386	80	Clst:	a.a. Tr carb Frag, tr carb	
	20	Sst:	also Tr carb else a.a.	No shows

WELLSITE SAMPLE DESCRIPTION

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Country: Norway			Area: Haltenbanken			Field: Morvin		
Well no: 6506/11-8			Company: Statoil ASA, Norsk Hydro Produksjon AS, Eni Norge AS, Total E&P AS					
RKB: 18.0 meters			Geologist: Olav Giskeødegard / Nick Townley / Bjørn Paulsen					
Hole size: 12 ¼”			Cut solvent: Iso Propyl Alcohol				Date: 27.04.2005	
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.	

4389	80	Clst:	pred dk gry – brn blk, also olv gry – brn gry, firm, sbblky – blk, non calc, loc slty, Tr micropyr, r micromic, Tr carb	
	20	Sst:	v lt gry – m gry, clr – trns Qtz, vf – f, r v crs, sbang – sbrndd, frm – fri, loc lse, No Shows srted, gen kao Mtrx, loc arg, sli calc cmt, Tr carb, Tr micromic/mic, i.p. slty, n.v.p.	
4392	90	Clst:	a.a.	
	10	Sst:	a.a.	
4395	a.a.			
4398	100	Clst:	a.a.	
	Tr	Ls:	pa yel brn – brnsh gry, hd – mod hd, ang - blk, loc grad xln Dol	
4401	100	Clst:	a.a.	
	Tr	Sst:	a.a.	
	Tr	Ls:	a.a.	
4404	100	Clst:	loc v slty grad Slst, a.a.	
	Tr	Sst:	a.a.	
	Tr	Ls:	a.a.	
4407	100	Clst:	Oov gry – dk gry, brn gry – brn blk, firm, blk – sbblky, non calc, Tr micro-Pyr, slty i.p. v slty, Tr carb	
	Tr	Ls:	a.a.	
4410	100	Clst:	a.a.	
4413	100	Clst:	Tr Pyr nod, a.a.	
	Tr	Ls:	a.a.	
	Tr	Sst:	clr – trns Qtz, m – crs, ang – sbang, mod – pr srt, lse	
4416	a.a.			
4419	LOST			
4422	100	Clst:	also pl yel brn, Tr carb, a.a.	
4425	100	Clst:	brn gry, olv blk, grdg – mod olv brn i.p., sft – mod hd, micrmic, occ blk Carb lams, slty i.p.	
4428	100	Clst:	a.a.	
	Tr	Lst:	pa yel brn, pa olv, sft – frm, cmbly, micrxln	
4431	100	Clst:	pred brn gry, olv blk, occ med dk gry, sft – mod hd, stky – blk, micmic, occ crs mic, Musc	
4434	100	Clst:	pred dk gry – olv blk, brn gry, sft – mod hd, pred sft, stky i.p., blk, micrmic occ sl calc,	

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Country: Norway		Area: Haltenbanken		Field: Morvin	
Well no: 6506/11-8		Company: Statoil ASA, Norsk Hydro Produksjon AS, Eni Norge AS, Total E&P AS			
RKB: 18.0 meters		Geologist: Olav Giskeødegard / Nick Townley / Bjørn Paulsen			
Hole size: 12 ¼"		Cut solvent: Iso Propyl Alcohol		Date: 27.04.2005	
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.

4440	100	Clst:	olv gry-brn gry, olv blk, sft-mod hd, pred sft, stky, blkly i.p., micromic, sl calc i.p.	
4443	100	Clst:	pred olv gry-olv blk, brn gry i.p., sft-mod hd, pred sft, stky, blkly i.p., slty i.p., micromic, crypto fiss i.p.	
4446	100	Clst:	pred olv blk, brn blk, frm-hd, sft-blky, occ sbfiss, micromic	
4449	50	Clst:	pred olv blk, brn blk, frm-hd, sft-blky, occ sbfiss, micromic	
	30	Ls:	pa yel brn, pa olv, sft-frm, cmbly	
	20	Sst:	pred brn blk, olv gry, wh-clr trnspl occ mlky wh trnspl Qtz gr, sbang-sbrnd, sbsph	No shows
			Qtz, silc occ calc cmt, abd brn blk cly mtx, occ carb mtx, crs micromic, Musc i.p., also obs a lt gn gry, stky, cmbly, calc rk flour grd Ls, occ f-crs, lse Qtz gr, Tr shows	
4452			Lost sample due to lunch	
4455			Lost sample due to lunch	
4458	30	Clst:	a.a., sft-occ mod hd	
	10	Ls:	a.a.	
	60	Sst:	pred lt grn gry, lt brn gry, pa olv, sft-occ frm, cmbly, Sil, occ calc Rk Flour, occ brn blk, arg Sst a.a	No shows
4461	20	Clst:	a.a.	
	10	Ls:	a.a.	
	70	Sst:	a.a occ f – m sbang, sbsph lse Qtz	Pr shows: sptty dull
			Shrds.	Yel nat fluor, slw stmg
				Diff blu wh/mlky
				Cut fluor, pa brn resd rng
4464	10	Clst:	a.a.	
	10	Ls:	a.a.	
	80	Sst:	pred brn blk, frm – hd, blkly Sst A/ AT 4449 m w occ clr, transp, Sil cmt	Pr shows: sptty dull
			Shrds.	Yel nat fluor, slw stmg
				Diff blu wh/mlky
				Cut fluor, pa brn resd rng
4467	30	Clst:	dk gry, gry blk, olv blk, sft – mod hd, pred mod hd, sbblky – blkly, slty i.p.	
	10	Ls:	wh, yel gry, pred sft, microxln	
	60	Sst:	clr-trnsl Qtz, vf-f, occ med f, mod srt, sbang-sbrnd, calc cmt i.p.	Shows a.a
4470	30	Clst:	olv gry-olv blk, brn gry, frm-mod hd, slty i.p., micromic, occ grad Sst	
	10	Ls:	wh-yel wh, brn yel, sft-frm, microxln	
	60	Sst:	clr-trnsl Qtz, vf-f, occ med f, mod srt, sbang-sbrnd, calc cmt i.p., micromic, no vis por	Shows a.a
4473	70	Clst:	olv gry, olv blk, brn blk, frm-hd, cmbly-splty ip, micromic, occ vf-crs, grd Sst i.p.	

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Country: Norway			Area: Haltenbanken			Field: Morvin		
Well no: 6506/11-8			Company: Statoil ASA, Norsk Hydro Produksjon AS, Eni Norge AS, Total E&P AS					
RKB: 18.0 meters			Geologist: Olav Giskeødegard / Nick Townley / Bjørn Paulsen					
Hole size: 12 ¼"			Cut solvent: Iso Propyl Alcohol				Date: 27.04.2005	
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.	

	30	Sst:	brn blk, olv blk, arg, a.a.	Shows a.a.
4476	80	Clst:	a.a., abd crs Musc mic, Sil cmt	
	20	Sst:	a.a.	Shows a.a.
4479	100	Clst:	olv blk, brn blk, grd to brn gry, occ med gry, med dk gry, sft-frm, amor-blky, calc	Top Albian recognised From Biostrat and as Formation texture change
4482	100	Clst:	a.a.	
4485	100	Clst:	a.a.	
4488	100	Clst:	a.a.	
4491	100	Clst:	a.a.	
4494	100	Clst:	dk gry, gry blk, w/brn gry lam, sft-mod hd, stky, amrph-blky i.p., sl calc i.p., hygrofiss	
4497	100	Clst:	a.a.	
4500	100	Clst:	a.a.	
	Tr	Ls:	lt olv gry, pa yel brn, occ lt brn, sft-occ hd, amor-occ splty, micro –v occ vf xln	
4500 m MD TD 12 ¼" hole section				

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Country: Norway			Area: Haltenbanken			Field: Morvin		
Well no: 6506/11-8			Company: Statoil ASA, Norsk Hydro Produksjon AS, Eni Norge AS, Total E&P AS					
RKB: 18.0 meters			Geologist: Andreas Neitzel / T.F.Kristensen					
Hole size: 8 1/2"			Cut solvent: Iso Propyl Alcohol				Date: 13.05.2005	
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.	

4503	100	Clst:	gry blk – blk, olv blk, frm – mod hd, blk, slily micropyr, calc			Sample contam w/ Cement
4506	100	Clst:	a.a.			a.a.
	Tr	Pyr:				
4509	100	Clst:	med dk gry – gry blk, olv blk, blk, frm – mod hd, blk – sbfis, slily slty, occ micropyr, calc			Only tr cmt contam
4512	100	Clst:	a.a.			a.a.
4515	100	Clst:	non – slily calc, occ mod calc, else a.a.			
4518	100	Clst:	a.a.			a.a.
4521	100	Clst:	mod hd, else a.a.			a.a.
4524	100	Clst:	dk gry – gry blk, dk olv gry, frm – mod hd, blk – sbfis, slily slty, pt calc			a.a.
4527	100	Clst:	non calc, else a.a.			a.a.
4530	100	Clst :	a.a.			a.a.
4533	100	Clst :	a.a.			a.a.
4536	100	Clst :	a.a.			
4539	100	Clst :	med gry, olv gry, frm, sbblk			
4542	100	Clst:	dk ol gry, frm – mod hd, blk			
4545	50	Clst:	a.a.			
	50	Clst:	rd brn, frm, blk - sbfis			
4549	100	Clst:	rd brn, a.a.			
4551	90	Clst:	rd brn, a.a.			
	10	Clst:	med – dk gry, frm – mod hd, sblk - blk			
4554	60	Clst:	rd brn, a.a.			
	40	Clst:	med – dk gry a.a.			
4557	20	Clst:	rd brn, a.a.			
	80	Clst:	dk olv gry, frm – mod hd, blk			
4560	10	Clst:	rd brn, a.a.			
	90	Clst:	dk olv gry, a.a.			

WELLSITE SAMPLE DESCRIPTION

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Country: Norway			Area: Haltenbanken			Field: Morvin		
Well no: 6506/11-8			Company: Statoil ASA, Norsk Hydro Produksjon AS, Eni Norge AS, Total E&P AS					
RKB: 18.0 meters			Geologist: Andreas Neitzel / T.F.Kristensen					
Hole size: 8 1/2"			Cut solvent: Iso Propyl Alcohol				Date: 13.05.2005	
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.	

4563	10	Clst:	rd brn, a.a.	
	90	Clst:	dk olv gry, a.a.	
4566	60	Clst:	rd brn, a.a.	
	40	Clst:	dk olv gry, a.a.	
4569	30	Clst:	rd brn, a.a.	
	70	Clst:	dk olv gry, a.a.	
4572	10	Clst:	Rrd brn, a.a.	
	90	Clst:	dk olv gry, a.a.	
4575	100	Clst:	olv gry – dk olv gry, grysh brn, mod hd, occ hd, sbblky – blk, slily slty	
4578	100	Clst:	dk gry – gry blk, olv blk, mod hd, blk – sbfis, slily slty, calc	
4581	100	Clst:	med dk gry – gry blk, olv blk, rd brn, mod hd, blk – sbfis, slily slty, calc – occ v calc	
4584	90	Clst:	rd brn – gry rd, frm – mod hd, blk – occ sbfis, slily slty, calc – v calc, grad Mrl i.p.	
	10	Clst:	med dk gry – gry blk, a.a.	
	Tr	Ls:	yel gry – lt olv gry, mod hd, micr, com arg	
4587	90	Clst:	rd brn – dsky rd - gry rd, frm – mod hd, blk – occ sbfis, slily slty, calc – v calc, grad Mrl i.p.	
	10	Clst:	med dk gry - gry blk, olv gry – olv blk, mod hd, blk – sbfis, slily slty, calc	
	Tr	Ls:	a.a.	
4590	90	Clst:	rd brn, a.a.	
	10	Clst:	med dk gry, a.a.	
	Gd tr	Ls:	a.a.	
4593	80	Clst:	rd brn, a.a.	
	20	Clst:	med dk gry, a.a.	
	Tr	Ls:	a.a.	
4596	80	Clst:	rd brn, a.a.	
	20	Clst:	med dk gry, a.a.	
	Tr	Ls:	yel gry – lt olv gry – pa rd gry, mod hd, micr, com arg	
4599	60	Clst:	olv blk – brn blk – gry blk, com met lustre, frm – mod hd, blk, slty i.p., carb i.p., micropyr i.p., non – occ slily calc	No fluor, v wk bl wh – pa yel bloom cut fluor
	30	Ls:	yel gry – lt olv gry, occ par d gry, mod hd, micr – microxln, slily – occ mod arg	
	10	Clst:	rd brn – gry rd, a.a.	

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Country: Norway		Area: Haltenbanken		Field: Morvin	
Well no: 6506/11-8		Company: Statoil ASA, Norsk Hydro Produksjon AS, Eni Norge AS, Total E&P AS			
RKB: 18.0 meters		Geologist: Andreas Neitzel / T.F.Kristensen			
Hole size: 8 1/2"		Cut solvent: Iso Propyl Alcohol		Date: 14 - 17.05.2005	
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.

4602	100	Clst:	olv blk - gry blk - brn blk, com met lustre, frm - mod hd, blk, slty i.p., carb i.p., com micropyr, non - occ slily calc	No fluor, v wk bl wh - pa yel bloom cut fluor
	Tr	Clst:	rd brn, a.a.	
	Tr	Ls:	yel gry - lt olv gry, occ par d gry, mod hd, micr - microxln, slily - occ mod arg	
4603	100	Clst:	olv blk-blk, frm-md hd, sbblky-blky, occ slty, com micropyr	No fluor, wk wh-v pa yel cloudy cut fluor
			v carb, pt grad to Coal	
			At 4603m, POOH to cut 10m core in Viking Group	
			Description from core chips (Core #1 from 4603 - 4605.1 m)	
4603	100	Clst:	dk gry, hd, mass, slty, micromic, calc	
4604	100	Clst:	dk gry, hd, slty, mass, micromic, calc	
4604.6	100	Clst:	dk - olv gry, v hd, slty, mass, v micromic, non calc	
4605.1	100	Clst:	md - dk gry, hd, mass, micromic, non calc	
			Drilling ahead from 4606m	
4608	90	Clst :	med dk gry - dk gry, olv gry - olv blk, brn blk, frm - mod hd, amor - blk, slty, micromic, com micropyr, carb i.p., non - occ slily calc	
	10	Sst:	yel brn, clr - trns - pa yel brn Qtz, v f - f, wl srt, sbang - sbrndd, fri - mod hd, com arg, none - pr vis por	
4611	100	Clst:	a.a.	
	Tr	Sst:	a.a.	
4614	100	Clst:	a.a.	
	Tr	Sst:	a.a.	
4617	100	Clst:	dk gry - gry blk, olv blk - brn blk, frm - occ mod hd, sbblky - blk, com slty, micromic, micropyr i.p., carb i.p., non calc	
4620	90	Clst :	micropyr - occ v micropyr, occ slily calc, else a.a.	
	10	Sst :	yel brn, clr - trns - yel brn Qtz, v f - f, occ med, mod srt, ang - sbang, occ sbrndd, high ang due to braking sil cmt, app as les grns i.p., tr calc cmt, carb / arg mtrx i.p., app none - pr vis por	
4623	50	Clst:	a.a.	
	50	Sst:	yel brn, clr - trns - yel brn qtz, pred v f - f, occ med, rare crs, mod srt, ang - sbang, occ sbrndd, high ang due to breaking up sil cmt, app as lse grns i.p., sil cmt, tr calc cmt, com arg/carb mtrx, app non - pr vis por	Pr samples. Bit grinding ahead instead of drilling
4624	80	Sst :	a.a.	a.a.
	20	Clst :	a.a.	
			At 4624m, POOH to cut core no. 2 from top of Garn Fm	

WELLSITE SAMPLE DESCRIPTION

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Country: Norway			Area: Haltenbanken			Field: Morvin		
Well no: 6506/11-8			Company: Statoil ASA, Norsk Hydro Produksjon AS, Eni Norge AS, Total E&P AS					
RKB: 18.0 meters			Geologist: Andreas Neitzel / Nicholas Townley/Olav Giskeødegard/ Roger Hall					
Hole size: 8 1/2"			Cut solvent: Iso Propyl Alcohol				Date: 05.06.2006	
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.	

			CORE #2 at 4624 m	
			CUTTINGS DESCRIPTIONS WHILST CORING	
4626	100	Sst:	yel brn-md brn, clr-trnsl-yel brn Qtz, pred vf-f, occ med, rare crs, mod srt ang-sbang, sbrnd i.p., sil cmt, freq arg, non – v pr vis por	no direct fluor mod yel grn cut fluor, OBM ??
4629	100	Sst:	pred olv gry, dk yel brn, sft, cmbly, sil/calc Rk Flour, v occ vf-f, lse gr	a.a.
4632	100	Sst:	a.a., sft, stky-cmbly, silc, occ calc, Rk Flour, abd vf crsh, ang qtz, abd wh, silc cly fraction	a.a.
44635	90	Sst:	pred sft, stky Rk Flour, abd slt –f , sbang-sbsher, lse Qtz	a.a.
	10	Clst:	olv gry-olv blk, gry blk, frm-hd, blk, stky i.p.	
4638	90	Sst:	olv gry-olv blk, brn gry, pred olv gry, stky i.p., Rk Flour, cmbly i.p., clr-pa yel Qtz gr, sbang-spher lse Qtz gr, sl calc cmt i.p., sil cmt, micromic i.p.	a.a.
	10	Clst:	brn gry-brn blk, sft-frm, pred sft, sblky-blky, non-sl calc	
4641	80	Sst:	olv gry-brn gry, clr-trnsl Qtz gr, vf-f, occ m-crs, mod srt, cmbly, occ stky, sil cmt, occ v calc cmt, micromic, no vis por	a.a.
	20	Clst:	olv gry-olv blk, brn blk, frm-hd, sblky-blky, non calc	
4644	80	Sst:	a.a. dirty olv gry, brn gry, sft-frm, cmbly arg Rk Flour, w/ clr, trnsp, vf-f Qtz gr, rad Slstst i.p.	a.a.
	20	Clst:	a.a.	
4647	90	Sst:	a.a. pred lt olv gry, med gry, sft, stky-cmbly Rk Flour, grad arg Slstst	a.a.
	10	Clst:	olv blk, sft-hd, amorph-blky/splty	
	Tr	Ls:	med olv brn, hd, splty, crypto-microxln	
4650	100	Sst:	olv gry, brn gry, sft-frm, cmbly arg Rk Flour, w/ clr, trnsp, slty - m Qtz gr,	a.a.
	Tr	Clst:		
4653	70	Sst:	lt olv gry, olv gry, yel gry, sft, stky – cmbly Silc, occ Calc Rk Flour w/ abdt clr, transp, lt grn gry, off wh, transl, Silc shrds/crshed qtz? + occ – abdt, slty – m, v occ crs, sbang, lse qtz.	a.a.
	30	Slstst:	brn gry, gry olv, sft – frm, cmbly – occ blk, Silc, occ Calc, w/ abdt clr, off wh, transl Silc shrds/crshed qtz? Occ slty – vf , sbang, sbsph, lse qtz grs, grdg – ‘dirty’ arg vf Sst	
4656	30	Sst:	a.a., grad – ‘Dirty’ arg Sst	a.a.
	70	Slstst:	a.a., grad – Sst	
4658			Samples from 4656 – 4658 m, not circulated up	
			CORE # 2 CHIP DESCRIPTIONS	
4624	100	Sst:	brn blk, olv blk, w clr trnsp, occ lt gn gry, yel brn, trnsl, f-crs, ang- sbrnd, sbelg-sbsph, mod srt Qtz gr, v gd hd, pred clr trnsp silc, occ	Mud fluor, pr HC odeur

WELLSITE SAMPLE DESCRIPTION

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Country: Norway			Area: Haltenbanken			Field: Morvin		
Well no: 6506/11-8			Company: Statoil ASA, Norsk Hydro Produksjon AS, Eni Norge AS, Total E&P AS					
RKB: 18.0 meters			Geologist: Andreas Neitzel / Nicholas Townley/Olav Giskeødegard/ Roger Hall					
Hole size: 8 1/2"			Cut solvent: Iso Propyl Alcohol				Date: 05.06.2006	
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.	

			calc cmt, occ bn blk, olv blk, cly mtx (coating some grains), occ	
			glden micropyr coatings, occ abd blk carb matl/ lth frags, poss	
			sec Qtz ovgtgts, no vis por, tight, no shows	
4625	100	Sst:	a.a. + occ wh/blu wh felds/kaol, abdt crs, clr trnspr Musc laths, occ	Pr HC odeur
			folded around Gr, occ pa gn, Chlor?, v gd cmt, no vis por	No nat fluor, mky
				Wh cut
4626	100	Sst:	a.a., m – v crs, pred crs, ang-sbrnd, gd hd slcmt, qtz ogths, occ crs	Pr HC odeur
			Musc laths/sheets, occ cly mtx, micropyr, v occ pyr cmt, rk laths,	v occ bn blu wh,
			v occ mod vis por	Inst stng mky wh cut
4627	100	Sst:	a.a. bn blk, olv blk, occ blu wh gns, f-crs, pred m-crs, mod-gd fri – v hd, occ	No HC fluor
			Sil cmt, occ Musc, abd Qtz ovgtgts, no vis por	
4628	100	Sst:	a.a. f-crs, pred m-crs, gd-v hd silc cmt, v occ calc cmt, abd Qtz ovgtgts,	Pr HC odeur
			occ abd crs musc, abd yel gry, wh, degraded fspr/kaol, no vis por	No nat fluor
4629	100	Sst:	brn blk, grn blk, w/ clr transp, occ lt grn gry, blu wh, transl, m – crs, sbang – sbrnd	Pr HC Odour,
			sbelg – sbsph Qtz grs, mod – pred gd hd fri Silc cmt, sec Qtz ovgtgts, occ crs Mus	v pr lam blu wh
			laths 'sheaves' occ yel gry sft kaol (occ as halos around grains) n.v.p.	nat flour,
				v slw stmg blu wh cut,
				wk yel brn resd rng.
4630	100	Sst:	a.a., f – m well srtd, gd hd Silc cmt, sec Qtz ovgtgts, occ grn blk arg? Mtx, occ	Pr HC Odour,
			Flspr w/ yel gry Kaol halos, v occ Musc, v pr vis por	v pr sptty blu wh
				nat flour,
				inst stmg blu wh cut,
				wk yel brn resd rng.
4630.5	100	Sst:	a.a. m – crs. w srtd, w/ gd hd Silc cmt, brn blk mtx, abdt crs Musc 'sheaves', v pr	Pr HC Odour,
			vis por.	v pr sptty blu wh
				nat flour
				Inst stmg blu wh cut,
				wk yel brn resd rng
4631	100	Sst:	brn blk, grn blk, w/ clr transp, occ lt grn gry, blu wh, transl, f – crs, pred m – crs,	Pr HC Odour,
			ang – sbrnd, well srtd, w/ gd hd Silc cmt, tr grn blk mtx, Musc, tr micrpyr, occ blk	No vis fluor,
			Rk/Lith frags, no vis por	v slw diff mlky wh, cu
				wk yel brn resd rng.
4632	100	Sst:	a.a., f – m occ crs, w/ gd hd transl Silc cmt, tr ben blk grn blk arg/Cly mtx?, abdt	Pr HC Odour,
			sec Qtz ovgtgts, occ Musc + Chlor? Mic, occ sft yel gry Kaol/cshed qtz, n.v.p.	No vis fluor,
				v slw diff mlky wh, cut
				wk yel brn resd rng.

WELLSITE SAMPLE DESCRIPTION

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Country: Norway	Area: Haltenbanken	Field: Morvin
Well no: 6506/11-8	Company: Statoil ASA, Norsk Hydro Produksjon AS, Eni Norge AS, Total E&P AS	
RKB: 18.0 meters	Geologist: Andreas Neitzel / Nicholas Townley/Olav Giskeødegard/ Roger Hall	
Hole size: 8 1/2"	Cut solvent: Iso Propyl Alcohol	Date: 05.06.2006

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.

4633	100	Sst:	brn blk, w/ clr transp, occ lt grn gry, blu wh transl, f – m ang – sbrnd, sbelg, w srted Qtz grs, w/ gd hd brn blk/transl Silc cmt, occ brn blk mtx, occ crs Musc mic, Rk frags, micrpyr coatings to grs, n.v.p.	Pr HC Odour, v pr sppty – occ unif blu wh nat fluor, v slw diff mlky wh, cut wk yel brn resd rng.
4634	100	Sst:	a.a., f – m, occ crs.	a.a.
4635	100	Sst:	a.a., f – occ crs, pred f – m.	Pr HC Odour, v pr sppty blu wh nat fluor, V slw diff mlky wh, b cut, wk yel brn resd rng.
4636		Sst:	olv blk, brn gry w/ clr, transp, f – crs, pred m, ang – sbrnd, sbelg – sbsph, well srted Qtz grs, w/ gd hd transl Silc cmt, no mtx, occ lams of abdt crs musc mic, occ blk Rk frags, n.v.p.	Pr HC Odour. v pr sppty, (2%) blu wh nat flour, v slw blu wh cut fluor, wk yel brn resd
4637	100	Sst:	a.a., f – m, occ crs, abdt musc ‘sheaves’ occ micrpyr coatings to grs, v occ Cobalt blu/Gld mic? Gd hd transl Silc cmt, occ brn blk mtx, micrpyr, n.v.p.	Pr HC Odour. v pr sppty, (2%) blu wh nat flour, v slw blu wh cut fluor, wk yel brn resd
4638	100	Sst:	a.a.	a.a.
4639	100	Sst:	olv blk, brn blk, w/ clr transp, vf – m, pred f, ang – sbrnd, w srted Qtz grs, w/ gd hd Sil cmt, brn blk mtx, occ – abdt crs Musc ‘sheaves’ micrpyr, occ lt grn gry sft Kaol?, n.v.p.	No Shows
4640	100	Sst:	a.a., f – m, pred f, sbang – sbrnd, sbelg – sbsph, mod srted, w/ gd hd Silc cmt, brn gry mtx, occ abdt crs Musc, n.v.p.	Pr HC Odour, v pr sppty/pin point blu wh nat flour, v slw diff blu wh cut, wk yel brn resd rng
4641	100	Sst:	a.a., f – v occ m, pred f, gd hd Silc, v occ cal cmt, dk brn arg mtx, occ Musc, v occ lt grn gry, sft Kaol?, occ – abst brn blk coatings to grains.	Pr HC Odour, non - v pr sppty/ pin point, blu wh nat flour, v slw diff blu wh cut, wk yel brn resd rng

WELLSITE SAMPLE DESCRIPTION

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Country: Norway			Area: Haltenbanken			Field: Morvin		
Well no: 6506/11-8			Company: Statoil ASA, Norsk Hydro Produksjon AS, Eni Norge AS, Total E&P AS					
RKB: 18.0 meters			Geologist: Andreas Neitzel / Nicholas Townley/Olav Giskeødegard/ Roger Hall					
Hole size: 8 1/2"			Cut solvent: Iso Propyl Alcohol				Date: 05.06.2006	
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.	

4642	100	Sst:	brn blk, olv blk, w/ clr, transp, f – m, pred f, ang – sbrnd, sbelg – sbsph, well strtd, Qtz grs, w/ gd hd transl Silc cmt, tr mtx, occ abdt crs musc mic, n.v.p.	Pr HC Odour, no nat flour, v slw diff blu wh cut, wk yel brn resd rng
4643	100	Sst:	olv blk, brn gry, f – m, pred f, sbang- sbrnd, grs w/ gd hd Silc cmt, tr brn gry mtx, micrpyr, n.v.p.	Pr HC Odour, no nat flour, v slw diff blu wh cut, wk yel brn resd rng46
4644	100	Sst:	a.a., f-m, pred f, tr mtx, occ musc, n.v.p.	Shows a/a, diff-stmg
4645	100	Sst:	vf-f, pred f, mod fri silc cmt, bn blk mtx, abd Musc, occ blk biotite, v occ sft blk Carb/bitum material	No nat flour, v slw diff, blue wh
4646	100	Sst:	vf-f, pred f, mod fri silc cmt, bn blk mtx, else a.a.	No nat flour, very pr, v slw, diff blue wh cut
4647	100	Sst:	olv blk, brn blk, vf-m, pred f Qtz gr, gd hd, trnsil sil cmt, occ f Musc, n.v.p.	Shows a/a, v pa, v slw diff cut
4648	100	Sst:	a.a. vf-m, gd hd trnsil sil cmt, gry brn mtx, occ sft carb/bitum mtr, n.v.p.	a.a.
4649	100	Sst:	med dk gry-dk gry, olv blk, vf-f, occ m, pred f, clr-trnsp Qtz gr, gd hd sil cmt, sl Calc cmt i.p., abd Musc, n.v.p.	No nat flour, v pa-my wh cut flour
4650	100	Sst:	brn gry-brn blk, m dk gry, vf-f, occ med, pred f, clr-trnsp Qtz gr, sbang-sbrnd, gd hd sil cmt, abd Musc, pr vis por	Wk yelsh nat flour blsh wh cut flour, slow-m
4651	100	Sst:	med dk gry-dk gry, gry blk, vf-f, occ m, sl calc cmt i.p., else a.a.	Wh yelsh nat flour dul blsh yel cut, wk odeur
4652	100	Sst:	brn gry-brn blk, vf-m, pred f, micrpyr i.p., sl calc cmt, else a.a.	No nat flour, wk mlky wh cut, gd HC odour
4653	100	Sst:	med gry-med dk gry, f-crs, occ v crs, mod srt, shat Qtz gr, clr-trnsp, ang-sbang, Micrpyr, else a.a.	No nat flour, v slw diff wh yel cut, wk HC odour
4654	100	Sst:	a.a. f-m, pred f, gd hd trnsil sil cmt, brn gry mtrx, occ Musc, occ musc lams, v abd crs orient musc, n.v.p, v occ wh flspr	No nat flour, v slw wh yel cut, wk HC odour

WELLSITE SAMPLE DESCRIPTION

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Country: Norway		Area: Haltenbanken		Field: Morvin
Well no: 6506/11-8		Company: Statoil ASA, Norsk Hydro Produksjon AS, Eni Norge AS, Total E&P AS		
RKB: 18.0 meters		Geologist: Andreas Neitzel / Nicholas Townley/Olav Giskeødegard/ Roger Hall		
Hole size: 8 1/2"		Cut solvent: Iso Propyl Alcohol		Date: 05.06.2006
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.

4655	100	Sst:	a.a. f, hd silc cmt, abd dk brn arg mtx, micropyr, occ blk sft Carb lams w/ associate f Musc lams .	No nat fluor, v slw wh yel cut, wk HC odour
4656	100	Sst:	olv blk, brn blk, w/ clr transp, f – v crs, pred m Qtz grs. Gd hd transl Silc cmt, occ dk brn ‘drt’y’arg/mtx, occ v crs gr lams/lenses, v pr vis por.	No nat fluor, v slw wk, blu wh yel cut, wk HC odour
4657	100	Sst:	a.a., f – v crs, pred m, ang – sbrnd, mod - w srted w/ gd hd transl, Silc cmt, occ – abdt brn blk arg/mtx, abdt crs Musc ‘Sheaves’ non – v pr vis por.	No nat fluor, v slw wh yel cut, wk HC odour
4658	100	Sst:	olv blk, brn blk, w/ clr transp, f – crs, pred m – crs, transl + blu wh, sbang – sbrnd Qtz grs, v gd hd Silc cmt, tr brn gry mtx, occ musc ‘Sheaves’, abdt sec Qtz infills of por, non – v pr vis por	No nat fluor, v slw wh yel cut, wk HC odour
4658.3	100	Sst:	a.a. pred m, abdt Silc cmt, tight, brn gry mtx, n.v.p.	Mod HC Odour, no nat fluor, v slw diff, blu wh cut fluor.
CORE #3 4658.4 – 4671.4 m				
CUTTINGS SAMPLES WHILST CORING				
4659	100	Sst:	olv gry-brn gry, pal yel transl Qtz, vf-f, occ med, wl-mod srt, ang-sbrnd, occ Musc sl arg, wl sil cmt, n.v.p.	No fluor v slow, blooming wk bl/wh cut
4662	100	Sst:	a.a.	a.a.
4665	100	Sst:	pred obs a/ wh-wh blu wh sft, cmbly silc Rk Flour, occ clr-trnsl, pred f-m, occ m-v crs, mod-pr srt, ang-sbrnd Qtz grs, micromic (Musc), Pyr, Qtz agg i.p., sil cmt, Kao, n.v.p.	No fluor
Samples from 4665m to 4671.4m not circulated up				
CORE # 3 CHIP DESCRIPTIPONS 4658.4 – 4671.4 m				
4659	100	Sst:	olv gry-brn gry, clr-mky-lt brn transl Qtz, f-pred med, occ crs, pr-med srt, ang-sbang, v hd, freq Musc, wl sil cmt, fr vis por	fair HC odour, no fluor, slow cldy wh/yel cut
4660	100	Sst:	olv brn blk, clr-mky transl Qtz, vf-f, mod-wl srt, sbang-sbrnd, v hd, freq musc, abd olv brn mtx, wl sil cmt, non-v pr vis por	fair HC odour, wk dull yel fluor, fast blooming bl/wh cut
4661	100	Sst:	pr vis por, else a.a.	good HC odour v wk dull yel fluor, fast blooming bl/wh

WELLSITE SAMPLE DESCRIPTION

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Country: Norway		Area: Haltenbanken		Field: Morvin	
Well no: 6506/11-8		Company: Statoil ASA, Norsk Hydro Produksjon AS, Eni Norge AS, Total E&P AS			
RKB: 18.0 meters		Geologist: Andreas Neitzel / Nicholas Townley/Olav Giskeødegard/ Roger Hall			
Hole size: 8 1/2"		Cut solvent: Iso Propyl Alcohol		Date: 05.06.2006	
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.

				cut
4662	100	Sst:	olv gry-olv blk, clr-mky lt brn transl Qtz, med-crs, wl srt, sbang-sbrnd, v hd, occ arg, freq Musc, wl sil cmt, frey sec qtz infill of pores, pr-fr vis por	good HC odour strong wh/yel fluor, instant dull yel cut
4663	100	Sst:	crs-v crs, else a.a.	good HC odour strong wh/yel fluor, fast cldy bl/wh cut
4664	100	Sst:	med-crs, else a.a.	good HC odour dull yel fluor, slow streaming bl/wh cut
4665	100	Sst:	dk olv gry-olv blk, clr-occ mky, transl Qtz, pred med-occ crs, mod srt, ang-sbang-sbrnd, v hd, dk brn gry mtx, r Musc, wl sil cmt, pr-fr vis por	good HC odour wk yel fluor, fast blooming yel cut
4666	100	Sst:	pred f-med, v pr vis por, else a.a.	fair HC odour no fluor, slow blooming bl/wh cut
4667	100	Sst:	olv brn gry, clr transl Qtz, prd f-med, wl srt, sbrnd-rnd, v hd, abd brn gry mtx, wl sil cmt, non-v pr vis por	fair HC odour v wk dull yel fluor, fast blooming bl/wh cut
4668	100	Sst:	olv brn gry, abd clr-v lt brn transl Qtz, f-med, mod srt, sbang-sbrnd, v hd, occ blk arg rock fragments, wl sil cmt, pr-fr vis por	good HC odour v wk dull yel fluor, v slow cldy bl/wh cut
4669	100	Sst:	pr vis por, else a.a.	good HC Odour wk wh/yel Fluor slow cldy wh/yel cut
4670	100	Sst:	dk olv gry-olv blk, clr-brn gry transl Qtz, f-med occ crs, mod srt, sbang-sbrnd, v hd, r Musc, occ dk gry mtx, wl sil cmt, pr vis por	fair HC odour dull wh/yel fluor, slow p-p wh/yel cut

WELLSITE SAMPLE DESCRIPTION

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Country: Norway		Area: Haltenbanken		Field: Morvin	
Well no: 6506/11-8		Company: Statoil ASA, Norsk Hydro Produksjon AS, Eni Norge AS, Total E&P AS			
RKB: 18.0 meters		Geologist: Andreas Neitzel / Nicholas Townley/Olav Giskeødegard/ Roger Hall			
Hole size: 8 1/2"		Cut solvent: Iso Propyl Alcohol		Date: 05.06.2006	
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.

4671.4	100	Sst:	pr, occ fr vis por, else a.a.	fair HC odour nol fluor, slow cld wh/yel cut
			CORE #4 4671.4 – 4674.4 m	
			CUTTINGS SAMPLES WHILST CORING	
4672	50	Sst:	pred brn gry, sft, cmbly silc Rk Flour + abdt vf – occ v crs, pred m – crs, amg – sbrnd, prly srted grs, occ w/ gd hd Silc cmt + abdt vf – v crs lse grs, occ shtd /fract Sil cmt.	
	20	Clst:	dk gry, gry blk, occ mod yel brn, lt brn, hd – v hd, blkly –splty, micrmic, microcarb	CAVINGS?
	30		LCM CONTAMINATION?	
4674.4			Samples from 4672 m to 4674.4m not circulated up	
			<u>CORE # 4 CORE CHIP DESCRIPTIONS 4671.4 - 4674.4 m</u>	
4671.4	100	Sst:	olv blk, grn blk w/ clr, transp, lt grn gry, blu wh transl, f – v crs, pred um – crs, sbang – sbrnd, pred sbsph, mod srted Qtz grs, pred mod fri – occ gd hd lt brn transl Sil cmt, v occ Pyr cmt/por infills + cotg to grs, occ blk Carb + dk brn arg mtx, mod vis por.	Good HC odour, occ dk brn oil stn cotg/Carb cotg to grs. Unif dull yel/ stw nat Flour, inst dull diff yel cut -slw cldy bir blu wh cut., brn resd rng.
4672	100	Sst:	a.a., m – v crs, pred um – crs, pred wk – mod, fri Silc cmt, mod vis por.	Good HC odour, brn oil stn to grs + occ blk tar/Carb stn a/a
4673	100	Sst:	pred a.a., m – v crs, pred um – crs, sbang – occ rnd, mod – w srted, w/ gd hd lt brn transl Sil cmt, blk Carb + dk brn arg/Cly mtx, abd crs musc mic, mod vs por	Good HC odour, lt brn oil stn ip, pr sppty dull yel/stw nat fluor, dull inst diff yel cut – slw diff - stmg blu wh stw cut, pa brn resd rng.
4673.5	100	Sst:	a.a., m – v occ crs, pred um – crs, sbang – occ rnd, mod – w srted, w/ gd hd lt brn transl Sil cmt, blk Carb + dk brn arg/Cly mtx, mod vs por	Good HC odour, pr sppty – occ mod unif yel/stw nat fluor, inst dull diff yel cut- slw cldy bir blu wh cut, brn resd rng.
4674.2	100	Sst:	a.a., m – pbbl, pred m – v crs, pr srted, w/ gd hd transl Sil cmt, abd blk Carb + dk brn arg/Cly mtx infilling por spaces, abdt crs musc ‘sheaves’, mod vis por	Good HC Odour, slw bleeding dk brn HC fluid in por spaces.

WELLSITE SAMPLE DESCRIPTION

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Country: Norway			Area: Haltenbanken			Field: Morvin		
Well no: 6506/11-8			Company: Statoil ASA, Norsk Hydro Produksjon AS, Eni Norge AS, Total E&P AS					
RKB: 18.0 meters			Geologist: Andreas Neitzel / Nicholas Townley/Olav Giskeødegard/ Roger Hall					
Hole size: 8 1/2"			Cut solvent: Iso Propyl Alcohol				Date: 05.06.2006	
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.	

				Unif mod yel/stw nat fluor, Instg blmg/cldy blu wh cut fluor, lt brn resd rng.
			dk brn/blk light oil bleed from core onto deck.	
4674.4			LOST	
Core #5 4674.4 – 4699.8 m				
Cuttings whilst coring				
4677	100	Sst:	pred mod brn , pa yel brn, grddg – olv blk ip, sft – frm, cmbly, Sil Rk Flour, w/ abdt clr, transp, vf – crs, pred m-crs, ang – sbrnd, sbelg, Qtz grs, abdt crshed/ shttd Qtz grs	Unif – occ sptty, dull yel nat fluor, inst fst stmg – slw blmg blu wh cut, lt brn resd rng.
4680	100	Sst:	pred Rk Flour a.a.; occ vf – v crs, pred Um – crs, w srttd, lse Atz, abd shttd grs.	a.a.
4683	100	Sst:	pred mod brn, pa yel brn, dk brn, sft – frm, cmbly suc, Sil Rk Flour, abd vf – crs, occ v crs, pred m – crs, mod srttd lse Qtz.	a.a.
4686	100	Sst:	50% Rk Flour, 50% lse vf – crs, pred Um – crs, well srttd, lse Qtz.	a.a.
4689	100	Sst:	pred clr, transp, vf – crs, pred Um – crs, ang – sbrnd, sbelg – sbsph, lse Qtz, abdt shttd grs + frags ‘glssy’ Sil cmt.	a.a.
				4691m Change to smooth ‘Shale’ Torgue and –ve DB
4692	70	Sst:	a.a. pred lse Qtz	a.a.
	30	Clst:	dsly brn, dsly yel brn, sft, amor – cmbly i.p., micrmic, micrpyr.	
4695	30	Sst:	as 4689m	a.a.
	70	Clst:	a.a. grad – blk, hd, splty.	
Samples between 4695 – 4699m MD not circulated up				
CORE # 5 CORE CHIP DESCRIPTIONS 4674.4- 4699.8 m				
4675	100	Sst:	olv blk, clr- v lt brn transl Qtz, pred med-crs, occ v crs, pr srt, ang-sbang, v hd, abd blk carb and dk brn arg mtz, abd Musc, wl sil cmt, pr vis por, release of light HC film on chip surface	strong HC odour, srtong uniform yel fluor, fast cldy bl/wh cut, dk brn res ring
4676	100	Sst:	pred crs occ v crs, else a.a.	strong HC odour,

WELLSITE SAMPLE DESCRIPTION

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Country: Norway			Area: Haltenbanken			Field: Morvin		
Well no: 6506/11-8			Company: Statoil ASA, Norsk Hydro Produksjon AS, Eni Norge AS, Total E&P AS					
RKB: 18.0 meters			Geologist: Andreas Neitzel / Nicholas Townley/Olav Giskeødegard/ Roger Hall					
Hole size: 8 1/2"			Cut solvent: Iso Propyl Alcohol				Date: 05.06.2006	
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.	

				spty wh/ yel fluor, slow cldy bl/wh cut dk brn res ring
4677	100	Sst:	dk olv gry, clr transl Qtz, pred crs- v crs, pr srt, ang-sbang, v hd, occ dk brn arg mtx, r Musc, r micpyr, wl Sil cmt, pr-fr vis por, small release of v volatile HC from chip	v strong HC odour cldy dull yel fluor, instant cldy yel cut dk brn res ring
4678	100	Sst:	fr vis por, else a.a.	v strong HC odour, cldy dull yel fluor, instant blooming bl wh cut, dk brn res ring
4679	100	Sst:	olv gry-brn gry, clr transl Qtz, crs- v crs, mod srt, sbang-sbrnd, v hd, r dk brn, carb/arg mtx, mod Sil cmt, fr vis por	v strong HC odour, wk spty bl/wh fluor, instant blooming wh yel cut, dk brn res ring
4680	100	Sst:	a.a. + freq blk carb mtx, occ wood fragments.	v strong HC odour, strong cldy wh/yel fluor, instant bloom bl/wh-yel cut, dk brn res ring
4681	100	Sst:	olv blk-brn blk, clr transl Qtz, f-pred med, mod-wl srt, sbang-sbrnd, v hd, freq Musc, pr Sil cmt, Pr vis por	strong HC odour, strong wh yel fluor of filtrate invasion 5 mm inside core, slow blooming wk wh/yel cut
4682	100	Sst:	gry blk, brn blk, w/ clr transp, occ lt gry gry, blu wh, transl, f – v crs, pred m – crs, ang – sbrnd, sbelg . sbsph, pr – mod srted Qtz grs w/ gd hd Sil cmt, blk micpyr Carb + dk brn cly mtx, abd crs Musc, , v occ dk gry rnd Rk/Lith frags. pr – mod vis por.	Good HC odour, unif sptty dull yel/stw nat Flour, instg strmg blmg/cldy blu wh cut, brn resd rng
4683	100	Sst:	pred a.a., pred m – crs, w/ occ lams of pure clr transp hd Sil cmt w/ blk, micpyr Carb + dk gry mtx, w/ occ m gr Qtz, mod srted, pr – Mmod vis por.	a.a.

WELLSITE SAMPLE DESCRIPTION

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Country: Norway	Area: Haltenbanken	Field: Morvin
Well no: 6506/11-8	Company: Statoil ASA, Norsk Hydro Produksjon AS, Eni Norge AS, Total E&P AS	
RKB: 18.0 meters	Geologist: Andreas Neitzel / Nicholas Townley/Olav Giskeødegard/ Roger Hall	
Hole size: 8 1/2"	Cut solvent: Iso Propyl Alcohol	Date: 05.06.2006

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.

4684	100	Sst:	gry blk, brn blk, w/ clr transp, occ lt gry gry, blu wh, transl, vf – crs, pred m, ang sbrnd, sbelg - sbsph, mod srted Qtz grs w/ mod fri - gd hd Sil + occ pyr cmt/ cotg to grs, blk micrpyr Carb + dk brn cly mtx, occ lt olv gry sft cly Repl min/relics of Fsprs, pr – mod vis por.	a.a.
4685	100	Sst:	gry blk, brn blk, brn gry w/ abd clr transp, occ lt blu gry transl, f – m, sbang – sbrnd, sbsph, well srted Qtz grs, w/ mod fri – gd hd transl, occ mlky wh, transl Sil cmt, occ dk gry arg mtx, v occ blk, micrpyr Carb matx, occ lt olv, olv gry sft illite? Repl of Fsprs? Relics, occ – abd Musc, pr – mod vis por.	Mod HC odour, pr sppty dull yel/stw nat flour, slw diff dull mlky wh cut, pa brn resd rng
4686	100	Sst:	gry blk, brn blk, w/ clr transp, blu wh Qtz, f – m, pred m, gd hd transl Sil cmt, abd dk gry arg mtx + blk micrpyr Carb matx, occ musc lams, pr vis por in hd cmted prts	Pr HC odour, v pr sppty dull yel/stw nat flour, v slw blu wh cut, v pa resd rng
4687	100	Sst:	olv blk, brn gry w/ vf – crs, pred m, grs, gd hd transp, blu wh Sil cmt occ Carb + dk arg mtx, occ olv gry sft illite? Fspr relics, pr vis por	Pr HC odour, pr PP stw nat flour, slw blw wh cut,
4688		Sst:	gry blk, brn gry w/ abdt vf – m, pred m Qtz grs w/ gd hd transp Sil cmt, Ggrad to dk gry, olv blk 'Dirty' Sst w/ abd blk, micrpyr Carb + dk gry arg mtxs + dk transl Sil cmt + abd crs Musc, non – v pr vis por.	Pr HC odour, PP stw nat flour, slw blw wh cut,
4689	100	Sst:	pred gry blk, brn gry, vf – crs, pred m – crs, ang – sbrnd, sbsph, w srted Qtz w/ gd hd transp Sil cmt, occ gry blk, blk micrpyr Carb matl, non – v pr vis por.	Pr Hc Odour, pr unif – PP dull yel /stw nat flour, v slw diff blu wh cut, no resd rng
4690	100	Sst:	gry blk, brn gry w/ abdt vf – crs, pred Um – crs, ang – sbrnd, sbsph, mod srted Qtz, transp Sil cmt, occ – abd brn gry arg mtx /v occ blk micrpyr Carb matl, lt olv gry illite? Rpl/relics of Flsrs, pr vis por	V Pr HC odour pr unif dull yel/stw Nat flor, n slw diff, blu wh cut. no resd rng
4691	100	Clst :	med dk gry, hd, splty, w/ abd vf – v crs Musc, micrmic, tr micrpyr	No HC odour no nat flor, v slw diff blu wh cut.
4692	100	Sst:	olv blk, olv gry w/ clr transp f – crs, pred Um – crs, ang – sbrnd, sbsph Qtz w/ gd hd Sil cmt, occ blk micrpyr Carb matl/mtx, v occ Carb laths, occ lt mlky wh, lt olv gry sft cly illite/Kaol? Fspr relics, pr – mod vis por	Pr HC odour, mod unif – sppty dull yell nat flor, slw stng bri blu wh – v slw dull diff blu wh cut,lt brn resd rng
4693	100	Sst:	olv blk, gry blk w/ f – occ crs, pred m Qtz frs, gd hd transl Sil cmt, abd dk gry/ blk, arg or micrpyr Carb mtx, abd crs Musc, v occ illite as Repl to Fspr?, no vis por.	Pr HC odour, mod sppty dull yel nat flor in outer 5mm

WELLSITE SAMPLE DESCRIPTION

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Country: Norway		Area: Haltenbanken		Field: Morvin	
Well no: 6506/11-8		Company: Statoil ASA, Norsk Hydro Produksjon AS, Eni Norge AS, Total E&P AS			
RKB: 18.0 meters		Geologist: Andreas Neitzel / Nicholas Townley/Olav Giskeødegard/ Roger Hall			
Hole size: 8 1/2"		Cut solvent: Iso Propyl Alcohol		Date: 05.06.2006	
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.

					core (Infiltration?)
4694	100	Sst:	olv gry, dk grn gry w/ vf – m, pred m Qtz grs, gd hd transl Sil cmt, v occ arg Cly mtz, occ lt olv sft ‘rotted’ Flspr as illite?, occ med gr musc w/ mod vis por, grad –brn blk, olv blk ‘Dirty’ Sst: w/ occ m gr Qtz, abd olv blk, transl v hd Silc cm abd blk micrpyr Carb + dk gry arg mtz, abd crs Musc, tight, non – pr vis por		Mod – Pr HC odour. Dull unif – bri sptyy blu wh nat flor in ‘Clean’ prts, v slw diff blu wh cut, pa lt brn resd rng.
4695	100	Sst:	a.a., f – crs., pred Um – crs, pred fri – occ gd hd Sil cmt, occ brn blk, olv blk, Carb lams, mod vis por.		Mod HC odour. gd sptyy bri yel/Stw Nat flor, slw stmg – diff blu wh cut
4696	100	Sst:	brn blk, olv blk, f – crs, pred Um – crs, w/ gd hd Sil cmt, abd blk micrpyr Carb + dk grn arg mtxs, Musc, mod – pr vis por.		a.a.
4697	100	Sst:	brn blk, blk, f – crs, pred m w/ gd hd transl Sil cmt, occ blk Carb + dk gry arg mtxs, mod – pr vis por.		Mod – pr HC odour. Mod sptyy dull yel/stw nat flor, cut a.a.
4698	100	Sst:	vf – crs, pred m, well srtd, w/ gd hd Sil cmt, Carb + med brn arg mtxs, lt olv gry illite relacement, occ Musc lams of blk micrpyr Carb matll + crs Musc, pr vis por.		Pr HC odour, pr PP dull yel stw flor, v slw diff blu wh cut, no resd rng.
4699	100	Sst:	a.a.		a.a.
4699.8	100	Sst:	olv gry, brn gry w/ clr transp vf – m, pred f – m, sbang – sbrnd, well srtd, Qtz w/ gd hd Sil cmt, + dk gry/Blk Carb + arg mtz, abd random Musc, lt olv gry rotted Flspr /illite grs?, pr vis por, occ major blk, micrpyr fiss, Carb lams, grad – Clst.		Mod HC odour, v pr PP dull yel nat flor, v slw diff, mlky wh cut, no resd rng.
Start Drilling at 4699 m					
4701		Clst:	red		derived from
		Clst:	olv gry dk		reaming 4610-4699
		Clst:	blk, splintery		not considered to be
		Sst:	clr transl Qtz		representative
		LCM			
4704	50	Slst:	olv brn gry, sft, occ arg		No shows
	40	Clst:	dk yelsh brn-gry brn, sft, calc		
	10	Clst:	brn blk, sft, calc, occ micrpyr		
	Tr	Musc	lt – dk brn, crs		
4707	100	Slst:	grad Clst, olv gry-lt olv brn, sft, ptly blk, occ blk carb and micrpyr fragments, v calc		no shows

WELLSITE SAMPLE DESCRIPTION

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Country: Norway			Area: Haltenbanken			Field: Morvin		
Well no: 6506/11-8			Company: Statoil ASA, Norsk Hydro Produksjon AS, Eni Norge AS, Total E&P AS					
RKB: 18.0 meters			Geologist: Andreas Neitzel / Nicholas Townley/Olav Giskeødegard/ Roger Hall					
Hole size: 8 1/2"			Cut solvent: Iso Propyl Alcohol				Date: 05.06.2006	
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.	

4710	100	Slst:	a.a.		
4713	100	Slst:	a.a.		
4716	20	Slst:	a.a.		
	80	Clst:	olv blk-occ brn blk, frm-mod hd, blk, slty- v slty, micromic, carb		
4719	10	Slst:	a.a.		
	90	Clst:	a.a.		
4722	70	Slst:	varic brn gry, dk grn gry, grad - grn gry, olv gry, sft - frm, amor - cmbly occ suc, abd vf - f, clr shttd Qtz grs, arg - v arg i.p., grad - Clst.		
	20	Clst:	dk gry, brn blk, frm - hd, cmbly - blk, micrmic, occ musc mic, occ vf Qtz, grad - Slst i.p.		
	10	Ls:	yel gry, lt brn, frm, cmbly, suc, micrxln.		
4725	60	Slst:	a.a.		
	20	Clst:	a.a.		
	10	Ls:	a.a.		
4728	20	Slst:	a.a.		
	80	Clst:	a.a., w/ abd Musc + blk Carb matl, occ vf - f Qtz.		
	Tr	Dol:	mod brn, mod yel brn, frm, cmbly, micrxln.		
4731	10	Slst:	a.a.		
	90	Clst:	a.a.		
	Tr	Dol:	a.a.		
4734	80	Sst:	brn blk, olv blk, med dk gry, or lt grn gry, blu wh, sft, cmbly, suc Sil Rk Flour, w/ vf - f, ang, sbsph Qtz grs, occ w/ wk, fri, Sil cmt. Micrpyr i.p., occ Carb matl.	No shows	
	20	Clst:	dk gry, olv gry, sft - v occ mod hd, amor - blk, micrmic, occ vf Qtz grad - Slst i.p.		
4737	100	Sst:	a.a.pred brn blk, olv blk, brn gry, sft - frm, cmbly, Sil Rk Flour	No shows	
4740	100	Sst:	a.a.	No shows	
4743	100	Sst:	a.a. w/ abd vf - f, lse Qtz grs.	No shows	
CORE # 6 CORE CHIP DESCRIPTIONS 4743- 4753					
4743	100	Clst:	brn blk, olv blk, sft - mod hd, pred frm, blk - fiss i.p., micromic, Musc, occ obs a/ conch, rnd Mud clsts/drapes?	No Shows	
4743.2	100	Sst:	olv gry, brn gry w/clr transl, vf - m, pred f, amg - sbrnd, pred sbsph, w srted Qtz grs, w/ mod hd, fri, Sil cmt, occ crs Musc w/ occ wvy lams/bedding of abd v crs Musc + micrpyr blk Carb, micrcarb (@ 1mm thick), oftn cpct by grs.	V pr HC odour, v pr sptty/PP dull yel flor in thin Sst lams.	

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Country: Norway		Area: Haltenbanken		Field: Morvin	
Well no: 6506/11-8		Company: Statoil ASA, Norsk Hydro Produksjon AS, Eni Norge AS, Total E&P AS			
RKB: 18.0 meters		Geologist: Andreas Neitzel / Nicholas Townley/Olav Giskeødegard/ Roger Hall			
Hole size: 8 1/2"		Cut solvent: Iso Propyl Alcohol		Date: 05.06.2006	
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.

				V slw pr diff mlky wh cut, V pa lt brn resd rng
4744	100	Sst:	a.a., vf – f pred vf, occ crs Musc, occ brn gry sft Cly mtx, v w srted w/ gd hd Sil cmt, pr vis por, grad - Sltst	V pr HC odour v pr sptty/PP dull yel flor in thin Sst lams. v slw pr diff mlky wh cut, v pa lt brn resd rng
4745	100	Sst:	brn blk, gry blk, olv blk, w/ clr transl Qtz, vf – v occ crs, pred m-crs, ang – sbrnd, sbelg – sbsph, mod srted / gd hd transl Sil cmt, dk brn arg + blk Carb mtx/matl, occ crs Musc, occ dk gry rnd Rk/Lith frags, mod vis por.	Mod HC odour, mod unif dul yel – sptty bri wh nat flor, inst strmg blu wh cut.
4746	100	Sst:	a.a., vf – m, pred vf – f, ang – sbrnd, sbsph, w srted, w/ mod fri Sil cmt, brn gry Cly matx, occ – abd crs Musc, occ pyr, pr vis por.	a.a.
4747	100	Sst:	brn blk, olv blk w/ clr transl vf – occ crs, pred m, ang – sbrnd, sbelg – sbsph w srted Qtz, w/ gd clr, transl silc cmt, occ dk gry rnd Rk frags, dk brn sft Carb grs + mtx, randomly oriented Musc, mod vis por, occ blk 'dead' oil stn/Carb cotg to grs.	Mod HC odour, mod unif dull yell nat flor, a.a.
4748	100	Sst:	a.a., slty – occ f, pred vf, w/ gd hd transl Sil cmt, abd blu wh crushed Qtz cmt/ Cly?, occ crs Musc, v pr vis por, grad -Sltst	Pr HC odour, pr sptty dull yel nat flor,v slw diff mlky wh cut.
4749	100	Sltst:	brn gry, olv blk, grad – grn gry i.p., hd, blk, w/ finf lams of slt – f , ang, v well srted Qtz, gd hd Sil cmt, grn gry sft 'Cly* mtx, abd crs orientated Musc (Parrellel to bedding), v occ vf blk rnd Rk/Lith frags, abd Musc lams, v pr vis por.	V pr HC odour, v pr sptty/PP dull yel nat flor, no cut
4750	100	Sst:	a.a., slty – f, pred slt/vf, gd hd transl Sil cmt, abdt crs Musc + occ biot, v pr vis por	V pr HC odour, v pr sptty – occ PP dull yel nat flor, no cut or rng.
4751	100	Sst:	brn blk, olv blk, w/ vf – v occ crs, pred m, sbang – sbrnd, sbelg – sbsph, w/ srted, w/ gd hd Sil cmt, occ pyr cmt/por infilling, abd dk brn arg + occ blk, micrpyr Carb matx, abd Musc, mod vis por, occ blk *dead* oil/Carb cotgs to grs.	Mod HC odour, pr unif – occ gd bri sptty mlky wh nat flor,gd inst stmg – occ slw diff blu wh cut, v pa rng.
4752	100	Sst:	brn blk, olv blk, w/ vf – occ m, pred f, v w srted, w/ gd hd transl Sil cmt, abd Musc, occ lt grn Cly/Illite? mtx, pr vis por.	V pr HC odour, pr unif dull yel/wh nat flor, v slw diff mlky wh cut.

WELLSITE SAMPLE DESCRIPTION

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Country: Norway			Area: Haltenbanken			Field: Morvin		
Well no: 6506/11-8			Company: Statoil ASA, Norsk Hydro Produksjon AS, Eni Norge AS, Total E&P AS					
RKB: 18.0 meters			Geologist: Andreas Neitzel / Nicholas Townley/Olav Giskeødegard/ Roger Hall					
Hole size: 8 1/2"			Cut solvent: Iso Propyl Alcohol				Date: 05.06.2006	
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.	

4753.0	100	Sst:	a.a.		a.a.
			Core #6 4743 – 4753 m		
			Cuttings whilst coring		
4755	70	Sst:	brn gry, mod brn, gry brn, sft – frm, cmbly Sil, occ arg Rk Flour w/ occ gd hd Sil cmt vf – crs, pred f, ang – sbrnd Qtz grs, pr vis por in cmtsd prts		No shows
	30	Clst:	brn blk, olv blk, frm – v hd, blkly – occ splty, micrmic, micrpyr i.p.		
4758	60	Sst:	a.a. w/ dsky brn arg Cly mtx/cly smear, abd arg Cly mtsx to Rk Flour + occ blk micrpyr Carb matl, abd vf – crs, sbang lse Qtz		No shows
	40	Clst:	a.a., occ dk gry, vd hd splty, w blk incls?		
4761	30	Sst:	a.a., Pyr i.p.		No shows
	70	Clst:	a.a.		
4764	40	Sst:	a.a., occ blu wh, sft, cmbly Silc Rk Flour		No shows
	60	Clst:	a.a., occ mod brn, v hd, splty		
4768			NOT CIRCULATED UP		
4769			NOT CIRCULATED UP		
			<u>CORE # 7 CORE CHIP DESCRIPTIONS 4753-4769.4m</u>		
4753	100	Sst:	brn blk, olv blk, w/clr transp, occ blu wh, transl, f – m, pred f, w dg hd dk gry transl Sil cmt, occ – abd lams of crs Musc, occ brn blk carb mtx, mod vis por		V pr HC odour, v dull unif yel nat flor, slw diff mlky wh cut, sl 'Wet* Hc appearance to Chips
4754	100	Sst:	a.a. slt – f, pred vf-f, w/ gd hd transl Sil cmt, abd crs Musc, occ blk Carb matl/mtx, mod vis por		V Pr HC odour, pr v dull unif mlky wh nat flor, v slw, diff cldy mlky wh cut.
4755	100	Sst:	a.a., f – v crs, pred crs/v crs, ang – sbrnd, occ rnd i crs prs, sbelg – sbsph, mod srtld w/ gd hd dk gry transl Sil cmt, add Musc, abdt crs sft rnd Carb clsts/laths, mod vs por, occ blk 'dead' oil/Carb cotgs to grs		Mod HC odour, mod unif dull yel – occ bri sptty mlky wh, nat flor.
4756	100	Sst:	a.a., vf – crs, pred f – m, w/ gd hd transl Sil cmt, abd Musc, occ Carb matx/por infills, mod vis por.		Pr HC odour, pr dull yel /blu wh nat flor, pr instng stmg blu wh – slw diff cldy mlky wh cut.

WELLSITE SAMPLE DESCRIPTION

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Country: Norway		Area: Haltenbanken		Field: Morvin
Well no: 6506/11-8		Company: Statoil ASA, Norsk Hydro Produksjon AS, Eni Norge AS, Total E&P AS		
RKB: 18.0 meters		Geologist: Andreas Neitzel / Nicholas Townley/Olav Giskeødegard/ Roger Hall		
Hole size: 8 1/2"		Cut solvent: Iso Propyl Alcohol		Date: 05.06.2006
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.

4757	100	Sst:	a.a, f – v crs, pred m- crs, sbang – rnd in crs prts, sbelg – sbsph w/ gd hd transl, occ dk gry Sil cmt, occ crs Musc, occ dk gry rnd Rk/lith frags, occ blk, sft Carb clsts/laths, occ blk, micrpyr Carb mtx/por infills, occ musc lams, pr – mod vis por.	V pr HC odour, mod bri unif, yel/blu wh nat flor, slw diff mlky wh cut.
4758	100	Sst:	brn blk, olv gry, w/ clr transp, occ blu wh transl, m – v crs, pred crs grs, gen a.a., w/ occ Musc, Carb clsts/laths + rnd Rk frgas, mod vis por	V pr HC odour, mod unif – occ bri sptty yel/mlky wh nat flor, v slw diff mlky wh cut, no resd rng
4759	100	Sst:	brn blk, olv gry, m – v crs, pred m –crs w/ gd hd, dk gry transl Sil cmt, abd blk Carb mtx/por infill, abd blk Carb clsts/laths, dk gry 'sch' Rk/lith frags, abd crs Musc oftn compacted by grs, blk Carb cotgs to grs, mod vis por	Pr HC odour, pr sptty/PP yel/blu wh nat flor, v slw diff mlky wh cut, no resd rng
4759.5	100	Sltst/Sst :	brn blk, brn gry, hd, fiss w/ abdt f – crs Musc + biot grs, micrpyr Carb matl, Sil cmt, occ vf – f Qtz Laminated w/ med dk gry Sst lenses/lams of f – occ m, pree f, sbang – sbrnd, sbsph Qtz, w/ gd hd transl Sil cmt, pr vis por in Sst, (lenticular bedding)	No HC odour, pr unif – sptty, dull yel/blu wh cut, slw diff cldy mlky wh cut in Sst, no resd rng
4760	100	Sst:	brn blk, olv blk, w/ clr transp occ blu wh transl, f – v crs, pred crs, sbang – sbrnd, sbelg – sbsph, prly srted Qtz, w/ gd hd dk gry transl Sil cmt, abd Musc, abd m – crs dk gry rnd Sch Rk/lith frags, blk sft Carb laths/por infills, mod vis por.	No HC odour, sptty bri, blu wh – unif dull yel nat flor, slw strmg – v slw diff cldy mlky wh cut, no resd rng
4761	100	Sltst/Sst :	brn blk, brn gry, f – crs, pred m, ang – sbrnd, sbelg – sbsph, w srted w gd hd transl Sil cmt, micrpyr blk Carb mtx/por infills, occ blk Carb clsts, dk gry Rk/lith frags, occ – abd Musc, mod vis por, w/ brn blk, brn gry, hd fiss Sltst lams w/ gd hd dk gry transl Sil cmt.	No HC odour, mod bri sptty – unif dull yel/blu wh nat flor, sl diff mlky wh in Sst, no resd rng
4762	100	Sst:	a.a. + dk gry exotic Qtz, f – m, pred m, asbang – sbrnd, sbsph, w srted Qtz, w d hd dk gry transl Sil cmt, occ crs Musc, occ – abd dk gry micrpyr Carb mtx/por infils, occ cdk gry sch Rk/lith frags, abd blk Carb/dead oil cotgs to grs, pr – mod vis por.	No HC odour, gd sptty bri blu wh – unif dull yel nat flor, v slw diff cldy mlky wh cut flor, no resd rng
4763		Clst w/Sst:	brn blk, brn gry, hd, fiss, w/ gd hd Sil cmt, pred m – v crs lineated Musc+ biot grs, micrpyr, w/ vf lams of slty – vf Sst, w cmted	No Shows
4764	100	Sst:	brn blk, olv blk, w /clr transl, occ lt blu wh, transl, m – v crs, pred m – crs, mod srted Qtz, w/ gd hd dk gry transl Sil cmt, abd dk gry/blk micrpyr Carb mtx/por	Mod HC odour, v pr sptty dull mlky

WELLSITE SAMPLE DESCRIPTION

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Country: Norway		Area: Haltenbanken		Field: Morvin	
Well no: 6506/11-8		Company: Statoil ASA, Norsk Hydro Produksjon AS, Eni Norge AS, Total E&P AS			
RKB: 18.0 meters		Geologist: Andreas Neitzel / Nicholas Townley/Olav Giskeødegard/ Roger Hall			
Hole size: 8 1/2"		Cut solvent: Iso Propyl Alcohol		Date: 05.06.2006	
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.

			infills, abd non orientated Musc, occ compacted by grs, v occ musc lams., pr vis por.	wh nat flor, v slw stmg – diff cldy/mlky wh cut flor, resd rng.
4765	100	Sst:	olv blk, olv gry w/ clr transp lt grn gry, blu wh transl, m – v crs, pred crs, sbang – occ sbrnd, sbelg – sbsph, prly srted Qtz grs w/ gd hd transl Sil cmt, blk/dk gry, sft Carb mtx/por infills + Carb laths, occ crs Musc, occ blk rnd Carb grs, mod vis por.	Mod HC odour, gd bri, sptty – unif blu wh cut flor, no resd rng
4766	100	Sst:	a.a., f – crs, pred m, w srted, w/ gd hd Sil cmt, oicc micrpyr/pyr cmt, abd dk gry Carb mtx/por infills, abd crs Musc, micropyr Carb cotgs to grs, mod vis por	Mod Hc odour, pr sptty dull yel nat flor, slw stmg bir – v slw diff blu wh cut, no resd rng
4767	100	Sst:	a.a., ,m – pbbl, pred crs – v crs, sbang – rnd in v crs/pbbl fraction, v prly srted, gd hd dk gry, transl Sil, occ micrpyr cmts, abd blk micrpyr Carb mtx/por infills, occ dk gry RK/lith frags, (Occ v rnd pbbl grs of med dk gry micrpyr Volcan/altered Cly? frags), blk micrpyr Carb mtx/por infills, mod – Gd vis por	Mod- gd Hc odour, pr sptty dull blu wh nat flor,Slw stmg – v slw diff blu wh cut, no resd rng.
4768	100	Sst:	pred a.a., f - v crs, pred crs, prly srted, abd Carb mtx/por infills, abd crs Musc, gd vis por.	Mod HC odour, pr sptty dull yel nat flor, slw stmg – v slw diff blu wh cut, no resd rng.
4768.7	100	Sst:	brn blk, olv blk, f- m, w/ gd hd Sil cmt, abd blk Carb mtx, abd crs Musc (Oftn a discrete lams) mod vis por	Pr HC odour, no nat flor. v pr v slw diff mlky wh cut, no resd rng.
4769.3	100	Sst:	blk, w/ clr transp, occ blu wh transl, vf – v crs, pred m – crs, ang – occ w rnd, elg – sbsph prly srted Qtz grs, w/ gd hd Sil cmt, v abd blk/dk brn micrpyr Carb mtx/por infilld, occ Musc, mod vis por, (abdt blk dead oil/Carb cotgs to grs)	V strong Su odour, no Nat flor, slw stmg – diff mlky wh cut, pa brn resd rng.
			<u>CORE # 8 CORE CHIP DESCRIPTIONS 4769.4-4775.4m</u>	
4770	100	Sst:	lt gry – olv gry – lt brn, clr – trnsil – gry Qtz, vf – f, Tr m, sbang – sbrndd, mod – w srted, mod hd – hd, sil cmt, loc arg Mtrx, Tr Mic, carb, mod – pr vis por.	V wk pet od, no oil stn, spty dull yel dir flu, wk slo strmg bl wh flu cut, no vis cut, no vis resd
4771	100	Sst:	lt brn – brn blk, clr – trnsil Qtz, pred brn ctg on Qtz gn, f – m, Tr crs, sbang – sbrndd. mod srt. mod hd – hd. sil cmt. loc arg Mtrx. r Mic. carb. mod – pr vis por.	fr pet od, no oil stn. sptv dull vel dir

WELLSITE SAMPLE DESCRIPTION

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Country: Norway			Area: Haltenbanken			Field: Morvin		
Well no: 6506/11-8			Company: Statoil ASA, Norsk Hydro Produksjon AS, Eni Norge AS, Total E&P AS					
RKB: 18.0 meters			Geologist: Andreas Neitzel / Nicholas Townley/Olav Giskeødegard/ Roger Hall					
Hole size: 8 1/2"			Cut solvent: Iso Propyl Alcohol				Date: 05.06.2006	
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.	

				flu, wk slo strmg bl wh flu cut, no vis cut, no vis resd
4772	100	Sst:	lt brn – brn blk, clr – trns l Qtz, pred brn ctg on Qtz gn, f – m, Tr crs, sbang – sbrndd, mod srt, mod hd – hd, sil cmt, loc arg Mtrx, gd Tr Mic, carb, mod – pr vis por.	No pet od, no dir flu, v slo strmg wk bl flu cut, cut, no vis cut, no vis resd
4773	100	Sst:	as for 4772 m, v hd, v wl Sil cmt	No shows
4774	100	Sst:	lt brn – dk brn, clr – trns l Qtz, lt brn ctg on Qtz gn, vf – m, Tr crs, sbang – ang, pr srt, v hd, sil cmt, abd mud/arg Mtrx, abd Mic, carb, no vis por.	No Shows
4774.7	100	Sst:	lt brn – olv gry w Mic/lam, as for 4774 m	No pet od, no dir flu, v slo strmgwk bl flu cut, no vis cut, no vis resd
4775.4	100	Sst:	lt gry – brn gry, clr – trns l Qtz, loc gry Qtz, vf – crs, Tr pbls, sbang – rnd, pr srt, hd – v hd, sil cmt, loc arg Mtrx, loc Mic, loc carb, no vis por	No pet od, no dir flu, v slo strmgwk bl flu cut, no vis cut, no vis resd
4776	100	Sst:	v lt gry-brn gry, clr-transl, Qtz com brn ctg on gr, f-crs, sbang-ang, pr srt, abdt v lt gry Mtrx, Mic, com carb, no vis por.	Dull yel dir flu, v slo blmg bl wh flu, no vis resd.
4779	100	Sst:	a.a.	Shows a.a.
4782	100	Sst:	bcm slt – vf i.p. grad Slst, else a.a.	Shows a.a.
4785	100	Sst:	a.a. Pyr, carb, Tr Mic	Shows a.a.
4788	100	Sst:	vf – f, v slty grad Slst	Shows a.a.
4791	100	Sst:	a.a.	Shows a.a.
4794	100	Sst:	a.a. bcm more arg	Shows a.a.
4797	100	Sst:	lt gry, frm blk, vf-f, com slty grad Slst, firm – mod hd, w cmt, sbrnd, v arg Mtrx, pyr, carb, Mic, no vis por	Shows a.a.
4800	100	Sst:	lt gry, frm blk, vf-f, com slty grad Slst, firm – mod hd, w cmt, sbrnd, v arg Mtrx, pyr, carb, Mic, no vis por	Dull yel dir flu, v slo blmg bl wh flu, no vis resd.
4803	100	Sst:	grad Slst a.a.	Shows a.a. prob. Base cont?

WELLSITE SAMPLE DESCRIPTION

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Country: Norway		Area: Haltenbanken		Field: Morvin	
Well no: 6506/11-8		Company: Statoil ASA, Norsk Hydro Produksjon AS, Eni Norge AS, Total E&P AS			
RKB: 18.0 meters		Geologist: Andreas Neitzel / Nicholas Townley/Olav Giskeødegard/ Roger Hall			
Hole size: 8 1/2"		Cut solvent: Iso Propyl Alcohol		Date: 05.06.2006	
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.

4806	80	Sst:	lt gry – olv gry , frm blk, vf-f, com slty grad Slst, firm – mod hd, w cmt, sbrnd, v arg Mtrx, pyr, carb, Mic, no vis por	a.a
	20	Slst:	olv gry – dk gry, blk, mod hd – firm, non calc, vf sdy i.p., Tr carn, Tr Mic	a.a.
				a.a.
4809	60	Sst:	vf, a.a.	
	40	Slst:	a.a.	
4812	70	Sst:	a.a.	a.a.
	30	Slst:	a.a.	
4815	40	Sst:	a.a.	a.a.
	60	Slst:	loc sbfis and arg grad Sh, else a.a.	
4818	100	Slst:	lt gry-olv gry, dk gry, brn gry-brn blk, frm-mod hd, blk, non-sl calc, non sl dol, non carb, pyr- v pyr i.p., v arg Mtrx	a.a.
	R Tr	Ls :	v dsky red, hd, blk, v arg, grad v calc Clst	
4821	100	Slst:	a.a.	a.a.
4821	100	Slst:	a.a.	a.a.
4824	100	Slst:	a.a.	a.a.
4827	100	Slst:	a.a.	a.a.
4830	100	Slst:	a.a. bcm sdy grad Sst i.p., non calc/dol	a.a.
4833	100	Slst:	a.a.	a.a.
4836	100	Slst:	a.a.	a.a.
4839	60	Sst:	lt gry, clr – trns Qtz, vf – crs, lse, Tr hd agg, sbang – ang, pr srt, loc Sil cmt, lse Kaol/rock flour, Tr micropyr, Tr Mic, no vis por on agg	No dir flu, v slo strng bl wh flu cut, no vis cut, no flu resd., shows from base oil ?
	40	Slst:	a.a.	
4842	60	Sst:	a.a.	a.a.
	40	Slst:	a.a.	
4845	80	Sst:	loc sli calc cmt, gen sil cmt, Kao Mtrx i.p., else a.a.	a.a.
	20	Slst:	a.a.	
4848	100	Sst:	lt gry, clr – trns Qtz, vf – crs, lse, Tr hd agg, w/sil cmt, sbang – ang, pr srt, loc calc i.p., lse Kaol/rock flour, loc Tr pyr cmt, Tr micropyr, Tr Mic, no vis por on agg	Dull even dir flu(min Flu?) flu cut a.a.
	Tr	Slst:	a.a.	
4851	100	Sst:	abd Kao/cly Mtrx, loc abdt micropyr, else a.a.	a.a.
4854	100	Clst:	dk gry-brn blk com mottled/interlam v lt gy & brn blk, firm-mod hd, cmb-sb	

WELLSITE SAMPLE DESCRIPTION

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Country: Norway			Area: Haltenbanken			Field: Morvin		
Well no: 6506/11-8			Company: Statoil ASA, Norsk Hydro Produksjon AS, Eni Norge AS, Total E&P AS					
RKB: 18.0 meters			Geologist: Andreas Neitzel / Nicholas Townley/Olav Giskeødegard/ Roger Hall					
Hole size: 8 1/2"			Cut solvent: Iso Propyl Alcohol				Date: 05.06.2006	
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.	

			blky, calc,arg Mtrx intermixed w vf diss pyr, occ pyr masses, w/ occ vis calc xls, & some ??Kaol cl.	
4857	100	Clst:	a.a.	
4860	100	Clst:	a.a.	
4863	100	Clst:	a.a.	
4866	50	Sst:	lt brn gry, Qtz, clss-yel gry, lt gry, f-med, w srtd, s bang-sbrnd, v arg, v calc, occ w Mtrx, sl carb, gen lo vis por.	
	50	Clst:	a.a.	
4869	60	Sst:	brn gry, Qtz, f-crs, mod srtd, sb an-sb rnd, abd Mtrx washed out, rec pred as lse grns, where as ctgs Mtrx v argcalc, fri-sft, cmb-sb blky, lo-no vis por.	
	40	Clst:	a.a.	
4872	70	Sst:	a.a bec more arg	
	30	Clst:	a.a.	
4875	100	Sst:	lt gy, Qtz, clr-transl, f & med, pr srtd, ang-sb ang, Kaol Mtrx, frm-mod hd, carb, Pyr, lo-no vis por, abd lse grns, Qtz, a.a, f-crs, sba ang- ang.	
4878	100	Sst:	f – m, occ crs, a.a.	
4881	100	Sst:	a.a.	
4884	100	Sst:	lt gry – m gry, clr – trnsf Qtz, f – m, Tr crs – v crs, lse and mod hd – hd, sbang, Sil cmt, also Kao/cly Mtrx, i.p. calc cmt, r Mic, Tr micropyr, no vis por	
	Tr	Clst:	dk gry – loc brn gry, mod hd, sbblky – sbfis, non – sli calc, micropyr, slty loc grad Slst, loc vf sdy, i.p. abd micropyr	
4887	100	Sst:	a.a.	
	20	Clst:	a.a.	
4890	100	Sst:	a.a.	
	20	Clst:	a.a.	
4893	100	Sst:	a.a.	
	20	Clst:	a.a.	
			TD@4893 m 06.06.2006	
4896	95	Sst:	qtz, trnsf-mlky wht, sbang-sbrnd, prly srtd, vf-vcrs, dom fn-med, Kaol cem	
	5	Clst:	blk-dk gry, frm-hd, non-calc	
	Tr	Mica	brnsh trnsf – blksh trnsf, shny, flaky	
4899	90	Sst:	vf-fn, dom vf, mod srtd, else a.a.	
	10	Clst:	a.a.	
	Tr	Mica	a.a.	

WELLSITE SAMPLE DESCRIPTION

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Country: Norway			Area: Haltenbanken			Field: Morvin		
Well no: 6506/11-8			Company: Statoil ASA, Norsk Hydro Produksjon AS, Eni Norge AS, Total E&P AS					
RKB: 18.0 meters			Geologist: Andreas Neitzel / Nicholas Townley/Olav Giskeødegard/ Roger Hall					
Hole size: 8 1/2"			Cut solvent: Iso Propyl Alcohol				Date: 05.06.2006	
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.	

4902	90	Sst:	a.a.		
	10	Clst:	a.a.		
	Tr	Mica:	a.a.		
4905	85	Sst:	vf-fn, occ med-crs, dom vf; else a.a.		
	15	Clst:	a.a.		
	Tr	Mica:	a.a.		
4908	70	Sst:	vf-fn; else a.a.		
	30	Clst:	lt brnsh-blk, sft-frm, slty, non-calc		
	Tr	Mica:	a.a.		
4911	70	Sst:	dom vf, else a.a.		
	30	Clst:	a.a.		
	Tr	Mica:	a.a.		
4914	70	Sst:	a.a.		
	30	Clst:	a.a.		
	Tr	Mica:	a.a.		
4917	80	Sst:	a.a.		
	20	Clst:	a.a.		
	Tr	Mica:	a.a.		
4920	80	Sst:	a.a.		
	20	Clst:	a.a.		
	Tr	Mica:	a.a.		
4923	70	Sst:	a.a.		
	30	Clst:	a.a.		
	Tr	Mica:	a.a.		
4926	60	Sst:	a.a.		
	40	Clst:	olv blk-dk gry, frm-hd, sbblky, non-calc		
4929	60	Sst:	a.a.		
	40	Clst:	a.a.		
4932	60	Sst:	Qtz, mlky wht-trnsl, sbang-sbrnd, vf-fn, mod srtd, occ. mic		
	40	Clst:	olv blk -dk gry, blk, frm-hd, non-calc		
4935	50	Sst:	a.a.		
	50	Clst:	a.a.		
4938	60	Sst:	a.a.		
	40	Clst:	a.a.		

WELLSITE SAMPLE DESCRIPTION

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Country: Norway		Area: Haltenbanken		Field: Morvin
Well no: 6506/11-8		Company: Statoil ASA, Norsk Hydro Produksjon AS, Eni Norge AS, Total E&P AS		
RKB: 18.0 meters		Geologist: Andreas Neitzel / Nicholas Townley/Olav Giskeødegaard/ Roger Hall		
Hole size: 8 1/2"		Cut solvent: Iso Propyl Alcohol		Date: 05.06.2006
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.

4941	60	Sst:	a.a.	
	40	Clst:	a.a.	
4944	70	Sst:	a.a.	
	30	Clst:	a.a.	
4947	70	Sst:	prly-mod srted, else a.a.	
	30	Clst:	a.a.	
4950	70	Sst:	a.a.	
	30	Clst:	a.a.	
4953	70	Sst:	a.a.	
	30	Clst:	a.a.	
4956	60	Sst:	occ crs grains, else a.a.	
	40	Clst:	a.a.	
4959	50	Sst:	a.a.	
	50	Clst:	a.a.	
4962	60	Sst:	a.a.	
	40	Clst:	a.a.	
4965	60	Sst:	a.a.	
	40	Clst:	a.a.	
4968	70	Sst:	a.a.	
	30	Clst:	a.a.	
4971	80	Sst:	a.a.	
	20	Clst:	a.a.	
4974	85	Sst:	a.a.	
	15	Clst:	a.a.	
4977	75	Sst:	a.a.	
	25	Clst:	a.a.	
4980	70	Sst:	a.a.	
	30	Clst:	a.a.	
4983	75	Sst:	a.a.	
	25	Clst:	a.a.	
4986	80	Sst:	a.a.	
	20	Clst:	a.a.	

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Country: Norway		Area: Haltenbanken		Field: Morvin	
Well no: 6506/11-8		Company: Statoil ASA, Norsk Hydro Produksjon AS, Eni Norge AS, Total E&P AS			
RKB: 18.0 meters		Geologist: Andreas Neitzel / Nicholas Townley/Olav Giskeødegard/ Roger Hall			
Hole size: 8 1/2"		Cut solvent: Iso Propyl Alcohol		Date: 05.06.2006	
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.

[illegible]

Country: Norway								Area: Haltenbanken							Field: Morvin					
Well no: 6506/11-8								Formation: Melke												
Core no: 1								Interval: 4603.0-4606.0m MD							Cored: 3.0m Rec: 2.1m 70.0%					
Core size: 4"								Geologists: A.Neitzel/ TFK/B.E.Paulsen							Date: 16.05.06					
Depth (mRT)	Lithology/Grain size cly slt vf f m c vc								Shows						Φ	Lithological Description Rock name, mod. lith., colour, grain size, sorting, roundness, matrix, cementation, hardness, sed. struct., accessories, fossils, porosity, contamination	Remarks Shows, etc.			
									ODOUR	FLUOR	CUT	POOR	FAIR	GOOD						
4603	M																SH : dk gry, hd, mass, slty, micromic, calc	No shows		
4604									M											
4605	M																			
4606																				
4607																				
4608																				
4609																				
4610																				
4611																				
4612																				

CONVENTIONAL CORE DESCRIPTION

Country: Norway		Area: Haltenbanken				Field: Morvin										
Well no: 6506/11-8		Formation: Garn														
Core no: 2		Interval: 4624–4658.4 m MD				Cored: 34.4 m		Rec: 34.39 m		100%						
Core size: 4"		Geologists: A.Neitzel/ N.Townley				Date: 21.05.06										
Depth (mRT)	Lithology/Grain size							Shows						Φ	Lithological Description Rock name, mod. lith., colour, grain size, sorting, roundness, matrix, cementation, hardness, sed. struct., accessories, fossils, porosity, contamination	Remarks Shows, etc.
	cly	slt	vf	f	m	c	vc	ODOUR	FLUOR	CUT	POOR	FAIR	GOOD			
4624															SST: brn blk-olv blk, clr trnsl Qtz, f-crs, mod srt, ang-sbrnd, occ brn-olv blk cly Mtrx, wl sil cmt, hd, no vis por	Pr HC odour, no HC fluor
4625															SST: occ fspr/Kao, else a.a.	Pr HC odour, no fluor, mlky wh cut
4626															SST: pred med crs, occ Musc, else a.a.	Pr HC odur occ blooming bl/wh fluor, inst streaming mky wh cut
4627															SST: pred med crs, else a.a.	No HC odour no HC fluor
4628															SST: abd Qtz overgrowth, v wl sil cmt else a.a.	Pr HC odour no HC fluor
4629															SST: brn blk-grn blk, wh-clr transl Qtz, med-crs, mod srt, sbang-sbrnd, occ crs Musc and yel gry Kao, wl sil cmt, abd sec qtz overgrowth, hd, no vis por	Pr HC odour v pr lam bl/wh fluor, v slow strm bl/wh cut, wk yel brn res fluor ring
4630															SST: f-med, wl srt, v poor vis por, else a.a.	Pr HC odour v poor spty bl/wh fluor, inst strm bl/wh cut, wk yel brn res fluor ring
4631															SST: med-crs, wl srt, else a.a.	Pr HC odour no fluor, v slow cloudy mky wh cut, wk yel brn res fluor ring
4632															SST: f-med, else a.a.	Pr HC odeur No vis fluor, v Slw diff mky wh yel brn resd rng
4633															SST: brn blk, clr transl Qtz, f-med, wl srt, ang-sbrnd, occ crs Musc, micpyr coatings on grains, wl sil cmt, no vis por	Pr HC odour v poor spotted wh fluor, v slow cloudy mky wh cut, wk yel brn res fluor ring

CONVENTIONAL CORE DESCRIPTION

Country: Norway		Area: Haltenbanken				Field: Morvin									
Well no: 6506/11-8		Formation: Garn													
Core no: 2		Interval: 4624–4658.4 m MD				Cored: 34.4 m		Rec: 34.39 m		100%					
Core size: 4"		Geologists: A.Neitzel/ N.Townley				Date: 21.05.06									
Depth (mRT)	Lithology/Grain size							Shows					Φ	Lithological Description Rock name, mod. lith., colour, grain size, sorting, roundness, matrix, cementation, hardness, sed. struct., accessories, fossils, porosity, contamination	Remarks Shows, etc.
	cly	slt	vf	f	m	c	vc	ODOUR	FLUOR	CUT	POOR	FAIR			
4634														SST: a.a., f-m, occ crs	Pr HC Odeur, v pr sptty-occ uni wh nat Fluor., v slw diff mlky Wh, wh yel brn resd rng
4635														SST: a.a., f-occ crs, pred f-m	Pr HC odeur, v sptty blu wh nat fluor, v Ssw diff mky wh cut, wk yel brn resd rng
4636														SST: olv blk, brn gry, wh-clr transl Qtz, f-crs wl srt, ang-sbrnd, occ laminae of crs Musc, wl sil cmt, no vis por	Pr HC odeur, v sptty blu wh nat fluor, v slw diff mky wh cut, wk yel brn resd rng
4637														SST: a.a., f-m, occ crs, abdt musc "sheves" Occ micpyr coat to grs, v occ cobalt blu/ Gld mic, gd hd trnsl Sil cmt, occ brn blk Mtrx, occ-abd crs Musc, micpyr, no vis por	Pr HC odeur, v sptty blu wh nat fluor, v slw diff mky wh cut, wk yel brn resd rng
4638														SST: micpyr, else a.a.	Pr HC odeur, v sptty blu wh nat fluor, v slw diff mky wh cut, wk yel brn resd rng
4639														SST: olv blk- brn blk, wh-clr transl Qtz, vf-med, wl srt, ang-sbrnd, abd crs Musc and micpyr, wl sil cmt, no vis por	No HC shows
4640														SST: f-med, mod srt, else a.a.	Pr HC odour v pr pinpoint/wh fluor, v slow cloudy bl/wh cut,wk yel brn res fluor ring
4641														SST: a.a., f-v occ m, pred f, gd hd silc, v occ Calc cmt, dk brn arg Mtrx, occ Musc, v occ lt grn gry, sft Kaol?, occ-abst brn bl coatings to grains	Pr HC odour non-v pr sptty/ sptty pin poin, wh nat Fluor, else a/a
4642														SST: brn blk, olv blk, w/ clr, trnsph, f-m, pred f, ang-sbrnd, sbelg-sbsph, wl srted, Qtz gr, w/ gd hd trnsl Sil cmt, tr Mtrx, occ abd crs Musc mic, no vis por	Pr HC odour no fluor, v slow cloudy bl/wh cut, wk yel brn res fluor ring
4643														SST: olv blk brn gr, f-med, wl srt, sbang-sbrnd, micpyr, wl Sil cmt, no vis por	Pr HC odour no fluor, v slow cloudy mky wh cut, wk yel brn res fluor
	cly	slt	vf	f	m	c	vc								

CONVENTIONAL CORE DESCRIPTION

Country: Norway		Area: Haltenbanken				Field: Morvin											
Well no: 6506/11-8		Formation: Garn															
Core no: 2		Interval: 4624–4658.4 m MD				Cored: 34.4 m		Rec: 34.39 m 100%									
Core size: 4"		Geologists: A.Neitzel/ N.Townley				Date: 21.05.06											
Depth (mRT)	Lithology/Grain size							Shows					Φ	Lithological Description Rock name, mod. lith., colour, grain size, sorting, roundness, matrix, cementation, hardness, sed. struct., accessories, fossils, porosity, contamination	Remarks Shows, etc.		
	cly	slt	vf	f	m	c	vc	ODOUR	FLUOR	CUT	POOR	FAIR				GOOD	
4644															SST: a.a., f-m, pred f, tr Mtrx, occ Musc, no vis por.	Shows, a.a., diff stm	
4645																SST: olv blk, brn gry, vf-f, md srt, sbang-sbrnd, abd Musc, occ blk biotite, ptl carb, mod Sil cmt, no vis por	Pr HC odur, no fluor, v slow blooming bl/wh cut
4646																SST: olv blk, brn gry, vf-f, md srt, sbang-sbrnd, abd Musc, occ blk biotite, ptl carb, mod Sil cmt, no vis por	Pr HC odur, no fluor, v slow blooming bl/wh cut
4647																SST: olv blk, brn blk, pred clr Qtz, vf-med, mod srt, sbang-sbrnd, Sil cmt, occ f Musc, no vis por	Pr HC odur, no fluor, v slow blooming bl/wh cut
4648																SST: olv blk, brn blk, pred clr Qtz, vf-med, mod srt, sbang-sbrnd, sil cmt, occ f Musc, no vis por	Pr HC odur, no fluor, v slow blooming bl/wh cut
4649																SST: med dk gry-dk gry- olv blk, clr tansl Qtz, vf-f, md srt, sbang-sbrnd, abd Musc, wl Sil cmt, occ sl calc cmt, no vis por	No HC odour no fluor. v pl mky wh cut flour
4650																SST: brn gry-brn blk, m dk gry, vf-f, occ med, pred f, clr-trnsp Qtz gr, sbang-sbrnd, gd hd sil cmt, abd Musc, pr vis por	Fr HC odour wk yel fluor, slow cloudy bl/wh cut
4651																SST: med dk gry-dk gry-gry blk, sl calc cmt, else a.a.	Wk HC odour wh yelsh fluor, dul bl/wh cu
4652																SST: brn gry-brn blk, f-med, micropyr, sl calc cmt, else a.a.	Gd HC odour no fluor, wk mky wh cut
4653																SST: med-dk gry, clr transp Qtz, f-crs, mod srt, ang-sbang, micropyr, wl Sil cmt, pr vis por	Wk HC odour no fluor, v slow cloudy wh/yel cut

CONVENTIONAL CORE DESCRIPTION

Country: Norway		Area: Haltenbanken				Field: Morvin										
Well no: 6506/11-8		Formation: Garn														
Core no: 2		Interval: 4624–4658.4 m MD			Cored: 34.4 m		Rec: 34.39 m 100%									
Core size: 4"		Geologists: A.Neitzel/ N.Townley				Date: 21.05.06										
Depth (mRT)	Lithology/Grain size							Shows						Φ	Lithological Description Rock name, mod. lith., colour, grain size, sorting, roundness, matrix, cementation, hardness, sed. struct., accessories, fossils, porosity, contamination	Remarks Shows, etc.
	cly	slt	vf	f	m	c	vc	ODOUR	FLUOR	CUT	POOR	FAIR	GOOD			
4654															SST: md dk gry, clr transp Qtz, f-med, mod srt, ang-sbang, abd lam and oriented Musc, rare wh fspr, wl Sil cmt, no vis por	Wk HC odour, no HC fluor, v slow yel cut
4655															SST: micpyr, occ blk sft carband Musc lam,,abd dk brn arg Mtxr, else a.a.	Wk HC odour, no HC fluor, v slow yel cut
4656															SST: olv blk-brn blk, clr transl Qtz, f-v crs, mod srt, ang sbrnd, occ v crs gry lenses, abd brn arg Mtxr, wl Sil cmt, v pr vis por	Wk HC odour, no HC fluor, v slow yel cut
4657															SST: olv blk-brn blk, clr transl Qtz, f-v crs, mod srt, ang sbrnd, occ v crs gry lenses, abd brn arg Mtxr, wl Sil cmt, v poor vis por	Wk HC odour, no HC fluor, v slow yel cut
4658															SST: olv blk brn blk, clr transp Qtz, f-crs, mod srt, sbang-sbrnd, wl Sil cmt, abd cmt filled pors, v pr vis por	Wk HC odour, no HC fluor, v slow yel cut
4659																
4660																
4661																
4662																
4663																
	cly	slt	vf	f	m	c	vc									

CONVENTIONAL CORE DESCRIPTION

Country: Norway		Area: Haltenbanken				Field: Morvin									
Well no: 6506/11-8		Formation: Garn													
Core no: 3		Interval: 4658.4–4671.4 m				Cored: 13 m Rec: 13 m 100%									
Core size: 4"		Geologists: A.Neitzel/ N.Townley				Date: 22.05.06									
Depth (mRT)	Lithology/Grain size							Shows					Φ	Lithological Description	Remarks
	cly	slt	vf	f	m	c	vc	ODOUR	FLUOR	CUT	POOR	FAIR			
														Rock name, mod. lith., colour, grain size, sorting, roundness, matrix, cementation, hardness, sed. struct., accessories, fossils, porosity, contamination	Shows, etc.
4659									SST: olv gry-brn gry, clr-mky-lt brn transl Qtz, f-pred med, occ crs, pr-med srt, ang-sbang, v hd, freq Musc, wl Sil cmt, fr vis por					Fr HC odour, no fluor, slow cldy wh/yel cut	
4660									SST: olv brn blk, clr-mky transl Qtz, vf-f, mod-wl srt, sbang-sbrnd, v hd, freq Musc, abd olv brn Mtxr, wl Sil cmt, non-v pr vis por					Fr HC odour, wk dull yel fluor, fast blooming bl/wh cut	
4661									SST: pr vis por, else a.a.					Gd HC odour v wk dull yel fluor, fast blooming bl/wh cut	
4662									SST: olv gry-olv blk, clr-mky lt brn transl Qtz, med-crs, wl srt, sbang-sbrnd, v hd, occ arg, freq Musc, wl Sil cmt, frey sec Qtz infill of pores, pr-fr vis por					Gd HC odour strong wh/yel fluor, Instant dull yel cut	
4663									SST: crs-v crs, else a.a.					Gd HC odour strong wh/yel fluor, fast cldy bl/wh cut	
4664									SST: med-crs, else a.a.					Gd HC odour dull yel fluor, slow strn bl/wh cut	
4665									SST: dk olv gry-olv blk, clr-occ mky, transl Qtz, pred med-occ crs, mod srt, ang-sbang-sbrnd, v hd, dk brn gry Mtxr, r Musc, wl Sil cmt, pr-fr vis por					Gd HC odour wk yel fluor, fast blooming yel cut	
4666									SST: pred f-med, v pr vis por, else a.a.					Fr HC odour no fluor, slow blooming bl/wh cut	
4667									SST: olv brn gry, clr transl Qtz, prd f-med, wl srt, sbrnd-rnd, v hd, abd brn gry Mtxr, wl Sil cmt, non-v pr vis por					Fr HC odour v wk dull yel fluor, fast blooming bl/wh cut	
4668									SST: olv brn gry, abd clr-v lt brn transl Qtz, f-med, mod srt, sbang-sbrnd, v hd, occ blk arg rock fragments, wl Sil cmt, pr-fr vis por					Gd HC odour v wk dull yel fluor, v slow cldy bl/wh cut	
	cly	slt	vf	f	m	c	vc								

Country: Norway	Area: Haltenbanken	Field: Morvin
Well no: 6506/11-8	Formation: Garn	
Core no: 3	Interval: 4658.4–4671.4 m	Cored: 13 m Rec: 13 m 100%
Core size: 4"	Geologists: A.Neitzel/ N.Townley	Date: 22.05.06

Depth (mRT)	Lithology/Grain size cly slt vf f m c vc	Shows						Lithological Description	Remarks
		ODOUR	FLUOR	CUT	POOR	FAIR	GOOD		
4669	M							SST: pr vis por, else a.a.	Gd HC Odour wk wh/yel Fluor slow cldy wh/yel cut
4670	M							SST: dk olv gry-olv blk, clr-brn gry transl Qtz, f-med occ crs, mod srt, sbang-sbrnd, v hd, r Musc, occ dk gry Mtrx, wl Sil cmt, pr vis por	Fr HC odour dull wh/yel fluor, slow p-p wh/yel cut
4671	M							SST: pr, occ fr vis por, else a.a.	Fr HC odour nol fluor, slow cld wh/yel cut

Country: Norway

Area: Haltenbanken

Field: Morvin

Well no: 6506/11-8

Formation: Garn

Core no: 4

Interval: 4671.4–4674.4 m

Cored: 3 m **Rec:** 2.82 m 94%

Core size: 4"

Geologists: A.Neitzel/ N.Townley

Date: 23.05.06

Depth (mRT)	Lithology/Grain size cly slt vf f m c vc	Shows						Lithological Description Rock name, mod. lith., colour, grain size, sorting, roundness, matrix, cementation, hardness, sed. struct., accessories, fossils, porosity, contamination	Remarks Shows, etc.
		ODOUR	FLUOR	CUT	POOR	FAIR	GOOD		
4671								SST: olv blk, grn blk w/ clr, transp, lt grn gry, blu wh transl, f – v crs, pred um – crs, sbang – sbrnd, pred sbsph, mod srted Qtz grs, pred mod fri lt brn transl Sil cmt, v occ Pyr cmt/por infills + cotg to grs, occ blk Carb + dk brn arg Mtrx, mod vis por	Gd HC odour, occ dk brn oil stn cotg/ Carb cotg to grs. uni dull yel/stw nat flour, inst dull diff yel cut-slw cldy bir blu wh cut., brn resd rng.
4672								SST: a.a., m – v crs, pred um – crs, pred wk – mod, fri Sil cmt, mod vis por	Gd HC odour, brn oil stn to grs + occ blk tar/Carb stn a.a.
4673								SST: pred a.a., pred um – crs, sbang – occ rnd, mod – w srted, w/ gd hd lt brn transl Sil cmt, blk Carb + dk brn arg/Cly Mtrx, abd crs Musc mic, mod vis por	Gd HC odour, lt brn oil stn i.p., pr spty dull yel/stw nat flour, inst dull inst diff yel cut –slw diff - stmg blu wh stw cut, pa brn resd rng.
4674								SST: a.a., m – v occ crs, pred um – crs, sbang – occ rnd, mod – w srted, w/ gd hd lt brn transl Sil cmt, blk Carb + dk brn arg/Cly mtr, mod vis por	Gd HC Odour, slw bleeding dk brn HC fluid in por spaces, uni mod yel/stw nat flour, Instg blmg/cldy blu wh cut flour, lt brn resd rng
Bottom of Core #4 at 4674.22 m								SST: a.a., m – pbbl, pred m – v crs, pr srted, w/ gd hd transl Sil cmt, abd blk Carb + dk brn arg Mtrx infilling por spaces, abd crs Musc 'sheaves', mod vis por	
								Dark brown/Black light oil bleed from core onto deck.	

CONVENTIONAL CORE DESCRIPTION

Country: Norway		Area: Haltenbanken				Field: Morvin									
Well no: 6506/11-8		Formation: Garn													
Core no: 5		Interval: 4674.4–4699.8 m				Cored: 25.4 m		Rec: 25.4 m		100%					
Core size: 4"		Geologists: A.Neitzel/ N.Townley				Date: 25.05.06									
Depth (mRT)	Lithology/Grain size							Shows						Lithological Description	Remarks
	cly	slt	vf	f	m	c	vc	ODOUR	FLUOR	CUT	POOR	FAIR	GOOD		
														Rock name, mod. lith., colour, grain size, sorting, roundness, matrix, cementation, hardness, sed. struct., accessories, fossils, porosity, contamination	Shows, etc.
4675	M	C		M		C								SST: olv blk, clr- v lt brn transl Qtz, pred med-crs, occ v crs, pr srt, ang-sbang, v hd, abd blk carb and dk brn arg Mtrx, abd Musc, wl Sil cmt, pr vis por, release of light HC film on chip surface	Strong HC odour, strtong uni yel fluor, fast cldy bl/wh cut, dk brn res ring
4676	M			M										SST: pred crs occ v crs, else a.a.	Strong HC odour, spty wh/ yel fluor, slow cldy bl/wh cut dk brn res ring
4677	M				C									SST: dk olv gry, clr transl Qtz, pred crs- v crs, pr srt, ang-sbang, v hd, occ dk brn arg Mtrx, r Musc, r micpyr, wl Sil cmt, pr-fr vis por, small release of v volatile HC from chip	V strong HC odour cldy dull yel fluor, instant cldy yel cut dk brn res ring
4678				M										SST: fr vis por, else a.a.	V strong HC odour, cldy dull yel fluor, instant blooming bl wh cut, dk brn res ring
4679	C													SST: olv gry-brn gry, clr transl Qtz, crs- v crs, mod srt, sbang-sbrnd, v hd, r dk brn carb/arg Mtrx, mod Sil cmt, fr vis por	V strong HC odour, wk spty bl/wh fluor, instant blooming wh yel cut, dk brn res ring
4680	C	C			M	C								SST: freq blk carb Mtrx, occ wood fragments else a.a.	V strong HC odour, strong cldy wh/yel fluor, instant bloom bl/wh-yel cut, dk brn res ring
4681	M			M										SST: olv blk-brn blk, clr transl Qtz, f-pred med, mod-wl srt, sbang-sbrnd, v hd, freq Musc, pr Sil cmt, pr vis por	strong HC odour, strong wh yel fluor of filtrate invasion 5 mm inside core, slow blooming wk wh/yel cut
4682		M												SST: gry blk, brn blk, w/ clr transp, occ lt gry gry, blu wh, f – v crs, pred m – crs, ang – sbrnd, pr – mod srt / gd hd Sil cmt, blk micpyr Carb + dk brn cly Mtrx, abd crs Musc, pr – mod Vis por	Gd HC odour, unif spty dull yel/stw nat Flour, instg strmg – slw blmg/cldy blu wh cut, pa brn resd rng
4683	M			C		M								SST: pred m – crs, w/ occ lams of pure clr transp hd Sil cmt w/ blk, micpyr Carb + dk gry Mtrx, w/ occ m gr Qtz, mod srt, pr – mod vis por	
4684	M				C									SST: gry blk, brn blk, vf – crs, pred m, ang, mod srt, w/ mod fri - gd hd Sil + occ pyr cmt/ cotg to grs, blk micpyr Carb + dk brn cly Mtrx, occ lt olv gry sft cly Repl min/relics of Fsprs, pr – mod vis por	a.a.
	cly	slt	vf	f	m	c	vc								

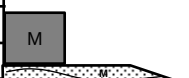
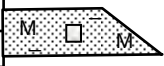
CONVENTIONAL CORE DESCRIPTION

Country: Norway		Area: Haltenbanken				Field: Morvin									
Well no: 6506/11-8		Formation: Garn													
Core no: 5		Interval: 4674.4–4699.8 m				Cored: 25.4 m		Rec: 25.4 m		100%					
Core size: 4"		Geologists: A.Neitzel/ N.Townley				Date: 25.05.06									
Depth (mRT)	Lithology/Grain size							Shows					Lithological Description	Remarks	
	cly	slt	vf	f	m	c	vc	ODOUR	FLUOR	CUT	POOR	FAIR			GOOD
														Rock name, mod. lith., colour, grain size, sorting, roundness, matrix, cementation, hardness, sed. struct., accessories, fossils, porosity, contamination	Shows, etc.
4685									SST: gry blk, brn blk, w/ clr transp, occ lt blu gry transl, f – m, well srted Qtz, w/ mod fri – gd hd transl, Sil cmt, dk gry arg Mtrx, v occ blk, micrpyr Carb Mtrx, occ – abd Musc, pr – mod vis por						Mod HC odour, pr sptty dull yel/stw nat flour, slw diff dull milky wh cut, pa brn resd rng
4686									SST: pred a.a., f – m, pred m, gd hd transl Sil cmt, abd dk gry arg Mtrx + blk micrpyr Carb matx, occ Musc lams, pr vis por in hd cmted prts						Pr HC odour, v pr sptty dull yel/stw nat flour, v slw blu wh cut, v pa resd rng
4687									SST: olv blk, brn gry vf – crs, pred m, grs, gd hd Sil cmt occ Carb + dk gry arg Mtrx, occ olv gry sft illite? Fspr relics, pr vis por						Pr HC odour, pr PP stw nat flour, slw blw wh cut
4688									SST: gry blk, brn gry vf – m, pred m Qtz, gd hd transp Sil cmt, grad to dk gry, olv blk 'Dirty' SST abd blk, micrpyr Carb + dk gry arg Mtrx + gd hd dk transl Sil cmt + abd crs Musc, non – v pr vis por						Pr HC odour, PP stw nat flour, slw blw wh cut
4689									SST: vf – crs, pred m – crs, w srted Qtz w/ gd hd transp Sil cmt, occ gry blk, blk micrpyr Carb matl, non – v pr vis por.						Pr Hc Odour, pr uni – PP dull yel /stw nat flour v slw diff blu wh cut, no resd rng
4690									SST: gry blk, brn gry, vf – crs, pred Um – crs, ang – sbrnd, sbsph, mod srted, gd hd Sil cmt, occ – abd brn gry arg Mtrx /v occ blk micrpyr Carb matl, lt olv gry illite? Repl/relics of Flsrs, pr vis por						V Pr HC odour pr unif dull yel/stw nat flor, V slw diff, blu wh cut. No resd rng
4691									CLST: med dk gry, hd, splty, w/ abd vf – v crs Musc, micrmic, tr micrpyr						No HC odour, no nat flor, v slw diff blu wh cut
4692									SST: olv blk, olv gry f – crs, pred Um – crs Qtz w/ gd hd Sil cmt, occ blk micrpyr Carb matl/Mtrx, V occ Carb laths, pr – mod vis por						Pr HC odour, Mod unif – sptty dull yell nat flor, Slw stng bri blu wh – v slw dull diff blu wh cut. Lt brn resd rng
4693									SST: a.a. f – occ crs, pred m Qtz, gd hd transl Sil cmt, abd dk gry/blk arg or micrpyr Carb Mtrx, abd crs Musc, no vis por.						Pr HC odour, mod sptty dull yel nat flor in outer 5mm of core (Infiltration?)
4694									SST: vf – pred m, Qtz, gd Sil cmt, v occ arg Cly Mtrx, occ lt olv sft 'rotted' Flspr as illite?, occ med gr Musc w/ mod vis por, grad – brn blk, olv blk m gr Dirty' SST, abd olv blk, transl v hd Sil cmt, abd blk micrpyr Carb + dk gry arg Mtrx, abd crs Musc, tight, non – pr vis por						Mod – Pr HC odour.Dull unif – bri sptty blu wh nat V slw diff blu wh cut, pa lt brn resd rng.
	cly	slt	vf	f	m	c	vc								

CONVENTIONAL CORE DESCRIPTION

Country: Norway		Area: Haltenbanken				Field: Morvin										
Well no: 6506/11-8		Formation: Garn														
Core no: 5		Interval: 4674.4–4699.8 m				Cored: 25.4 m		Rec: 25.4 m		100%						
Core size: 4"		Geologists: A.Neitzel/ N.Townley				Date: 25.05.06										
Depth (mRT)	Lithology/Grain size								Shows					Φ	Lithological Description	Remarks
	cly	slt	vf	f	m	c	vc	ODOUR	FLUOR	CUT	POOR	FAIR	GOOD			
4695															SST: pred a.a., f – crs, pred um – crs, pred fri – occ gd hd Sil cmt, occ brn blk, olv blk Carb lams, mod vis por	Mod HC odour. Gd sptty bri yel/Stw Nat flor, Slw stmg – diff blu wh cut
4696															SST: brn blk, olv blk, f – crs, pred Um – crs, w/ gd hd Sil cmt, abd blk micrpyr Carb + dk grn arg Mtrx, Musc, mod – pr vis por	a.a.
4697															SST: brn blk, blk, f – crs, pred m w/ gd hd transl Sil cmt, occ blk Carb + dk gry arg Mtrx, mod – pr vis por	Mod – Pr HC odour. Mod sptty dull yel/ stw nat flor, cut a.a.
4698															SST: vf – crs, pred m, well srtd, w/ gd hd Sil cmt, Carb + med brn arg Mtrx, occ Musc, lams of blk micrpyr Carb matll + crs Musc, pr vis por	Pr HC odour, pr PP dull yel stw flor, v slw diff blu wh cut, no resd rmg
4699															SST: a.a.	a.a.
4700															SST: olv gry, brn gry pred f – m, well srtd, gd hd Sil cmt, + dk gry/blk Carb + arg Mtrx, abd random Musc, pr vis por, occ major blk, micrpyr fiss, Carb lams, grad – CLST.	Mod HC odour, v pr PP dull yel nat flor, v slw diff, milky wh cut, No resd rng
	cly	slt	vf	f	m	c	vc									

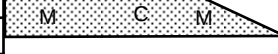
CONVENTIONAL CORE DESCRIPTION

Country: Norway		Area: Haltenbanken				Field: Morvin										
Well no: 6506/11-8		Formation: Ile														
Core no: 6		Interval: 4743–4753.04 m				Cored: 10.04 m		Rec: 10.04 m		100%						
Core size: 4"		Geologists: A.Neitzel/ N.Townley				Date: 29.05.06										
Depth (mRT)	Lithology/Grain size							Shows						Lithological Description	Remarks	
	cly	slt	vf	f	m	c	vc	ODOUR	FLUOR	CUT	POOR	FAIR	GOOD			
4743															CLST: brn blk-olv blk, sft-mod hd, pred frm, blkly-fiss, micromic, occ Musc	No shows
4744															SST: olv gry-brn gry, clr transl Qtz, vf-med pred f, wl srt, ang-sbrnd, mod hd, mod Sil cmt, brn gry sft Mtrx, occ crs Musc, pr vis por, grad - SLTST	V pr HC odour, v pr pinpoint dull yel fluor, v sl strm mlky wh cut, pa brn res ring
4745															SST: brn blk-gry blk, clr transl Qtz, vf-occ crs, pred med crs, mod srt, ang-sbrnd, sbelg-sbsph, hd, wl Sil cmt, dk brn arg Mtrx, abd blk carb matl, occ crs Musc, mod vis por, light HC and gas released from core chip	Mod HC odour, mod spty dull yel fluor, instant strm bl/wh cut
4746															SST: pred vf-f, wl srt, mod fri Sil cmt, abd crs Musc, occ pyr, pr vis por, else a.a.	Shows a.a.
4747															SST: brn blk-olv blk, clr transl Qtz, vf-occ crs, pred med, wl srt, sbelg-sbsph, wl Sil cmt, occ dk gry rk frags, dk brn sft carb grs/Mtrx, mod vis pr, occ blk dead oil/carb cotg grns	Shows a.a.
4748															SST: brn blk-blk, clr transl Qtz, slyt-occ f, pred vf, v wl srt, sbang-sbrnd, abd bl/wh crshd qtz/cly Mtrx, occ crs Musc, v pr vis por, grad- SLTST	Pr HC odour, pr spty dull yel fluor, no cut
4749															SLTST: brn gry olv blk, grad grn gry, hd, blkly, w vf lam of silt to f Qtz, grn gry sft cly mtrx, abd crs Musc lam, wl Sil cmt, no vis por	V Pr HC odour, v pr spty dull yel fluor, no cut
4750															SST: brn blk-olv blk, silt-f, pred vf, clr transl Qtz, v wl srt, sbang-sbrnd, hd, wl Sil cmt, abd Musc, occ biot, v pr vis por	Shows a.a.
4751															SST: vf-occ crs, pred med, occ pyr cmt, abd dk brn arg Mtrx, occ blk micpyr carb matl, abd mic, mod vis por, else a.a.	Mod HC odour, pr uni-occ spty mlky wh fluor, instant strm bl/wh cut, v pa brn res ring
4752															SST: brn blk-olv blk, clr transl Qtz, vf-occ med, pred f, v wl srt, ang-sbrnd, wl Sil cmt, abd Musc, lt grn gry cly Mtrx, pr vis por	V pr HC odour, no fluor, slow dull wh/yel diff cut

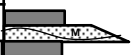
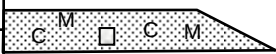
CONVENTIONAL CORE DESCRIPTION															
Country: Norway			Area: Haltenbanken					Field: Morvin							
Well no: 6506/11-8			Formation: Ile												
Core no: 6			Interval: 4743–4753.04 m				Cored: 10.04m Rec: 10.04 m 100%								
Core size: 4"			Geologists: A.Neitzel/ N.Townley					Date: 29.05.06							
Depth (mRT)	Lithology/Grain size							Shows		Φ	Lithological Description	Remarks			
	cly	slt	vf	f	m	c	vc	ODOUR	FLUOR	CUT	POOR	FAIR	GOOD	Rock name, mod. lith., colour, grain size, sorting, roundness, matrix, cementation, hardness, sed. struct., accessories, fossils, porosity, contamination	Shows, etc.
4753														SST: a.a.	V pr HC odour, no fluor, slow dull wh/yel cut

cly
slt
vf
f
m
c
vc

CONVENTIONAL CORE DESCRIPTION

Country: Norway		Area: Haltenbanken			Field: Morvin										
Well no: 6506/11-8		Formation: Ile													
Core no: 7		Interval: 4753.04–4769.38 m		Cored: 16.34 m		Rec: 16.34 m 100%									
Core size: 4"		Geologists: N.Townley/O.Giskeødegård			Date: 30.05.06										
Depth (mRT)	Lithology/Grain size							Shows						Lithological Description	Remarks
	cly	slt	vf	f	m	c	vc	ODOUR	FLUOR	CUT	POOR	FAIR	GOOD		
4753														SST: brn blk, olv blk, w/clr transp, occ blu wh, transl, f – m, pred f, w gd hd dk gry transl, gd hd Sil cmt, occ – abd lams of crs Musc, occ brn blk carb Mtrx, mod vis por	V pr HC odour, v dull uni yel nat flor, slw diff mlky wh cut, sl 'Wet* Hc appearance to Chips
4754														SST: a.a. slt – f, pred vf-f, w/ gd hd transl Sil cmt, abd crs Musc, occ blk Carb matl/Mtrx, mod mod vis por	V Pr HC odour, pr v dull uni mlky wh nat flor, v slw, diff cldy mlky wh cut
4755														SST: a.a. f – v crs, pred crs/v crs, ang – sbrnd, occ rnd i crs prts, sbelg – sbsph, mod srted, w/ gd hd dk gry transl Sil cmt, abd Musc, abd crs sft rnd Carb clsts/laths, mod vs por, occ blk 'dead' oil/Carb cotgs to grs	Mod HC odour, mod uni dull yel – occ bri sppty mlky wh, nat flor
4756														SST: a.a. vf – crs, pred f – m, w/ gd hd transl Sil cmt, abd Musc, occ Carb matx/por infills, mod vis por	Pr HC odour, pr dull yel /blu wh nat flor, pr instng strm blu wh – slw diff cldy mlky wh cut
4757														SST: a.a. f – v crs, pred m- crs, sbang – rnd in crs prts, sbelg – sbsph, occ crs Musc, occ dk gry rnd Rk/lith frags, occ blk, sft Carb clsts/laths, occ blk, micrpyr Carb mtz/por infills, occ Musc lams, pr – mod vis por	V pr HC odour, mod bri uni, yel/blu wh nat flor,slw diff mlky wh cut
4758														SST: brn blk, olv gry, w/ clr transp, occ blu wh transl, m – v crs, pred crs grs a.a., w/ occ Musc, Carb clsts/laths + rnd Rk frags, mod vis por	V pr HC odour, mod uni – occ bri sppty yel)Mlky wh nat flor, v slw diff mlky wh cut
4759														SST: brn blk, olv gry, w/ clr transp, occ blu wh transl, m – v crs, pred crs grs a.a., w/ occ Musc, Carb clsts/laths + rnd Rk frags, mod vis por	Pr HC odour, pr sppty/PP yel/blu wh nat flor,V slw diff mlky wh cut
4760														Laminated SLTST w/ f SST: SST: pred a.a., f – v crs, pred crs, prly srted Qtz, w/ gd hd dk gry transl Sil cmt, abd Musc, abd m – crs dk gry rnd Sch Rk/lith frags, blk sft Carb laths/por infills, mod vis por	No HC odour, sppty bri, blu wh- uni dull yel nat flor, slw strm – v slw diff cldy mlky wh cut
4761														SST brn blk, brn gry, f – crs, pred m, ang – sbrnd, sbelg – sbsph, w srted w gd hd transl Sil cmt, micrpyr blk Carb Mtrx/por infills, occ blk Carb clsts, dk gry Rk/lith frags, occ – abd Musc, mod vis por, W/ brn blk, brn gry, hd fiss SLTST lams w/ gd hd dk gry transl Sil cmt	No HC odour, mod bri sppty – uni dull yel/blu wh nat flor,sl diff mlky wh cut in SST
4762														SST a.a. + dk gry exotic qQz, f – m, pred m, w srted Qtz, occ crs Musc, occ – abd dk gry micrpyr Carb mtz/por infills, occ ck gry sch Rk/lith frags, pr – mod vis por	No HC odour, gd sppty bri blu wh – uni dull yel nat flor, V slw diff cldy mlky wh cut flor

CONVENTIONAL CORE DESCRIPTION

Country: Norway		Area: Haltenbanken				Field: Morvin										
Well no: 6506/11-8		Formation: Ile														
Core no: 7		Interval: 4753.04 – 4769.38 m				Cored: 16.34m		Rec: 16.34 m		100%						
Core size: 4"		Geologists: N.Townley/O.Giskeødegård				Date: 30.05.06										
Depth (mRT)	Lithology/Grain size							Shows					Lithological Description	Remarks		
	cly	slt	vf	f	m	c	vc	ODOUR	FLUOR	CUT	POOR	FAIR			GOOD	
4763															CLST: brn blk, brn gry, hd fiss, w/ gd hd Sil cmt, m – v crs lineated Musc+ biot grs, micrpyr, w/ vf lams of slty – vf SST,w cmt	No Shows
4764															SST: brn blk, olv blk, w/clr transl, occ lt blu wh, transl, m – v crs, pred m – crs, mod srted Qtz, w/ gd hd dk gry transl Sil cmt, abd dk gry/blk micrpyr Carb mtr/por infills, abd non orientated Musc, occ compacted by grs, v occ Musc lams, pr vis por	Mod HC odour, v pr sppty dull milky wh nat flor v slw stm – diff cldy
4765															SST: olv blk, olv gry w/ clr transp lt grn gry, blu wh transl, m – v crs, pred crs, sbang – occ sbrnd, sbelg – sbsph, prly srted Qtz grs w/ gd hd transl Sil cmt, blk/dk gry, sft Carb Mtrx/por infills + Carb laths, occ crs Musc, occ blk rnd Carb grs, mod vis por	Mod HC odour, gd bri, sppty – uni blu wh cut flor, no resd rng
4766															SST: a.a., f – crs, pred m, w srted, w/ gd hd Sil cmt, occ micrpyr/pyr cmt, abd dk gry Carb Mtrx/por infills, abd crs Musc, micrpyr Carb cotgs to grs, mod vis por	Mod Hc odour, pr sppty dull yel nat flor, slw stm bir – v slw diff blu wh cut, no resd rng
4767															SST: a.a., m – pbbl, pred crs – v crs, sbang – rnd in v crs/pbbl, v prly srted, occ micrpyr cmt, abd blk micrpyr Carb Mtrx/por infills, occ RK/lith frags, (Occ v rnd pbbl grs of micrpyr Volcan/alterd Cly? frags), blk micrpyr Carb Mtrx/por infills, mod – gd vis por	a.a.
4768															SST: pred a.a., f - v crs, pred crs, prly srted, abd Carb Mtrx/por infills, abd crs Musc, gd vis por	Pr HC odour, no nat flor, v pr v slw diff milky wh cut. No resd rng
4769															SST: blk, w/ clr transp, occ blu wh transl, vf – v crs, pred m – crs, ang – occ w rnd, elg – sbsph prly srted Qtz grs, w/ gd hd Sil cmt, v abd blk/dk brn micrpyr Carb Mtrx/por infilld, occ Musc, mod vis por, (abd blk dead oil/Carb cotgs to grs)	V strong Su odour, no Nat flor, slw stm – diff milky wh cut, pa brn resd rng

CONVENTIONAL CORE DESCRIPTION

Country: Norway		Area: Haltenbanken				Field: Morvin										
Well no: 6506/11-8		Formation: Ile Fm														
Core no: 8		Interval: 4769.38 – 4775.4 m		Cored: 6.02 m		Rec: 6.02 m		100%								
Core size: 4"		Geologists: N.Townley/O.Giskeødegaard				Date: 01.06.06										
Depth (mRT)	Lithology/Grain size							Shows					Lithological Description Rock name, mod. lith., colour, grain size, sorting, roundness, matrix, cementation, hardness, sed. struct., accessories, fossils, porosity, contamination	Remarks Shows, etc.		
	cly	slt	vf	f	m	c	vc	ODOUR	FLUOR	CUT	POOR	FAIR			GOOD	
4769															SST: brn blk, olv blk, clr - transl, loc brn ctg on gn, f – crs, sbang – ang, mod hd – hd, pr srt, Sil cmt, abd carb/cly Mtrx, carb, Mic, micropyr, no vis por	Strng Su odour, v wk pet odour, no oil stn, spty dull yel dir flu, wk slo strm bl wh flu cut, no vis cut, no vis resd
4770															SST: lt gry – olv gry – lt brn, clr – trnsl – gry Qtz, vf – f, Tr m, sbang – sbrndd, mod – w srt, mod hd – hd, Sil cmt, loc arg Mtrx, Tr Mic, carb, mod – pr vis por	V wk pet od, no oil stn, spty dull yel dir flu, wk slo strm bl wh flu cut, no vis cut, no vis resd
4771															SST: lt brn – brn blk, clr – trnsl Qtz, pred brn ctg on Qtz gn, f – m, Tr crs, sbang – sbrndd, mod srt, mod hd – hd, Sil cmt, loc arg Mtrx, r Mic, carb, mod – pr vis por	Fr pet od, no oil stn, spty dull yel dir flu, wk slo strm bl wh flu cut, no vis cut, no vis resd
4772															SST: lt brn – brn blk, clr – trnsl Qtz, pred brn ctg on Qtz gn, f – m, Tr crs, sbang – sbrndd, mod srt, mod hd – hd, Sil cmt, loc arg Mtrx, gd Tr Mic, carb, mod – pr vis por	No pet od, no dir flu, v slo strm wk bl flu cut, cut, no vis cut, no vis resd
4773															SST:As for 4772 m, v hd, v wl Sil cmt	No Shows
4774															SST: lt brn – dk brn, clr – trnsl Qtz, lt brn ctg on Qtz gn, vf – m, Tr crs, sbang – ang, pr srt, v hd, Sil cmt, abd mud/arg Mtrx, abd Mic, carb, no vis por	No Shows
4775															SST: lt brn – olv gry w Mic/lam, as for 4774 m	No pet od, no dir fluor, v slo strm wk bl flu cut, no vis cut, no vis resd
4775															SST: lt gry – brn gry, clr – trnsl Qtz, loc gry Qtz, vf – crs, Tr PbIs, sbang – rnd, pr srt, hd – v hd, Sil cmt, loc arg Mtrx, loc Mic, loc carb, no vis por	No pet od, no dir flu, v slo strm wk bl flu cut, no vis cut, no vis resd
4776																
4777																
4778																