

# PL281 Well 6405/7-1 & 7-1T2

Final Well Report



**Final Well Report  
Well 6405/7-1 & 7-1 T2  
Ellida PL281**

**04c94\*127**

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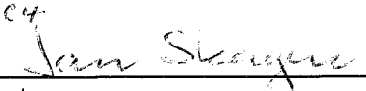
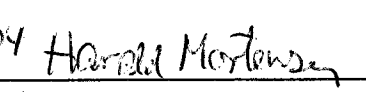
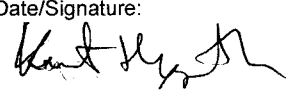
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## **1 Introduction**

### **1.1 Well data record**

Well name : 6405/7-1 and 6405/7-1 T2  
Type of well : Exploration  
Prospect : Ellida  
Country : Norway  
Area : Norwegian Sea  
License : PL 281  
Licencees : Statoil ASA (Operator) 30 %  
                  Petro AS 20 %  
                  AS Norske Shell 20 %  
                  BP Norge A/S 20 %  
                  ConocoPhillips Skandinavia AS 10 %

Drilling unit : West Navigator  
Type : Drill ship (DP)  
Water depth : 1206 mMSL  
Air gap : 36 m  
On license : 18.06.03  
Rig release : 15.10.03  
Formation at TD : Lysing Formation

Geographic co-ordinates : 64° 17' 16.42" N  
                                  05° 07' 58.60" E  
Datum/Spheroid : ED-1950 / Int. 1924

UTM : UTM Zone 31, CM 03° E  
      7 131 004N  
      603 243E

Deviation from planned location: 8m in direction 75°

Seismic reference : Seismic survey GH0103, Inline 1268, Cross-line 2342.

All depths in this report refer to MD RKB (Measured Depth, Rotary Kelly Bushing) unless otherwise stated.

### LOCATION MAP

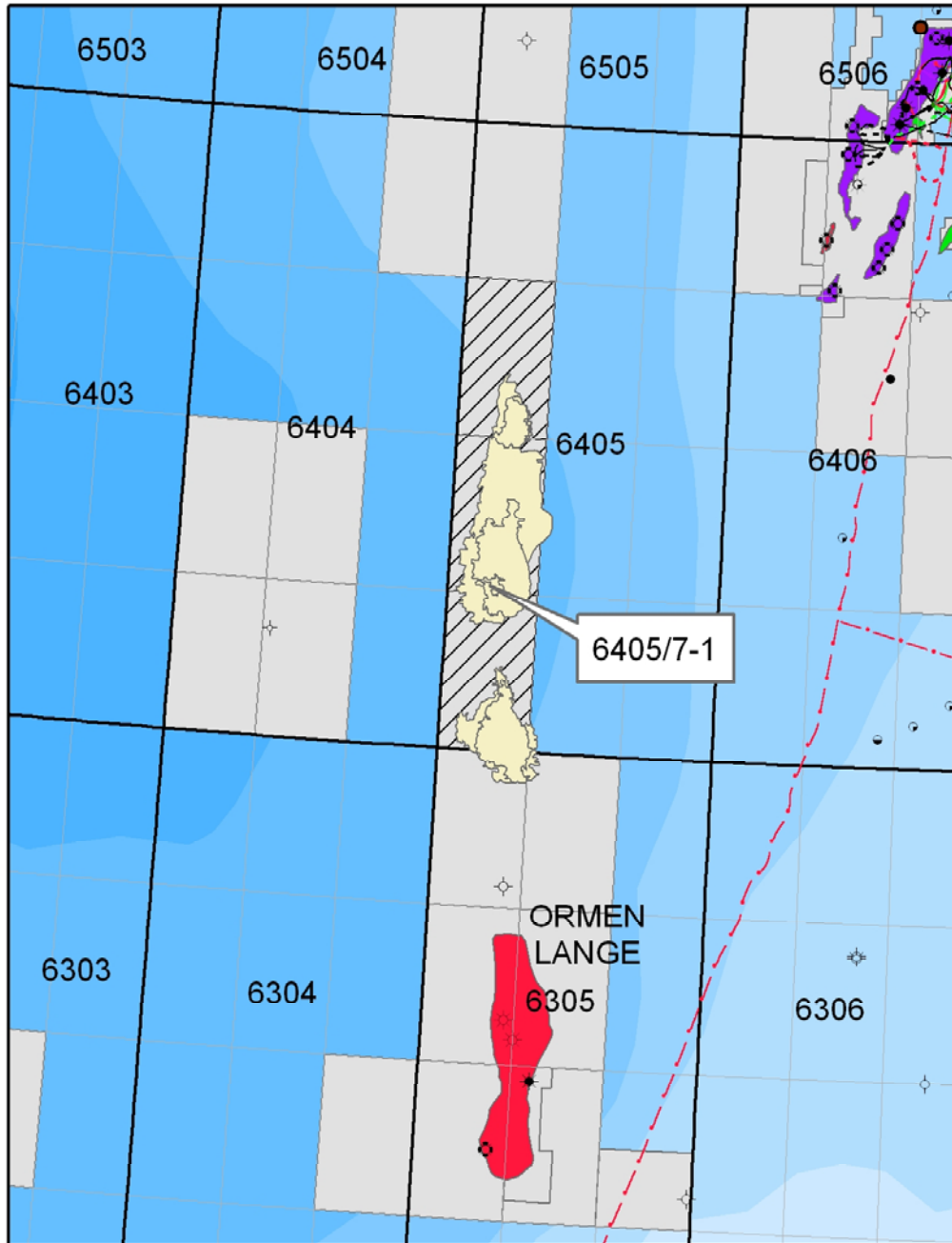


Figure 1.1

## **1.2 Well objectives**

The objectives of the well were to test the potential for hydrocarbons and to evaluate the reservoirs present. The primary target was the Nise Formation of Campanian age and the secondary target was the Lysing Formation of Coniacian age. In addition, understanding of a mapped flat event was a main objective for this well. A Danian lead, the Egga Member Equivalent, was also planned to be investigated.

## **1.3 Results of the well**

The well was spudded in a water depth of 1206 mMSL and drilled to a total depth of 4300m, in the Lysing sandstone member.

Due to higher pore pressure than expected in the Nise Formation, the well was plugged back into the 13 3/8" casing, and the sidetracked from below the casingshoe.

No shallow gas was observed by the ROV or on MWD logs.

To ensure a cost effective operation, a thorough evaluation of the need for data in the tophole section was carried out. The conclusion was that only in a discovery case there was a need in particular for velocity data. The dual drilling rig system on West Navigator was fully utilized. When the well was at TD and the discovery confirmed, a new 8 1/2" hole was drilled 15 m from the original hole from seafloor to 1920m using LWD in one derrick, while performing wireline logging in the other.

The primary target, the Nise Formation, 2757m-2816m in well 6405/7-1 and 2760.6m-2960m in 6405/7-1T2, consists of layered/laminated and bioturbated claystones, siltstones and sandstones with poor reservoir quality. 5 cores were cut in the interval 2754m-2881m. The Nise formation is proved to be oil-bearing from the top at 2760.5m and down to 2823m. However, good oil shows are also described below this depth, to the base of the deepest core at 2881m and on SWCs down to 2892m. Oil samples were collected from wireline testing tool at 2763m, 2770.5m and 2828m and from a drillstem test in the interval 2758m-2811.7m. The production rate from the test was 40 m<sup>3</sup> oil/day, with a GOR of 175 m<sup>3</sup>/m<sup>3</sup>. Water samples were taken with wireline testing tool at 2828m and 2850m.

The secondary target, the Lysing Formation, redefined as the Lysing sandstone member, was encountered at 3665m. The base of the Lysing Formation was not seen. Two cores were cut in the interval 3751m-3784m. The reservoir properties were poor. It consisted of highly bioturbated, very fine to fine grained sandstones, siltstones and claystones. Quartz cementation is common. The sands were water wet. No samples were taken due to tight formation.

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The sediments in both Nise Formation and the Lysing sandstone member are thought to represent deep-marine, highly bioturbated and reworked low density/low concentration turbidite deposits. The depositional setting is most likely a local sub-basin situated on a stable slope. Deposition occurred within the upper bathyal-zone i.e. at a few hundreds of meters of water depth. The mapped seismic flat event is likely to represent the oil-water contact at 2823m, but a change in lithology could also be a cause. The possible Danian lead was not encountered.

The well was drilled in 118.6 days, including a drillstem test of 31.4 days

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## 1.4 Well program summary

### 1.4.1 Casing

Casing	Shoe depth [mMD / mTVD]	LOT / FIT [Equivalent mud weight]
30"	1310 / 1310	N/A
20"	1900 / 1900	LOT: 1.33 g/cm <sup>3</sup>
13 3/8"	2417 / 2417	LOT: 1.42 g/cm <sup>3</sup>
11 3/4" (*)	2741 / 2740	LOT: 1.60 g/cm <sup>3</sup>
9 5/8"	3187 / 3186	LOT: 1.70 g/cm <sup>3</sup>

Table 1.1 Casing program summary

### 1.4.2 Drilling fluids

Section	Section TD [m MD]	Max mud weight [g/cm <sup>3</sup> ]	Mud type
36"	1310	1,03	Seawater / high visc. Sweeps
26"	1910	1,03	Seawater / high visc. Sweeps
17"	2425	1,23	Glydril DW (water based KCl/NaCl/Glycol/MEG/polymer)
12 1/4"	2816	1,37	Glydril DW (water based KCl/NaCl/Glycol/MEG/polymer)
14" (*)	2741	1,38	Glydril DW (water based KCl/NaCl/Glycol/MEG/polymer)
12 1/4" (**)	3200	1,45	Glydril DW (water based KCl/NaCl/Glycol/MEG/polymer)
8 1/2"	4300	1,42	Glydril DW (water based KCl/NaCl/Glycol/MEG/polymer)
8 1/2" Pilot hole (***)	1920	1,03	Seawater / high visc. Sweeps

Table 1.2 Drilling fluids summary

(\*) The original 12 1/4" hole drilled into the Nise reservoir was plugged back. A 12 1/4" sidetrack (T2) was drilled out of the 13 3/8" casing shoe. The 12 1/4" hole was under reamed to 14" and thereafter an 11 3/4" liner was set above the Nise reservoir.

(\*\*) Out of the 11 3/4" liner a 10 5/8" x 12 1/4" hole was drilled (T2) and a 9 5/8" liner was set through the Nise reservoir.

(\*\*\*) The 8 1/2" pilot hole was drilled from the auxiliary rig while running wire line in the main rig.

## **1.5 Data acquisition summary**

See figure 1.2 and 1.3

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PL 281

Formation evaluation  
Well 6405/7-1



RKB - MSL: 36 m

Water Depth: 1206m MSL

Made by: ØH

Date: Dec. 2003

Stratigraphy		Lithology	Casing	Depth mMD RKB	Coring Programme	Sampling Programme	Logging Programme
System	Formations – Seis. markers						
	Seabed 1242			1200			
Quat.	Naust Fm		30"	1310			<p><u>MWD</u> : gr-res-dir-pwd (in 26" hole)</p> <p>LWD: gr-res-density-neutron-sonic 8 1/2" hole for data acquisition from seabed to 1920m. The hole was drilled while logging at TD of the well</p>
				1400		Returns to seabed	
				1600			
				1800			
Tertiary	Brygge Fm		20"	1935		<p>One bulk (ca. 5lt.), one washed and dried sample and one canned cuttings sample collected at each sampling level.</p> <p>Every 10 m from 20" csg. shoe to 2650 m</p> <p>Every 3 m from 2650 m to 2816m</p> <p>Gas bag samples, when increased background gas/ gas peaks</p>	<p><u>MWD</u> : gr-res-dir-pwd (in 26" hole)</p> <p><u>WIRELINE</u> : density-neutron-resistivity-sonic-spectralog</p>
				1900			
				2000			
				2200			
				2400			
Cretac.	Tare Fm			2506		<p><u>LWD</u>: gr-res-density-neutron-sonic-dir-pwd</p>	
	Tang Fm			2602			
	Springar Fm			2664			
	Nise Fm			2757			
			13 3/8"	2417			

TD: 2816 MD / (2816 m TVD)

Fig. 1.2

PL 281

Formation evaluation  
Well 6405/7-1T2



RKB - MSL: 36 m

Water Depth: 1206m MSL

Made by: ØH

Date: Dec. 2003

Stratigraphy		Lithology	Casing	Depth mMD RKB	Coring Programme	Sampling Programme	Logging Programme	
System	Formations – Seis. markers							
Tertiary	Brygge Fm		13 3/8"	2400				
	2506		2417			MWD: gr-res-dir-pwd		
	Tare Fm		2602	2600				
	Tang Fm		2664	2664				
	Springar Fm		2760.5	2760.5	11 3/4"			
Cretaceous	Nise Fm		2741	2800	5 cores in Nise sst and through the flat event (Cored interval 2754-2880m)	Drillstem test in the interval 2758-2811.5m	MWD: gr-res-dir-pwd WIRELINE : Density/neutron-resistivity-sonic-spectralog	
	2960		3000		One bulk (ca. 5lt.), one washed and dried sample and one canned cuttings sample collected at each sampling level.	Pressure points/sampling (3 oil samples and two water samples) NMR (saturation log) Sidewall cores Borehole image log		
			3187	3200	9 5/8"			
				3400		Every 10 m from 13 3/8" csg. shoe to 2650 m		
				3600		Every 3 m from 2650 m to 2900m		
				3800		Every 10m from 2900m to 3700m		
				4000		Every 3 m from 3700m to TD		MWD : gr-res-dir-pwd
				4200		One 1lt. mud-sample every 200 m from 20" csg to TD		WIRELINE : Density/neutron-resistivity-sonic-spectralog Pressure points (no sample due to tight formation) Sidewall cores Walk away VSP
						2 cores in Lysing sst (Cored interval 3751-3784m)	One 1lt. mud-sample every 20 m in HC- bearing zones	
							Gas bag samples, when increased background gas/ gas peaks	

TD: 4300 m MD

Figure 1.3

## 2 Dispensations

Dispensation from	Synergi no.	Date	Title
WR0436	225222	25.06.2003	Dispensation from testing BOP to maximum well design pressure before installing 13 3/8" casing.
WR0436	230065 / 230605	03.08.2003 / 08.08.2003	Dispensation from 14-day periodic pressure testing of BOP due to performing an extended reservoir-logging programme.
Document "Utslipssøknad for boring av letebrønn 6405/7-1"	235164	15.09.2003	Due to performing a drill stem test of the well, some additional chemicals will have to be used.
WR0436	236970 / 238204	29.09.2003 / 08.10.2003	Dispensation from 14-day periodic pressure testing of BOP due to waiting on weather while performing DST.
WR0436	237303	02.10.2003	Cut and pull 13 3/8" casing without casing spear pack-off

Table 2.1 Summary of dispensations

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

### 3.1 General comments

Statoil is satisfied with the HSE performance of the drilling- and service companies during the Ellida well. Extraordinary high focus on reporting unsafe conditions, near misses and accidents was maintained throughout the operation that was long lasting and fairly complex. Everybody involved demonstrated a sincere and honest will to promote good HSE culture.

Unfortunately we had one LTI at the end of the operation. However, it was not a serious LTI and the circumstances around this accident were such that it might have happened anywhere.

There are still areas for further improvement; procedures (quality and adherence), communication and cooperation, individual knowledge, concentration and attitude.

### 3.2 MUF and Synergi reports

A total number of 2316 MUF (Message of Unwanted Incidents/Conditions) reports were filed on the rig during the operation on the Ellida well; average to 20 a day.

Statoil registered 359 incidents and Non-Conformances in our Synergi system.

### 3.3 Comments to the MUF/Synergi reports

Of the above mentioned accidents/incidents/conditions, there were:

- 1 LTA
- 1 red (High risk potential) incident
- 9 yellow (Medium risk potential) incidents
- 3 spills to sea
- 0 first aid incidents
- 6 falling objects and 16 potential falling objects detected

The red incident was a 15-ton tugger wire that ruptured when being used to make up one of the riser joints. The incident was investigated.

The nine yellow incidents were:

- One LTI. Person fell when walking down an outdoor stairway. No slippery floor, no external influence.
- Problems with DP system.
- Problems with riser tensioner ring rotation
- Main generator no 6 did not start automatically when no 3 stopped
- Person in riding belt above yoke wheel while DDM was lifted
- Bolt fell from DDM (195 gram – 10 m)
- 1100 kg sandbag ruptured while lifted
- Two potential falling objects; adjustable spanner found on top of tank and 8” MWD lifted without thread protector

The three spills to sea were all rated green (5):

- Wrong valve was opened and 10m<sup>3</sup> mud was dumped to sea
- Valve on dump line leaking – 15 m<sup>3</sup> mud dumped to sea
- 6 m<sup>3</sup> CaCl/Ca Br<sub>3</sub> lost to sea due to leaking slip joint packer.

The falling object incidents/conditions may be grouped as follows;

- One red accident – 15-ton tugger wire parted
  - One yellow near miss - Bolt fell from DDM (195 gram – 10 m)
  - Two yellow unsafe conditions – adjustable spanner found unsecured and 8” MWD tool lifted without thread protector
-

### 3.4 Non conformance

*Table 3.1 Summary of registered Non Conformances*

Title	Synergi no.	Date	Comments
Cement recommendations was not followed	224980	23.06.2003	
Flat battery in PWD sub. Resulted in no PWD data in memory (26" section)	222071	23.06.2003	
Dril-Quip equipment was not delivered according to plan. Resulted in rush-mobilisation of new equipment	225254	23.06.2003	
Halliburton cement head was delivered without pre-made x-overs	225255	22.06.2003	
Current meter was not removed from the well location prior to West Navigator arriving location	225256	22.06.2003	
The bulls eye brackets was installed with 180 degrees distance instead of 90 degrees	225343	21.06.2003	
DWFS blend had to be manually mixed when cementing the conductor	225345	22.06.2003	
Problems with the hydraulic system on the foam unit. Was fixed before the cement job	225347	24.06.2003	
Leak in the cement head caused one hour down time	225346	25.06.2003	
Leak in the hydraulic system on magnum caused one hour down time	225349	21.06.2003	
Leak in UIBOP	225766	27.06.2003	
Lost circulation while drilling 17" hole	225795	28-29.06.2003	
Plugged choke line	225823	29-30.06.2003	
Swabbed 500 liters	226230	01.07.2003	
Upper guiding arm hydraulic hose failed during tripping operation	226294	03.07.2003	
Circulated and worked 13 3/8" casing from 2370 m to setting depth with partial losses	227324	05.07.2003	
Leak in IBOP	226632	07.07.2003	
Jammed lifting sub in BX elevator	227686	14.07.2003	
Problems with ram rig positioning indicators (SIMS)	227826	14.07.2003	
Ball did not drop from Nodeco cement head when setting 11 3/4" liner hanger	228511	20.07.2003	
Not able to seat BOP test tool	228534	21.07.2003	
Leak in hydraulic line to standpipe sensor	228655	22.07.2003	
Some joints of 9 5/8" HSLX casing were measured onshore inclusive threads	229329	28.07.2003	
Placement and design of bulls eye brackets - in conflict with inspecting the pre-load tension ring on wellhead	230262	04.08.2003	
Communication and telemetry problems on RCOR logging tool (side wall cores)	230488	07.08.2003	
Communication and telemetry problems with	230665	09.08.2003	

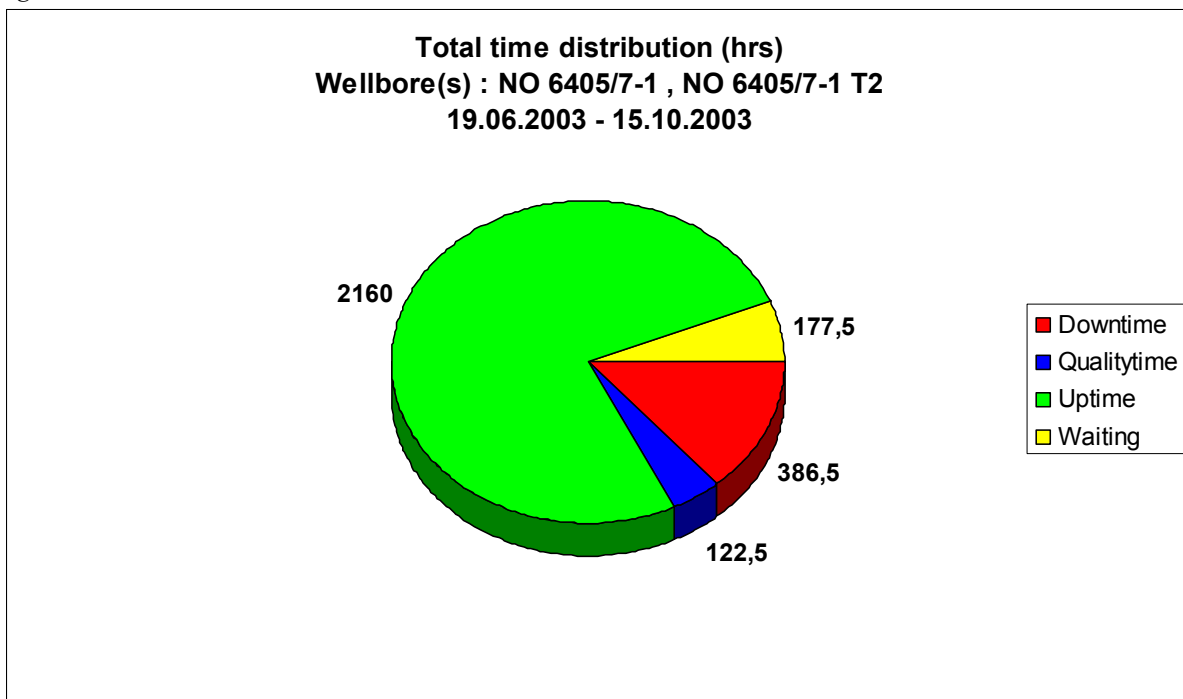
RCL logging tool			
Surface computer to Baker Atlas crashed	230670	09.08.2003	
9 5/8" liner got stuck while making up cement stand	230934	11.08.2003	
Problems with the pipe handling system	231123	12.08.2003	
Problems with DP system	231414	16.08.2003	
Sperry Sun delivered small radioactive sources in a 10 ft container	232385	24.08.2003	
3 m <sup>3</sup> of brine was lost to sea	233055	29.08.2003	
Problems with RCI packer on logging tool	235019	14.09.2003	
Problems with RCOR logging tool	235021	14.09.2003	
Troubleshoot weight indicator	235022	14.09.2003	
HPU unit shut down	235027	14.09.2003	
Secured finger on upper guiding arm	235030	14.09.2003	
Skate pusher solenoid valve problems	235032	14.09.2003	
Problems with riser tensioner support ring rotation system	235717	20.09.2003	
Damaged proximity switch on main skate	235965	21.09.2003	
Racked one stand of 3 1/2" tubing due to damaged pin end	235966	21.09.2003	
Leak in poppet valve on retainer valve	236810	27.09.2003	
Communication problem on Metrol system	236811	27.09.2003	
Troubleshoot main rig hoisting function.	236917	29.09.2003	
Diesel supply broke down	237091	29.09.2003	

**3.5 Time distribution**

Total time	<b>118,6 days</b>
Total down time	<b>386,5 hrs</b>
Waiting on weather (WOW)	<b>162,0 hrs</b>
<hr/>	
Ops. Factor: = $\frac{\text{Total\_time} - \text{Down\_time} - \text{WOW}}{\text{Total\_time} - \text{WOW}} * 100$	<b>85,6%</b>

Table 3.2

Fig. 3.1 Time distribution



## **4 Geology and formation data report**

### **4.1 Geological setting**

Block 6405/7 is situated in the area between the Møre Basin and the Vøring Basin. The structural framework of these basins was established during the Upper Jurassic/Lower Cretaceous extensional tectonics in the region. Later structuring is mainly related to the Cretaceous and Tertiary basinal subsidence. Major nearby structural elements are the Klakk Fault Complex to the east, the Grip High in the west, the Helland Hansen Arch opening up to the north and the Ormen Lange Dome to the south. Inversion in the early to mid Eocene until the mid Miocene caused the development of Ellida 4-way dip closures. (Figure 4.3)

The well was drilled on the Ellida South prospect in the southern part of the block 6405/7 and penetrated rocks of Quaternary to Cretaceous age (Holocene-Middle Coniacian). The TD is within the Lysing sandstone member. The primary target; sandstones in the Nise Formation, consists of distal gravity flow deposits. The secondary target; sandstones of the Lysing Formation, is interpreted as “toe-of-slope” gravity flow deposits. Sandstones of the Egga Member equivalent of Danian age were also considered a possible target since the play was proven in the Ormen Lange area. A mapped flat event within the Nise Formation is interpreted to be an oil/water contact. A lithology effect cannot be excluded.

### **4.2 Shallow gas results**

No shallow gas warning was given for the well location based on the site survey report. No indication of shallow gas was detected on ROV sonar or MWD logs. The standard NPD shallow gas form is presented in appendix E

### **4.3 Stratigraphy**

#### **4.3.1 General Information:**

The stratigraphy is based on biostratigraphy, wireline logs and correlation with nearby wells. It is illustrated in figures 4.4, 4.5, 4.6 and listed in table 4.2 and 4.3

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4.3.2 *Table of chronostratigraphy*

Stratigraphic succession		mMD	
		From	To
Tertiary	Lower Pliocene (Top not seen)	1920m	1937m
	-----Unconformity-----		
	Upper Oligocene	1937m	2082m
	Lower Oligocene	2082m	2270m
	Upper Eocene	2270m	2340m
	Middle Eocene	2350m	2470m
	Lower Eocene	2470m	2552m
	Upper Paleocene	2552m	2670m
	-----Unconformity-----		
	Cretaceous	Upper Maastrichtian	2670m
Lower Maastrichtian		2712m	2724m
Upper Campanian		2724m	2737m
Middle Campanian		2737m	2819.5m
Lower Campanian		2819.5m	2960m
Upper – Middle Santonian		2960m	3470m
Lower Santonian		3470m	3634m
Upper Coniacian		3634m	3968m
Middle Coniacian (Base not seen)		3968m	4300m

Table 4.1

### 4.3.3 Table of lithostratigraphy

Table of lithostratigraphy, well 6405/7-1					
Period	Group / Formation	Observed depth			TWT sec.
		mMD	m TVD	m TVD MSL	
QUATERNARY	NORDLAND GROUP. (Sea Floor)	1242.0	1242.0	1206.0	1.644
	Naust Formation	1242.0	1242.0	1206.0	1.644
TERTIARY	HORDALAND GROUP	1935.0	1935.0	1899.0	2.372
	Brygge Formation	1935.0	1935.0	1899.0	2.372
	ROGALAND GROUP	2506.0	2506.0	2470.0	3.010
	Tare Formation	2506.0	2506.0	2470.0	3.010
	Tang Formation	2602.0	2602.0	2566.0	3.108
CRETACEOUS	SHETLAND GROUP	2664.0	2664.0	2628.0	3.168
	Springar Formation	2664.0	2664.0	2628.0	3.168
	Nise Formation	2757.0	2757.0	2721.0	3.280
	TD	2816.0	2816.0	2780.0	

Table 4.2

Table of lithostratigraphy, well 6405/7-1T2					
Period	Group / Formation	Observed depth			TWT sec.
		mMD	m TVD	m TVD MSL	
TERTIARY	ROGALAND GROUP	2506.0	2505.0	2469.0	3.010
	Tare Formation	2506.0	2505.0	2469.0	3.010
	Tang Formation	2602.0	2601.0	2565.0	3.108
CRETACEOUS	SHETLAND GROUP	2664.0	2663.0	2627.0	3.168
	Springar Formation	2664.0	2663.0	2627.0	3.168
	Nise Formation	2760.5	2759.5	2723.5	3.280
	Kvinos Formation	2960.0	2959.0	2923.0	*
	Lysing Sandstone Member	3665.0	3664.0	3628.0	4.053
	TD	4300.0	4299.0	4263.0	

Table 4.3







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The pick of the top of the Nise Formation is based on an increase in resistivity, caused by oil-filled sand/siltstone and on information from the image log and core data.

The Nise Formation consists of interbedded/laminated and bioturbated sandstone, claystone and siltstone. Towards the base of the formation there are some thin limestone and dolomite stringers. The sediments are thought to represent deep-marine, highly bioturbated and reworked low density/low concentration turbidite deposits. Deposition occurred within the upper bathyal-zone i.e. at a few hundreds of meters of water depth. Figure 4.1 is a core photo from 2781m-2781.5m and illustrates the appearance of sediments.

The claystone is dark green grey to olive grey, dark to medium grey, firm to moderately hard, blocky, sub fissile, often very micaceous; biotite and muscovite, micropyritic with occasional to abundant pyrite veining, glauconitic, with abundant glauconite pellets in places. Occasional coarse plant debris and very fine black carbonaceous material occur. It is generally non calcareous. It grades to siltstone in places.

The sandstone, mainly discrete laminae or lenses, is medium grey to light medium grey, occasionally light green grey with clear to translucent, very fine to fine, occasionally medium grained, angular to sub-rounded, well sorted, mostly loose quartz grains with a medium grey to dark grey argillaceous matrix, or clear siliceous or calcareous cements. Abundant glauconite pellets, mica, both biotite and muscovite, occasionally coarse pyrite, sometimes crystalline. It grades to siltstone and shows generally poor to no visual porosity.

Bright yellow-green direct fluorescence and blue white cut fluorescence was present in the cored section.

The siltstone is olive grey, medium dark grey grading to medium grey with depth, amorphous, abundant very fine to fine, sub-angular quartz grains, locally abundant glauconite pellets, pyrite veining, and nodules, occasional very fine to coarse mica (biotite and muscovite) and also traces to abundant carbonaceous material and coarse plant remains. It is slightly calcareous in places, grading to very fine sandstone.

The limestone/dolomitic limestone is varicoloured, blue white, light green grey, pale olive, grading to light brown, dark yellow orange in dolomitic parts, soft to moderately hard, crumbly to splintery, microcrystalline, occasionally coarse crystalline calcite.

The image log indicates a fault in the interval 2758m to 2760m.

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Core no. 2, 2781-2781.5m



2781.5m

2781m

*Fig. 4.1*

**Kvitnos Formation**

**2960.0 – 4300 m MD, (2959.0 - 4299.0 m TVD)**  
**(2923.0 - 4263.0 m TVD MSL)**

**System: Cretaceous**

**Series: Upper Cretaceous**

**Stage: Lower Campanian - Middle Campanian**

**Depositional environment: Marine shelf - bathyal**

The boundary between the Kvitnos Formation and the Nise Formation is based on biostratigraphy, the transition from Campanian to Santonian. The Kvitnos Formation is similar to the overlying Nise in the general characteristics. It consists predominantly of claystone grading to siltstone, with very fine sandstones present. The logs indicate a more interbedded lithology from the top and down to 3200m than in the Nise Formation.

The Lysing sandstone member is located in the lower part of the Kvitnos Formation from 3665m to TD of the well.

The claystone is medium grey to dark grey, soft to firm, mainly blocky, occasionally sticky, micromicaceous, also occasionally coarser mica, both muscovite and biotite, with occasional very fine glauconite pellets, microcarbonaceous, occasional coarse plant material, occasional pyrite nodules, also occasional very fine quartz, grading to siltstone in places.

The siltstone is medium grey to medium dark grey, becoming light grey to medium light grey with depth. It is argillaceous, soft to firm, crumbly to blocky in places, occasionally amorphous and sticky, with traces to abundant carbonaceous material and plant remains, abundant very fine glauconite pellets and very fine to coarse mica -muscovite and biotite. Some quartz grains, clear to translucent to light green grey, very fine to fine, sub angular to sub rounded occur. It is grading to very fine sandstone with a medium grey argillaceous matrix.

The sandstone is light medium grey to medium grey, occasionally light green grey, dark grey, clear to translucent, quartz grains, very fine to fine, sub angular, well sorted. There is a light to medium grey argillaceous matrix in places also locally a light green grey kaolinitic matrix. Some soft to friable

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siliceous cement, and very occasional hard calcareous cement occur. There are occasional to abundant dark green to black glauconite pellets, coarse mica; muscovite and biotite, and carbonaceous material including plant remains. Poor visual porosity. No shows were reported.

**Lysing sandstone member**                      **3665 – 4300 m MD, (3664 - 4299.0 m TVD)**  
**(3628 - 4263.0 m TVD MSL)**

**System: Cretaceous**

**Series: Upper Cretaceous**

**Stage: Lower Campanian - Middle Campanian**

**Depositional environment: Marine shelf - bathyal**

The Lysing sandstone member is characterised by interbedded sandstones, siltstones and claystones. Limestone stringers occur. The sediments are thought to be highly bioturbated and reworked low density/low concentration turbidite deposits

In the cored interval the sandstones appear as laminations and lenses and are grading to siltstone. The cores show that the sandstones and claystones are strongly bioturbated. The sandstones are observed as either discrete lenses, thin inclusions, larger discrete units, less occasionally as laminations, often as infill to burrows whilst the claystones are often observed as drapes around sandstone lenses disrupting fissility, and as discrete clasts in thicker sandstone units, possibly rip up clasts. The figure 4.2 is a photo of an interval in core no. 6 and illustrates the lithology. It is likely that this lithology is similar throughout the Lysing sandstone member.

The sandstone is clear, transparent, light green grey, occasionally dark grey, translucent, very fine to occasionally coarse, predominantly fine to medium, angular to subrounded, elongate to subspherical, moderately to occasionally poorly sorted quartz, with hard siliceous, occasionally calcareous or pyritic cement. Light green grey kaolinitic matrix, occasional to abundant glauconite pellets, occasional black carbonaceous material, also muscovite and biotite mica. No visible porosity. No shows.

The siltstone is olive grey, occasionally brown grey, soft, amorphous, sticky with abundant very fine to fine, subangular to subrounded quartz, glauconitic, micropyrritic, very fine black carbonaceous material, occasional micaceous, slightly calcareous in places, occasional clear, transparent sponge spikes. The siltstone is grading to silty claystone and occasional very fine sandstones.

The claystone is generally grey brown grading to dusky brown, dusky yellow brown, occasionally medium grey, soft to firm, occasionally moderately hard, predominantly amorphous, sticky, plastic, occasionally blocky, glauconitic, micaceous, trace pyrite, occasional to abundant very fine to fine subangular quartz.

The limestone is light green grey, yellow grey, pale olive, firm to moderately hard, crumbly to blocky, argillaceous in places, microcrystalline.

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Core no 6, 3751.4-3751.8m

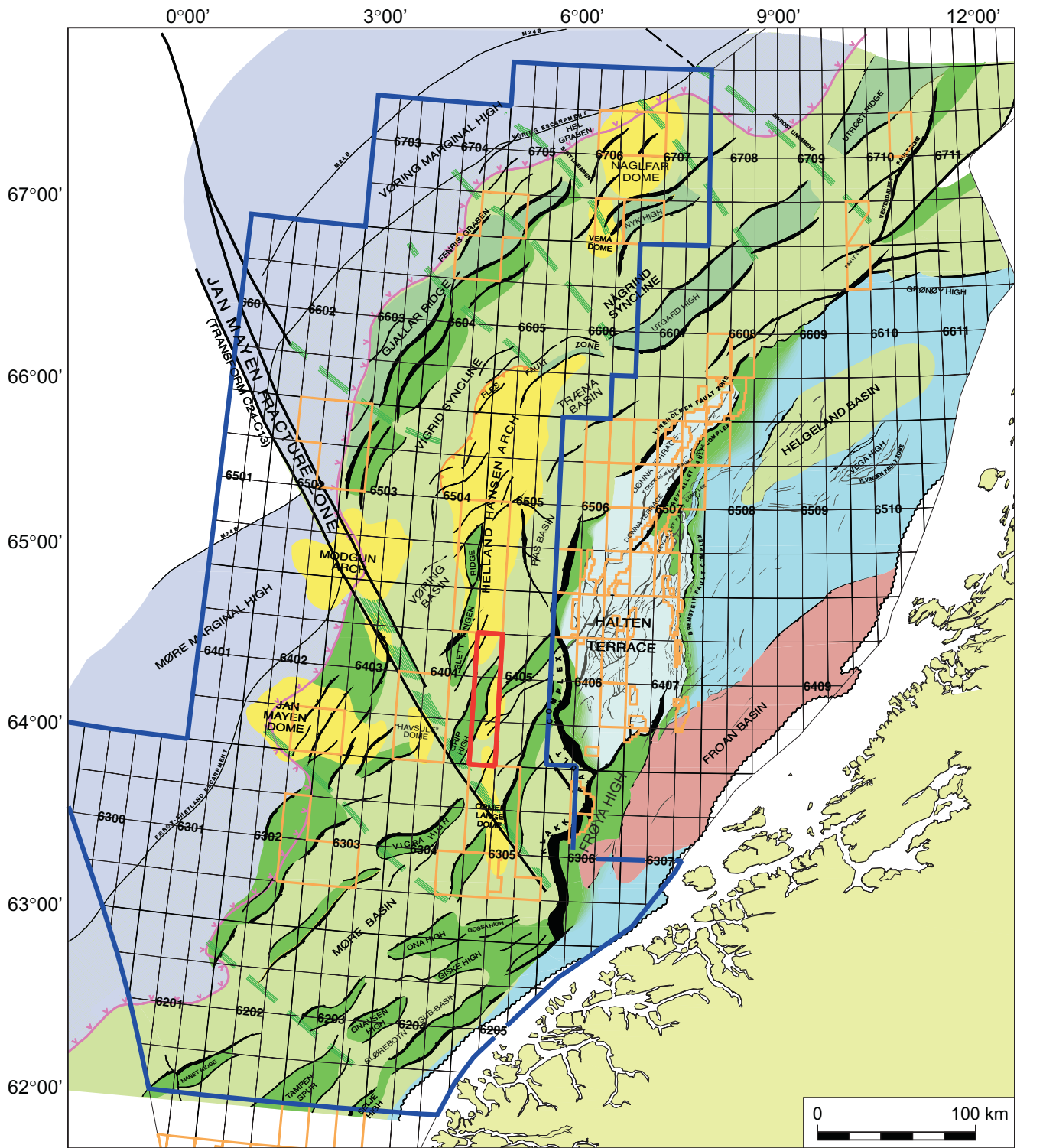


3751.8m

3751.4m

*Figure 4.2*

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- |                                                                                                                                           |                                                                                                                                                                  |                                                                                                                                                                           |
|-------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <span style="border: 1px solid red; display: inline-block; width: 15px; height: 10px; vertical-align: middle;"></span> Blocks applied for | <span style="background-color: yellow; display: inline-block; width: 15px; height: 10px; vertical-align: middle;"></span> Tertiary domes and arches              | <span style="background-color: lightblue; display: inline-block; width: 15px; height: 10px; vertical-align: middle;"></span> Jurassic platform area                       |
| <span style="border: 1px solid blue; display: inline-block; width: 15px; height: 10px; vertical-align: middle;"></span> AMI Area          | <span style="background-color: lightgreen; display: inline-block; width: 15px; height: 10px; vertical-align: middle;"></span> Late Cretaceous uplift             | <span style="background-color: lightcyan; display: inline-block; width: 15px; height: 10px; vertical-align: middle;"></span> Jurassic terrace area                        |
| <span style="border: 1px solid orange; display: inline-block; width: 15px; height: 10px; vertical-align: middle;"></span> Held Acreage    | <span style="background-color: #c8e6c9; display: inline-block; width: 15px; height: 10px; vertical-align: middle;"></span> Cretaceous basins                     | <span style="background-color: #bbdefb; display: inline-block; width: 15px; height: 10px; vertical-align: middle;"></span> Volcanic marginal high                         |
|                                                                                                                                           | <span style="background-color: #81c784; display: inline-block; width: 15px; height: 10px; vertical-align: middle;"></span> Upper Jurassic/Lower Cretaceous highs | <span style="border-bottom: 1px dashed green; display: inline-block; width: 15px; height: 10px; vertical-align: middle;"></span> Transfer zones                           |
|                                                                                                                                           | <span style="background-color: #e57373; display: inline-block; width: 15px; height: 10px; vertical-align: middle;"></span> Permo-Triassic basin                  | <span style="border-bottom: 1px dashed pink; display: inline-block; width: 15px; height: 10px; vertical-align: middle;"></span> Eastern extent of Palaeocene basalt flows |
|                                                                                                                                           |                                                                                                                                                                  | <span style="border-bottom: 1px dashed black; display: inline-block; width: 15px; height: 10px; vertical-align: middle;"></span> Subcrop of Basement below Quaternary     |

Updated structural elements map (modified from Blystad et al., 1995).

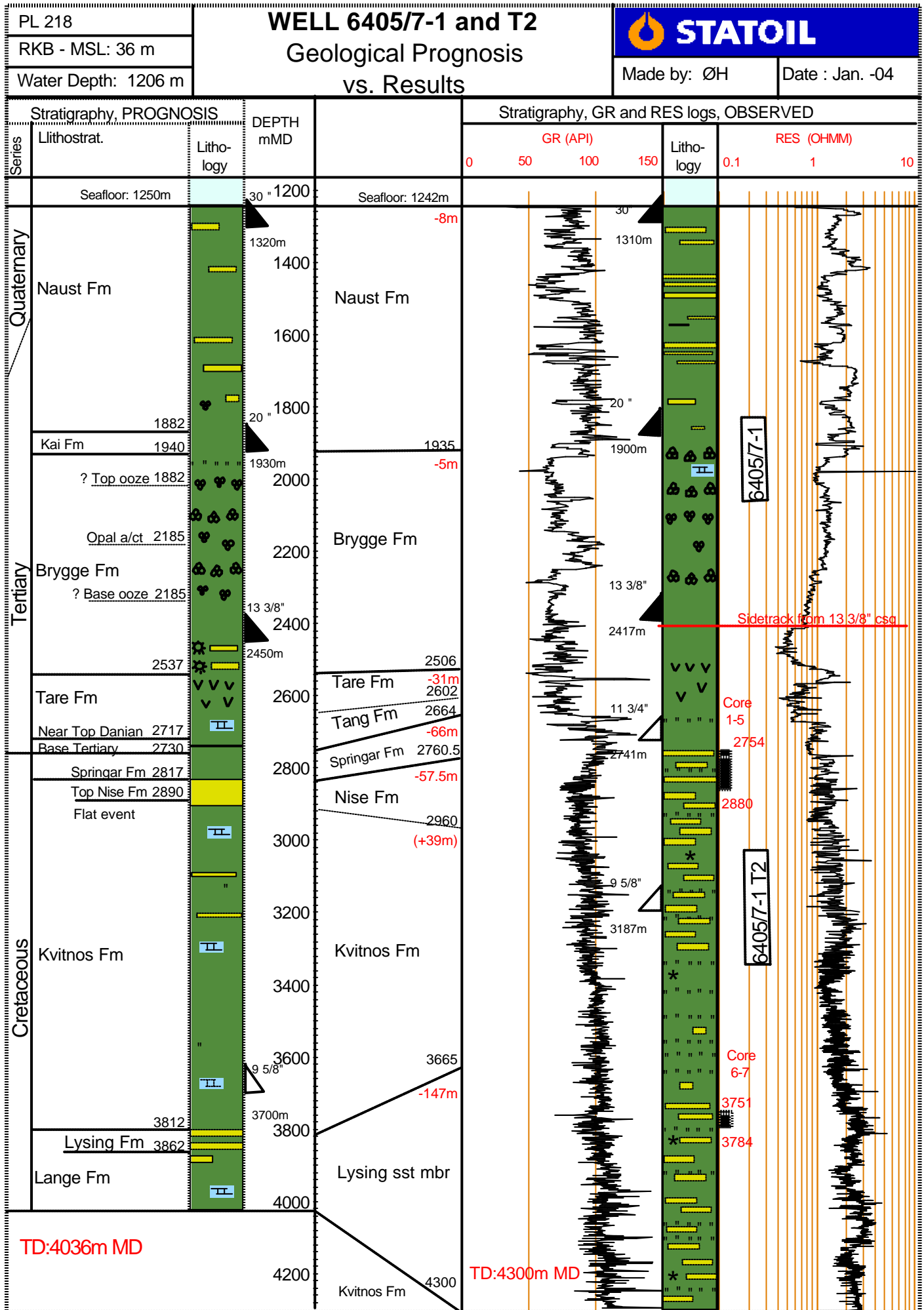


Figure 4.4

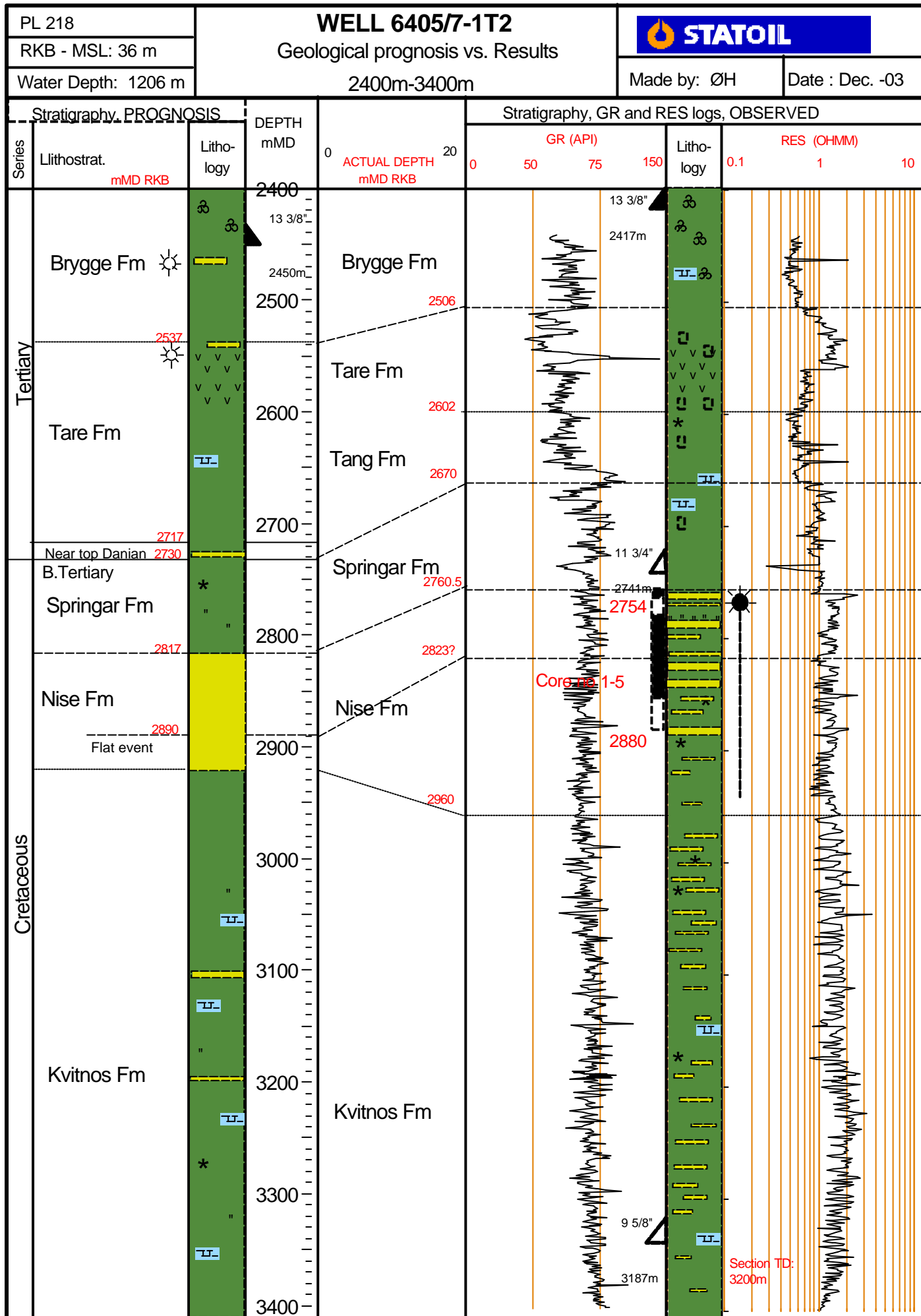


Figure 4.5

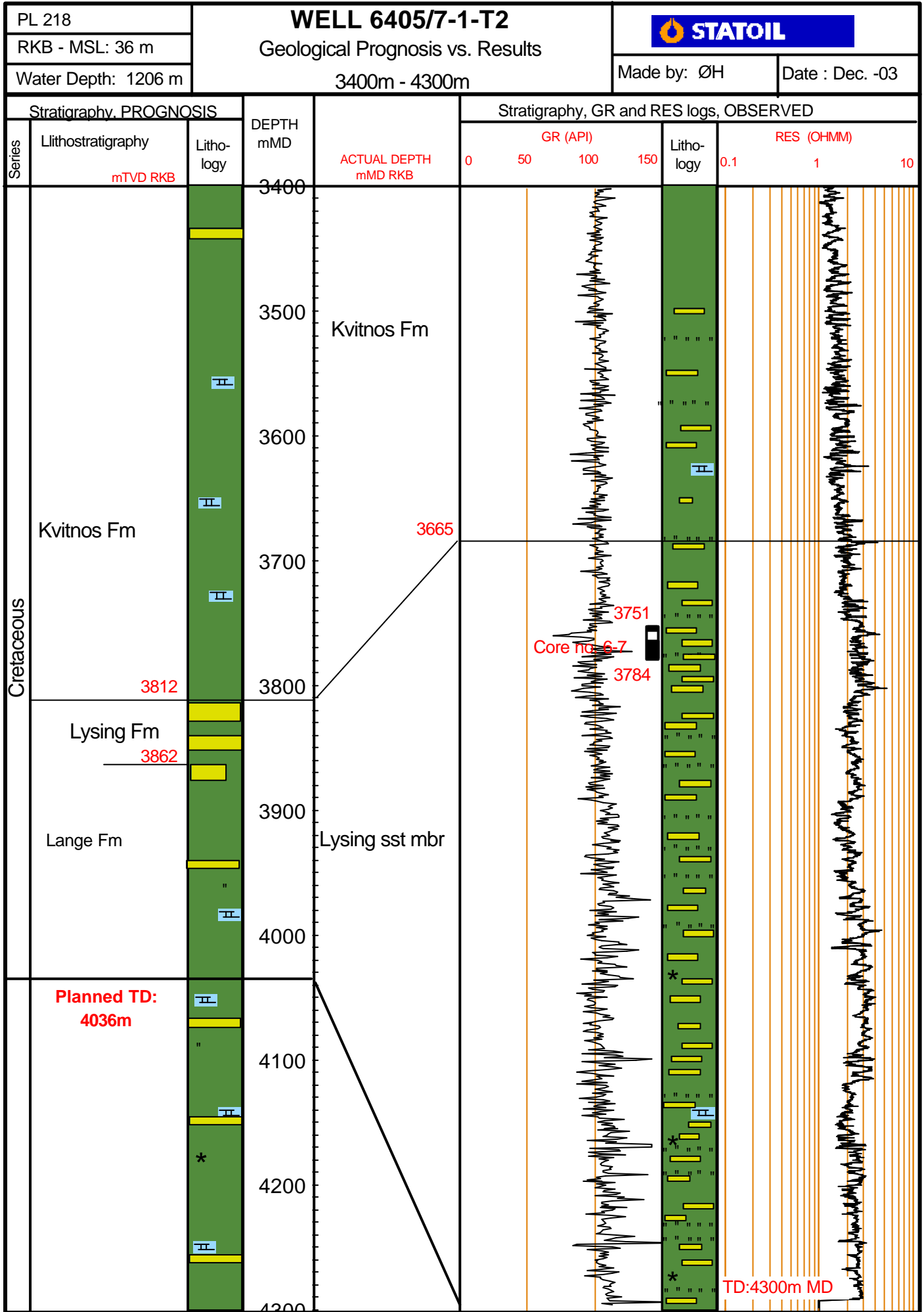


Figure 4.6

#### 4.5 HYDROCARBON INDICATIONS / SHOWS:

The 36” and 26” hole sections were drilled to 1910m with returns to sea floor, hence no gas measurements were possible. However, no indications of shallow gas were detected using ROV sonar or MWD/LWD logs while drilling these sections.

The result was confirmed by the 8 ½” hole drilled from seafloor to 1920m, 15m from the original well location using LWD.

Gas measurement was performed from 20” casing to TD of the well.

The gas level was low down to 2708 m were the background gas increased abruptly, caused by abnormal pore pressure. Reaching 2816m, gas peaks up to 60 % was recorded, oil in the mud was observed and fluorescence on cutting was described. The 12 ¼” hole section was plugged and a sidetrack drilled from the 13 3/8” casing shoe.

In 6405/7-1T2, only a few gas peaks were recorded.

Table 4.4 and 4.5 and figure 4.8 highlight the main observations. Details on gas measurements are given in the mud logging report.

#### Tables of gas breakdown, original hole and in side track:

Total gas and gas break down in 6405/7-1										
Depth MMD	mTVD	Gas %	Type	BG %	C1 ppm	C2 ppm	C3 ppm	nC4 ppm	iC4 ppm	C5 ppm
1910.0	1910.0	1.80	TG	0.01	11031	101	6	2	2	
2053.0	2052.0	0.20	FG	0.10	490	9	3	1	1	
2250.0	2250.0	1.20	STG	0.13	7991	234	7	2	3	
2315.0	2315.0	0.27	FG	0.24	1873	21	5	2	2	
2414.0	2414.0	1.10	STG	0.30	7635	11	6	2	2	
2507.0	2507.0	0.60	FG	0.47	5344	78	5	2	3	4
2667.0	2667.0	1.60	FG	0.60	12702	594	104	19	27	12
2708.0	2708.0	14.95	FG	1.20	70087	3744	588	111	140	47
2714.0	2714.0	14.20	FG	1.20	89789	5941	1225	233	297	98
2618.0	2618.0	41.50	POG	14.50	220121	22310	7430	1418	2011	760
2759.0	2759.0	19.70	FG	11.40	111967	9215	2856	481	647	222
2768.0	2768.0	14.30	CG	11.40	82984	1141	5005	1037	1307	473
2796.0	2796.0	15.50	FG	14.50	100044	13323	5011	955	1260	473
2816.0	2816.0	60.40	FG	45.00	576531	27932	5362	1136	1797	994

Table 4.4

<b>Total gas and gas break down in 6405/7-1T2</b>										
<b>Depth MMD</b>	<b>Depth mTVD</b>	<b>Gas %</b>	<b>Type</b>	<b>BG %</b>	<b>C1 ppm</b>	<b>C2 ppm</b>	<b>C3 ppm</b>	<b>nC4 ppm</b>	<b>iC4 ppm</b>	<b>C5 ppm</b>
2471.0	2471.0	1.40	FG	0.50	8988	95	9	10	28	53
2531.0	2531.0	2.40	FG	2.40	19377	198	11	9	26	59
2709.0	2707.9	32.20	FG	1.60	115281	4097	684	71	110	137
2748.0	2746.9	1.16	FG	0.80	9152	275	41	12	26	48
2780.0	2778.9	10.60	FG	0.90	88062	4374	667	64	100	96
2803.0	2082.9	2.90	FG	1.30	24584	1509	263	29	42	40
2835.0	2834.0	4.80	TG	1.30	35791	2198	345	67	112	97
2862.0	2861.0	1.60	TG	0.70	14573	989	216	34	56	14
3200.0	3199.0	18.50	TG	3.50	166097	14902	3561	431	552	190
3751.0	3750.0	1.20	TG	0.12	6933	319	112	17	22	14
3784.0	3783.0	1.80	TG	0.40	11225	689	297	49	61	27
3801.0	3800.0	2.20	FG	0.90	13829	795	270	32	42	14
4295.0	4293.6	0.73	FG	0.50	3839	243	192	30	56	21

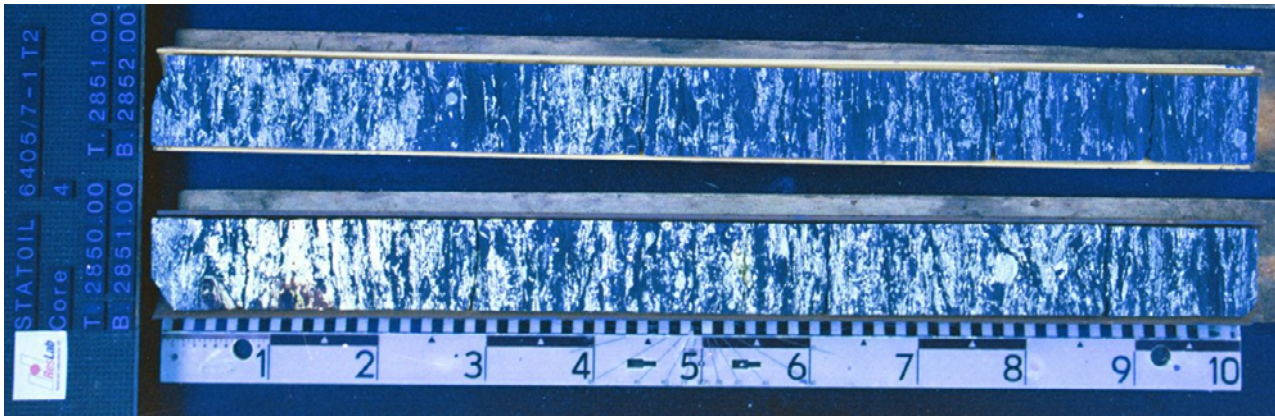
Table 4.5

Fluorescence is described from the top of the Nise Formation and down to 2892m, both on cuttings, cores and sidewall cores. A possible oil/water contact is interpreted at 2823m. The table 4.6 gives an overview of the fluorescence described in the core and figure 4.7 is a core photo in UV light from 2850-2852m, below the oil/water contact.

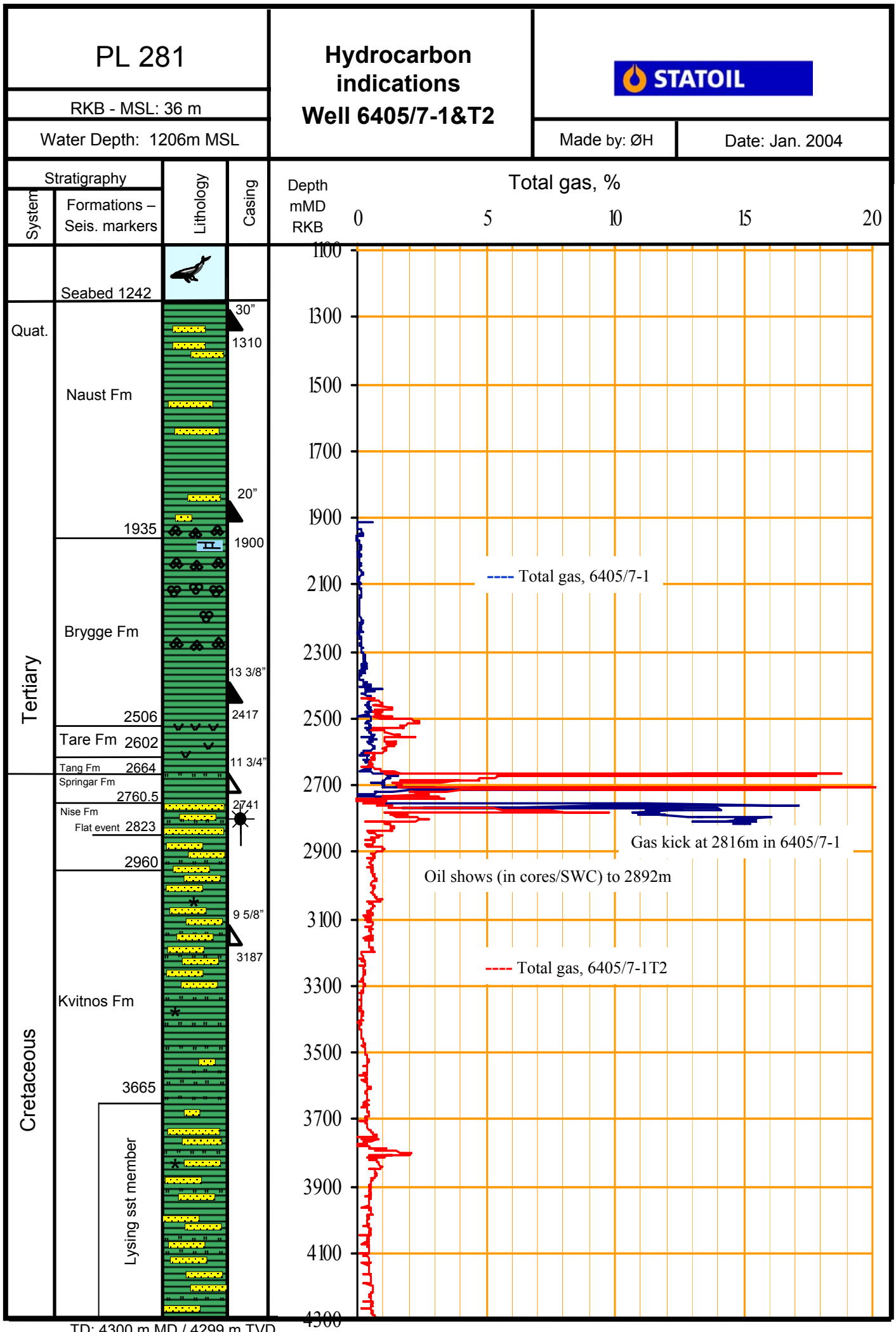
<b>Fluorescence from the cores</b>				
<b>Depth Interval</b>	<b>Odour</b>	<b>Stain</b>	<b>Direct fluorescence</b>	<b>Cut fluorescence</b>
2760-2763m	Yes		Bright yellow	Strong blue white
2781m			Bright yellow	Weak slow blue white
2786-2793m			Bright yellow	Yellow white-blue white
2796m	Yes		Dull yellow	Yellow-white
2798-2802m			Dull yellow	Yellow-white
2804-2806.6m	Weak		Even-patchy yellow white	Mod fast yellow white cut
2808-2817m	Yes	Trace	Bright patchy yellow	Mod to slow blue white
2823-2831m	Weak	Trace	Strong yellow in laminae	Good to Mod blue white
2835-2852m	Weak		Bright-dull yellow in laminae	Moderate, slow, blooming to diffuse blue white.
2857m	Weak		Bright-dull yellow in laminae	Moderate, slow, blooming to diffuse blue white.
2863-2864m	Weak		Bright yellow / yellow white in laminae	Instantaneous streaming to slow diffuse blue white
2866-2868m	Weak		Bright yellow / yellow white in laminae	Instantaneous streaming to slow diffuse blue white

Table 4.6

Core no. 4, 2850-2852m illustrates the fluorescence in Nise Formation below the interpreted oil/water contact.



*Figure 4.7*



TD: 4300 m MD / 4299 m TVD

Figure 4.8

#### **4.6 Geophysical results**

The formation tops down to top Cretaceous were encountered close to prognosis and within the prognosed uncertainties.

From Top Cretaceous and down to TD the observed tops were encountered shallower than expected. This is caused by use of too high velocities in the depth conversion. The discrepancy on base Nise Formation is due to poor seismic control/tie to other wells.

Figure 4.4 illustrates the prognosed and observed formation tops, and figure 4.9 shows the seismic interpretation after drilling.

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# Seismic interpretation

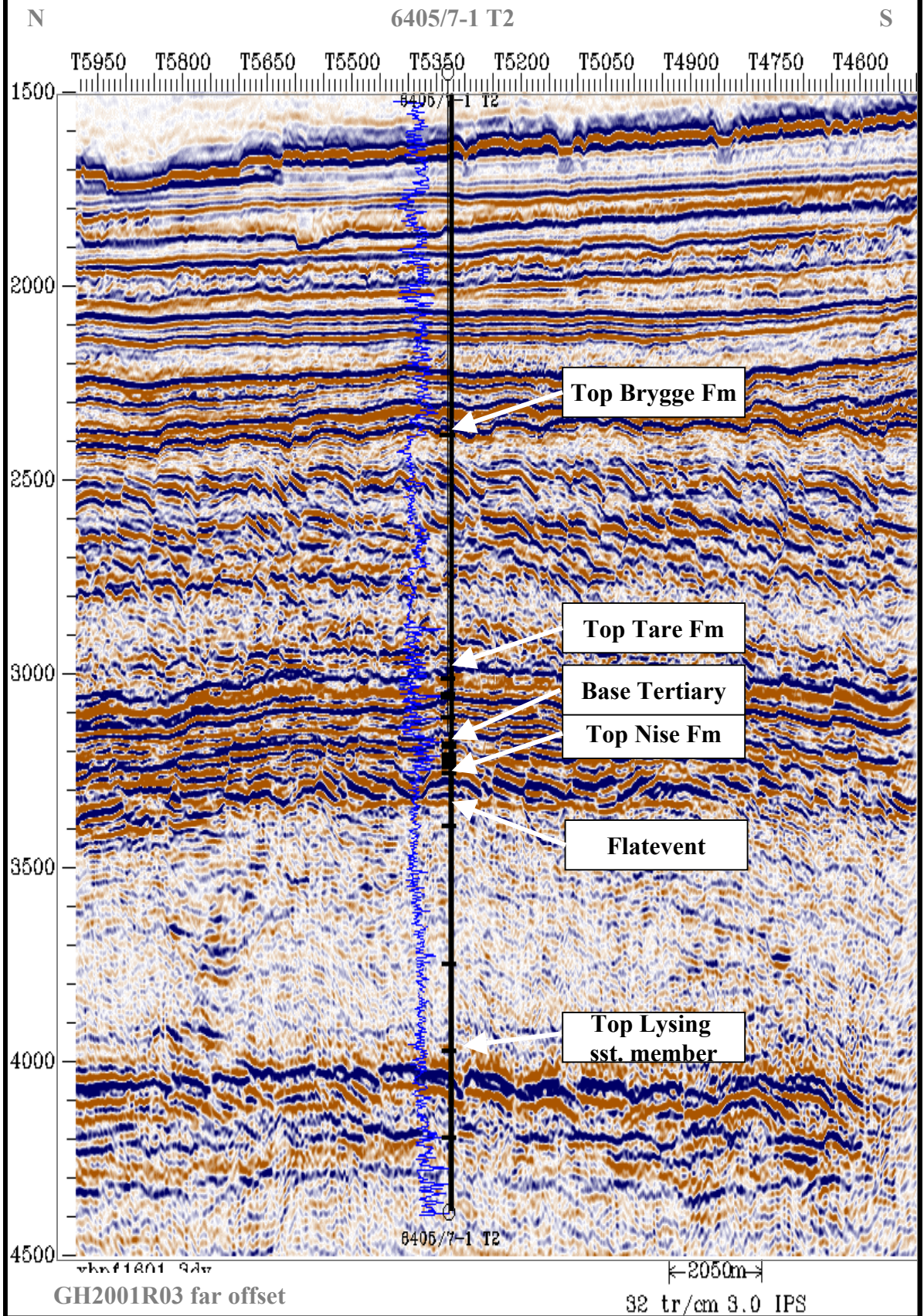


Figure 4.9

# PL281 Top Nise Depth Map (Post Well)

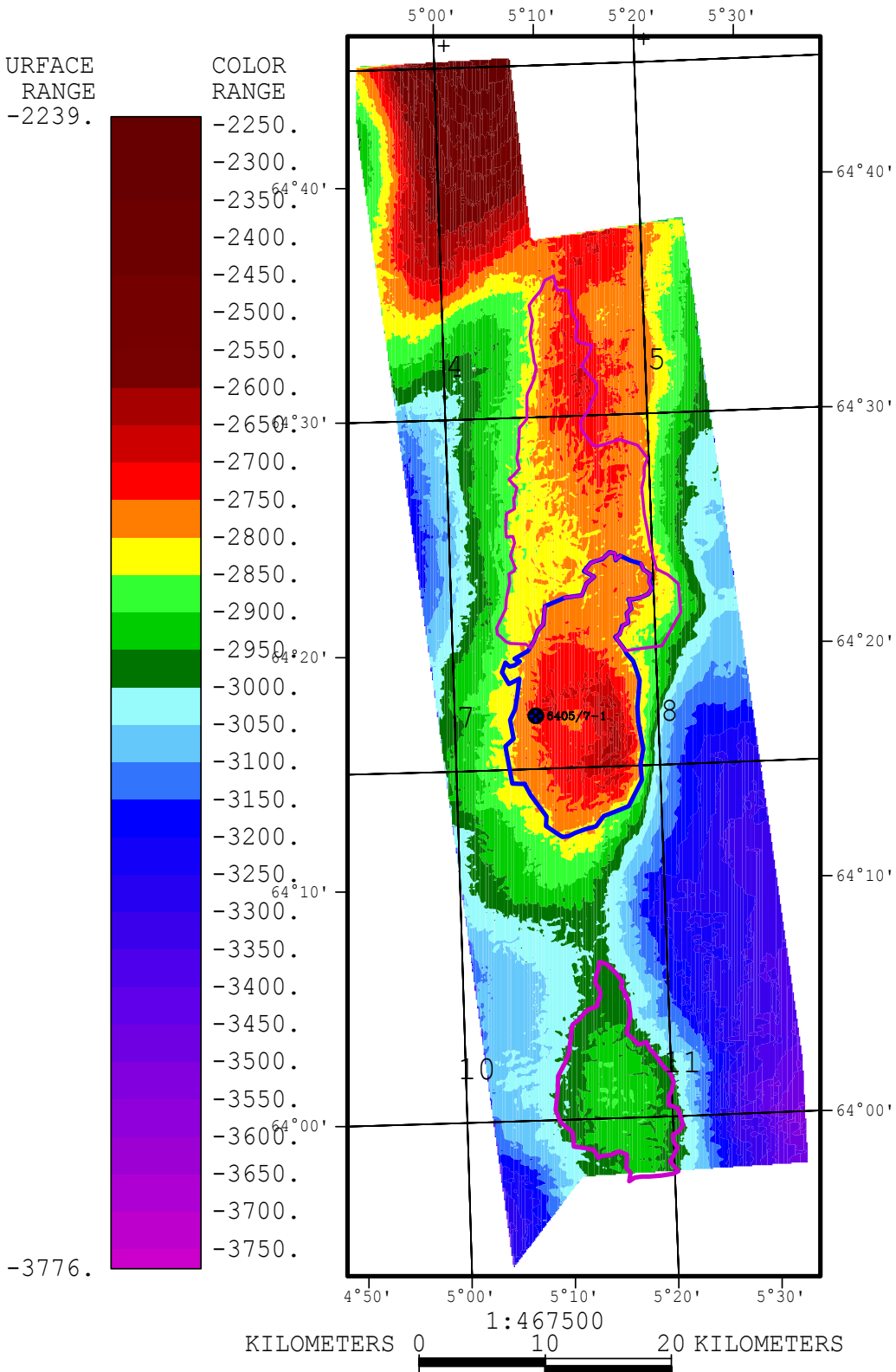


Figure 4.10

## 4.7 Data acquisition

### 4.7.1 Cuttings, mud and gas samples

In 6405/7-1, cuttings were collected every 10m in the interval 1912m to 2650m and then every 3m down to 2816m.

In 6405/7-1 T2 cuttings were sampled from 2417m to 2742m for description only. From 2742 and to top of core 1, at 2754m, the sampling interval was 3m. Cores were cut down to 2880m and the sampling of cuttings continued from this depth to TD. Samples were then every 6m from 2880m to 3000m, every 10m from 3000m to 3600m, every 3m from 3600m to 3804m and every 6m for the remaining of the well. Cuttings descriptions are attached in Appendix D.

Mud samples were collected every 200m from 20" casing to TD and every 20m through the Nise Formation.

Drill gas was collected in sample bags when the background gas increased significantly and when gas peaks occurred. Table 4.7 shows the sampling depths.

6405/7-1		6405/7-1 T2	
Depth, m	% gas	Depth, m	% gas
2135.5	0.2	2669	19.9
2249.7	0.9	2709	30.2
2389.5	0.4	2781	10.2
2403.5	0.6	2808	3.6
2425.5	0.3	2835	4.8
2425.5	0.4	3412	0.2
2425.5	2.5	3719	1.2
2469.6	0.5	3747	0.8
2537.8	0.5	3801	2.2
2667	1.3		
2708	13		
2759	19.7		
2767	13.2		
2794	13.4		
2798	15.2		
2814.5	15.5		
2816	21.3		
2816	33		
2816	27		
2816	31		
2816	39		
2816	55		

Table 4.7

Biostratigraphy was performed on cuttings, on the rig, in preplanned intervals. The results were used to confirm the stratigraphy. The biostratigraphy is shown in table 4.1. A separate report has been made.

#### 4.7.2 Conventional coring

Five cores were taken in the Nise Formation and two in the Lysing sandstone member in the 6405/7-1 T2. Core barrels of 27m were used for all seven cores. A jambuster equipment (telescopic inner tubes) was used for the cores 1-4 and for the core 7. The core 5 and 6 were cut with standard core equipment. The recovery was better than experienced in the area, probably due to use of the Jambuster. It was proven that the Jambuster was activated three times during the core run 1 and 2. It is uncertain if it was activated during some of the other core runs since the aluminium inner tubes had been removed at the core laboratory before proper assessment was conducted. The total amount of core cut was 159m with a recovery of 123.6m. Core information is given in table 4.8 and figure 4.11. Core descriptions are attached in Appendix F.

Core no.	Cored interval (m)	Recovered			Barrel length	Shifted interval m	Comments
		Interv. (m)	m	%			
1	2754 - 2781	2754 - 2764	10	37	27	2755.05 - 2765.05	Jambuster; Jammed, milled 19mtr
2	2781 - 2808	2781 - 2808	25.6	95	27	2781.64 - 2806.88	Jambuster
3	2808 - 2835	2808 - 2831	23.6	87.4	27	2806.94 - 2829.94	Jambuster
4	2835 - 2862	2835 - 2862	26.8	99	27	2833.24 - 2859.74	Jambuster
5	2862 - 2880	2862 - 2880	7.4	40.9	27	2860.35 - 2867.75	No Jambuster; Jammed
6	3751 - 3757	3751 - 3757	5.01	83.5	27	?	No Jambuster; Stopped due to low ROP. Difficult to depth shift
7	3757 - 3784	3757 - 3784	26.1	96.9	27	3755-3782 ?	Jambuster. Difficult to depth shift

Table 4.8: Coring summary (The depth shift of core no 1-5 is based on image log)

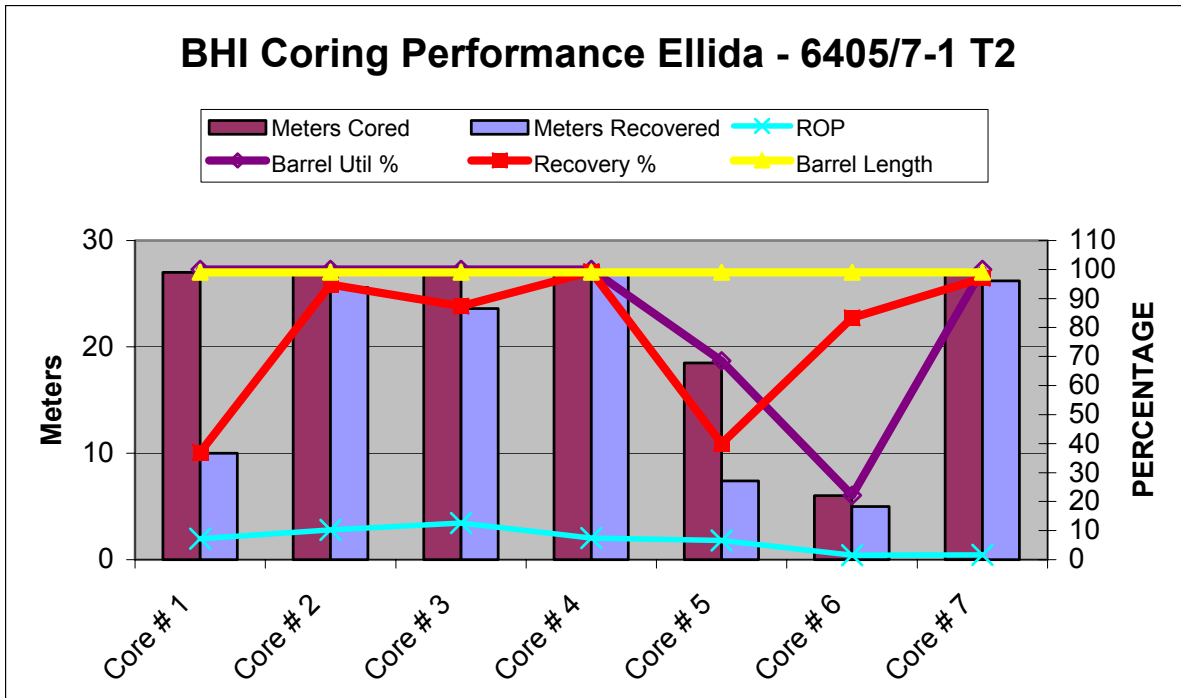


Figure 4.11

Rotary sidewall cores were taken both in the Nise Formation and Kvitnos Formation. In the first run, 25 of 29 SWCs were recovered and in the second run, 8 were recovered out of 12. The sidewall core descriptions are attached in Appendix E.

#### 4.7.3 MWD/LWD

Run no	Tool combination	Interval	Remarks
<b>Well 6405/7-1</b>			
1	DIR-RES-GR	1312-1910	Flat battery; did not store PWD data in memory in 26" section.
2	DIR-RES-GR	1849-2425	
3	DIR- RES-GR-Nuclear-Sonic	2428-2816	
<b>Well 6405/7-1 T2</b>			
4	DIR- RES-GR	2440-2743	
5	DIR- RES-GR	2425-2743	
6	DIR- RES-GR	2740-3200	Pulser failed, data retrieved from memory
7	DIR- RES-GR	3200-3750	
8	DIR- RES-GR	3784-4300	
<b>Well 6405/7-1, data acquisition hole</b>			
9	DIR- RES-GR-Nuclear-Sonic	1242-1920	

Run no 1 and 2 conducted by Baker Hughes Inteq, run no 3 to 9 by Sperry Sun

Table 4.9

#### 4.7.4 Wireline logging

Run no.	Tool combination	Interval, m	Remarks
<i>Well 6405/7-1</i>			
1A	TTRM-DSL-ORIT-XMACii-DLL-MLL	2416 - 1900	
<b>Well 6405/7-1 T2</b>			
2B	TTRM-DSL-CN-ZDL-XMACii-DLL-MLL	3200 - 2625	Computer crash
2A	MRIL-GR	3112 - 2750	
2A	RCI-GR (std. Probe)	3158 - 2760	
2B	RCI-GR (straddle packer)	2824 - 2763	
	Wiper trip		
2A	RCOR-GR	3174 - 2765	Transmission & telemetry problems
2A	STAR-GR	3197.5 - 2736	
2C	RCI-GR (straddle packer)	2886.5 - 2754.5	Computer crash x 2
3C	TTRM-DSL-ORIT-XMACii-HDLL-MLL	4300 - 3187	
3C	TTRM-DSL-CN-ZDL-DLL	4300 - 3187	
3B	MRIL-GR	4300 - 3200	
3A	Walk-away VSP	4295 - 1885	
3D	RCI-GR (probe /straddle packer)	4195 - 3227	Noise + Unable to inflate packer
3B	RCOR-GR	4293 - 4099	12 cores-failed-misrun
3E	RCI-GR (straddle packer re-run)	3756.9	Problems to inflate packer
4A	PFC GR-EZSV bridge plug	2840 - 2650	
4A	SBT-CCL-GR	3185 - 2180	

Table 4.10

#### 4.7.5 Well testing

##### 4.7.5.1 Summary

Well test results from the well 6405/7-1T2 are summarized in this chapter. Three mini-DSTs and one full drill stem test (DST) were performed. The result from the DST confirmed the results from the mini-DSTs. The flow capacity seen by the DST was approximately three times the combined flow capacity of the mini-DSTs. Since the mini-DSTs covered only 7 m of the 52 meters perforated in the full DST, it is assumed that they were performed in intervals with better flow properties than the average for the full 52 m interval.

For more detailed information on mini-DST and DST operations and interpretation results, please refer to a separate "Well Test Report" that will be issued.

#### 4.7.5.2 Mini-DST

Three mini-DST's were performed with the RCI tool in this well. A straddle packer was used for recording the mini-DSTs, and fluid samples were collected in conjunction with the tests. The test results are listed in table 4.11. All tests showed low permeabilities.

Depth (m)	Pumping time (Hrs)	Build-up time (Hrs)	Hor. perm. (mD)	Vert. perm (mD)	Thickness (m)	Skin	Radius of investigation (m)
2806	~20	2.28	0.35	0.009	2	1.75	6.2
2705	~17	2.13	0.6	0.035	3	0.6	7.5
2763	4.85	2.83	0.345	0.0035	2	0.6	5.5

Table 4.11 Mini-DST interpretation results

#### 4.7.5.3 DST

The production test was performed in the Nise Formation in the interval 2758 m-2811.7 m. A period of 22 days was planned for the testing operations. The actual duration was 32 days, with 6.5 days spent on waiting on weather.

The primary objectives of the tests were to:

- Determine well productivity, flow capacity (kh), skin, etc
- Examine the effect of well stimulation (FracPack).

Secondary objectives were to:

- Obtain representative fluid samples
- Identify presence of heterogeneities and/or reservoir boundaries

The well was plugged back inside the 9 5/8" liner and displaced to clean brine. Tubing conveyed 4 1/2" guns were used to perforate the well. A mini-frac was performed before doing a FracPack for sand control. The test string was then run in the hole. An estimated 175 m<sup>3</sup> of frac fluid was lost to the formation during FracPack operations and an additional 120 m<sup>3</sup> of completion brine was lost in the 12 days that passed from the end of the FracPack operation until the well was put on flow. The test string was displaced to diesel to create a maximum underbalance, and injection of nitrogen at the sea floor was planned to assist in lifting produced liquids to the surface.

The well was open to flow for 74 hours 26 minutes. The well was producing without artificial lift as very little N<sub>2</sub> could be injected due to collapse of the injection hose. Total production was approximately 113 m<sup>3</sup> of water/brine, 60 m<sup>3</sup> of formation oil, and 8 m<sup>3</sup> of diesel, for a total liquid production of 181 m<sup>3</sup>. Flow rates were difficult to determine due to the low and unstable flow rates. An estimated total flow rate of approximately 40 m<sup>3</sup>/day was used for the test interpretation. No measurements of produced gas volumes were made as the gas rates were too low to be measured on the separator.

An acoustically transmitted surface read-out system was used to monitor sea floor and bottom hole pressures and temperatures. This system was also used to trigger bottom hole samplers. The build-up was stopped after 45 hours 22minutes based on data from the surface read-out and the test terminated.

The interpretation indicates a flow capacity of 9 mD-m. The horizontal permeability and radius of investigation are highly dependant on the on the model used for the interpretation. Different models will match the test data, and alternative interpretations are possible. Assuming a net-to-gross ratio of 0.2 and a porosity of 17%, the resulting permeability is 0.88 mD for a thickness of 10.4 m contributing to flow. A boundary could then be located approximately 43 m away from the borehole, and radius of investigation is 62 m. The fracture half-length would be 15 m with a fracture-face skin of 2.6.

For more detailed information about the fluid sampling and PVT properties, please refer to chapter 4.9 and separate PVT fluid reports. The main well test results are summarized in Table 4.12.

DST	Fm.	Perf.Interval (m MD RT)	Height (m)	Flow period	Choke size (mm)	WHP (bar)	WHT (°C)	BHP at ref. depth (bar)	BHT at ref. depth (°C)	Ref. Depth (m MD RKB)	Liquid rate (m <sup>3</sup> /d)
1	Nise	2758-2811.7	53.7	Main	12.7	~5	~10	390	72	2785	~40

Table 4.12: Well test results

## 4.8 Formation pressure

### 4.8.1 Pore pressure

Figure 4.14 shows the estimated pore pressure gradient, extended leak-off test (LOT) values and overburden gradient from wells 6405/7-1 pilot hole, 6405/7-1 and 6405/7-1T2. The pore pressure evaluation is based on LWD logs, wireline logs and drilling data. Pressure data from the RCI log was included in the reservoir sections.

A normal pore pressure gradient of 1.03 g/cc equivalent mud weight (EMW) is estimated from seabed at 1242 m down to approximately 1925 m. The pressure starts increasing at this depth, and increases gradually to approximately 1.24 g/cm<sup>3</sup> EMW at the bottom of the 17" section.

In the 12 ¼" section, pressure interpretation was difficult. D-exponent, resistivity and density data all failed to give meaningful pore pressure estimates in this section. Some gas peaks were noted, and the mud weight was increased. After drilling into the reservoir with a mud weight of 1.35 g/cm<sup>3</sup> EMW, several flow checks were performed at 2767 m without indications of gain. Connection gas peaks indicated that the pressure could be higher than the mud weight, but well 6405/7-1 was drilled 58 m into the reservoir section before a gain was noticed and that the well was actually being drilled underbalanced. This is indicative of the reservoir quality of the Nise Fm. reservoir section.

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The well was then plugged back and sidetracked as well 6405/7-1T2. At top of the reservoir section a pore pressure of 1.43 g/cm<sup>3</sup> EMW was later measured with the RCI-tool. This is the maximum pore pressure gradient for the well. The pressure decreases to 1.33 g/cm<sup>3</sup> EMW at approximately 3300 m in the upper part of the Kvitnos Fm.. Through the Kvitnos Fm., the pressure gradient is relatively constant. In the Lysing Formation the RCI measurements indicated a pressure of approximately 1.38 g/cm<sup>3</sup> at 3759 m.

The decrease in the calculated pore pressure gradient in the interval from 3980 to 4180 m (based on MWD resistivity log) may be due to lithology effects (sandy interval) and there is a possibility that the pore pressure gradient in this interval is somewhat higher (approx. 1.35 g/cc), indicated by the shaded area in the plot.

#### **4.8.2 Overburden**

The overburden gradient calculation is based on the density log from the LWD tool in the 6405/7-1 pilot hole from seabed down to 1900 m, from wireline logs in the 17" hole section from 1900 to 2417 m, from LWD logs in well 6405/7-1 from 2417 down to 2750 m, and from wireline logs in well 6405/7-1T2 from 2750 m to TD.

#### **4.8.3 Leak off tests**

The results of the leak-off tests made in the well are presented in table 1.1. The LOT exceeded the calculated overburden pressures at the 11 3/4" and 9 5/8" casing shoes. At the 11 3/4" casing shoe, an LOT of 1.6 g/cm<sup>3</sup> EMW was measured, and after drilling 10 m, a formation integrity test was performed to 1.55 g<sup>3</sup> EMW to verify the LOT. These leak off test results were based on evaluation of surface recorded data. Time recorded data from the MWD seem to indicate lower LOT values, but the evaluation of these data is not finished.

#### **4.8.4 Reservoir pressure summary**

##### **4.8.4.1 Nise Fm.**

Three runs with the RCI tool were made in the interval 2740.0 to 3200.0 m in 8 1/2" hole. A total of 126 pretests attempts were made, giving 45 recordings of formation pressure, 77 tight pretests and 4 pretests with lost seal. All recordings of formation pressure showed low permeability formation. No problems with sticking was experienced during the pretests, but after the first sampling with a probe at 2828 m, the RCI tool was stuck for one hour before it was pulled free.

The first run was run with only standard probes to record pressures and identify gradients. Sample chambers were also included in this run, and one water sample was taken. A straddle packer was included on the second and third run for sampling and mini-DSTs. Three mini-DSTs were performed in this hole section, and samples collected at four levels.

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A fluid gradient of 0.7 g/cm<sup>3</sup> was established with the RCI tool in the hydrocarbon bearing zones. The water gradient is uncertain, and there are indications that there could be different pressure regimes in the water zone. This is supported by the results from the water samples, as they seem to have different water compositions. The results of the pressure measurements are listed in table appendix D and plotted in figure 4.13

Interpretation of the downhole pressure measurements from the drill stem test confirmed the reservoir pressure in the Nise Fm.

For details on interpretation of mini-DSTs and DST #1, please see separate reports.

#### *4.8.4.2 Lysing Sst. Member*

Two runs with the RCI tool were made in the interval 3200.0 to 4195.0 m in 8 ½" hole. A total of 15 tight pretests were made using a probe on the first run. An attempt to use the straddle packer failed as the packer would not open. On the second run the straddle packer was set 2 times, but only one pressure measurement seemed to give a pressure reading indicative of formation pressure. An attempt to take a fluid sample was aborted due to the low permeability.

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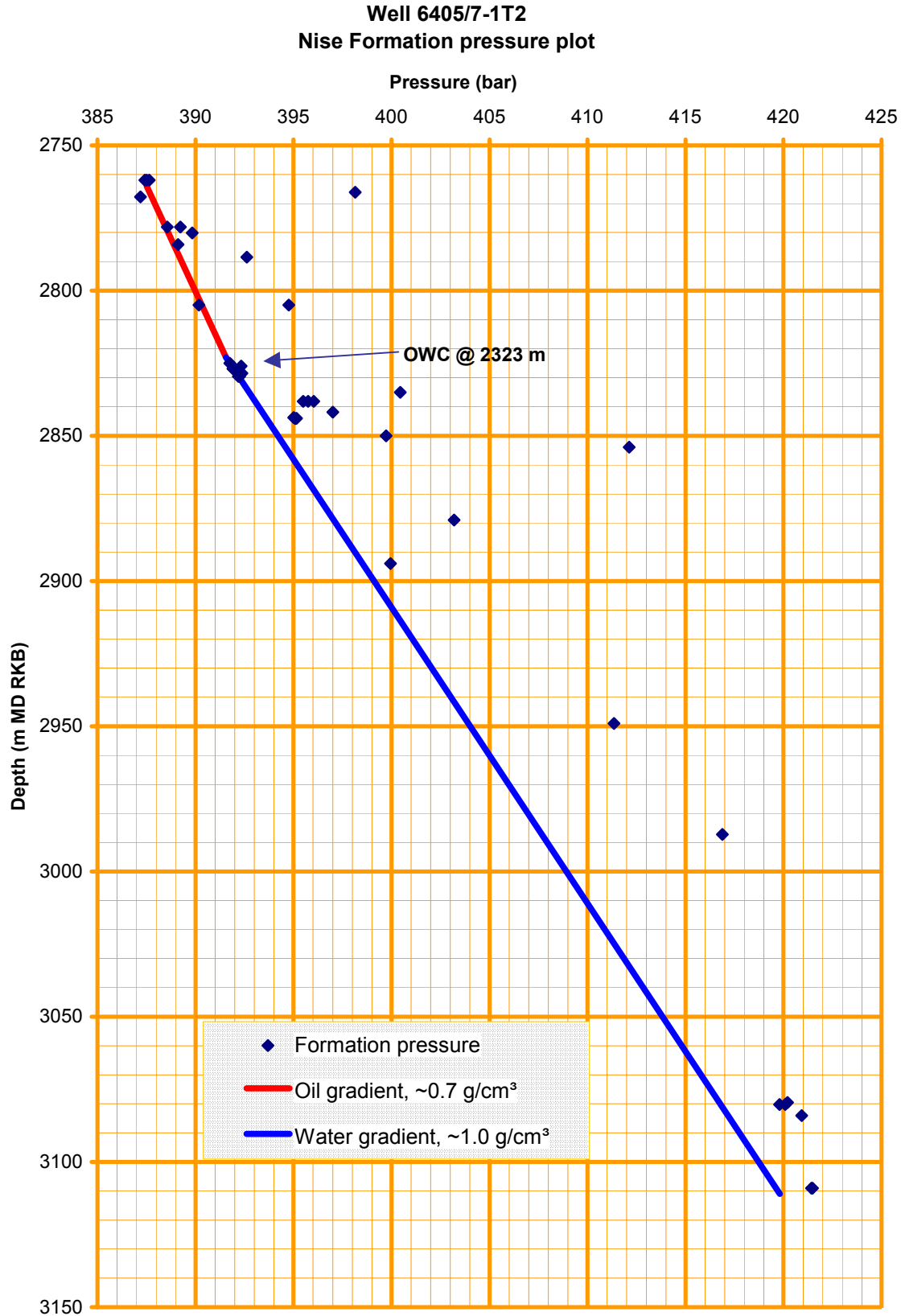


Figure 4.13

## **4.9 Reservoir fluid sampling**

### **4.9.1 Sampling summary**

The sampling program in the well showed that the Nise Fm. contained an oil system with good quality oil overlying a water zone with very fresh water. Due to the formation and well characteristics with low permeability and varying mud properties, there are uncertainties with respect to the fluid analysis results.

Oil samples were collected at 2806 m, 2770.5 m and 2763 m on wireline in addition to samples collected during the DST. Bubble point on samples were measured to approximately 345 bar, with formation volume factor  $B_o = 1.4 \text{ m}^3/\text{sm}^3$ , viscosity  $\mu = 0.46 \text{ cP}$  and gas to oil ratio  $R_s = 164 \text{ Sm}^3/\text{Sm}^3$  at this pressure. Stock tank oil density was measured to  $868 \text{ kg/m}^3$  ( $31^\circ \text{API}$ ).

Formation water samples were collected at 2828 m and 2950 m on wireline. The samples were too contaminated to give complete and accurate formation water properties, but the formation water is clearly very fresh, with Chloride concentrations between 5 000 mg/l and 10 000 mg/l.

### **4.9.2 Wireline fluid samples**

Extensive sampling of reservoir fluids was made with the RCI tool, and long sample clean-ups were performed. There are some uncertainties regarding the actual contamination values due to mud parameters not being kept constant during drilling and logging of the 12 ¼" section. Both standard and single phase samples were collected. The first RCI run was performed with a standard probe, and one water sample was taken. The subsequent runs were made with a straddle packer in the tool string to minimize drawdown during sampling, but relatively high drawdowns were experienced anyway due to the low permeability in the formation. The oil samples may have been collected as two phase samples below the actual bubble point. Analysis results have to be viewed in light of this.

The mud contamination of the water samples was estimated to 8% and 20% for the samples at 2828 m and 2850 m respectively, but should have been below 5% for the actual sulphate concentration in the mud to meet the criteria for good quality water samples. Attempts were made to estimate true formation water properties, but the calculated formation water compositions are not correct as the results show negative Potassium values. It is, however, clear that the formation water is very fresh, with approximate Chloride concentrations between 5 000 mg/l and 10 000 mg/l, depending on which sample and which set of mud properties are used.

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Sample depth	Run No.	*Bottle Number	Chamber	Drawdown	Formation Pressure	Pumped Volume	Mobility	Opening pressure	Transferred to
m MD			Size	Bar	Bar	Litres	mD/cP	Bar/ °C	
2828	1A	10047692PVT	840 cc	74.2-81.2	391.24	10	4.1	124/20	Analyzed offshore
2828	1A	10056371SPT	450 cc	74.2-81.2	391.24	17	4.1	475/20	TS-61065
2828	1A	10056391SPT	450 cc	27.2-38.2	391.24	21.5	4.1	477/19	TS-61603. Analyzed offshore
2806	1B	10047698PVT	840 cc	34.2-54.2	390.18	89	N/A	255/15	TS-4002. Analyzed offshore
2806	1B	10047694PVT	840 cc	51.2-54.2	390.18	97	N/A	234/12	TS-61105
2806	1B	10056393SPT	450 cc	28.2-38.2	390.18	154	N/A	410/15.7	TS-12418
2806	1B	333301	4 l	10.2-50.2	390.18	185	N/A	65.8/17	TS-52004. Contaminated, mud in sample
2770.5	1B	333308	4 l	17.2-39.2	387.21	139	N/A	316/14	TS-47304
2770.5	1B	10056370SPT	450 cc	16.2-25.2	387.21	144	N/A	405/17	TS-10918
2770.5	1B	10047693PVT	840 cc	21.2-30.2	387.21	154	N/A	346/16	C-23406. Analyzed offshore
2850	1C	369220	840 cc	36	409.5	93.5	N/A	76/15	TS-61601. Analyzed offshore
2763	1C	369221	840 cc	24-43	383.0?	56	N/A	391/17.7	TS-61804
2763	1C	369222	840 cc	24-43	383.0?	58	N/A	390/16	TS-23903
2763	1C	10047691	840 cc	24-43	383.0?	59	N/A	390/20	TS-61704
2763	1C	10047697	840 cc	24-43	383.0?	60	N/A	400/20.8	TS-61706. Analyzed offshore.
2763	1C	311763	4 l	24-43	383.0?	66	N/A	390/22	TS-47503

Table 4.13

For details on sampling and fluid analysis results, please refer to the following reports:

Altinex: Well 6405/7-1 Ellida; Wireline Formation Testing; Reservoir Analysis Report  
 Statoil: Well 6405/7-1 Water analysis, RCI samples from Nise Fm.  
 Corelab: Reservoir Fluid Study, 6405/7-1 T2 RCI

#### 4.9.3 Drill Stem Test sampling

A comprehensive sampling program was performed during the DST. The well was produced with low rates at a high drawdown, and the pressure at surface was not sufficient to operate the DST separator. The sampling program was therefore limited to sampling at the wellhead and from the calibration tank. Thus, no pressurized gas samples were taken, and no continuous rate measurements were made. Rates are calculated from calibration tank volume readings over time. Considerable amounts of completion fluid had been lost to the formation during FracPack operations before the test started, and a mix of completion brine and formation water was flowed back during the test. Samples of produced fluids were collected at regular intervals throughout the test. Four bottom hole samples were taken, one towards the end of the flowing period and three during the final build up.

Water samples were clearly not representative of formation water, as the water salinity seemed to level out at approximately 80 000 mg/l NaCl at very low rates towards the end of the test. The DST oil

samples suffer from the same uncertainties as the RCI with regards to bubble point and GOR due to the high drawdown and unstable production with slug flow.

For details on sampling and fluid analysis results, please refer to the following reports:

Altinex: Well Test Data, Sampling and Gauge Report; Well 6405/7-1T2; DST 1  
 Statoil: Well 6405/7-1 Water analysis of DST samples  
 ResLab: PVT Analysis of BHS from Well 6405/7-1T2, DST 1 Nise Fm.

#### **4.10 Formation temperature**

The temperature profile is based on extrapolation of temperature measurements from wireline logging runs in the different hole sections and temperatures measured during the DST in the Nise Fm.

The first measured temperature was from wireline at the bottom of the 17” hole section. Only one run was made, and the resulting temperature estimate is uncertain. Measured maximum and extrapolated temperatures from the wireline logs in wells 6405/7-1 and 6405/7-1T2 are shown in Table 4.13 and Figure 4.14. Measured temperature from the DST in well 6405/7-1T2 is also included.

The estimated temperature gradient from the sea bottom to top Nise Fm. is 46 °C/km. The gradient changes in the lower section, and from top Nise Fm. to TD is 38 °C/km.

<b>Run no.</b>	<b>Log</b>	<b>Time since circulation (hrs)</b>	<b>Measured temperature (°C)</b>	<b>Depth (m)</b>	<b>Extrapolated temperature (°C, Horner method)</b>
1A	DLL	12	33	2362	?
	DST		72	2785	72
2B	DLL	15,5	72	3146	
2A	RCI	58,8	85,4	3128	
2	Horner interpolated temperature			3190	90
3C	HDLL	35	116	4265	
3C	ZDEN	50	120	4276	
3B	MRIL	72	124	4267	
3D	RCI	129	111	2844	
3C	RCOR	144	126	4278	
3	Horner interpolated temperature			4300	129

*Table 4.13 Measured and extrapolated temperatures*

#### **4.11 Experiences and recommendations**

- **Conventional coring:**  
Use of the Jambuster coring system (telescopic core barrels) proved to be useful. It was activated three times and therefore saving trips.
  - **Wireline logging:**  
Communicate purpose of logging and intervals to be covered to avoid gaps in needed information.
  - **Drill stem testing:**  
A multiphase flow meter should be placed upstream of the choke manifold to register continuous flow rates during testing.  
A surface read out system is very valuable when conditions are difficult. The acoustic system used in this well performed very well.
  - **Pore pressure:**  
Implement Best Practice for performing LOT and use MWD time base downhole data to evaluate LOT.
-

PL 281

Hydrocarbon indications  
Well 6405/7-1&T2

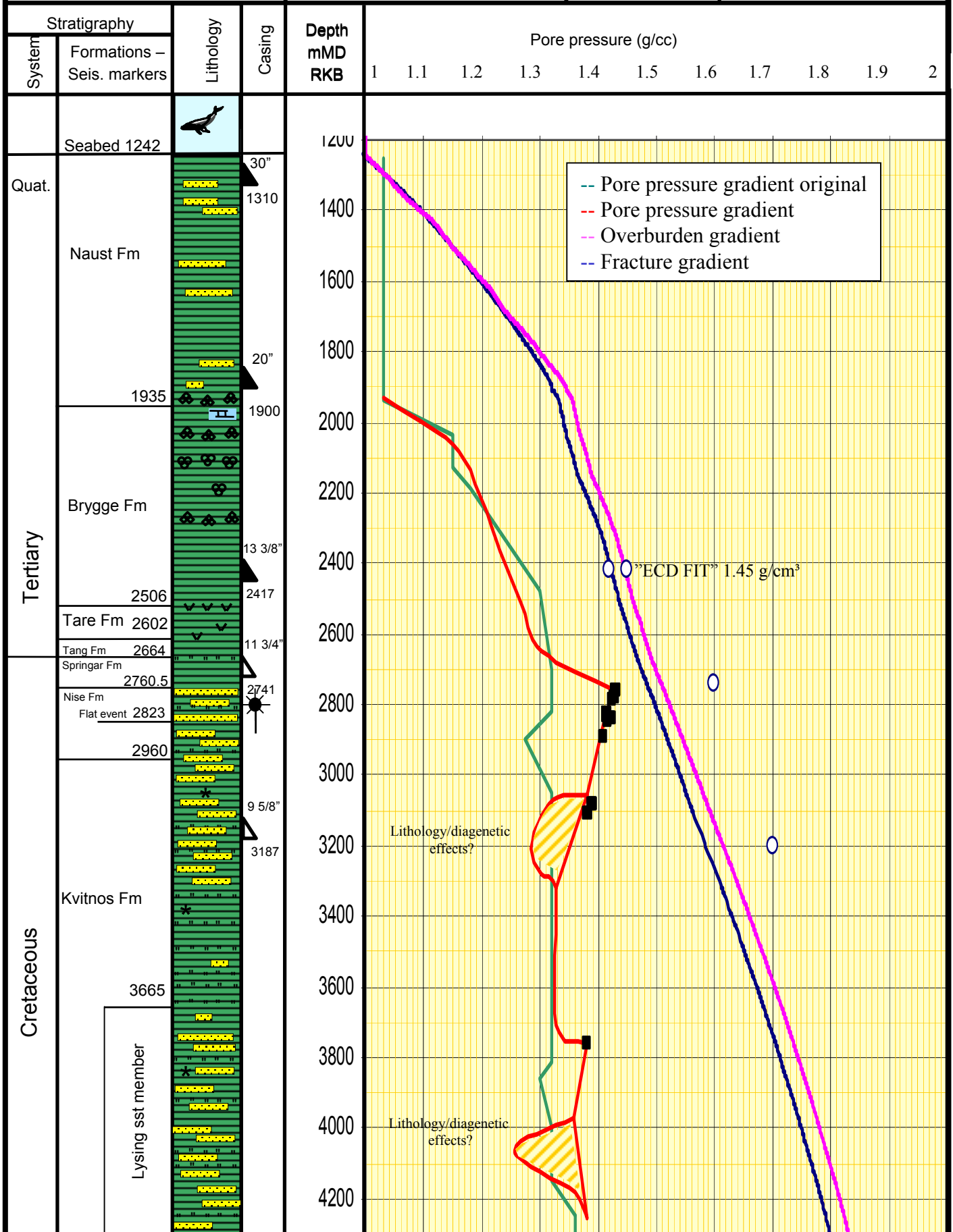


RKB - MSL: 36 m

Water Depth: 1206m MSL

Made by: ØH

Date: Jan. 2004



TD: 4300 m MD / 4299 m TVD

Figure 4.14

PL 281

Hydrocarbon indications  
Well 6405/7-1&T2

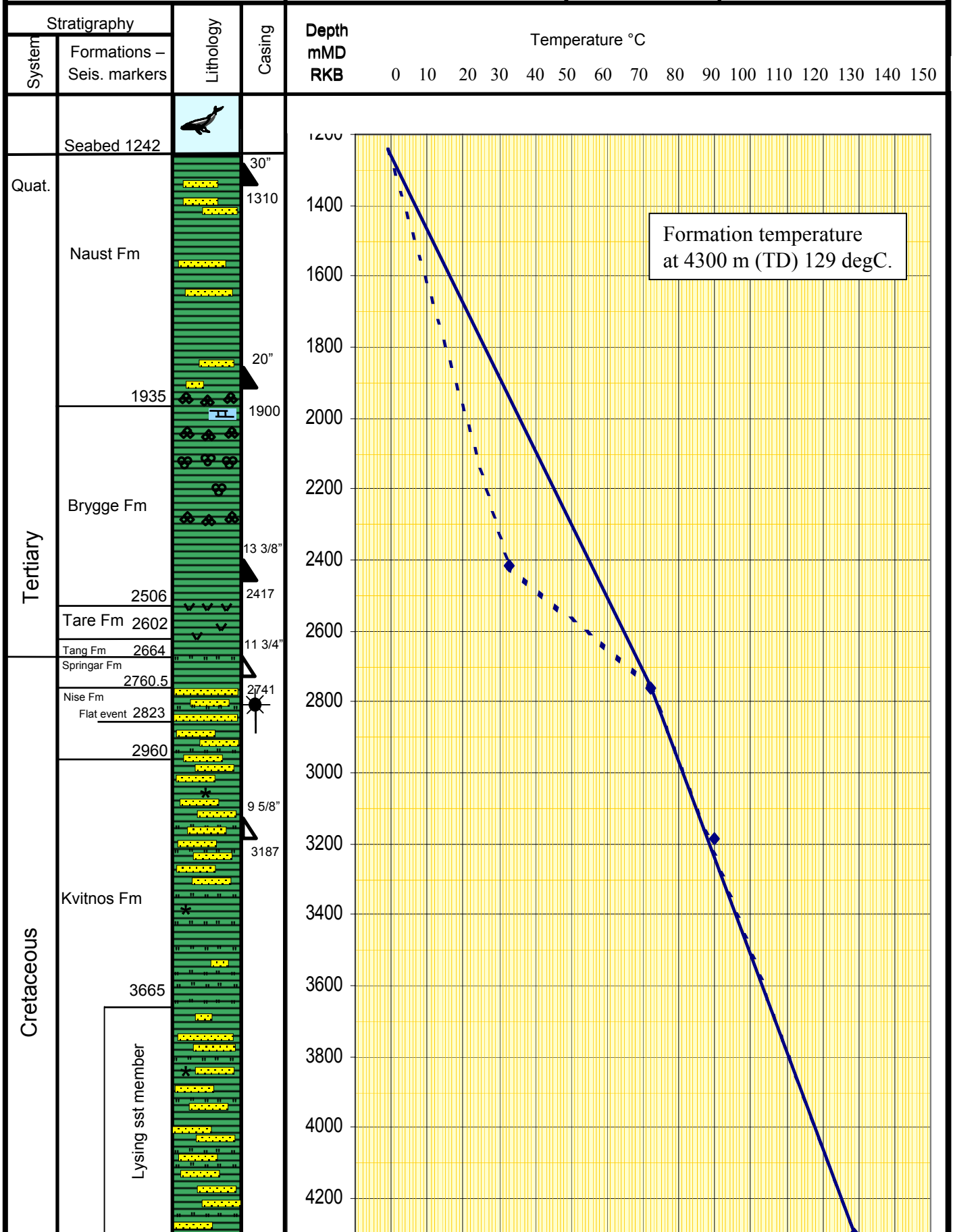


RKB - MSL: 36 m

Water Depth: 1206m MSL

Made by: ØH

Date: Jan. 2004



TD: 4300 m MD / 4299 m TVD

Figure 4.15

## 4.12 Data quality

### 4.12.1 Conventional coring:

The core quality was good except for core 1. The core was occasionally of a lesser diameter than expected and partly broken. The core was cut with 8 ½” equipment starting from a 10 ¾” hole.

### 4.12.2 MWD / LWD:

The MWD / LWD data was generally of good quality. Due to the long transit times of the shear sonic signal, the BAT tool was not able to register the shear arrivals. Two incidents of tool failure occurred:

- The BHI tool assembly was shipped from shore with a flat battery. This resulted in pressure data not being stored in the tool, and the data was lost.
- The Sperry Sun tool failed to pulse data to surface at the end of drilling the 12 ¼” section. Drilling continued, and the data were retrieved from memory.

### 4.12.3 Wireline logging:

Hole conditions were mostly good in the whole well, and did not adversely affect the open hole wireline logs except for some wash-outs at the top of the Nise Fm.

In the 17” hole size, wireline logging was completed in one run without problems and with good logs.

Open hole wireline logs are missing in the interval 2416 m to 2625 m covered by the 11 ¾” casing in the 6405/7-1T2 well. This interval was logged by LWD logs in well 6405/7-1 but not logged on wireline before setting the 11 ¾” liner in well 6405/7-1T2.

The 12 ¼” section was logged in an 8 ½” hole size before the section was opened up to 12 ¼” hole and setting of the 9 5/8” liner. The deep resistivity, RD, in this interval is taken from the down log, as an incorrect tool setting resulted in erroneous readings on the main log. A fixed borehole correction for 8 ½” hole was applied to the RD-curve. Apart from this, the logs were of good quality. RCI pressures and samples were successful, with good quality oil samples collected at three different depths. Two water samples were collected, but they were not conclusive with regards to formation water properties due to sample contamination. Sidewall cores were drilled and recovered. The recovered cores were good, but the nature of the rock made it difficult to perform measurements on the drilled core plugs. This was also the case on plugs taken from the conventional cores.

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After logging the open hole section, the XMACii sonic log was recorded through casing only from the casing shoe to 2539 m in this interval. Shear velocities in this interval were computed, but signal quality was reduced due to poor cement behind the liner. The confidence in the shear wave velocities is reduced in this interval. As shear wave velocities could not be processed from the MWD/LWD sonic, shear wave velocities are missing in the interval from 2539 m to 2393 m.

Log quality in the 8 ½" section is good for the resistivity, nuclear and sonic logs. Twelve sidewall cores were collected with the RCOR tool before technical problems stopped further sidewall coring. Only one formation pressure measurement was recorded with the RCI tool due to very tight formation.

A walkaway VSP survey was performed in well 6405/7-1T2. Data quality suffers from poor signal strength at the top of the Nise Fm. reservoir section and in the interval covered by the 11 ¾" liner.

#### **4.12.4 Well testing:**

##### **Mini-DST:**

Excellent pressure data were collected from the mini-DSTs performed with the RCI tool. For the mini-DST performed at 2770.5 m there seems to be some uncertainty in the rate history.

##### **Well testing: DST**

Pressure and temperature measurements from the DST were of excellent quality. Both Altinex and Metrol supplied pressure and temperature gauges, and they agreed very well. Metrol also supplied a system for surface read out of downhole pressure and temperature, and real-time data agreed with the data recovered from memory.

Rate measurements were difficult to perform during the DST. Due to the low flow rates, the turbine meters on the separator was not measuring correct liquid volumes. Liquid rates are therefore based on manual reading of levels in the calibration tank and water volumes dumped to a storage tank for transfer to the slop tank. The unstable flow conditions with slug flow for large parts of the test aggravated the problem. Gas rate measurements could not be made due to too low pressure differential across the orifice plate.

Surface measurements of pressures and temperatures are good, except for the annulus pressure, which was very noisy. The noise was repeating on several independent gauges, and the reason for this noise was not found.

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## **5 Drilling operations report**

### **5.1 Rig move and positioning**

After completing an exploration well for Exxon Mobil in the 6706 area, the drill ship West Navigator went on contract for Statoil and moved to the Ellida location. The transit time was close to 20 hrs, including a 4,5 hr stop for taking onboard the spud equipment.

At location transponders and marker buoys were deployed, and the DP (dynamic positioning) system was calibrated and tested. Meanwhile carrying out the DP testing, the 30" x 36" conductor was made up and hung off in the auxiliary rig. In the main rig the spud BHA was made up and RIH to seabed.

### **5.2 Drilling top-hole section**

BHA: 17 1/2" pilot bit, 26"x36" heavy duty hole opener, and spaced out (4 x 9 1/2" DC) to 42" Odfjell hole opener (for opening the upper most 23 m to 42" for the 36" conductor/conductor housing).

Tagged the seabed at 1242 m. Spudded in 1.5 m with no indications of hard seabed. A 36" x 42" hole was drilled from seabed to section TD at 1312 m (depth of 17 1/2" bit), using seawater and high viscosity pills as drilling fluid. Spudding parameters 0-2 ton WOB/800-1000 lpm/30-80 rpm. Drilling parameters 3000-4500 lpm/1-4 ton WOB/100-115 rpm/150-160 bar. Built angle to max 3 deg at 1295 m. Reamed angle down to max 2 deg. Anderdrift measurement in top, 1,5° and on TD 1,5°. No indications of boulders. Average on bottom ROP for the section was 15,8 m/hr. The hole was displaced to 1,35 g/cm<sup>3</sup> mud prior to pulling out. No over pull was experienced when pulling out of hole.

While drilling the top-hole from the main rig, the conductor was run to 30 m above seabed in the auxiliary rig. Ran and cement a 5 joint conductor (4 joints of 30" conductor + 1 joint 36" conductor + 36" conductor housing). Had no problems stabbing in, good visibility with ROV. Ran down and sat conductor on bottom with 3 m stick up (as planned). Spaced out the stick up based on TD of 26" stage on 26" x 36" hole opener. Cemented the conductor in place using Deep Water Flow Stop (DWFS) blend, 1,75 g/cm<sup>3</sup>. Had full returns during the cement job. 300% open hole excess was used. The original plan was to release the conductor running tool straight after the cement job, but this was abandoned due to the recorded 1.5° angle on the top hole. Waited on cement for more than 12 hrs.

While waiting on cement the conductor was inspected with the ROV. A "deep" crater around the conductor was discovered, > 5 m deep and 3.5 m in diameter. After waiting on cement, releasing the CART tool and pulling the inner string out of the conductor, the inner string was grabbed by the ROV and lowered into the crater. Firm cement was tagged 9-10 m below

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seabed. A 40 m<sup>3</sup> grouting job was performed with a 5 ½" cement stinger from the auxiliary rig.

### **5.3 Drilling 26" section**

BHA: Packed with 26" milled tooth bit.

Made up and RIH with the 26" BHA from the auxiliary rig. Drilled out the 30" conductor shoe and cleaned the rat hole in 2,5 hours. Continued drilling a 26" hole from 1312 m to 1910 m with 4500 lpm/100-125 bar/100-140 rpm/2-10 ton WOB, using seawater and high viscosity pills as drilling fluid. The average on bottom ROP was 28,2 m/hr. Had some indications of boulders at 1708m, 1716m and 1736m. Displaced the well to 1,35 g/cm<sup>3</sup> prior to pulling out of hole. Had some minor tight spots from 1763-1757 m while pulling out of hole from TD. No wiper trip was performed.

Ran and stabbed the 20" casing without any problems. Washed down the last stand and landed wellhead housing with casing shoe at 1900 m. Cemented the 20" casing in place using DWFS foam cement. The foam cement (DWFS) was chosen for eliminating any potential shallow water flow (seen in off set wells further north of the location). The foam job was performed without any problems and with full returns throughout the job. The base slurry was 1,75 g/cm<sup>3</sup>, and "foamed" (Nitrogen) to 1,42-1,46 g/cm<sup>3</sup> for down hole. The cement plug was not bumped during the displacement. TOC inside the 20" casing was later tagged at 1849m (37m high).

Meanwhile drilling the 26" hole from the auxiliary rig, the riser and BOP was run in the main rig.

### **5.4 Drilling 17" section**

BHA: Milled tooth bit, rotary pendulum assembly (17" stabilizers, 8" DC).

The cement inside the 20" casing was tagged at 1849 m (hard cement). Drilled out the cement, cleaned the rat hole and drilled 3 m new formation in 3,5 hrs. Conditioned hole and spotted a 10 m<sup>3</sup> high viscosity pill in the open hole. Pulled into the 20" shoe and performed a LOT to 1,33 sg EMW.

Displaced the hole from seawater to 1,25 g/cm<sup>3</sup> water based mud (Glydrill Deep Water). Drilled a 17" hole from 1913 m to 1956 m. Parameters: 4200 lpm/235 bar/1-5 ton WOB/50 - 70 rpm/ECD: 1.27 sg/ROP: 30 m/hr.

At 1956 m losses to formation were experienced (15 m<sup>3</sup>/ 10 min). The suspected loss zone was in the Ooze sequence in the Brygge Fm at +/- 1936 m. Cured the losses by pumping LCM materials, decreased pump rated to 3000 lpm and continued drilling with controlled ROP at +/- 15 m/hr. The mud weight was decreased to 1,23 g/cm<sup>3</sup> while drilling from 1971 m

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to 1990 m. Ref. separate report in Experience listing. Continued with controlled drilling parameters from 1990 m to section TD at 2425 m (15 m/hr).

After a stable flow check at TD the string was pulled out of hole. When pulling from 2385 m to 2375 m, swabbed in/gained 500 liter. Performed a stable flow check at 2375 m. Ran in back to bottom and circulated bottoms up to evaluate the well status. No flow was observed and the well was static. For further details, ref. separate report in - Experience listing.

Due to tight hole it was necessary to ream out of hole into the 20" casing (made several attempts to pull without rotating). When the BHA was out of the hole, the stabilizers were found completely packed with cuttings ("blue" shale).

Average on bottom ROP over the section was 12.5 m/hrs (controlled to limit ECD due to losses).

Performed wire line logging (TTRM/DSL/CN/ZDL/ORIT/XMACii/DLL/MLL).

Ran in hole with the 13 3/8" casing. The string took weight at 2370 m. Worked and washed the casing down from 2370 m, had only partly returns and over 80 tons over pull to free the casing. Landed the casing with no returns. Picked up the casing again and positioned the hanger above the wellhead. Flushed the hanger area through the choke line and re-landed the hanger. Established circulation with 400 lpm as maximum rate with full returns. Mixed and pumped 36 m<sup>3</sup> of 1,92 g/cm<sup>3</sup> cement slurry at 700 lpm (partly returns). Displaced the cement down to the shoe with 1000 lpm (partly returns). With the cement at the shoe the pump rate was increased to 2000 lpm (no returns). The cement plug was not bumped after having pumped the theoretical displacement volume. Lost at total of 56 m<sup>3</sup> of fluid to the formation during the cement and displacement job.

## **5.5 Drilling 12 1/4" section – well control situation**

The 12 1/4" section was drilled from 2425 m to 2816 m (core point). Several incidents with high gas levels and also gain in the active system were recorded and responded to. In the end the mud weight had been increased from initially 1,33 g/cm<sup>3</sup> when drilling to core point at 2816 m, to 1,42 g/cm<sup>3</sup> prior to pulling out of the hole. Good craftsmanship from the drill crew and the Statoil personnel onboard ensured full control in all stages. At the end the decision was made to plug back the 12 1/4" hole and initiate a side track with an 11 3/4" liner set above top of the reservoir. The below following text describes in detail the operational events leading to the sidetrack.

BHA: Milled tooth bit, rotary pendulum assembly.

Ran in hole with 12 1/4" BHA and tagged soft cement at 2368 m (23m high). Drilled out the cement, cleaned the rat hole and drilled 3 m new formation in 10,0 hrs. Circulated and

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conditioned the mud to even 1,25 g/cm<sup>3</sup>. Performed a LOT to 1,42 sg EMW and increased the mud weight to 1,30 g/cm<sup>3</sup>.

Drilled 12 1/4" hole from 2425 m to 2717 m.

Parameters: 3500 lpm/198 bar/0-5 ton WOB/70-100 rpm. Flow checked the well at 2565 m and at 2599 m due to reported gain in the active system. The well was static. When reaching 2717 m, a sharp increase in gas levels from 2708 m lag depth was recorded. The drilling was halted and 12 % gas was recorded in the return. The well was flow checked for 30 min, and was static. Closed the well in on choke and observed the pressure for 10 min. No pressure build up was recorded. Circulated bottoms up from 2680 m. Maximum gas at bottoms up was 6,6 %. Increased the mud weight from 1,30 to 1,33 g/cm<sup>3</sup> and made a two stand check trip without pumping.

Continued to drill 12 1/4" hole from 2717 m to 2742 m.

Had 1,8 % gas from bottoms up after the check trip at 2717 m. At 2742 m the drilling was stopped due to some sloughing shale in returns. Performed a pump off test (10-10-10) prior to commence drilling.

Continued to drill 12 1/4" hole from 2742 m to 2816 m.

The gas response from the pumps off test at 2742 m showed 1,0 %. Observed a gas peak of 19,7 % from 2758 m lag depth. Circulated while assessing the situation. At bottoms up the gas was reduced to 12 % and 9 %. Continued to drill 12 1/4" hole from 2767 m to 2816 m (core point).

Circulating at 2816 m.

Circulated bottoms up from 2816 m. Maximum gas in the return were 14,8 %. Flow checked the well and the well was static. Performed a pump off test (10-10-10) and circulated bottoms up. While circulating an increase in the active system was recorded. Flow checked the well and the well was static. The maximum gas in the return was 20,6 % at bottoms up. Increased the mud weight to 1,37 g/cm<sup>3</sup> but the gas readings continued to stay high, 25 – 41 % at bottoms up with 1,37 g/cm<sup>3</sup> mud. At 41 % gas in return the well was shut-in. Monitored the well on the pressure probe in the BOP and recorded a 4,5 bar pressure increase in 45 minutes. The pressure at the BOP probe showed 176,5 bar, equivalent to a formation pressure of 1,42 g/cm<sup>3</sup>. Lined up and circulated down string and up choke line over poor boy degasser. Maximum recorded gas after the poor boy was 8,5 % and at bottoms up 4,8 %. Opened up the well and circulated with 3500 lpm, giving an ECD of 1,41 sg EMW. After 30 min circulation, the well was flow checked for 15 min and was stable. After another 30 min circulation, the well was flow checked for 10 min and stable. Continued to circulate and the gas levels recorded from the flow checks showed 29,5 % and 34,5 %. At further circulation the gas dropped down to 1,9 % but then started to increase to a steady 10 % again. At bottoms up after a MWD restart (pumps off for 1 min) a gas peak of 34 % was recorded. The gas level increased during further circulation to 50 - 55 %. After another restart of the MWD, a gain of 700 liters was recorded. The well was then closed-in and the pressure probe in the BOP recorded a 6,5 bar pressure increase in 15 minutes (equivalent to a formation pressure of 1,40 g/cm<sup>3</sup>). Circulated out the annular volume over an open choke. Maximum gas recorded after

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the poor boy at bottoms up was 4,5 %. Flow checked the well and the well was stable. Opened up the well and flow checked for 30 minutes. A gain of 200 liters from gas expansion in the riser was then recorded. Circulated up riser with 3500 lpm and an ECD of 1,40 sg EMW. Made another stable 10 minutes flow check. While circulating, the gas reading varied from 17 - 41 %. Gas from the 30 min flow check peaked up to 60,9 % and from the 10 min flow check it peaked to 65 %.

The conclusion that was drawn from the gas reading data and the shut-in pressure response was that the penetrated reservoir had to be low permeable with a formation pressure of approximately 1,41 g/cm<sup>3</sup>. To be able to pull out of hole the mud weight had to be increased to a minimum of 1,42 g/cm<sup>3</sup>. The LOT at the 13 3/8" shoe was interpreted to 1,42 sg EMW (conservative approach), but the plotted LOT curve was not fully conclusive. A new interpretation of the LOT data showed that the formation most likely would withstand a pressure of at least 1,45 sg EMW. In the current situation a new FIT or LOT was not applicable. To keep the gas readings within an acceptable level, the circulation had to be maintained with an ECD of minimum 1,40 sg EMW. The decision was therefore made to increase the mud weight in steps, maintaining circulation at all times and using pump rate to gradually increase the ECD to test the formation integrity towards 1,45 sg EMW.

The mud weight was then increased in steps from 1,33 g/cm<sup>3</sup> to finally 1,42 g/cm<sup>3</sup>. Maximum ECD during the process was recorded to 1,448 sg EMW. No losses were observed. With a mud weight of 1,39 g/cm<sup>3</sup> and an ECD of 1,425 sg EMW, the gas reading dropped down to a steady level of 0,7 %. With 1,42 g/cm<sup>3</sup> mud in the well the gas was down to 0,35 %. And when circulating bottoms up after a 30 min stable flow check, there were no gas peaks.

Started to pump out of hole with 400 lpm. At 2535 m the string took 10 ton weight and almost packed-off. Due to tight hole the string was worked and reamed all the way from 2535 m and up to the 13 3/8" shoe. No losses were recorded.

Due to the situation with the uncertain LOT value at the 13 3/8" shoe and a potentially unstable hole (very tight while pulling out), the decision was made to plug back the 12 1/4" hole and initiate a side track.

## **5.6 Plug back of 12 1/4" hole**

Ran in hole with a 3 1/2" cement stinger and 5 1/2" drill pipe. Plugged back the 12 1/4" open hole with a balanced gas tight cement plug from 2816 m to 2630 m. Placed a second balanced cement plug (kick off plug) from 2573 m to 2360 m (+/- 50 m into 13 3/8" casing).

## **5.7 Drilling 12 1/4" sidetrack (T2)**

BHA: Motor assembly (9 5/8" SperryDrill, AKO: 1,15°) with milled tooth bit.

Tagged firm cement at 2322 m and reduced the mud weight from 1,42 g/cm<sup>3</sup> to 1,37 g/cm<sup>3</sup>. Drilled out cement and confirmed 50 % formation in shaker samples at 2440 m. Drilled and

steered a 12 ¼” hole from 2440 m to section TD 2742 m. Increased the mud weight to 1,38 g/cm<sup>3</sup> due to increasing gas values while circulating at TD (max 31 %). Maximum gas after the mud weight increase was 1,5 %. Pumped out of open hole.

**5.8 Drilling 14” section and setting 11 ¾” liner (T2)**

BHA: 10 5/8” bit, 12 ¼” stabilizer and 12 ¼” x 14” under reamer (Andergauge).

Under reamed 12 ¼” hole to 14” from 2420 m to 2740 m. Parameters: 3500 lpm/270-275 bar/0-8 ton WOB/80-120 rpm/6-20 kNm/ECD: 1,42 sg EMW. Pumped out of open hole. No problems experienced.

Ran in hole with the 11 ¾” liner. Started to loose mud when running in at 1470 m. At 2520 m the string took weight, but managed to push through the obstruction with 40 ton down weight. The running speed was 9-10 min per stand with partial losses. Had tight hole at 2538 m and 2543 m. At 2543 m the string was pulled free with 15 ton over pull. Due to the string packing off, it was not possible to wash down. Worked the string through the obstruction at 2543 m and had tight hole all the way down to TD.

Established circulation with 200 lpm and got full return. When attempting to increase the flow rate to 1000 lpm (in steps), the return was lost. Cemented the 11 ¾” liner with no return. Total losses during the running and cementing of the 11 ¾” liner was 140 m<sup>3</sup>.

**5.9 Drilling 10 5/8” and 8 ½” hole, coring and wire line logging (T2)**

Ran in hole with a 10 5/8” bottom hole assembly. Drilled out the 11 ¾” liner and new formation down to 2745 m. Performed a LOT to 1,60 g/cm<sup>3</sup>. Increased the mud weight to 1,44 g/cm<sup>3</sup>. Drilled a 10 5/8” hole from 2745 m to core point at 2754 m and pulled out of hole for coring.

Cut a total of 5 cores (8 ½”) from 2754 m to 2880 m.

Cored Interval	Core length	Core bit	ROP	Recovery
2754 - 2781	27 m	Hughes Christensen URC478G8	7,3 m/hr	10,0 m (37,0 %)
2781 - 2808	27 m	Hughes Christensen RC478C3G8	9,0 m/hr	25,6 m (95,0 %)
2808 - 2835	27 m	Hughes Christensen URC478G8	9,0 m/hr	23,6 m (87,4 %)
2835 - 2862	27 m	Hughes Christensen RC478C3G8	6,8 m/hr	26,8 m (99,0 %)
2862 - 2880	18 m	Hughes Christensen URC478G8	6,0 m/hr	7,37 m (40,9 %)

*Table 4.1 Summary of cored interval in Nise Fm.*

Ran in hole with an 8 ½” rotary packed assembly and a five bladed aggressive PDC bit (19 mm cutters). Reamed and logged over the cored interval. Drilled an 8 ½” hole from 2880 m to 3200 m. Circulated well clean and pulled out of hole for wire line logging. Had some tight spots with maximum 20 ton over pull while pulling out of hole.

Performed in total 7 logging runs on wire line in approximately 8 days, including a wiper trip performed after run number 4.

Run	Type of logs
No.1	Formation logs (TTRM/DSL/CN/ZDL/ORIT/XMACii/DLL/MLL)
No.2	Formation logs - sonic (MRIL/GR)
No.3	Pressure points and fluid sampling (RCI-GR)
No.4	Fluid sampling with dual packer. Mini DST (RCI-GR with straddle packer)
No.5	Side wall cores (RCOR)
No.6	Image log (STAR)
No.7	Fluid sampling with dual packer (RCI-GR with straddle packer)

*Table 4.2 Summary of wire line logging in 12 ¼" section.*

### **5.10 Drilling 10 5/8" x 12 ¼" hole for 9 5/8" liner (T2)**

BHA: 6 ¾" bull nose, 8 ½" string stab, 10 5/8" hole opener (Security DBS) and a 10 5/8"x 12 ¼" under reamer (Andergauge).

Under reamed the 8 ½" x 10 5/8" hole to 12 ¼" from 2757 m to 3192 m. Parameters: 3000-3500 lpm/210-290 bar/2-10 ton WOB/100 rpm/5-25 kNm. Experienced some minor losses. Circulated well clean and started to pull out of hole. Observed increasing drag as the under reamer and hole opener was pulled through the 11 ¾" liner shoe. At 2743 m a sudden 20 ton over pull was experienced. Attempted to rotate and setting down weight to free the string, without success. Established circulation with 100 lpm (no return) and was able to pull the string free with 25 ton over pull. Continued to pull slowly out of hole while circulating at 100-200 lpm (partly returns). The drag increased gradually to maximum 55 ton over pull at 2705 m. From 2705 m to 2695 the drag decrease slowly to normal drag (no over pull). At surface the whole bottom hole assembly was packed with sticky clay.

Ran in hole with a 10 5/8" clean out assembly. Washed down from 2644 m to 2761 m and 3168 m to 3192 m. Got lots of sticky clay in returns when circulating bottoms up at 3192 m. No tight hole observed. Pulled out of hole with the clean out assembly.

Ran in hole with the 9 5/8" liner. Started to loose mud at 2530 m. Broke circulation at 11 ¾" shoe and had partly return (30 % loss). Circulated down last stand (partly return) and was unable to pass 3187 m. The string got stuck at 3187 m (5 m above planned shoe depth). Tried unsuccessfully to free the string with 100 ton over pull. Cemented the 9 5/8" liner with partly returns. Bumped the cement plug and pressure tested the liner to 230 bar/10 min.

**5.11 Drilling 8 1/2" section (T2)**

BHA: 5-bladed PDC bit, rotary packed assembly (8 1/2" stabilizers, 6 1/2" DC).

Ran in hole and tagged hard cement at 3140 m. Drilled out excess cement from 3140 m to 3165 m (3 hrs). Drilled wiper plug and shoe track from 3165 m to 3189 m (3,5 hrs). Cleaned rat hole and drilled 3 m new formation to 3203 m. Conditioned mud and performed LOT to 1,70 sg EMW.

Drilled an 8 1/2" hole from 3203 m to 3751 m (core point). Parameters: 2500 lpm/260 - 300 bar/ 4-12 ton WOB/70 - 150 rpm/ROP: 5 - 25 m/hr (average 12,8 m/hr).

Pumped out of hole into the 9 5/8" liner. Had some tight spots (maximum 10 ton over pull) at 3730 m and 3480 m.

Ran in hole with an 8 1/2" coring assembly (jam buster and 12-bladed core head). Observed 4 m heave when starting to core. Stopped coring after 6 m (3757 m) due to low ROP and smooth torque. Suspected that the core had jammed off due to the rig heave. No over pull observed when picking off bottom. Recovered 5,01 m (83,5 %).

Performed intermediate WL logging (cement bond log).

Ran in hole with an 8 1/2" coring assembly (jam buster and 12-bladed core head due to not mobilised more aggressive bits). Based on experience from the first run, the ROP was expected to be low. Cut a 27 m core from 3757 m to 3784 m. Cored with 0.5 - 2 m/hr with 10 - 14 ton WOB. Observed same smooth torque as in first run but had 10 ton over pull when picking off bottom. Recovered 26,15 m (96,9 %).

Ran in hole with the 8 1/2" drilling assembly (same 5 bladed PDC on packed assembly - changed out NB stab with a 6 point roller reamer). Drilled from 3784 m to TD at 4300 m. Parameters: 2500 lpm/270-300 bar/4-6 ton WOB/120 rpm/ROP average 17,9 m/hr (restricted ROP). Performed a wiper trip to 9 5/8" shoe and pulled out of hole. No tight spots observed while pulling out of hole.

Performed a total of 7 logging runs on wire line in approximately 4 days.

Run	Type of logs
No.1	Formation logs (TTRM/DSL/ORIT/XMACii/HDLL/MLL)
No.2	Formation logs (TTRM/DSL/CN/ZDL/DLL)
No.3	Formation logs - Sonic (MRIL/GR)
No.4	VSP - Walk away
No.5	Pressure points and fluid samples (RCI/GR)
No.6	Side wall cores (RCOR/GR)
No.7	Pressure points and fluid samples (RCI/GR), re-run log number 5.

*Table 4.3 Summary of wire line logging in 8 1/2" section*

## 5.12 Drilling 8 ½” pilot hole (Dual operations while wire line logging)

During wire line logging at TD in the main rig, an 8 ½” pilot hole was drilled from the auxiliary rig. Since the well had proved to be a discovery, quality MWD data from the 26” section interval had to be collected. A full risk assessment (HAZOP) was conducted for dual operations; “*Drilling pilot hole from auxiliary rig with BOP and riser installed on the well head from main rig*”. The risk assessment involved personnel from both offshore and onshore and revealed no “showstoppers”. A set of operational criteria was defined and the project got acceptance from both Smedvig and Statoil.

The pilot hole was spudded 15 m away from the main well, without any difficulties. It was drilled from seabed at 1242 m to 1920 m in 37 hrs with an average ROP of 18,2 m/hr. Drilling parameters: 2000- 2200 lpm/105-135 bar/ 40-60 rpm (string rpm)/ 0-4 ton WOB. The bottom hole assembly consisted of an 8 ½” milled tooth bit, a 6 1/4" mud motor (120-130 rpm) and a Triple Combo + sonic MWD/LWD package.

## 5.13 Plug back of 8 ½” section (T2)

Ran in hole with a 3 ½” cement stinger. Plugged back the 8 ½” open hole by placing 3 cement plugs from 3800 m to 3000 m (approximately 190 m into the 9 5/8” liner). As a foundation for the cement plugs a CST tool was pumped down string and placed at 3800 m.

## 5.14 FracPac completion

FracPac operations commenced after the well had been plugged back to 3000 m (RKB), 187 meters inside the 9 5/8” liner. The riser was first cleaned using a riser brush whilst making a dummy run to check BOP space-out, then the wellbore was cleaned and the PBR dressed. During this latter operation the casing and cement plug were tested to 260 bar.

Following a high viscosity sweep pill the well was displaced to seawater up to the BOP and in-flow tested for one hour.

The well was then circulated with seawater whilst simultaneously cleaning the surface systems and filtering the CaCl<sub>2</sub>/CaBr<sub>2</sub> brine. With the seawater returns indicating 28 NTU the well was displaced to brine. The final NTU reading for the brine were 40-50.

After pulling out of the hole and laying down the scrapers and dressing mill a 9 5/8” EZSV (as sump packer) was run on wireline and set at 2817 m RKB (wireline depth, later tagged at 2822,3 m with the TCP assembly).

4 ½” TCP guns were made up and run on drillpipe, the top of the sump packer tagged and the string pulled up to correct perforating depth. With the MPR closed the guns were activated and the interval 2758,0 – 2811,7 mRKB perforated.

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The Baker FracPac assembly (*see chapter 4.18.10*) was made up and run in hole on 3 ½” and 5” tubing, the sump packer tagged and the string spaced out. The SC-2 GP packer was then set by dropping a ball and pressuring the tubing to 200 bar. The work string was then released from the packer and the ballseat sheared out.

A pump test was performed at rates up to 2500 litres/min before performing a minifrac test by pumping 20 m<sup>3</sup> of gel into the formation. As the results from the minifrac were inconclusive a second test was then performed, again pumping 20m<sup>3</sup> of gel into the formation. The falloff data was then analysed and the FracPac job designed

The FracPac operation was performed and a total of 29,8 tons of sand placed at slurry concentrations of 1 – 8 ppg with a maximum rate of 1800 l/min and 240 bar. The slurry was displaced with 1,45 sg brine at 2500 l/min and 280 bar.

The string contents were reversed out but the well became unstable with gains and pressure at surface. It was not possible to establish circulating position and a planned remedial gravel pack was cancelled. The well was then circulated with brine until stable and the work string pulled.

Subsequent to the FracPac operation the well exhibited a constant daily loss to formation of approximately 10 m<sup>3</sup> brine.

Problems with the rigs riser tensioner system then delayed starting to run the test string for approximately 1,5 days.

### **5.15 Production test**

The bottom hole assembly was made up and pressure tested to 400 bar before running in hole with stands of 3 ½” tubing. The Metrol ANTICS (surface readout system) transmitter/receivers were installed externally approximately every 300 meters and the string was filled with brine. When all the 3 ½” tubing had been run the string was again tested to 400 bar before crossing over to 5 ½” thermo-tubing.

When 1346 meters of the string had been run in the hole, deteriorating weather conditions made it necessary to install and run the hang off tool and suspend further operations until the weather improved. With the string hung off the well was observed via the choke line and topped up as necessary. The bad weather led to operations being suspended for approximately 3 ½ days.

After laying out the hang off tool the test string was run in on 5 ½” drillpipe to perform a control check of the distance between the BOP and the top of the SC-2 gravel pack packer. The string was stung into the packer and the LPR closed to mark the pipe. The string was then

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pulled back to the thermo-tubing, the marks on the pipe controlled and the final space out calculated.

The cable to the sub-seabed transmitter/receiver was connected and the SSTT made up on the string. The entire SSTT assembly including retainer valve and seabed carrier were also made up and the system function tested. Problems arose due to a faulty poppet valve when pressure testing the SSTT assembly, the poppet valve was then changed out and the system tested satisfactorily.

The 5 ½" thermotubing landing string was run without incident except for a minor communication problem with the downhole gauges. This was traced to the surface computer and was quickly rectified. The SSTT umbilical, injection hose and SRO data cable were clamped to the landing string every second stand using Lasalle clamps and securely taped on the alternate stands.

The lubricator valve was installed and tested before the remaining joints of the landing string were made up. 45 foot bails and 5" elevator inserts were then installed and the flowhead with single joint picked up and made up on the string.

The flow and kill hoses were connected to the flowhead and the string ultimately stabbed into the packer and landed in the wear bushing, holding landing string weight plus 18 tons on the hook to keep the landing string in tension.

The pressure testing programme was completed and the annulus pressured to shear the RD-bypass valve and place the DST tools in test mode. Due to hydraulic losses in the choke line to the BOP it was not possible to get sufficient annulus pressure to operate the RD without losses to the formation. To overcome the problem the rigs mud pumps were used, with higher pop off settings. By pumping at 2370 l/min and with a surface pressure of 152 bar the RD-bypass was operated and the annulus isolated from the test string.

The OMNI circulating valve was then cycled to circulating position and 10 m<sup>3</sup> of diesel was displaced as cushion. The OMNI was then cycled back to well test position and the final preparations made for commencing the flow test.

The well was opened for flow after checking all valve positions and testing the PSD system.

Flow was commenced on a 9,5 mm (24/64") choke which was increased to 12,7 mm (32/64") and finally to 14,3 mm (36/64"). Nitrogen injection was initiated shortly after opening the well to try to assist in lifting the brine but it was not possible to obtain the calculated injection rates (after pulling the string at the conclusion of the test it was found that the injection hose had collapsed).

The well was flowed for a total of some 73 hours before being shut in at the LPR-N valve for a final build up. Details of the flow rates and produced fluids can be found in the test report. The well was kept shut in for about 46 hours with bottomhole pressures being monitored with

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the Metrol SRO system. At this point the data collected was considered good enough and the test was terminated.

Well killing was effected by first bleeding off all pressure above the LPR-N valve and then filling the string with a brine/CaCO<sub>3</sub> kill pill. The LPR-N was then opened and a total 10 m<sup>3</sup> of kill pill pumped and displaced with 9,3 m<sup>3</sup> of kill weight brine. The well was then observed for stability for 30 minutes.

The RD circulating valve was opened by applying annulus pressure, the MPR opened and after observing that the well was static brine was circulated down the tubing. The MPR was again closed and returns taken up the choke line after pumping 2/3 annulus volume. Maximum gas recorded in the returns was 3,4%.

After circulating and observing that the well was still static it was deemed impossible to commence pulling the string due to excessive rig movement (heave 4 – 7 meters, roll 2,8° and pitch 5°). The well was observed until the weather subsided and activity was recommenced after some 18 hours WOW.

On pulling out of the production packer losses of 1,5 m<sup>3</sup> were observed, losses stabilised at 400 l/hour. Pulling the string and laying down test equipment was carried out without any problems being encountered.

The well was plugged back by mechanically setting a 9 5/8" EZSV bridge plug at 2636 mRKB. After circulating the well and testing the plug to 152 bar a 4 m<sup>3</sup> cement plug was placed above the plug.

The test phase was then considered completed and the final P&A commenced.

## **5.16 Permanent P&A**

Ran in hole and set a 9 5/8" EZSV at 2636 m. Pressure tested the EZSV to 150 bar/10 min and placed a 50 m high gas tight cement plug on top.

Ran in hole for setting a 13 3/8" EZSV (hydraulic setting tool) and pulling the wear bushing on the same run. The DrilQuip Multi Purpose Tool (MPT), for retrieving the wear bushing, was spaced out for landing in the wear bushing when bottom of EZSV was one stand above top of 9 5/8" liner. When the wear bushing was retrieved and pulled above the BOP, the EZSV was set at 2206 m. Pressure tested the 13 3/8" EZSV to 60 bar/10 min. Displaced the well from 1,45 g/cm<sup>3</sup> brine to 1,28 g/cm<sup>3</sup> water based mud. Placed a 50 m high cement plug on top of the EZSV and then pulled out of hole.

The 13 3/8" casing was cut (1553 m) and pulled in one run with a combined motor cutter and spear assembly. The seal assembly was pulled in the same run, due to no lock ring installed. A deviation for pulling the casing without a pack-off was approved in advance. When the casing hanger was 46 m below the rotary the elevator accidentally opened and the 5 1/2" work string

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and casing cut-off was lost in hole. Made up overshot and grapple, ran in hole and entered the "fish" at 1196. Pulled the lost assembly free with 60 ton over pull and pulled out of hole. When the casing hanger was pulled above the rotary, the string was hung-off and a C-plate was used to pull out the inner string before the casing was pulled conventionally.

Made up a 20" EZSV on a hydraulic setting tool and ran in hole on drill pipe. At 1033 m (inside the riser) the string took 5 ton weight when coming down after a connection. The rig heave while running in was 2-3 m. A heave peak of 4,5 m was recorded during connection. Pulled up one stand and ran back in. The string took weight at 1033 m. Pulled out of the hole and found that the EZSV had been set in riser.

Made up and ran in hole with a 17 1/2" assembly for drilling out the 20" EZSV. Pressure tested the 13 3/8" x 20" annulus to 80 bar (70 bar above 20" LOT), and thereby verified the annulus barrier effective. Displaced the kill and choke lines to sea water and performed a 1-hour in-flow test. Drilled out the 20" EZSV in 51 minutes and circulated and washed down to 1225 m without any resistance. Pulled the bit into the riser and disconnected LMRP. Attempted to push out the remains of the EZSV through riser and LMRP without success. Suspected that the lower annular preventer was not fully open or the remains of the EZSV were stuck inside the LMRP.

Ran in with a 5 1/2" cement stinger from the auxiliary rig. Positioned the auxiliary rig over the BOP and wellhead. Stabbed the cement stinger into the BOP and wellhead and continued to 1600 m. Spotted a 13 m<sup>3</sup> high viscosity pill and placed a 200 m high surface cement plug on top. Pulled out of hole with the cement stinger. Positioned the main rig over the BOP and wellhead and landed the LMRP on the BOP.

Disconnected the BOP and positioned the auxiliary rig over the wellhead. Meanwhile pulling the BOP in the main rig, stabbed in with the casing cutting and MOST tool assembly from the auxiliary rig. Cut the casing 5 m below the seabed at 1247 m. Attempted to pull free the wellhead but the MOST tool slipped off at 100 ton over pull. Re-entered the MOST tool and made a new attempt with maximum pull at 180 tons, still unable to pull free the wellhead. Pulled out of hole and re-dressed the cutters (marks on the cutting blades indicated full 47" sweep). Ran back in and made a new cut at 1243,5 m, still unable to pull free the wellhead with 180 ton over pull. Moved the rig 20 m and observed return at seabed. Continued to circulate to wash away the cement outside the 36" conductor. Moved the rig in 20 m in all directions circulating and pulling with up to 180 ton over pull. After 3 hrs the wellhead came free with 120 ton over pull. Retrieved the wellhead to surface.

Completed the pulling of the riser and the BOP and secured the BOP in the parking position. When breaking off the riser pup joint, the bottom part of the EZSV was found stuck in the upper annular preventer.

ROV retrieved transponders, and the rig went off contract 15.10.03 at 02:40 hrs.

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## 5.17 Experience listing

*Table 4.4 Experience listing*

Section	Down time	Experience (Subject and description)	Immediate solution	Solution recommended for future
26"		Landing string Pull test after 20" csg was pretensioned, exceeded the capacity of 5 1/2" DP used as landing string. Pull test could not be fully completed. Had to accept a lower pull test. High strength landing string required for this operation.	Accepted a lower pull test.	Use a dedicated "High strength" landing string for deep water applications.
17"	20,5	Synergi 225823 (Closed) - 29.06.2003 - Non conformance - Choke line plugged Found choke line plugged when attempting to displace kill/choke lines to 1.23 sg mud. The lines had been previously displaced from sea water to 1.25 sg mud at 22:00 hrs 27.06.  According to Statoil proced. "Drill 17" hole" the lines had to be displaced at every shift due to potential hydrates.	Unplugged choke line The following procedure was performed to unplug the choke line:  Pressured up to 345 bar down the choke line. No go. Increased to 400 bar. No go. Ran DQ Multipurpose tool and set in well head and closed upper pipe rams. Lined up on kill line. Pressured up to 630 bar. No go. Bled off quickly. Opened upper inner and upper outer choke fail safe valves. Pressured up on kill line to 41 bar. Choke line became unplugged and returns were taken into the BOP and up the riser above the UVBR. Flushed all lines and valves OK.  The drilling procedure clearly states that the lines should be displaced to avoid hydrates. This, however, was not a hydrate problem but more likely a Barite settling problem due to "freshly" displaced mud. Potentially not sheared properly.	Ensure the procedures are followed.  Consider to use base fluid in the C&K lines to remove any possibility of solids settling out.
17"	12,5	Synergi 225795 (Closed) - 28.06.2003 - Non conformance - Lost circulation Lost approx. 130 m3 of mud to formation, caused by the formation strength in the Ooze Fm being weaker than predicted. In addition lost approx. 120 m3 of mud over the shakers reported by the mud engineer due to LCM.  Started loosing mud when drilling at 1956 m, 50 m below 20" casing shoe (LOT: 1.33 sg EMW). The mud weight was 1.25 sg, giving an ECD of 1.27 sg w/ 4200 lpm.  Initially lost 21 m3 in 30 minutes. No static loss. Well static.	The following operational activities (in sequence) were carried out until the losses were cured:  1. Spotted 20 m3 LCM pill (150 kg/m3, medium nut plug) on bottom at 160 lpm with full returns. Staged up rate to 1675 lpm with 80 % returns. Followed by an additional 10 m3 LCM pill spotted on bottom. 2. Pulled into shoe. Spotted 10 m3 LCM pill. Established circulation in steps to 3000 lpm. 3. Drilled controlled down to 1971 m. Lost 4.3 m3 over the last metres. 4. Pumped 10 m3 LCM pill (200 kg/m3) at 3500 lpm. No return. 5. Pulled back into shoe. Established circulation in steps, no loses below 3000 lpm. 6. Decreased mud weight to 1.23 sg while drilling controlled at 15 m/hr down to 1990 m. Continuously added traces of LCM to the mud system. 7. Cont. drilling controlled down to 2250 m. Pumped at 3300 lpm (minimum flow rate for the MWD tool to be working). Had minor losses to the formation (decreased by depth). However, lost mud over the shakers due to the LCM.	Based on that the formation strength in the Ooze Fm was weaker than predicted, the mud weight should be kept as low as the pore pressure allows (equal to or below 1.23 sg).
17"		Landing string Use of 5 1/2" S-135 DP as landing string was not sufficient in the case where 13 3/8" csg. got stuck. Pulled 90% of max to pull csg. free.		Use dedicated "high strength" landing string for deep water applications.

12 1/4"	107,5	<p>Well control situation.</p> <p>The actual pore pressure in the Nise fm was 0,10 sg higher than prognoses. Drilled to core point (through the reservoir sequence) with 0,09 sg under balanced.</p> <p>Resulted in plugging back the 12 1/4" hole and initiating a sidetrack.</p>	<p>The 12 1/4" section was drilled from 2425 m to 2816 m (core point). Several incidents with high gas levels and also gain in the active system were recorded and responded to. In the end the mud weight had been increased from initially 1,33 g/cm<sup>3</sup> when drilling to core point at 2816 m, to 1,42 g/cm<sup>3</sup> prior to pulling out of the hole. Good craftsmanship from the drill crew and the Statoil personnel onboard ensured full control in all stages. At the end the decision was made to plug back the 12 1/4" hole and initiate a side track with an 11 3/4" liner set above top of the reservoir.</p> <p>Reference is made to the EOW report, chapter 4.5, were the incident is described in details.</p>	<p>The incident shows the usefulness of a PWD sub in well control situations.</p>
12 1/4" (T2)		<p>The 9 5/8" Hydril SLX slick liner was planned to be run with 9 5/8" inserts in the BX elevator. The Hydril SLX has a small offset which is not compatible with the 9 5/8" BX profile. The 9 5/8" Hydril SLX has to be run with 9 7/8" inserts. If the 9 5/8" inserts had been used; then in worst case the BX elevator could have "cracked", and the string dropped into the well bore.</p>		<p>Reminder for the future!</p>
8 1/2" (T2)		<p>8 1/2" drilling bit.  Hughes Christensen HC605  5 bladed PDC with 19 mm cutters.  Drilled in total 1387 m and was graded 1-1.</p> <p>An in-house drill ability study was carried out in the planning phase, stating that aggressive drill bits are needed to drill these formations with decent ROP.</p> <p>The results from the Ellida well clearly show that the strategy of using very aggressive bits was successful.</p>		<p>The use of aggressive drilling bits is recommended for the future.</p>
8 1/2" (T2)		<p>Low ROP while coring in Lysing fm - Heavy set corehead Cored with Jam Buster (3 1/2" core) and 12-bladed PDC corehead.</p> <p>1. Run: Observed 4 m heave when starting to core. Stopped core after 6 m due to low ROP and smooth torque. Suspected core had jammed off due to the rig heave. No over pull observed when picking off bottom. When out of hole, it was observed that approx 5 m was recovered.</p> <p>2. Run: Expected low ROP based on experience from the first run. Was not able to change corehead due to only 12-bladed coreheads onboard. Cored with 0.5 - 2 m/hr. 10 - 14 ton WOB. Observed same smooth torque as in first run.</p>		<p>Recommendation for coring in Lysing fm in next wells: Try more aggressive Tripax corehead for improved ROP. Tripax corehead has proved to give decent ROP and good recovery in other areas (ex. Norne) where coring with waterbased mud. Drilling experience in the Ellida well also shows that aggressive drill bits are needed to drill this formation with decent ROP. Even a 5-bladed 8 1/2" PDC bit with 19 mm cutters has been graded "green" after drilling 870 m.</p>
DST		<p>SSTT The Halliburton specification for the deepwater umbilical indicated two twisted pair cables for data transmission. Both Halliburton and Metrol failed to control that this was the case and that these cables were intact</p>		<p>Pre-shipment and compatibility checks must be thorough. This is especially the case where equipment form two different companies have to interface.</p>

		<p>whilst performing the onshore pre-shipment and compatibility checks. Offshore it was discovered that only one cable was available and it was necessary to mobilise a separate cable drum with reeler from Aberdeen.</p> <p>The additional cable complicated the running of the landing string as there was now a further cable to handle and clamp as well as need for extra floor space for the reeler unit.</p> <p>The cable from the Metrol data unit below the seabed had to pass around the SSTT and would have been severed in the event of a disconnect</p>		Better follow up needs to be implemented.
DST		<p>Check valve in kill line A check valve was installed at the flowhead to prevent the possibility of hydrocarbons draining back to the cement unit. The check valve has to be locked open if pressure is to be bled back to the unit. This requires man riding and may not be a very safe operation</p>	<p>The check valve was placed in active position after completing pressure testing and all subsequent bleeding off was done through the test equipment</p>	<p>Look at the position of any check valves and ensure that any manipulation can be performed without man riding. The flowhead was equipped with hydraulic valves with the express purpose of avoiding man riding.</p>
DST		<p>FracPac equipment                  On completion of the FracPac operation the Statoil engineers left the rig without leaving sufficient data or drawings regarding the equipment in the hole</p>		<p>Make sure that all necessary drawings, data files etc are available to those that have to continue the job. A good handover is vital.</p>
DST		<p>Waiting on Weather At the planning phase, and for developing the testing budget, insufficient time was allowed for WOW. A better estimate needs to be made in the future bearing in mind the time of year and other local weather conditions. For the Ellida test some 7 days were lost due to weather.</p>		
DST		<p>Baker "Tent" (Hole cover) The Baker tent was used to keep the hole covered whilst making up various items requiring working with hand tools around the rotary. The tent was extremely effective</p>		
DST		<p>Fishing tools for SSTT Fishing tools were not available on the rig for retrieving the test string after shearing with the BOP. This had been discussed at pre-test planning stage but no action taken. The tools would have had to have been sourced from Brazil and would have taken several days to reach the rig</p>	<p>Tools were located in Brazil and could have been mobilised in the event of the string being sheared. The fishing tool is specially developed to retrieve the latch mechanism and regular overshot would probably not have been able to engage the stub</p>	<p>Ensure that tools are available at very short notice. In the event of a shear due to rig going into red alert there would probably be some time to get tools to location. The chances of the rig being idle waiting on tools to be hot-shotted from the other side of the world is however very great.</p>
DST		<p>Sheaves for umbilical The construction of the RamRig gives no suitable points for installing sheaves over which to run umbilical and cables in connection with the SSTT and SRO.</p> <p>It is important that these items be kept under constant tension whilst running to avoid loose hoses in the riser and the danger of these</p>		<p>The issue should be addressed at the planning phase and a plan developed. Halliburton should have picked this up during the rig visit/survey</p>

		being damaged		
DST		<p>Seabed carrier A specially designed seabed carrier was designed and constructed by Metrol to allow real time measurements of pressure and temperature inside the tubing at the seabed level (immediately above the SSTT). Knowledge of these parameters is essential when performing DSTs in deepwater due to the likelihood of hydrates forming in the landing string.</p> <p>The gauges were hard wired back to the surface interface. A separate cable had to be utilised as the Halliburton umbilical only had one twisted pair available</p> <p>An improvement would be to configure the system such that both internal and external pressures and temperatures were recorded</p>	<p>As it was discovered that only one cable was available in the Halliburton umbilical it was decided to run a separate cable for data transmission. The Halliburton cable was used for the seabed gauges whilst the additional cable was used for the reservoir gauges</p>	<p>Ensure that there are two cables included in the umbilical</p>
DST		<p>Use of RD bypass valve The RD-bypass valve was included in the DST completion to allow stinging into and out of the packer without causing swabbing or surging and also to provide a valve for pressure testing the test string. It proved difficult to close (deactivate) the valve at the start of the test. The valve was set to deactivate with an applied annulus pressure of 65 bar due to friction losses in the choke/kill lines down to the BOP and the fact that the perforations below the packer were open it was difficult to pump up to this pressure using normal (low) pump rate. It was necessary to adjust the pop off valves on the mud pumps to a much higher value and pump at a very high rate to overcome friction and other losses. The fear was that due to the inertia of the pumps annulus pressure would continue to increase after the valve was deactivated and could shear open the RD safety circulating valve and lead to having to abort the test.</p> <p>In hindsight this valve should not have been used. A TST valve should have been used, alternatively the string could have been tested against the LPR-N valve</p>	<p>Pump at high rate using mud pumps to generate sufficient pressure at valve to deactivate</p>	<p>Use of other valve such as TST or LPR-N</p>
DST		<p>Water shields and flame detectors The rig installed water curtain in the burner area gives insufficient protection against radiant heat from the burners. The Halliburton burner throws the oil flame upwards at about 30 degrees and therefore much of the radiant heat is above the curtain. Smedvig were supplied with heat radiation calculations before the rig up but these only show radiation levels in</p>		<p>Device better method for connecting hoses.</p>

		<p>the horizontal plane. A 3-D concept needs to be considered when designing water shields.</p> <p>The flame detectors in the derrick reacted to the flaring and one was triggered. Fortunately it requires two detectors to provoke an alarm status and it was possible to isolate the detectors before this arose. This eventuality needs to be built into the test planning and detectors disarmed before flaring commences</p>		
DST		<p>Rig up flowhead on drillfloor The rigfloor is very small and the position of the production and kill standpipes are fairly close to well centre such that making up Coflexip hoses is complicated. The hoses cannot hang with a natural bending radius and therefore there are always forces tending to push the hoses towards the V-door. This is very apparent when finally stabbing the flowhead onto the string; the forces due to the hose radius try to push the flowhead off centre and could easily lead to thread galling and a potential loss of several hours rig time should it be necessary to lay down the flowhead to change out a joint. This would also be a potentially serious safety hazard as the tools might be in a position preventing use of the BOP for a long period.</p>		
DST		<p>Tubular handling on rig floor:</p> <p>The length of tubular assemblies that can be handled (i.e. picked up from the deck and transported to the rig floor) is limited to approximately 15 meters. For planning this needs to be borne in mind and no assemblies should exceed this maximum length.</p> <p>Handling odd shaped assemblies such as the surface flowhead with tubing below was also difficult. Vessel movement also makes transport into and out of the derrick with normal crane and tugger assist very difficult.</p> <p>Changing of elevators, bails etc is a very time consuming operation and with frequent changes of tool and tubular diameter a lot of time is wasted. A more harmonised approach should be aimed for.</p> <p>A lot of time was spent (wasted) on frequent meetings to discuss how to change elevators, bails, etc. Especially use of manual elevators and rig tongs, which are no longer in daily usage. Rig crews, have little experience with these tools so any operation that cannot be performed automatically</p>		<p>For future testing work closely with Smedvig during test planning phase to try to devise better methodology and improve productivity</p>

		<p>takes a long time.</p> <p>The drillfloor is not equipped with a mouse hole, which would permit making up longer assemblies. Normal procedure, with the seal stem well above the packer and the SSTT safely placed above the shear ram, would be to pick up the flowhead and one single as an assembly and then attach two or more pup joints using the mousehole before making the assembly up to the test string. For this test the seal stem was only about one meter out of the packer.</p> <p>Ideally it should be possible to use the auxiliary rig to make up assemblies and then store these vertically before transport to the main rig for make up on the string. For any future testing with this rig this possibility should be considered.</p> <p>As much as possible of tubing should be made up in stands prior to running the string as picking up singles is very time consuming</p>		
DST		<p>Acoustic surface read out system (SRO) The Metrol Antics SRO system worked extremely well and allowed decisions affecting the conduct of the test to be made in real time. For this type of well the data obtained was extremely valuable.</p> <p>On the negative side see the related experience with Halliburton umbilical and SSTT</p> <p>Due to inherent noise levels in the marine riser it is advisable to run a cable to about 30-50 meters below seabed to pick up the signals</p>		<p>Metrol are working on software to eliminate the need for cables below the seabed but this is still in a prototype form. In our case signals were transmitted across the SSTT without problems but no guarantee can be given that this will always be so perfect.</p>
DST		<p>WHP sensors The difference in elevation between rigfloor and test area result in different pressures being registered. The sensors for WHP and WHT should be installed at or very close to the rig floor.</p> <p>There is also a safety and affectivity aspect here as the HP line between the rigfloor and the test area has to be pressurized throughout the test. If this could be depressurized other operations could be performed in and over the test area.</p>		<p>Ensure that there is provision in the production standpipe or preferably on the flowhead to install sensors</p>
DST		<p>Annulus pressure maintenance Approximately 100 bar is required to keep the LPR-N valve open. This is maintained using the rig mud pumps and choke line system. It was noted that annulus pressure dropped continually and had to be regularly pumped up to avoid closing the valve. The problem was located to a leaking mud pump (check valve). Isolating the pump cured the problem</p>	<p>Isolate leaking pump</p>	<p>Better pre-test checking of the mud pump manifolding and valves</p>

DST	<p>Oscillation of annulus pressure          The annulus pressure was seen to oscillate and that the amplitude of the oscillations was increasing with time. There was a danger that the pressure cycles could trigger the down hole samplers</p> <p>The various annulus pressure sensors (Altinex, Sperry Sun, Smedvig) were all connected at the same point and reflected identical oscillating.</p>	<p>The annulus pressure was bled down as far as possible without closing the LPR-N then pumped up again. This reduced the amplitude somewhat. The cause was never pinpointed</p>	<p>Ensure that sensors are located at different nodes so that troubleshooting can be effective</p>
DST	<p>Use of slop tank The slop tank was extremely useful in that the contaminated brine could be stored and allowed to settle before draining the slops to the rig slop system.</p>		
DST	<p>Modified master bushing and power slips To ensure that umbilical, cables etc were not damaged when running the landing string a modified (cut out) master bushing was used in combination with a set of power slips from HD-Oiltech. See note below:</p> <p>"HD-Oiltech kunne tilby ferdig modifiserte power slips, som er redesignet for å passe i modifisert master bushing med cut-out, hvor den ene bit-breaker hullet er gjort om til cut-out. Et standard power slips trenger alle fire bit-breaker hullene i master bushingen, mens HD sitt bruker kun to hull. Samtidig har HD utviklet en mekanisme som drar slipset så langt til side fra hullet, at det er mulig å komme til med kroker for å løfte ut den ene slips-bowlen når klemmene skal kjøres gjennom rotary"</p>		<p>Ensure suitable cut-out bushing is in place in advance of the operation.</p>
DST	<p>LaSalle umbilical clamps The clamps were originally purchased for a different project (Ocean Alliance) and had only been used once by BP. Initially installation was very slow but improved considerably as the crews became used to handling them. Again things would have been easier if the hoses had been passed over sheaves and tension maintained whilst installing clamps.</p> <p>Clamps were run every second stand with umbilicals being strapped to the pipe with both glassfibre and PVC tape every second joint</p>	<p>Liquid soap was used on the rubber inserts to ease installation</p>	<p>Review the use of the clamps and inserts. Perform mock up installation onshore so that the crews are familiar with these items</p>
DST	<p>Pipe Dope OCR 325 AG dope was originally specified and sent to the rig for making up the test string. For some reason this was not observed and Bestolife 200 was used initially. It proved difficult to make up the tubing correctly and finally OCR 325 was used</p>	<p>Use the correct dope</p>	<p>Make sure that the specified dope is used. Failure to do so can cause galling of threads and require a lot of expensive re-cutting</p>

P&A		Cutting and pulling of 13 3/8" casing in one run. The 13 3/8" casing was cut and pulled in one run with a combined motor cutter and spear assembly. The seal assembly was pulled in the same run, due to no lock ring installed. A deviation was approved in advance due to no pack off in string. When the casing hanger was pulled above RKB, the string was hung off. A C-plate was used to pull out the inner string before the casing was pulled conventionally.		This is a recommended practice in deep-water wells when no potential hydrocarbon bearing zones behind casing to be cut.
P&A		The wear bushing was pulled and 13 3/8" EZSV installed in the same run The Dril-Quip Multi Purpose Tool (MPT) was run in the same string as a 13 3/8" EZSV on a hydraulic setting tool. The MPT was spaced out so that it landed in WB when bottom of EZSV was one stand above top of 9 5/8" liner. The WB was engaged and pulled above the BOP. The EZSV was then sat by pumping down DP, and a cement plug was installed above the EZSV. This saved one trip to WH.		This is a recommended solution in deep-water wells to save trips.
P&A		Synergi 238757 (Closed) - 11.10.2003 - Accident - MUF 4070; 20 " EZSV- packer satte seg i risern på dybde 1033 m. Under kjøring av EZSV packer på DP satte packeren seg da riggen plutselig hev ca 4 m. Det hadde vært dårlig vær, men det hadde lagt seg. Levrandør anbefaler mindre enn 3 meter hiv under kjøring.	Drill out with 17 1/2" bit from riser. See attached procedure.	In deep water wells the long riser increases the time for EZSV being run in riser, i.e. longer time - higher risk. This had not been focused enough in the planning phase. If a solution with running an 20" EZSV is chosen, more consideration with regards to risk related to time vs. weather conditions (time of the year) has to be made. Also do not use hydraulic setting tool. A mechanical setting tool gives a more robust solution.

## **5.18 Figures and tables**

### **5.18.1 *Well schematic well 6405/7-1 & 7-1 T2***

*Fig. 4.1 Well Schematic*

Well: 6405/7-1 & 7-1 T2  
 Field: PL281, Ellida  
 Rig: West Navigator

## FINAL WELL SCHEMATIC

Date: 29.10.2003

FINAL WELL SCHEMATIC																
HOLE		CASING				LOT / FIT	TOC		CSG. SHOE		RKB		M.W.	LWD LOGS	SURV CSG/ OH	
SIZE	TVD MD	SIZE	TYPE / RAD. MARKERS	CENTRALIZERS	TEST PRESS [BAR]	[SG]	TVD	MD	TVD	MD			[SG]			
<b>SB</b>	1242						1242	1242								
<b>42" x 36"</b>	1310 1310	<b>36"x30"</b>	Interval: 1240 - 1310 m (70 m) : Type: 552 x 309 lb/ft, X-52, SL-60 Drift: 27.813"		N/A	N/A	Sea bed	Sea bed				1310	1310	Sea water - 1,35	N/A	Anderdrift
<b>26"</b>	1910 1910	<b>20"</b>	Interval: 1240 - 1900 m : Type: 133 lb/ft, X-56, E-60/MT Drift: 20,870"	1 x Bow type / 4 first joints	190	LOT 1.33								sea water - 1,35	Resistivity Gamma Ray Pressure	MWD
							1900	1900	1900	1900						
<b>17"</b>	2425 2425	<b>13 3/8"</b>	Interval: 1240 - 2417 m : Type: 72 lb/ft, P-110, New Vam Drift: 12.258"	1 x Bow type / 5 first joints	395	LOT 1.42	Unknown	Unknown	Top liner: 2260	Top liner: 2260				1,17 - 1,23	Resistivity Gamma Ray Pressure	MWD
							Unknown	Unknown	Top liner: 2308	Top liner: 2308						
									2417	2417						
<b>14"</b>	2740 2741	<b>11 3/4"</b>	Interval: 2308 - 2741 m Type: 65 lb/ft, P-110, Hydril SLX Drift: 10,630"	None	100	LOT 1.60						2740	2741	1,38	Resistivity Gamma Ray Pressure	MWD
<b>12 1/4"</b>	3199 3200	<b>9 5/8"</b>	Interval: 2260 - 3187 m Type: 53,5 lb/ft, Q-125, Hydril SLX Drift: 8.508"	None	230	LOT 1.70								1,45	Resistivity Gamma Ray Pressure	MWD
												3186	3187			
<b>8 1/2"</b>	4299 4300	<b>N/A</b>												1,42	Resistivity Gamma Ray Pressure	MWD
												4299	4300			

**5.18.2** *P&A wellbore schematic*

*Fig. 4.2 P&A Schematic*

# Well 6405/7-1 T2 Ellida West Navigator



Not to scale  
All depth are MD RT

**36"x30" conductor @ 1310 m :**

552.7 x 309 lb/ft  
X-52, SL-60  
TOC: Seabed

**20" casing @ 1900 m :**

133 lb/ft, X-56, E-60/MT  
TOC: Seabed  
LOT = 1.33 SG

**13 3/8" casing @ 2417 m :**

72 lbs/ft, P-110, New Vam  
TOC: +/- 20" shoe  
LOT = 1.42 SG

**11 3/4" liner @ 2741 m :**

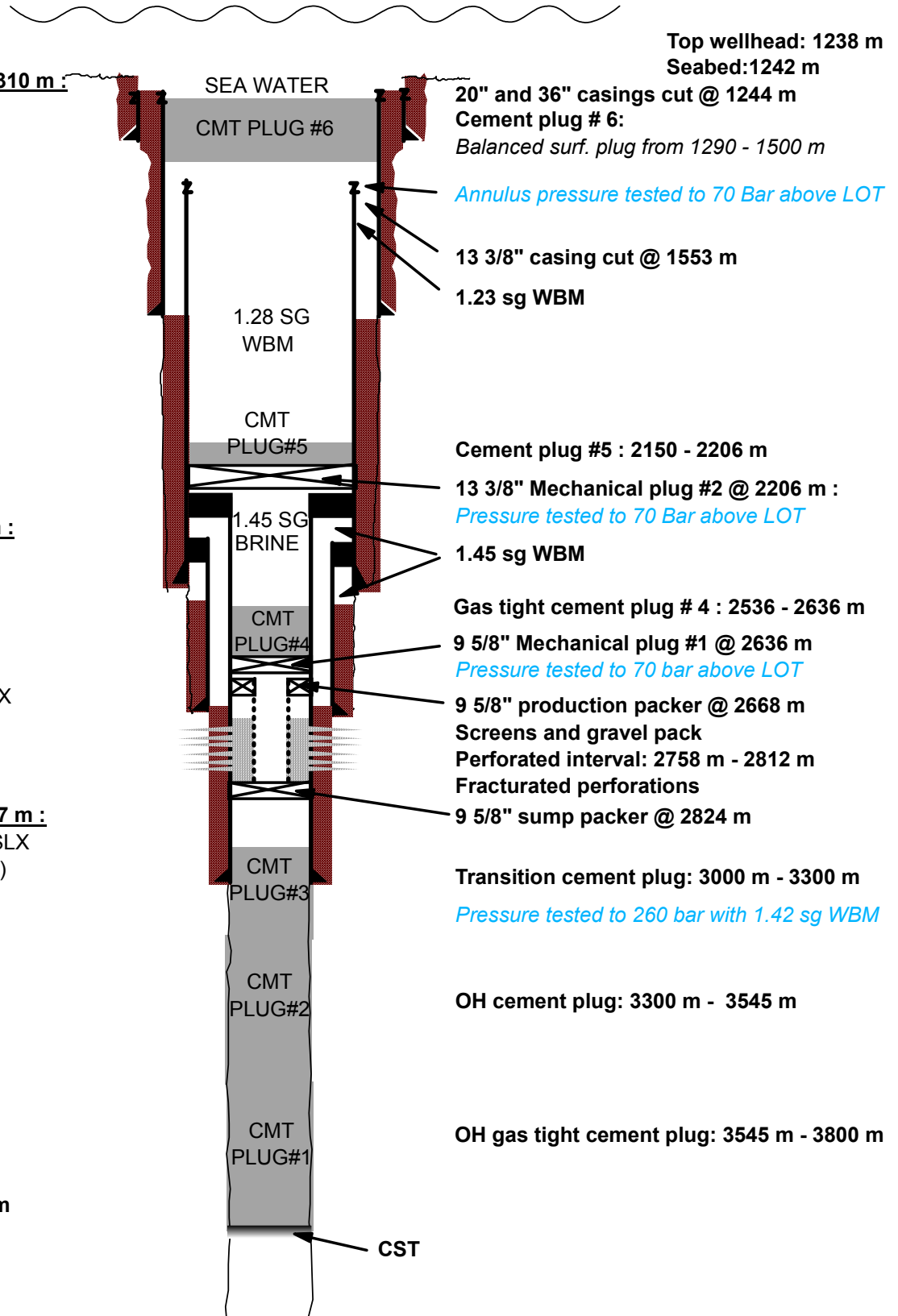
65 lbs/ft, P-110, Hydril SLX  
TOC: Unknown  
LOT = 1.60 SG

**9 5/8" liner @ 2260 - 3187 m :**

53.5 lbs/ft, Q-125, Hydril SLX  
TOC: 2741 m (cement log)  
LOT = 1.70 SG

Top Lysing fm @ 3730 m

TD of well @ 4300 m



### **5.18.3** *Time/depth curve*

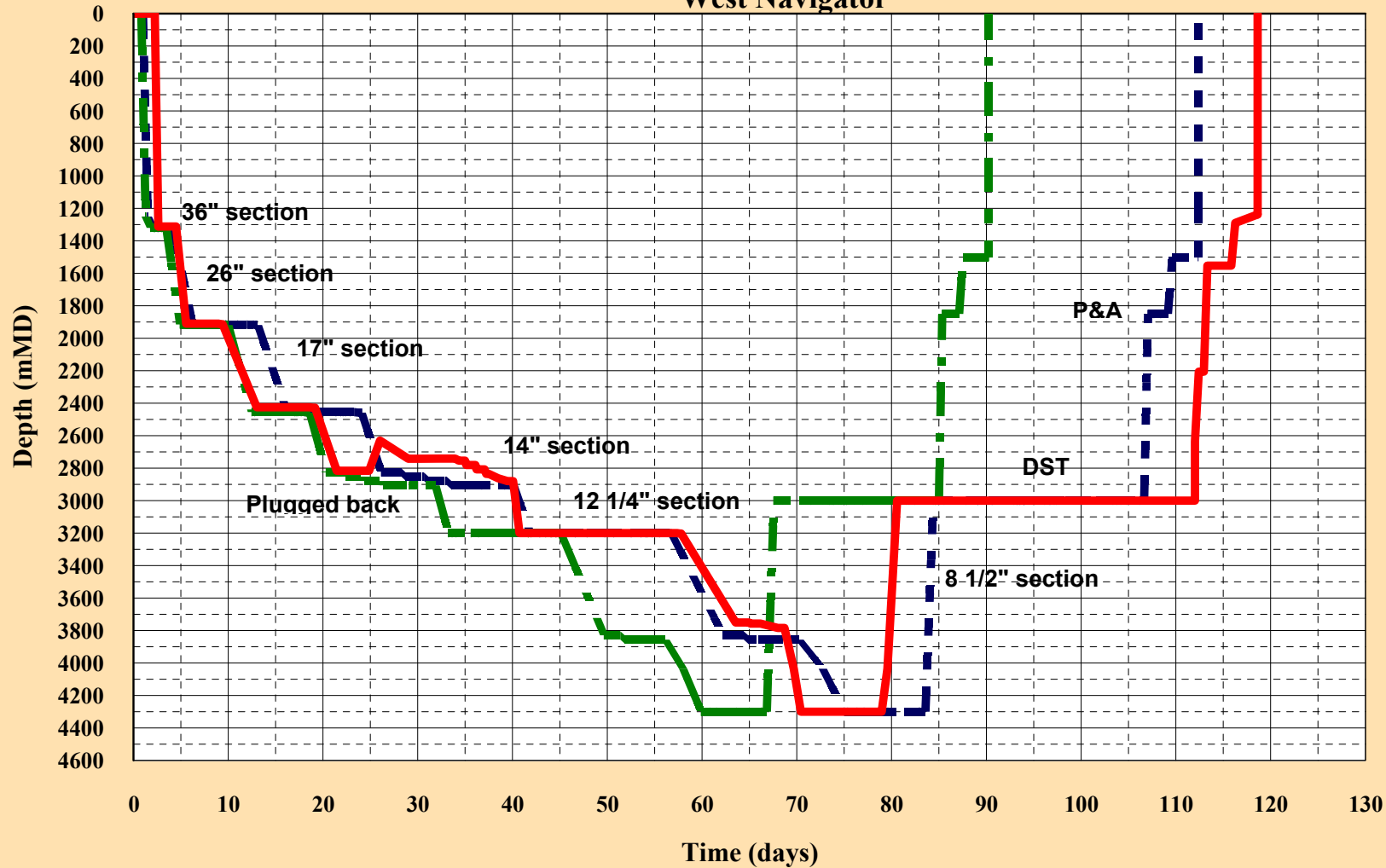
*Fig. 4.3 Time/Depth curve*

# Time - Depth Plot

## PL 281, 6405/7-1 T2 Ellida - Revised Scope of work

### West Navigator

- - - Budget time (days)
- - - p10 time (days)
- Actual time (days)



**Updated date/time:**

Date: 16.10.2003

Time: 12:51

**Start date/time:**

Date: 18.06.2003

Time: 12:00

**Est. finish date/time:**

Date: 15.10.2003

Time: 03:00

**Total budget time:**

112,4 days

**Time used:**

118,6 days

**Time behind budget:**

6,3 days

**Comments:**

Dry well budget: 70,7 days.  
 Revised SoW: 19,9 days  
 FracPack/DST budget: 21,8 days

#### **5.18.4** *Timeplanner*

*Table 4.5 Timeplanner*

TIMEPLANNER										STATOIL		Down time/Waiting time						
Thu 16.10.2003 12:51	Updated									PL 281, 6405/7-1 T2 Ellida - Revised Scope of work		PL 281, 6405/7-1 T2 Ellida - Revised Scope of work						
Wed 18.06.2003 12:00	Start date									Time behind budget:		West Navigator						
Wed 15.10.2003 03:00	Est. finish date									6,3 days		West Navigator						
D A Y	START DATE	START TIME	Budg. time (hrs)	Acc. budg. time (days)	p10 time (hrs)	Acc. opt. time (days)	Budg./ Opt. depth (mMD)	Plan time (hrs)	Actual time (hrs)	Acc. actual time (days)	Actual Depth (mMD)	Activity description	Company	Down time (hrs)	Accum. down time (hrs)	Waiting time (hrs)	Accum. waiting time (hrs)	Comments (reason for down/waiting time)
Transit / Prespud												Transit / Prespud						
Wed 18.06.2003	12:00		0,0	0,0	0,0	0,0	0	0,0	0,0	0,0	0	F Start operation		0,0	0,0	0,0	0,0	
Wed 18.06.2003	12:00		24,0	1,0	20,0	0,8	0	17,0	24,5	1,0	0	F Transit from Esso location to Ellida location (152 NM).			0,0		0,0	
Thu 19.06.2003	12:30		12,0	1,5	11,0	1,3	1250	24,0	29,5	2,3	0	F Set out transponders, prepare for operation		1,0	1,0		0,0	Oceaneering: Hydraulic leakage on Magnum
Section time (days)			1,5		1,3			1,7	2,3			Section time ahead of/behind (-) budg:-0,8 days, Tot. time ahead of/behind (-) budg:-0,8 days		1,0	hours	0,0	hours	Down time: 1,9% , Total Down time: 1,9% , Waiting time: 0,0% , Total Waiting time: 0,0%
36" hole section (1250 - 1320 mMD) 70 m												36" hole section (1250 - 1320 mMD) 70 m						
Fri 20.06.2003	18:00		0,0	1,5	0,0	1,3	1250	0,0	0,0	2,3	0	F Offline activity: MU 36" x 42" Spud BHA, RHH.			1,0		0,0	
Fri 20.06.2003	18:00		14,0	2,1	13,0	1,8	1320	11,0	9,0	2,6	1312	F Drill 36" x 42" hole.			1,0		0,0	
Sat 21.06.2003	03:00		12,0	2,6	9,0	2,2	1320	5,0	4,0	2,8	1312	F Circ hole clean, displace to 1.35 sg mud, POOH.			1,0		0,0	
Sat 21.06.2003	07:00		0,0	2,6	0,0	2,2	1320	0,0	0,0	2,8	1312	F Offline activity: MU 30" x 36" conductor and stinger,			1,0		0,0	
Sat 21.06.2003	07:00		0,0	2,6	0,0	2,2	1320	0,0	0,0	2,8	1312	F Offline activity: RHH with conductor			1,0		0,0	
Sat 21.06.2003	07:00		5,0	2,8	4,0	2,4	1320	3,5	3,0	2,9	1312	F Stab in conductor.			1,0		0,0	
Sat 21.06.2003	10:00		11,0	3,3	8,0	2,7	1320	14,0	14,0	3,5	1312	F Cement conductor, WOC.			1,0	13,5	13,5	WOC
Sun 22.06.2003	00:00		6,0	3,5	6,0	3,0	1320	5,0	5,0	3,7	1312	F Release running tool and POOH with RT and stinger.			1,0		13,5	
Sun 22.06.2003	05:00		0,0	3,5	0,0	3,0	1320	5,0	6,0	4,0	1312	F RHH with cement stinger and perform grouting job.			1,0		13,5	
Sun 22.06.2003	11:00		0,0	3,5	0,0	3,0	1320	3,0	2,0	4,0	1312	F Remove current meter device from location.			1,0		13,5	
Sun 22.06.2003	13:00		12,0	4,0	9,0	3,3	1320	7,0	8,5	4,4	1312	F M/U 26" BHA, rih and tag cement.			1,0		13,5	
Sun 22.06.2003	21:30		4,0	4,2	3,0	3,5	1323	3,0	2,5	4,5	1312	F Drill out 30" shoetrack.			1,0		13,5	
Section time (days)			2,7		2,2			2,4	2,3			Section time ahead of/behind (-) budg:0,4 days, Tot. time ahead of/behind (-) budg:-0,3 days		0,0	hours	13,5	hours	Down time: 0,0% , Total Down time: 0,9% , Waiting time: 25,0% , Total Waiting time: 12,5%
26" hole section (1320 - 1915 mMD) 595 m												26" hole section (1320 - 1915 mMD) 595 m						
Mon 23.06.2003	00:00		50,0	6,3	35,0	4,9	1915	26,0	25,5	5,6	1910	F Drill 26" hole to 1910 m w/ SW.		1,0			13,5	
Tue 24.06.2003	01:30		6,0	6,5	4,0	5,1	1915	2,5	2,5	5,7	1910	F Circulate BU, displace hole to 1.35 sg mud. (equal 1.14 sg at TD).			1,0		13,5	
Tue 24.06.2003	04:00		12,0	7,0	8,0	5,4	1915	0,0	0,0	5,7	1910	F Wiper trip to seabed.			1,0		13,5	
Tue 24.06.2003	04:00		15,0	7,6	12,0	5,9	1915	7,0	8,5	6,0	1910	F POOH w/26" BHA.			1,0		13,5	
Tue 24.06.2003	12:30		17,0	8,3	14,0	6,5	1915	13,0	13,0	6,6	1910	F MU and run 20" casing.			1,0		13,5	
Wed 25.06.2003	01:30		10,0	8,8	7,0	6,8	1915	9,0	10,5	7,0	1910	F Run 20" casing on landing string to setting depth.			1,0		14,5	Waiting on safety stand down
Wed 25.06.2003	12:00		6,0	9,0	3,0	6,9	1915	2,0	4,0	7,2	1910	F M/U cement stand. Break circulation.			1,0	1,0	14,5	
Wed 25.06.2003	16:00		8,0	9,3	5,0	7,1	1915	4,0	4,5	7,4	1910	F Cement 20" casing.		1,0	2,0		14,5	Halliburton: Leakage in cement head when pressure testing cement hoses
Wed 25.06.2003	20:30		10,0	9,8	7,0	7,4	1915	1,0	1,0	7,4	1910	F Release casing running tool. Offline: POOH with landing string. Rack back cement stand.			2,0		14,5	
Wed 25.06.2003	21:30		0,0	9,8	0,0	7,4	1915	0,0	0,0	7,4	1910	F Offline activity: Prepare to run BOP			2,0		14,5	
Wed 25.06.2003	21:30		0,0	9,8	0,0	7,4	1915	0,0	0,0	7,4	1910	F Offline activity: Run riser and BOP.			2,0		14,5	
Wed 25.06.2003	21:30		30,0	11,0	25,0	8,5	1915	22,0	24,5	8,4	1910	F Run riser and BOP. Land BOP. Clear Drill floor.		18,0	20,0		14,5	Smedvig: 15 ton tigger failed
Thu 26.06.2003	22:00		24,0	12,0	19,0	9,3	1915	10,0	14,5	9,0	1910	F MU 17" BHA, RHH, function test BOP. Tag cement (1849 m).		0,5	20,5		14,5	Smedvig: Top drive UIBOP not fully opened
Fri 27.06.2003	12:30		15,0	12,6	8,0	9,6	1915	4,0	3,5	9,2	1913	F Drill out 20" shoe and 3 m new formation.			20,5		14,5	
Fri 27.06.2003	16:00		6,0	12,9	5,0	9,8	1918	2,0	4,0	9,3	1913	F Circulate hole clean and perform LOT (1.33 sg EMW).			20,5		14,5	
Section time (days)			8,7		6,3			4,3	4,8			Section time ahead of/behind (-) budg:3,9 days, Tot. time ahead of/behind (-) budg:3,5 days		19,5	hours	1,0	hours	Down time: 16,8% , Total Down time: 9,2% , Waiting time: 0,9% , Total Waiting time: 6,5%
17" hole section (1915 - 2455 mMD) 540m												17" hole section (1915 - 2455 mMD) 540m						
Fri 27.06.2003	20:00		6,0	13,1	5,0	10,0	1918	3,0	2,0	9,4	1913	F Displace well to 1.25 sg Glydriol DW WBM.			20,5		14,5	
Fri 27.06.2003	22:00		74,0	16,2	60,0	12,5	2455	87,0	86,5	13,0	2425	F Drill 17" hole to 2425 m.		33,0	53,5		14,5	Statoil: Mud losses (12.5 hrs), Smedvig: Plugged choke line (20.5 hrs)
Tue 01.07.2003	12:30		12,0	16,7	7,0	12,8	2455	4,0	5,0	13,2	2425	F Circulate bottoms up		9,5	63,0		14,5	Statoil: Swabbed 500 l
Tue 01.07.2003	17:30		12,0	17,2	8,0	13,1	2455	22,5	25,5	14,3	2425	F POOH				63,0	14,5	
Wed 02.07.2003	19:00		20,0	18,0	15,0	13,8	2455	12,0	12,5	14,8	2425	F Perform wireline logging in 17" hole (1 run).				63,0	14,5	
Thu 03.07.2003	07:30		16,0	18,7	13,0	14,3	2455	0,0	0,0	14,8	2425	F Perform wipertrip.				63,0	14,5	
Thu 03.07.2003	07:30		6,0	19,0	6,0	14,5	2455	2,5	5,5	15,0	2425	F RHH with jet sub and bore protector pulling tool.		0,5	63,5		14,5	Smedvig: Upper guiding arm hydraulic hose failed
Thu 03.07.2003	13:00		6,0	19,2	6,0	14,8	2455	2,5	4,0	15,2	2425	F Pull bore protector. Wash WH area. POOH.				63,5	14,5	
Thu 03.07.2003	17:00		8,0	19,5	6,0	15,0	2455	3,0	1,5	15,3	2425	F Rig up to run 13 3/8" casing.				63,5	14,5	
Thu 03.07.2003	18:30		16,0	20,2	14,0	15,6	2455	12,5	12,5	15,8	2425	F Run 13 3/8" casing.				63,5	14,5	
Fri 04.07.2003	07:00		12,0	20,7	10,0	16,0	2455	4,0	21,0	16,7	2425	F Run 13 3/8" casing on landing string. Land casing in WH.				63,5	14,5	
Sat 05.07.2003	04:00		4,0	20,9	3,0	16,2	2455	2,0	4,5	16,9	2425	F Circulate and condition mud prior to cementing.				63,5	14,5	
Sat 05.07.2003	08:30		12,0	21,4	10,0	16,6	2455	4,0	4,0	17,0	2425	F Cement 13 3/8" casing				63,5	14,5	
Sat 05.07.2003	12:30		12,0	21,9	10,0	17,0	2455	1,0	3,0	17,1	2425	F Set seal assy.				63,5	14,5	
Sat 05.07.2003	15:30		6,0	22,1	4,0	17,2	2455	2,0	4,5	17,3	2425	F POOH with landing string.				63,5	14,5	
Sat 05.07.2003	20:00		6,0	22,4	4,0	17,3	2455	3,0	4,5	17,5	2425	F RHH with 13 3/8" wear bushing (on MP tool).				63,5	14,5	
Sun 06.07.2003	00:30		12,0	22,9	9,0	17,7	2455	10,0	14,5	18,1	2425	F Install wear bushing. Pressure test BOP. POOH.				63,5	14,5	
Sun 06.07.2003	15:00		10,0	23,3	8,0	18,0	2455	6,0	10,0	18,5	2425	F MU 12 1/2" BHA, RHH.		2,0	65,5		14,5	Smedvig: Pressure test of IBOP failed
Mon 07.07.2003	01:00		12,0	23,8	8,0	18,4	2458	3,5	10,5	19,0	2428	F Drill out 13 3/8" casing and 3 m new formation				65,5	14,5	
Mon 07.07.2003	11:30		7,0	24,1	5,0	18,6	2458	3,5	4,5	19,2	2428	F Circulate and condition mud and perform LOT.				65,5	14,5	
Section time (days)			11,2		8,8			7,8	9,8			Section time ahead of/behind (-) budg:1,4 days, Tot. time ahead of/behind (-) budg:4,9 days		45,0	hours	0,0	hours	Down time: 19,1% , Total Down time: 14,2% , Waiting time: 0,0% , Total Waiting time: 3,2%
12 1/2" hole section (2455 - 3187mMD) 732 m												12 1/2" hole section (2455 - 3187mMD) 732 m						
Mon 07.07.2003	16:00		50,0	26,2	42,0	20,3	2825	38,0	55,0	21,5	2816	F Drill 12 1/2" hole to core point # 1 at 2825. Get high gas readings, controlled ROP.		65,5			14,5	
Wed 09.07.2003	23:00		6,0	26,4	5,0	20,5	2825	3,0	4,5	21,6	2816	F Circulate bottom up for sample.		65,5			14,5	

TIMEPLANNER										STATOIL		Down time/Waiting time					
Thu 16.10.2003 12:51	Updated		PL 281, 6405/7-1 T2 Ellida - Revised Scope of work							Time behind budget:		PL 281, 6405/7-1 T2 Ellida - Revised Scope of work					
Wed 18.06.2003 12:00	Start date		West Navigator							6,3 days		West Navigator					
Wed 15.10.2003 03:00	Est. finish date																
D A Y	START DATE	START TIME	Budg. time (hrs)	Acc. budg. time (days)	p10 time (hrs)	Acc. opt. time (days)	Budg./ depth (mMDD)	Plan time (hrs)	Actual time (hrs)	Acc. actual time (days)	Actual Depth (mMDD)	Company	Down time (hrs)	Accum. down time (hrs)	Waiting time (hrs)	Accum. waiting time (hrs)	Comments (reason for down/waiting time)
Thu	16.07.2003	03:30	0,0	26,4	0,0	20,5	2825	0,0	48,0	23,6	2816	F	107,5	173,0		14,5	Statoil: Higher PP than prognosed. Plugged back hole
Sat	12.07.2003	03:30	0,0	26,4	0,0	20,5	2825	30,0	29,5	24,9	2816	F		173,0		14,5	
Sun	13.07.2003	09:00	0,0	26,4	0,0	20,5	2825	31,0	27,5	26,0	2630	F		173,0		14,5	
Mon	14.07.2003	12:30	0,0	26,4	0,0	20,5	2825	72,0	71,5	29,0	2742	F	3,0	176,0		14,5	Smedvig: Repaired ram rig indicator system
Thu	17.07.2003	12:00	0,0	26,4	0,0	20,5	2825	48,0	31,5	30,3	2742	F	7,0	183,0		14,5	Smedvig (4 + 3 hrs): Repaired ram rig indicator system
Fri	18.07.2003	19:30	0,0	26,4	0,0	20,5	2825	47,0	47,5	32,3	2741	F	1,0	184,0		14,5	Nodoco: Ball did not drop from cement head when setting 11 3/4" liner hanger
Sun	20.07.2003	19:00	0,0	26,4	0,0	20,5	2825	22,0	21,0	33,2	2741	F	8,0	192,0		14,5	Statoil: Not able to seat BOP test tool
Mon	21.07.2003	16:00	0,0	26,4	0,0	20,5	2825	20,0	19,0	34,0	2741	F	0,5	192,5		14,5	Smedvig: Leak in hydraulic line to standpipe pressure sensor
Tue	22.07.2003	11:00	0,0	26,4	0,0	20,5	2825	8,0	9,0	34,3	2754	F		192,5		14,5	
Tue	22.07.2003	20:00	16,0	27,1	13,0	21,1	2825	6,0	7,5	34,6	2754	F		192,5		14,5	
Wed	23.07.2003	03:30	24,0	28,1	18,0	21,8	2825	6,0	8,5	35,0	2754	F		192,5		14,5	
Wed	23.07.2003	12:00	4,0	28,3	4,0	22,0	2825	3,0	3,0	35,1	2781	F		192,5		14,5	
Wed	23.07.2003	15:00	12,0	28,8	10,0	22,4	2852	5,0	5,5	35,4	2781	F		192,5		14,5	
Wed	23.07.2003	20:30	18,0	29,5	16,0	23,1	2852	12,0	7,5	35,7	2781	F		192,5		14,5	
Thu	24.07.2003	04:00	24,0	30,5	18,0	23,8	2852	9,0	7,0	36,0	2781	F		192,5		14,5	
Thu	24.07.2003	11:00	4,0	30,7	4,0	24,0	2852	3,0	3,0	36,1	2781	F		192,5		14,5	
Thu	24.07.2003	14:00	12,0	31,2	10,0	24,4	2879	5,0	3,0	36,2	2808	F		192,5		14,5	
Thu	24.07.2003	17:00	18,0	31,9	16,0	25,1	2879	8,0	9,0	36,6	2808	F		192,5		14,5	
Fri	25.07.2003	02:00	24,0	32,9	18,0	25,8	2879	7,0	6,0	36,8	2808	F		192,5		14,5	
Fri	25.07.2003	08:00	4,0	33,1	4,0	26,0	2879	3,0	5,5	37,1	2808	F		192,5		14,5	
Fri	25.07.2003	13:30	12,0	33,6	10,0	26,4	2906	3,0	4,0	37,2	2835	F		192,5		14,5	
Fri	25.07.2003	17:30	18,0	34,3	16,0	27,1	2906	9,0	6,5	37,5	2835	F		192,5		14,5	
Sat	26.07.2003	00:00	58,0	36,8	48,0	29,1	2906	22,0	23,5	38,5	2862	F		192,5	1,0	15,5	Waited on decision regarding further coring or drilling
Sat	26.07.2003	23:30	58,0	39,2	48,0	31,1	2906	23,0	24,0	39,5	2880	F		192,5		15,5	
Sun	27.07.2003	23:30	12,0	39,7	10,0	31,5	2906	6,0	7,5	39,8	2880	F		192,5		15,5	
Mon	28.07.2003	07:00	11,0	40,1	9,0	31,9	2906	4,0	6,5	40,1	2880	F		192,5		15,5	
Mon	28.07.2003	13:30	42,0	41,9	33,0	33,3	3200	12,0	16,5	40,8	3200	F		192,5		15,5	
Tue	29.07.2003	06:00	12,0	42,4	9,0	33,6	3200	3,0	14,0	41,3	3200	F		192,5		15,5	
Tue	29.07.2003	20:00	12,0	42,9	10,0	34,0	3200	8,0	7,0	41,6	3200	F		192,5		15,5	
Wed	30.07.2003	03:00	45,0	44,8	38,0	35,6	3200	31,0	31,5	42,9	3200	F		192,5		15,5	
Thu	31.07.2003	10:30	22,5	45,7	19,0	36,4	3200	52,0	48,0	44,9	3200	F		192,5		15,5	
Sat	02.08.2003	10:30	22,5	46,6	19,0	37,2	3200	70,0	69,5	47,8	3200	F		192,5		15,5	
Tue	05.08.2003	08:00	30,0	47,9	20,0	38,0	3200	30,0	30,0	49,1	3200	F		192,5		15,5	
Wed	06.08.2003	14:00	22,5	48,8	19,0	38,8	3200	18,0	16,0	49,8	3200	F	1,5	194,0		15,5	Baker Atlas: Telemetry/communication problems with tools.
Thu	07.08.2003	06:00	22,5	49,8	19,0	39,6	3200	12,0	15,5	50,4	3200	F		194,0		15,5	
Thu	07.08.2003	21:30	22,5	50,7	19,0	40,4	3200	36,0	37,5	52,0	3200	F	2,5	196,5		15,5	Baker Atlas: Telemetry/communication problems with tools. Surface computer crashed.
Sat	09.08.2003	11:00	44,0	52,5	30,0	41,7	3200	46,0	47,0	53,9	3200	F	1,0	197,5		15,5	Statoil: Stuck inside 11 3/4" liner.
Mon	11.08.2003	10:00	0,0	52,5	0,0	41,7	3200	24,0	21,0	54,8	3200	F		197,5		15,5	
Tue	12.08.2003	07:00	8,0	52,9	7,0	42,0	3200	2,0	2,0	54,9	3200	F		197,5		15,5	
Tue	12.08.2003	09:00	17,0	53,6	15,0	42,6	3200	10,0	15,0	55,5	3200	F	1,5	199,0		15,5	Smedvig: Troubleshot problems with proximity switch on shute for HTV (pipe handling system).
Wed	13.08.2003	00:00	12,0	54,1	10,0	43,0	3200	6,0	12,0	56,0	3200	F		199,0		15,5	
Wed	13.08.2003	12:00	4,0	54,2	3,0	43,1	3200	1,0	0,5	56,0	3200	F		199,0		15,5	
Wed	13.08.2003	12:30	12,0	54,7	9,0	43,5	3200	3,0	3,5	56,2	3200	F		199,0		15,5	
Wed	13.08.2003	16:00	15,0	55,4	13,0	44,0	3200	6,0	7,0	56,5	3200	F		199,0		15,5	
Wed	13.08.2003	23:00	4,0	55,5	2,0	44,1	3200	1,0	1,0	56,5	3200	F		199,0		15,5	
Thu	14.08.2003	00:00	0,0	55,5	11,0	44,6	3200	13,0	11,0	57,0	3200	F		199,0		15,5	
Thu	14.08.2003	11:00	12,0	56,0	0,0	44,6	3200	8,0	10,0	57,4	3200	F		199,0		15,5	
Thu	14.08.2003	21:00	12,0	56,5	8,0	44,9	3200	2,5	7,0	57,7	3203	F		199,0		15,5	
Fri	15.08.2003	04:00	6,0	56,8	5,0	45,1	3203	4,0	3,0	57,8	3203	F		199,0		15,5	
Section time (days)			32,7	26,5				35,5	34,1				133,5	hours	1,0	hours	Down time: 16,3% , Total Down time: 14,3% , Waiting time: 0,1% , Total Waiting time: 1,1%
8 1/2" hole section (3187 - 4300 mMD) 1113 m												8 1/2" hole section (3187 - 4300 mMD) 1113 m					
Fri	15.08.2003	07:00	131,0	62,2	109,0	49,7	3830	128,0	138,0	63,5	3751	F	81,0	280,0		15,5	Smedvig: Troubleshot fault in GPS/DP system.
Fri	21.08.2003	01:00	6,0	62,5	5,0	49,9	3830	3,0	3,5	63,7	3751	F		280,0		15,5	
Thu	21.08.2003	04:30	18,0	63,2	15,0	50,5	3830	8,0	13,5	64,3	3751	F		280,0		15,5	
Thu	21.08.2003	18:00	24,0	64,2	18,0	51,3	3830	13,0	14,0	64,8	3751	F		280,0		15,5	
Fri	22.08.2003	08:00	4,0	64,4	3,0	51,4	3830	3,0	2,5	64,9	3751	F		280,0		15,5	
Fri	22.08.2003	10:30	12,0	64,9	12,0	51,9	3857	6,0	4,0	65,1	3757	F		280,0		15,5	
Fri	22.08.2003	14:30	24,0	65,9	18,0	52,6	3857	10,0	12,5	65,6	3757	F		280,0		15,5	
Sat	23.08.2003	03:00	20,0	66,7	16,0	53,3	3857	10,0	13,0	66,2	3757	F		280,0		15,5	
Sat	23.08.2003	16:00	64,0	69,4	51,0	55,4	3857	42,0	44,0	68,0	3784	F		280,0		15,5	
Mon	25.08.2003	12:00	21,0	70,3	17,0	56,1	3857	7,0	17,0	68,7	3784	F		280,0		15,5	
Tue	26.08.2003	05:00	59,0	72,7	45,0	58,0	4036	24,0	23,5	69,7	4036	F		280,0		15,5	
Wed	27.08.2003	04:30	55,0	75,0	46,0	59,9	4300	24,0	18,0	70,4	4300	F		280,0		15,5	
Wed	27.08.2003	22:30	8,0	75,4	4,0	60,1	4300	3,0	2,5	70,5	4300	F		280,0		15,5	
Thu	28.08.2003	01:00	24,0	76,4	18,0	60,8	4300	14,0	19,0	71,3	4300	F		280,0		15,5	

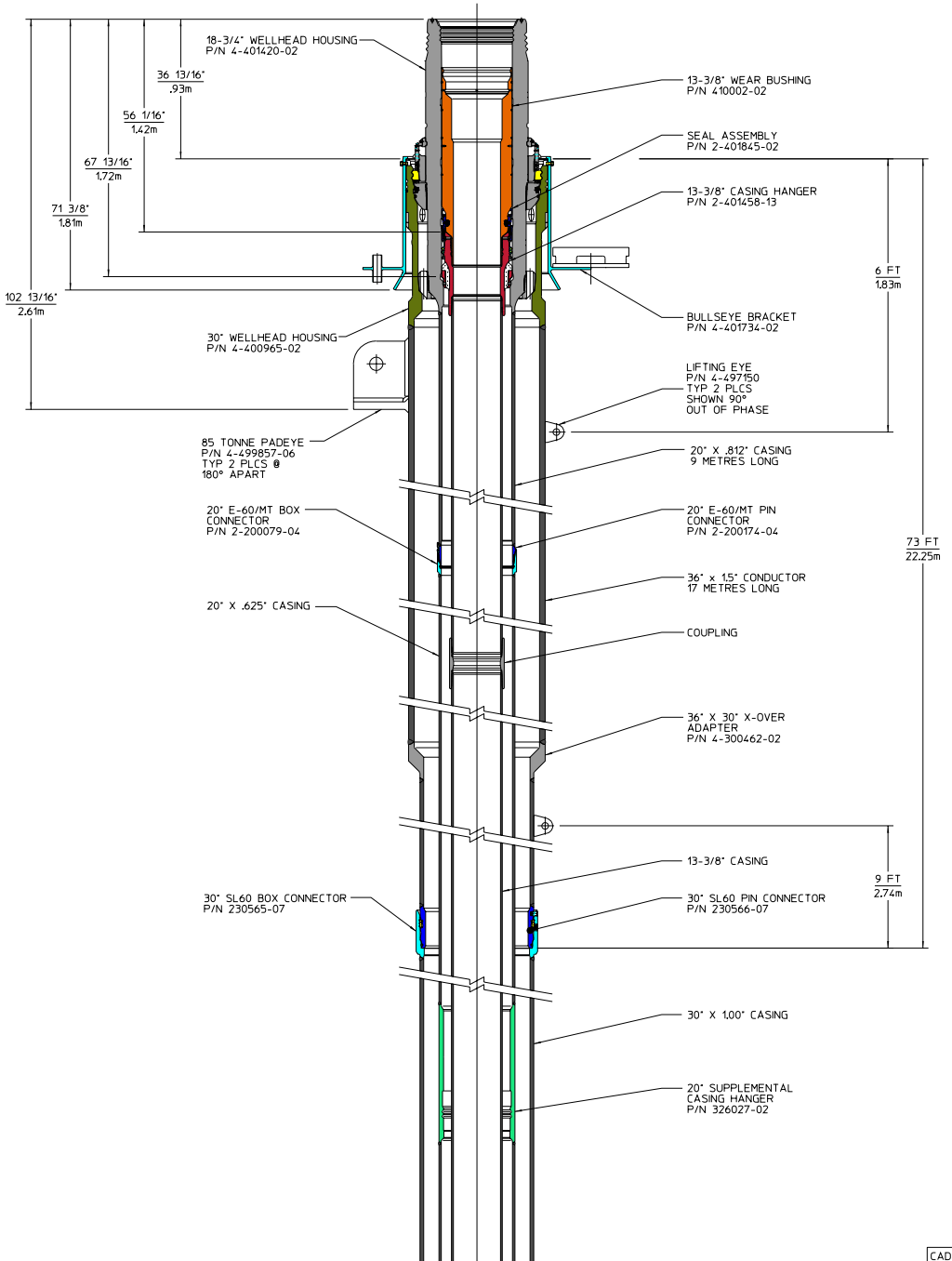
TIMEPLANNER										STATOIL		Down time/Waiting time									
PL 281, 6405/7-1 T2 Ellida - Revised Scope of work										Time behind budget:		PL 281, 6405/7-1 T2 Ellida - Revised Scope of work									
West Navigator										6,3 days		West Navigator									
D A Y	START DATE	START TIME	Budg. time (hrs)	Acc. budg. time (days)	p10 time (hrs)	Acc. opt. time (days)	Budg./depth (mMDD)	Plan time (hrs)	Actual time (days)	Acc. actual time (days)	Actual Depth (mMDD)	Activity description	Company	Down time (hrs)	Accum. down time (hrs)	Waiting time (hrs)	Accum. waiting time (hrs)	Comments (reason for down/waiting time)			
Thu	16.10.2003	12:51	Updated																		
Wed	18.06.2003	12:00	Start date																		
Wed	15.10.2003	03:00	Est. finish date																		
Thu	28.08.2003	20:00	18,0	77,1	17,0	61,5	4300	6,0	9,0	71,7	4300	F POOH.			280,0		15,5				
Fri	29.08.2003	05:00	0,0	77,1	0,0	61,5	4300	12,0	12,5	72,2	4300	F Test BOP.			280,0		15,5				
Fri	29.08.2003	17:30	60,0	79,6	50,0	63,6	4300	34,0	58,5	74,7	4300	F RU and perform wireline logging (3 runs).			280,0		15,5				
Mon	01.09.2003	04:00	0,0	79,6	0,0	63,6	4300	0,0		74,7	4300	F Offline activity: Drill pilot hole from Aux rig (not included in budget).			280,0		15,5				
Mon	01.09.2003	04:00	80,0	82,9	64,0	66,3	4300	110,0	103,0	79,0	4300	F Extra WL logging (not included in budget).		16,0	296,0		15,5	Baker Atlas: 8 hrs: Not able to set RCI-packer. 8 hrs: Malfunction of RCOR-tool			
Section time (days)			26,2	21,2				19,0	21,2			Section time ahead of/behind (-) budg:5,0 days, Tot. time ahead of/behind (-) budg:4,0 days		97,0	hours	0,0	hours	Down time: 19,1% , Total Down time: 15,6% , Waiting time: 0,0% , Total Waiting time: 0,8%			
FRAC.PACK - DST and P&A																	FRAC.PACK - DST and P&A				
Fri	05.09.2003	11:00	15,0	83,6	13,0	66,8	4300	9,0	14,5	79,6	4036	F RHH with cement stinger, Function test LPR			296,0		15,5				
Sat	06.09.2003	01:30	20,0	84,4	18,0	67,6	3000	11,0	24,5	80,6	3000	F Plug back open hole. POOH.			296,0		15,5				
Sun	07.09.2003	02:00	0,0	84,4	0,0	67,6	3000	0,0	0,0	80,6	3000	F			296,0		15,5				
Sun	07.09.2003	02:00	15,0	85,0	12,0	68,1	3000	12,0	18,5	81,4	3000	F Dummy run with fluted hanger, brush and clean riser.		1,5	297,5		15,5	Smedvig: Problems with UPS for HPU unit			
Sun	07.09.2003	20:30	12,0	85,5	10,0	68,5	3000	10,0	10,0	81,8	3000	F MU and RHH with 9 5/8" x 13 3/8" clean out assy (incl. PBR polish mill)			297,5		15,5				
Mon	08.09.2003	06:30	56,0	87,9	48,0	70,5	3000	6,0	8,5	82,1	3000	F Clean out 9 5/8" x 13 3/8" casing from mud to seawater. Inflow check well.			297,5		15,5				
Mon	08.09.2003	15:00	0,0	87,9	0,0	70,5	3000	42,0	30,0	83,4	3000	F Clean well by circulating seawater until NTU<100, wash surface system with soap pill.			297,5		15,5				
Tue	09.09.2003	21:00	10,0	88,3	8,0	70,8	3000	8,0	8,0	83,7	3000	F Displace well to 1,45 sg brine.			297,5		15,5				
Wed	10.09.2003	05:00	10,0	88,7	8,0	71,2	3000	8,0	8,5	84,1	3000	F POOH with 9 5/8" x 13 3/8" clean out string.			297,5		15,5				
Wed	10.09.2003	13:30	10,0	89,1	8,0	71,5	3000	10,0	5,5	84,3	3000	F RU Baker Atlas Wireline. Run and set 9 5/8" EZSV bridge plug. RD.			297,5		15,5				
Wed	10.09.2003	19:00	0,0	89,1	0,0	71,5	3000	12,0	17,5	85,0	3000	F Test BOP. M/u kill collexip to stand pipe in parallel.		0,5	298,0		15,5	Smedvig: Problems with finger on upper guiding arm			
Thu	11.09.2003	12:30	0,0	89,1	0,0	71,5	3000	4,0	4,0	85,2	3000	F P/u and b/o xo's from fluted hgr. P/u Surface Flow Tree (SFT) and make up to single.		0,5	298,5		15,5	Smedvig: Problems with skate pusher solenoid valve			
Thu	11.09.2003	16:30	28,0	90,3	24,0	72,5	3000	24,0	18,5	86,0	3000	F MU and RHH with perforation guns on drillstring. Perforate and POOH.			298,5		15,5				
Fri	12.09.2003	11:00	8,0	90,6	6,0	72,8	3000	6,0	21,5	86,9	3000	F MU screens, blanks, inner pipe and packer and RHH same to 1158MDD.		0,5	299,0		15,5	Smedvig: Weight indicator failure			
Sat	13.09.2003	08:30	0,0	90,6	0,0	72,8	3000	52,0	59,5	89,3	3000	F WOW - (too much heave to set packer and perform fracpack). Held TBT			299,0	57,5	73,0	WOW			
Mon	15.09.2003	20:00	20,0	91,4	12,0	73,3	3000	13,0	13,5	89,9	3000	F Continue RHH with screen on 3 1/2" x 5" tubing.			299,0		73,0				
Tue	16.09.2003	09:30	5,0	91,6	4,0	73,4	3000	4,0	6,0	90,1	3000	F Space out, circulation test and set packer.			299,0		73,0				
Tue	16.09.2003	15:30	1,0	91,7	1,0	73,5	3000	1,0	2,0	90,2	3000	F Perform pre job meeting prior to pumping. Perform pump test.			299,0		73,0				
Tue	16.09.2003	17:30	8,0	92,0	6,0	73,7	3000	8,0	7,0	90,5	3000	F Pump 2 mini fracs, close in and analyse data (re-design pump job based on collected data).		2,5	301,5		73,0	Statoil: Annulus gauge was isolated by mistake			
Wed	17.09.2003	00:30	2,0	92,1	2,0	73,8	3000	23,5	21,0	91,4	3000	F Pump FracPack - Wait on brine - attempt to gravel pack across perforated interval		8,0	309,5		73,0	Statoil: 7 hrs: Waiting on brine. Baker Oil Tools: 1 hr: Not able to move XO-tool			
Wed	17.09.2003	21:30	2,0	92,2	2,0	73,9	3000	1,0	0,5	91,4	3000	F Pull out innerstring from SC-2 packer			309,5		73,0				
Wed	17.09.2003	22:00	2,0	92,3	1,0	73,9	3000	1,0	4,0	91,6	3000	F Flow check			309,5		73,0				
Thu	18.09.2003	02:00	15,0	92,9	12,0	74,4	3000	12,0	12,0	92,1	3000	F POOH with tubing.			309,5		73,0				
Thu	18.09.2003	14:00	8,0	93,2	6,0	74,7	3000	6,0	6,0	92,3	3000	F POOH and LD inner pipe.			309,5		73,0				
Thu	18.09.2003	20:00	0,0	93,2	0,0	74,7	3000	26,0	33,0	93,7	3000	F Problems with supporter ring on Marine Riser. Aborted plug operation, problem solved.		29,0	338,5		73,0	Smedvig: Problems with riser tensioner support ring rotation system			
Sat	20.09.2003	05:00	7,0	93,5	5,0	74,9	3000	6,0	11,0	94,2	3000	F PU and run lower DST tools. Pressure test lower DST tools.		0,5	339,0		73,0	Smedvig: Damaged proximity switch on main skate			
Sat	20.09.2003	16:00	1,0	93,6	1,0	74,9	3000	0,0	0,0	94,2	3000	F Check out SRO (surface read out). (To be performed later)			339,0		73,0				
Sat	20.09.2003	16:00	10,0	94,0	8,0	75,3	3000	8,0	10,0	94,6	3000	F RHH with 3 1/2" tubing and singles w/ Metrol Instrument Securing Device.		0,5	339,5		73,0	Statoil: Racked one stand of tubing due to bad pin threads			
Sun	21.09.2003	02:00	0,0	94,0	0,0	75,3	3000	6,0	6,0	94,8	3000	F RHH 5 1/2" thermotubing. Stop due to bad weatherforecast.			339,5		73,0				
Sun	21.09.2003	08:00	0,0	94,0	0,0	75,3	3000	76,0	81,0	98,2	3000	F Hang off tubing in BOP. Perform BOP function test. WOW. Pull hang-off string.			339,5	80,5	153,5	WOW			
Wed	24.09.2003	17:00	0,0	94,0	0,0	75,3	3000	15,0	15,0	98,8	3000	F RHH to perform spacout run. WOW. Sting into sealstem, close LPR on painted jt. POOH.			339,5	3,5	157,0	WOW			
Thu	25.09.2003	08:00	16,0	94,6	8,0	75,6	3000	8,0	8,5	99,2	3000	F Run 5 1/2" thermotubing and space out below SSTT. Attach SRO clamps.			339,5		157,0				
Thu	25.09.2003	16:30	17,0	95,4	12,0	76,1	3000	16,0	18,5	100,0	3000	F Run SSTT and Retainer valve , perform function test. Pressure test. Check out SRO.			339,5		157,0				
Fri	26.09.2003	11:00	19,0	96,1	15,0	76,7	3000	32,0	37,0	101,5	3000	F Run 5 1/2" Thermotubing landing string. Attach clamps for SSTT umb. ch. inj line and SRO.		3,5	343,0		157,0	Halliburton DST (3 hrs): Leak in poppet valve. Metrol (0,5 hrs): Problems with surface computer			
Sun	28.09.2003	00:00	13,0	96,7	6,0	77,0	3000	8,0	13,5	102,1	3000	F Install surface test tree and hook up to kill/choke collexips and surface equipment.		1,5	344,5		157,0	Smedvig: Frozen pilot valve in main rig hoisting system			
Sun	28.09.2003	13:30	1,0	96,7	1,0	77,0	3000	1,0	0,5	102,1	3000	F Land string, by stinging sealstem into SC-2 packer, and land fluted hanger.			344,5		157,0				
Sun	28.09.2003	14:00	10,0	97,1	8,0	77,3	3000	8,0	7,0	102,4	3000	F Pressure test surface equipment			344,5		157,0				
Sun	28.09.2003	21:00	6,0	97,4	5,0	77,5	3000	5,0	9,0	102,8	3000	F Open OMNI and displace well to cushion, close OMNI.		1,0	345,5		157,0	Halliburton DST: Diesel supply broke down			
Mon	29.09.2003	06:00	24,0	98,4	20,0	78,4	3000	20,0	76,5	105,9	3000	F Final safety meeting and checks. Open well for clean up flow.			345,5		157,0				
Thu	02.10.2003	10:30	18,0	99,1	15,0	79,0	3000	48,0	45,5	107,8	3000	F Post clean up build up.			345,5		157,0				
Sat	04.10.2003	08:00	24,0	100,1	20,0	79,8	3000	0,0	0,0	107,8	3000	F Note: Main flow and build up deleted from programme.			345,5		157,0				
Sat	04.10.2003	08:00	36,0	101,6	30,0	81,1	3000	0,0	0,0	107,8	3000	F Build up duration estimated and dependent on bottom hole pressure data			345,5		157,0				
Sat	04.10.2003	08:00	15,0	102,3	12,0	81,6	3000	12,0	8,0	108,2	3000	F Kill well.			345,5		157,0				
Sat	04.10.2003	16:00	8,0	102,6	6,0	81,8	3000	6,0	21,0	109,0	3000	F Rig down hoses and remove surface test tree			345,5		157,0				
Sun	05.10.2003	13:00	18,0	103,4	15,0	82,5	3000	15,0	21,5	109,9	3000	F Pull landing string LD thermotubing			345,5	16,5	173,5	WOW			
Mon	06.10.2003	10:30	10,0	103,8	8,0	82,8	3000	8,0	1,5	110,0	3000	F Rig down SSTT.			345,5		173,5				
Mon	06.10.2003	12:00	10,0	104,2	8,0	83,1	3000	8,0	4,0	110,2	3000	F Pull and LD lower thermotubing.			345,5		173,5				
Mon	06.10.2003	16:00	15,0	104,8	12,0	83,6	3000	12,0	12,0	110,7	3000	F Pull test BHA and rig down		3,0	348,5		173,5	Smedvig (1,5 hrs): Problems with HTV pipehandling system. Smedvig (1,5 hrs): Problems with 3 1/2" ch			
Tue	07.10.2003	04:00	33,0	106,2	24,0	84,6	3000	32,0	32,5	112,0	3000	F RHH with 9 5/8" EZSV. Set same at 2638 m. Press.test. Set 100 m gas tight cmt plug above. POOH.			348,5		173,5				
Wed	08.10.2003	12:30	0,0	106,2	0,0	84,6	3000	0,0	0,0	112,0	2636	F			348,5		173,5				
Wed	08.10.2003	12:30	11,0	106,6	9,0	85,0	3000	9,0	9,5	112,4	2206	F RHH w/ 13 3/8" EZSV and MPT. Engage WB. Set 13 3/8" EZSV at 2210 m. Press.test.			348,5		173,5				
Wed	08.10.2003	22:00	10,0	107,1	8,0	85,3	1850	10,0	4,0	112,6	2206	F Displace well to 1,28 SG WBM.			348,5		173,5				
Thu	09.10.2003	02:00	0,0	107,1	0,0	85,3	1850	8,0	9,0	113,0	2206	F Set 50 m cement plug above 13 3/8" EZSV. Spot slop above. POOH			348,5		173,5				
Thu	09.10.2003	11:00	15,0	107,7	13,0	85,9	1850	11,0	9,0	113,3	1553	F RHH with casing cutting/spear assy. Cut 13 3/8" casing at 1553 m.			348,5		173,5				
Thu	09.10.2003	20:00	17,0	108,4	14,0	86,5	1850	28,0	28,5	114,5	1553	F Pull 13 3/8" casing hanger above RKB. Pull innerstring. Pull casing. (16 hrs fishing 13 3/8")		16,0	364,5		173,5	Smedvig (16 hrs): Elevator opened unintentionally. Resulted in lost casing/string in hole. Fished same			
Sat	11.10.2003	00:30	18,0	109,1	16,0	87,1	1850	12,0	32,0	115,9	1553	F Set 20" EZSV unintentionally in riser. Test 13 3/8 annulus to 70 bar. Drill plug and displace riser, disconnect LMRP		22,0	386,5	4,0	177,5	WOW to run EZSV. Statoil: Set 20" EZSV unintentionally in riser			
Sun	12.10.2003	08:30	12,0	109,6	10,0	87,5	1500	9,5	10,0	116,3	1290	F Spot high visc pill and set surface cement plug through BOP. POOH.			386,5		177,5				
Sun	12.10.2003	18:30	65,0	112,4	65,0	90,3	1500	57,5	56,5	118,6	1238	F Recover riser and BOP. Tag cement plug using aux rig with 10 ton at 1292 m.			386,5		177,5				

TIMEPLANNER										STATOIL		Down time/Waiting time						
Thu 16.10.2003 12:51		Updated		PL 281, 6405/7-1 T2 Ellida - Revised Scope of work						Time behind budget:		PL 281, 6405/7-1 T2 Ellida - Revised Scope of work						
Wed 18.06.2003 12:00		Start date		West Navigator						6,3 days		West Navigator						
Wed 15.10.2003 03:00		Est. finish date																
D A Y	START DATE	START TIME	Budg. time (hrs)	Acc. budg. time (days)	p10 time (hrs)	Acc. opt. time (days)	Budg./ Opt. depth (mMD)	Plan time (hrs)	Actual time (hrs)	Actual time (days)	Actual Depth (mMD)	Activity description	Company	Down time (hrs)	Accum. down time (hrs)	Waiting time (hrs)	Accum. waiting time (hrs)	Comments (reason for down/waiting time)
Wed	15.10.2003	03:00	0,0	112,4	0,0	90,3	1500	0,0	0,0	118,6	1238	F Offline activity: RHH w/wellhead cutting assy.			386,5		177,5	
Wed	15.10.2003	03:00	0,0	112,4	0,0	90,3	1255	0,0	0,0	118,6	1238	F Offline activity: Cut wellhead and 36" conductor, pull same.			386,5		177,5	
Wed	15.10.2003	03:00	0,0	112,4	0,0	90,3	1255	0,0	0,0	118,6	1238	F Offline activity: Perform survey, recover transponders.			386,5		177,5	
Wed	15.10.2003	03:00	0,0	112,4	0,0	90,3	0	0,0	0,0	118,6	0	F Release rig.			386,5		177,5	
Wed	15.10.2003	03:00		112,4		90,3				118,6					386,5		177,5	
Wed	15.10.2003	03:00	29,4		24,0			33,5	39,7			Section time ahead of/behind (-) budg:-10,3 days, Tot. time ahead of/behind (-) budg:-6,3 days		90,5	hours	162,0	hours	Down time: 9,5% , Total Down time: 13,6% , Waiting time: 17,0% , Total Waiting time: 6,2%
End of operation																		

### **5.18.5** *Wellhead system*

*Fig. 4.4 Wellhead System Schematic*

TYPICAL PROJECTION



NOTES:

REVISONS				DWG. BY: FB	SWS STACK-UP, WELLHEAD, TYPE SS-15, 30" X 20" X 13.38" CASING PROGRAM F/STATOIL WELL 4405/7-1 (ELIDA) SALES DRAWING	DWG. SIZE	PART NUMBER	LAST REV.				
REV.	DATE	CHGCD	APP.	REL.					DWG. BY: AFB			
A									APP. BY: ATH	A1	4-SD-30354CP	A
									REL. BY: RA			
					REL. DATE: 30-MAY-03							
					REF. LAYOUT:							
ALL DIMENSIONS IN INCHES												



CAD

### **5.18.6 *Drilling fluids***

*Table 4.6 Summary of Drilling fluids program*

Well: 6405/7-1 & 7-1 T2																				DRILLING FLUIDS PROGRAMME																			
Field: PL281, Ellida																				Rig: West Navigator																			
HOLE		CASING		MUD TYPE	MW [SG]	LGS [KG/m³]	10 sec. [Pa]	10 min. [Pa]	Fann 100 rpm	Fann 3 rpm	FV [sec]	PV [mPa]	API FL [ml]	pH	MBT [KG/m³]	NaCl (WPS)	KCl (WPS)	Glyc. [%]	MEG %	Ca++ mg/l	Total volume Old volume New volume Usage [m³]																		
SIZE	TVD MD	SIZE	TVD MD																																				
36"	1310 1310	30"	1310 1310	High vis. sweeps Bentonite mud	1,03 1,35						120 70		9 9	8 8								250 0 250 250																	
				Comments: Drilled with Bentonite sweeps; diluted heavy kill mud down to 1.35 s.g. Displacement mud																																			
26"	1910 1910	20"	1900 1900	High vis. sweeps Bentonite mud	1,03 1,35						100-120 80		7-9 8	8-9 8,5								1172 0 1172 1172																	
				Comments: 1169 m3 was invoiced on this section but 1172 m3 in reality due to 3 party sales. CMC EHV as contingency chemical showed to be a useful aid to enable mixing of HIVIS sweeps in large amounts simultaneously as mud for 17" section was taken onboard. CMC EHV yields more rapid than Bentonite sweeps hence less pit space are occupied for spud mud mixing Bentonite mud is beneficial when storing heavy kill mud in back up.																																			
17"	2425 2425	13 3/8"	2417 2417	Glydriil DW	1,23-1,25	28-100	2-5,5	2-8,5	20-29	6-9	NA	15-20	2	8,4-8,9	7-14	229-240	82-90	4	15-16	520-560	1558 0 1558 658																		
				Comments: Large volume on section due to down hole losses, reduction of mudweight in conjunction with centrifuge. Temporary blocked choke line when not flushing kill and choke line each shift. Centrifuge used to keep mw down. LCM pill pumped : 150 kg/m3 Conc in kg/m3: 27 MixII,45 Mica M, 28 Nut M, 50 G-seal at 1956 m a 10m3 pill sealed hole at 1971 m a 10 m3 pill sealed hole moderate at 2019 m a 5 m3 pill sealed hole from 1971 m 250 kg/hours of LCM was added to active to seal off potential loss zones as well as mw was reduced from 1.25 s.g to 1.23 s.g. LCM added to active was a blend of G-Seal, CaCO3 M and Mix II.																																			
12 1/4"	2816 2816	Plugged back		Glydriil DW	1,30-1,42	36-87	4-6	7-9,5	23-33	7-10	NA	17-21	2-2,8	6,7-8,8	14-21	215-240	80-93	4	14-15	400-800	1180 900 280 56																		
				Comments: Maintained salinity levels by adding some KCl/NaCl to active mud. Some MEG depletion was counteracted by some MEG addition to maintain glycol level as per spec. Tuned down rheology from 10 to 8 on 3 rpm reading to allow gas to escape from active mud when getting 15% gas in return towards TD. Packed off when pumping ooh with 400-800 LPM; had to work through thight spots with string after full circ was established. Pretreated active with bicarb and citric prior drlg out of csg shoe, setting cmt plug and drlg out same.																																			

Well: 6405/7-1 & 7-1 T2																				DRILLING FLUIDS PROGRAMME																			
Field: PL281, Ellida																																							
Rig: West Navigator																																							
HOLE		CASING		MUD TYPE	MW [SG]	LGS [KG/m³]	10 sec. [Pa]	10 min. [Pa]	Fann 100 rpm	Fann 3 rpm	FV [sec]	PV [mPa]	API FL [ml]	pH	MBT [KG/m³]	NaCl (WPS)	KCl (WPS)	Glyc. [%]	MEG %	Ca++ mg/l	Total volume Old volume New volume Usage [m³]																		
SIZE	TVD MD	SIZE	TVD MD																																				
14" (T2)	2740 2741	11 3/4"	2740 2741	Glydriil DW	1,37-1,38	36-65	4-4,5	7-8	24-28	7-8	NA	17-20	2,2-3	8,2-10,2	14-21	215-229	83-88	4	14-15	400-720	1176 1124 52 173																		
				Comments: Total fluid on section wrongly reported in PRS as 1124 m3 Partial losses when drlg and when running liner and no returns during cement job. Pretreated active with bicarb and citric prior drlg out shoe and prior cement job.																																			
12 1/4" (T2)	3199 3200	9 5/8"	3186 3187	Glydriil DW	1,44-1,45	45-99	4-6	6,5-9	27-37	7-10	NA	19-22	2,4-3,8	8,4-9	21-28	220-228	82-88	4	15	320-560	1122 1003 119 185																		
				Comments: Performed 5 core runs from 2754 m to 2880 m the hole was drilled 8,5" to TD @ 3200 m, sticky hole when pulling out from TD demanded backreaming. After backreaming no thight spots were observed. After 9 days of wire line logging a wipertrip was performed with no indications of fill og thight spots. Continued logging for 3 days prior opening the hole to 12 1/4".																																			
8 1/2" (T2)	4299 4300	N/A		Glydriil DW	1,42	84-102	4-5	7-12	29-35	9-12	NA	19-22	2,4-3,5	8-10,2	14-28	225	80-91	4	15	400-720	1001 937 64 127																		
				Comments: Observed some MEG depletion while drilling cement that was restored by adding MEG to active system. Some drag was experienced from TD at 4300 m to top of corepoint that was not observed after a vipertrip was performed. First logging run on wire line gave indications of thight spots but 6 subsequent runs were run without difficulties even the tools were larger.																																			
8 1/2" Pilot hole	1920 1920	N/A		High vis. sweeps	1,03						120		9	9							210 25 185 210																		
				Comments: The hole was displaced with 25 m3 1.35 s.g. Glydriil DW as displacement mud prior pooh. Sweeps was built of Bentonite and CMC EHV due to limited pitspace due to simultaneously activity on the main well.																																			

### **5.18.7 *Cementing data***

*Table 4.7 Summary of cementing data*

Well: 6405/7-1 &amp; 7-1 T2

Field: PL281, Ellida

Rig: West Navigator

## CEMENT PROGRAMME

HOLE		CASING SHOE		TOC	VOLUME/ EXCESS	CEMENT SLURRY DESIGN										SPACER	DISPLACEMENT  Fluids and Rates
SIZE	TVD MD	SIZE	TVD MD	TVD MD		Components	Lead [ltr/100kg]	Tail [ltr/100kg]	Density [ SG ]	Yield [ltr/100kg]	Stat. / Circ. Temp [°C]	Thickening time [hrs to 70 Bc]	API Free Water [%]	API Fluid loss [cc/30min]	24 hrs C.S. [ psi ]		
36"	1312 1312	30" + top up	1310 1310	Sea bed	65 + 31 m3 300% OH	DWFS-NS cement CaCl2 liquid NF-6 Sea water		3,68 0,10 60,87	1,75	93,41	2 / 2  (API)	09:50	< 1,4	N/A	+/- 2100	+/- 60 m3 Seawater	Sea water +/- 1650 lpm
26"	1910 1910	20"	1899,5 1899,5	Sea bed	180 m3 100% OH	DWFS-NS cement HR-5L Freshwater Zonesealant		0,51 57,01 1,39	base slurry 1,75  down hole 1,42 - 1,46	90,06	30 / 10  (Wellcat)	07:48	0	N/A	+/- 2300	10 m3 Freshwater	Sea water 3000 lpm
17"	2425 2425	13 3/8"	2417 2417	1900 1900	36 m3 20% OH	Norcem "G" +0,1% EZ-FLO Halad-613L HR-4L NF-6 Freshwater		0,50 0,90 0,10 42,52	1,92	<u>Code MPT14</u> 75,10	53 / 30  (Wellcat)	04:02	0	N/A	+/- 1300	10 m3 Freshwater 15 m3 1,35 SG spacer	Mud 1000 - 2000 lpm
12 1/4"	2816 2816	Plug back	2816 2816	2630 2630	17 m3 20% OH	Norcem "G" +0,1% EZ-FLO Gascon CFR-3L HR-5L Halad-613L NF-6 Freshwater		3,50 2,00 0,60 9,00 0,10 31,48	1,90	<u>Code GTT90</u> 77,76	70 / 40  (Wellcat)	05:42	0	43	+/- 2500	8 m3 1,66 SG spacer	Mud 2000 lpm
12 1/4"	2573 2573	KOP	2573 2573	2360 2360	20 m3 20% OH	Norcem "G" +0,1% EZ-FLO Halad-613L HR-4L NF-6 Freshwater		0,50 0,90 0,10 42,52	1,92	<u>Code MPT14</u> 75,10	60 / 30  (Wellcat)	04:02	0	N/A	+/- 1900	8 m3 1,66 SG spacer	Mud 2000 lpm
14"	2741,3 2742,4	11 3/4"	2740 2741	2540 2540	13,8 m3 20 % OH	Norcem "G" +0,1% EZ-FLO Gascon CFR-3L HR-5L Halad-613L NF-6 Freshwater		3,50 2,00 0,60 9,00 0,10 31,48	1,90	<u>Code GTT90</u> 77,76	65 / 40  (Wellcat)	05:42	0	43	+/- 2800	8 m3 Freshwater 15 m3 1,40 SG spacer	Mud 1300 lpm

Well: 6405/7-1 &amp; 7-1 T2

Field: PL281, Ellida

Rig: West Navigator

## CEMENT PROGRAMME

HOLE		CASING SHOE		TOC	VOLUME/ EXCESS	CEMENT SLURRY DESIGN										SPACER	DISPLACEMENT Fluids and Rates
SIZE	TVD MD	SIZE	TVD MD	TVD MD		Components	Lead [litr/100kg]	Tail [litr/100kg]	Density [ SG ]	Yield [litr/100kg]	Stat. / Circ. Temp [°C]	Thickening time [hrs to 70 Bc]	API Free Water [ % ]	API Fluid loss [ cc/30min ]	24 hrs C.S. [ psi ]		
12 1/4"	3199 3200	9 5/8"	3186 3187	2616 2616	18,1 m3 20 % OH	Norcem "G" +0,1% EZ-FLO Gascon 469 Halad-613L CFR-3L HR-5L NF-6 Freshwater		3,50 10,00 2,00 1,00 0,10 30,18	1,90	<u>Code GTT90</u> 77,87	87 / 60  (Wellcat)	05:02	0	36	+/- 3200	15 m3 1,50 SG spacer	Mud +/- 1500 lpm
8 1/2"	4300 4300	OH plug #1 & #2	3800 3800	3300 3300	2 x 10 m3 20 % OH	Norcem "G" + 35% SSA-1 Gascon 469 Halad-613L CFR-3L HR-5L NF-6 Freshwater		4,50 12,00 2,20 0,80 0,10 38,16	1,90	<u>Code HTG90</u> 102,15	117 / 65  (Wellcat)	04:47	0	52	+/- 2500	6 m3 1,68 SG spacer	Mud 2500 lpm
8 1/2"		Transition Plug #3	3300 3300	3000 3000	10 m3 20 % OH	Norcem "G" +0,1% EZ-FLO Halad-613L HR-5L CFR-3L NF-6 Freshwater		1,00 0,50 0,50 0,10 41,94	1,92	<u>Code MPT05</u> 75,13	94 / 45  (Wellcat)	03:31	0,2	N/A	+/- 2500	8 m3 1,68 SG spacer	Mud 2500 lpm
		Plug in 9 5/8" csg #4	2636 2636	2536 2536	4 m3	Norcem "G" +0,1% EZ-FLO Gascon Halad-613L HR-5L CFR-3L NF-6 Freshwater		3,50 9,00 0,30 2,00 0,10 31,78	1,90	<u>Code GTT90</u> 77,73	69 / 45  (Wellcat)	04:18	0	62	+/- 2900	6 m3 1,68 SG spacer	Brine 2200 lpm
		Plug in 13 3/8" csg #5	2206 2206	2146 2146	5 m3	Norcem "G" +0,1% EZ-FLO NF-6 Freshwater		0,10 45,44	1,90	<u>Code STTNT</u> 76,60	45 / 20  (Wellcat)	04:28	N/A	N/A	+/- 2000	6 m3 1,68 SG spacer	Mud 2500 lpm
		Surface Plug #6	1500 1500	1292 1292	40 m3	Norcem "G" + 0,10 % EZ-FLO DWFS (BWOC) NF-6 Freshwater		28% 0,10 71,20	1,80	<u>Code STTNT</u> 111,15	10 / 8  (Wellcat)	04:54	N/A	N/A	+/- 2000	Seawater	Seawater 2500 lpm

**5.18.8 Bottom hole assemblies**

**BHA report**

Wellbore: NO 6405/7-1

BHA seq: 1 BHA category: Drilling BHA description: Spud assy.

BHA no: 1

String component	OD in	ID in	Length m	Acc length m
BIT	17,500		0,42	0,42
BIT SUB	10,875	3,000	0,77	1,19
HOLE OPENER	36,000	3,000	4,31	5,50
X-OVER	11,250	2,813	0,58	6,08
ANDERDRIFT	9,500	2,813	2,53	8,61
X-OVER	9,500	2,813	0,64	9,25
DRIL COL	9,500	3,000	36,92	46,17
X-OVER	9,500	3,000	0,52	46,69
HOLE OPENER	42,000	3,000	2,57	49,26
X-OVER	9,500	3,000	0,91	50,17
DRILL COL	9,500	3,000	21,48	71,65
X-OVER	9,500	3,000	0,94	72,59
DRIL COL	8,000	2,813	136,67	209,26
X-OVER	7,938	2,750	1,01	210,27
HW DRILL PIPE	5,500		84,65	294,92

BHA seq: 2 BHA category: Drilling BHA description: 26" drilling assy.

BHA no: 2

String component	OD in	ID in	Length m	Acc length m
BIT	17,000		0,58	0,58
BIT SUB,	9,500		0,91	1,49
X-OVER	9,500	3,000	1,00	2,49
MPR SUB	8,250	2,813	5,03	7,52
MWD DCP	8,375	2,813	11,28	18,80
SAVER SUB	8,250	2,813	0,84	19,64
STAB STRING	17,000	2,813	2,33	21,97
DRIL COL	8,000	2,813	9,03	31,00
STAB STRING	17,000	2,813	2,35	33,35
DRIL COL	8,000	3,000	136,67	170,02
JAR	8,000	3,000	9,68	179,70
DRIL COL	8,000	2,813	45,94	225,64
X-OVER	7,938	2,750	1,01	226,65
HW DRILL PIPE	5,500	3,500	84,65	311,30

BHA 3 BHA Drilling BHA description: 17" drilling assy.

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seq: category:

BHA no: 3

String component	OD in	ID in	Length m	Acc length m
BIT	17,000		0,58	0,58
BIT SUB	9,500		0,91	1,49
X-OVER	9,500	3,000	1,00	2,49
MPR SUB	8,250	2,813	5,03	7,52
MWD DCP	8,375	2,813	11,28	18,80
SAVER SUB	8,250	2,813	0,84	19,64
STAB STRING	17,000	2,813	2,33	21,97
DRIL COL	8,000	2,813	9,03	31,00
STAB STRING	17,000	2,813	2,35	33,35
DRIL COL	8,000	3,000	136,67	170,02
JAR	8,000	3,000	9,68	179,70
DRIL COL	8,000	2,813	45,94	225,64
X-OVER	7,938	2,750	1,01	226,65
HW DRILL PIPE	5,500	3,500	84,65	311,30

BHA seq: 4 BHA Drilling category:

BHA description: 12 1/4" drilling assy.

BHA no: 4

String component	OD in	ID in	Length m	Acc length m
BIT, CONVENTIONAL	12,250		0,33	0,33
RLL MWD TOOL	8,625		14,40	14,73
SONIC TOOL	9,188		12,14	26,87
POWER PULSE MWD	12,250		7,47	34,34
DRILL COLLAR	8,000	2,813	73,12	107,46
JAR	7,750		9,68	117,14
DRILL COLLAR	8,000	2,813	27,26	144,40
X-OVER	7,750		1,01	145,41
H W DRILL PIPE	5,500	3,500	113,00	258,41

BHA seq: 5 BHA Drilling category:

BHA description: Cmt open hole and set KO plug

BHA no: 5

String component	OD in	ID in	Length m	Acc length m
MULE SHOE	5,000	2,375	6,63	6,63
DP 3 1/2"	5,000	2,375	290,44	297,07
X-OVER	6,813	2,938	1,12	298,19

BHA seq: 6 BHA Drilling category:

BHA description: 12 1/4" Motor kick off assy.

BHA no: 6

String component	OD in	ID in	Length m	Acc length m
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BIT, CONVENTIONAL	12,250		0,33	0,33
SPERRYDR 6/7L 1,15GR	9,625	6,135	8,56	8,89
STAB I-BLADE	12,000	2,875	2,19	11,08
X-O PIN X PIN	7,937	2,813	0,71	11,79
RLL MWD TOOL	8,625		8,24	20,03
POWER PULSE MWD	8,000		4,70	24,73
STAB I-BLADE	12,250	2,875	2,20	26,93
FLOAT SUB	8,000		0,58	27,51
DRILL COLLAR	8,000	2,813	73,12	100,63
JAR	7,750		9,68	110,31
DRILL COLLAR	8,000	2,813	27,26	137,57
X-OVER	7,750		1,01	138,58
HW DRILL PIPE	5,500	3,500	113,03	251,61

Wellbore: NO 6405/7-1 T2

BHA seq: 1 BHA category: Drilling BHA description: 12 1/4" Motor kick off ass.

BHA no: 6

String component	OD in	ID in	Length m	Acc length m
ROCK BIT	12,250		0,33	0,33
SPERRYDR 6/7L 1,15GR	9,625	6,135	8,56	8,89
STAB I-BLADE	12,000	2,875	2,19	11,08
X-O PIN X PIN	7,937	2,813	0,71	11,79
RLL MWD TOOL	8,625		8,24	20,03
POWER PULSE MWD	8,000		4,70	24,73
STAB I-BLADE	12,250	2,875	2,20	26,93
FLOAT SUB	8,000		0,58	27,51
DRILL COLLAR	8,000	2,813	73,12	100,63
JAR	7,750		9,68	110,31
DRILL COLLAR	8,000	2,813	27,26	137,57
X-OVER	7,750		1,01	138,58
HW DRILL PIPE	5,500	3,500	113,03	251,61

BHA seq: 2 BHA category: Drilling BHA description: 14" Andergauge UR assy

BHA no: 7

String component	OD in	ID in	Length m	Acc length m
ROCK BIT	10,625		0,28	0,28
BIT SUB	8,000	2,813	0,88	1,16
STAB I-BLADE	12,250	2,750	2,22	3,38
ANDERREAMER	14,000	2,000	3,53	6,91
X-O PIN X PIN	7,938	2,813	0,71	7,62
RLL MWD TOOL	8,625		8,24	15,86
POWER PULSE MWD	8,000		4,70	20,56
STAB I-BLADE	12,250	2,875	2,20	22,76
FLOAT SUB	8,000		0,58	23,34

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	DRILL COLLAR	8,000	2,813	73,12	96,46
	JAR	7,750		9,68	106,14
	DRILL COLLAR	8,000	2,813	27,26	133,40
	X-OVER	7,750		1,01	134,41
	HW DRILL PIPE	5,500	3,500	113,03	247,44

BHA seq: 3 BHA Drilling category: BHA description: 10 5/8" drill out assy.

BHA no: 8

String component	OD in	ID in	Length m	Acc length m
BIT	8,500		0,30	0,30
BIT SUB W/FLOAT	6,688	2,813	0,90	1,20
X-O PIN X PIN	6,500	2,750	0,56	1,76
MWD, RLL TOOL	6,688	2,813	7,84	9,60
MWD, POWER PULSE	6,688	2,813	4,70	14,30
STAB I-BLADE	8,500	2,750	2,05	16,35
DRILL COL	6,500	2,813	9,35	25,70
STAB I-BLADE	8,500	2,813	1,86	27,56
DRIL COL	6,500	2,813	74,68	102,24
JAR	6,500	2,813	9,69	111,93
DRIL COL	6,500	2,813	28,06	139,99
JAR,	8,000	2,812	9,68	149,67
8" DRILL COLLAR	8,000	2,812	9,44	159,11
8" DRILL COLLAR	8,000	2,812	9,24	168,35
8" DRILL COLLAR	8,000	2,812	8,90	177,25
XO SUB			1,11	178,36
HW DRILL PIPE	5,500		9,44	187,80
H W DRILL PIPE	5,500		9,45	197,25
HW DRILL PIPE	5,500		9,45	206,70
H W DRILL PIPE	5,500		9,46	216,16
HW DRILL PIPE	5,500		9,45	225,61
HW DRILL PIPE	5,500		9,33	234,94
H W DRILL PIPE	5,500		9,48	244,42
HW DRILL PIPE	5,500		9,30	253,72
HW DRILL PIPE	5,500		9,32	263,04
HW DRILL PIPE	5,500		9,44	272,48
HW DRILL PIPE	5,500		9,24	281,72
HW DRILL PIPE	5,500		9,45	291,17

BHA seq: 4 BHA Drilling category: BHA description: Coring assembly #1

BHA no: 9

String component	OD in	ID in	Length m	Acc length m
CORE HEAD	8,500	3,500	0,43	0,43
X-OVER	6,750	5,375	0,31	0,74
CORE BARREL	6,750	5,375	30,37	31,11

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	FLOAT SUB	6,469	2,810	1,02	32,13
	CIRC. SUB	6,469	2,063	0,58	32,71
	DRILL COLLAR	6,600	2,813	55,87	88,58
	X-OVER	7,313	2,813	0,93	89,51
	HW DRILL PIPE	5,500	3,500	112,38	201,89

BHA seq: 5 BHA category: Drilling BHA description: Coring assembly #2

BHA no: 10

String component	OD in	ID in	Length m	Acc length m
CORE HEAD	8,500	3,500	0,42	0,42
X-OVER	6,750	5,375	0,31	0,73
CORE BARREL	6,750	5,375	30,42	31,15
FLOAT SUB	6,469	2,810	1,02	32,17
CIRC. SUB	6,469	2,063	0,58	32,75
DRILL COLLAR	6,600	2,813	55,87	88,62
X-OVER	7,313	2,813	0,93	89,55
HW DRILL PIPE	5,500	3,500	112,38	201,93

BHA seq: 6 BHA category: Drilling BHA description: Coring assembly #3

BHA no: 11

String component	OD in	ID in	Length m	Acc length m
CORE HEAD	8,500	3,500	0,40	0,40
X-OVER	6,750	5,375	0,31	0,71
CORE BARREL	6,750	5,375	30,37	31,08
FLOAT SUB	6,469	2,810	1,02	32,10
CIRC. SUB	6,469	2,063	0,58	32,68
DRILL COLLAR	6,600	2,813	55,87	88,55
X-OVER	7,313	2,813	0,93	89,48
HW DRILL PIPE	5,500	3,500	112,38	201,86

BHA seq: 7 BHA category: Drilling BHA description: Coring assembly #4

BHA no: 12

String component	OD in	ID in	Length m	Acc length m
CORE HEAD	8,500	3,500	0,42	0,42
X-OVER	6,750	5,375	0,31	0,73
CORE BARREL	6,750	5,375	30,42	31,15
FLOAT SUB	6,469	2,810	1,02	32,17
CIRC. SUB	6,469	2,063	0,58	32,75
DRILL COLLAR	6,600	2,813	46,53	79,28
JAR	6,500	2,750	9,69	88,97
DRIL COL	6,500	2,750	2815,00	2903,97
X-OVER	7,313	2,813	0,93	2904,90
HW DRILL PIPE	5,500	3,500	112,38	3017,28

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BHA seq: 8 BHA category: Drilling BHA description: Coring assembly #5

BHA no: 13

String component	OD in	ID in	Length m	Acc length m
CORE HEAD	8,500	3,500	0,42	0,42
X-OVER	6,750	5,375	0,31	0,73
CORE BARREL	6,750	5,375	30,42	31,15
FLOAT SUB	6,469	2,810	1,02	32,17
CIRC. SUB	6,469	2,063	0,58	32,75
DRILL COLLAR	6,600	2,813	46,53	79,28
JAR	6,500	2,750	9,69	88,97
DRIL COL	6,500	2,750	2815,00	2903,97
X-OVER	7,313	2,813	0,93	2904,90
HW DRILL PIPE	5,500	3,500	112,38	3017,28

BHA seq: 9 BHA category: Drilling BHA description: 8 1/2" pendulum assembly

BHA no: 14

String component	OD in	ID in	Length m	Acc length m
BIT	8,500		0,30	0,30
BIT SUB	6,688	2,813	0,90	1,20
X-O PIN X PIN	6,500	2,750	0,56	1,76
MWD, RLL TOOL	6,688	2,813	7,84	9,60
MWD, POWER PULSE	6,688	2,813	4,70	14,30
STAB I-BLADE	8,500	2,750	2,05	16,35
DRILL COL	6,500	2,813	9,35	25,70
STAB I-BLADE	8,500	2,813	1,86	27,56
DRILL COL	6,500	2,813	74,68	102,24
JAR	6,500	2,813	9,69	111,93
DRILL COL	6,500	2,813	28,06	139,99
HWDP 5"	5,000	3,000	107,93	247,92
DP 5"	5,000	3,500	1010,56	1258,48
X-OVER	7,000	3,500	0,93	1259,41

BHA seq: 10 BHA category: Drilling BHA description: 8 1/2" clean out BHA.

BHA no: 15

String component	OD in	ID in	Length m	Acc length m
BIT	8,500		0,30	0,30
BIT SUB	6,688	2,813	0,90	1,20
DRILL COL	6,500	2,813	18,47	19,67
STAB STRING	8,500	2,813	2,05	21,72
DRILL COL	6,500	2,813	9,25	30,97
STAB STRING	6,500	2,813	2,19	33,16
DRIL COL	6,500	2,813	46,96	80,12

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JAR	6,500	2,813	9,69	89,81
DRILL COL	6,500	2,813	28,06	117,87
HWDP 5"	5,000	3,000	107,93	225,80
DP 5"	5,000	3,500	721,63	947,43
X-OVER	7,000	3,500	0,93	948,36

BHA seq: 11 BHA category: Drilling BHA description: 12 1/4" Andergauge UR assy

BHA no: 16

String component	OD in	ID in	Length m	Acc length m
BULL NOSE W/ NOZZLES	6,750	2,875	0,93	0,93
STAB STRING	8,500	2,750	1,86	2,79
HOLE OPENER	10,625	2,250	1,57	4,36
XO SUB	8,000	1,750	0,78	5,14
ANDERREAMER	12,250	1,750	5,19	10,33
FLOAT SUB	8,000	2,750	0,51	10,84
DRILL COLLAR	8,000	2,813	73,00	83,84
JAR	7,750		9,68	93,52
DRILL COLLAR	8,000	2,813	27,58	121,10
X-OVER	7,750		1,12	122,22
HW DRILL PIPE	5,500	3,500	112,38	234,60

BHA seq: 12 BHA category: Drilling BHA description: 10 5/8" clean out BHA.

BHA no: 17

String component	OD in	ID in	Length m	Acc length m
BIT	10,625		0,28	0,28
BIT SUB	8,000	2,875	0,89	1,17
DRILL COL	8,000	2,813	73,00	74,17
JAR	8,000	2,813	9,68	83,85
DRILL COL	8,000	2,813	27,58	111,43
XO SUB	8,000	2,875	1,12	112,55
HW DRILL PIPE	5,500	3,500	113,03	225,58

BHA seq: 13 BHA category: Drilling BHA description: 8 1/2" packed assy.

BHA no: 18

String component	OD in	ID in	Length m	Acc length m
BIT, PDC	8,500		0,29	0,29
NEAR BIT STAB	8,500		1,95	2,24
PONY COLLAR	6,875		2,75	4,99
IN LINE STAB (ILS)	8,500		1,49	6,48
MWD			12,93	19,41
IN LINE STAB (ILS)	8,500		1,87	21,28
DRILL COLLAR	6,500	2,813	74,62	95,90
JAR	6,750	2,750	9,69	105,59

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		DRILL COLLAR		6,500	2,813	28,12	133,71
		HW DRILL PIPE		5,000	3,000	107,93	241,64
BHA seq:	14	BHA category: Drilling	BHA description:	Coring assembly #6			

BHA no:	19						
		String component		OD in	ID in	Length m	Acc length m
		CORE HEAD		8,500	3,500	0,44	0,44
		CORE BARREL		6,750	5,375	30,42	30,86
		FLOAT SUB		6,750	5,375	1,02	31,88
		CIRCULATION SUB		6,750	5,375	0,58	32,46
		DRILL COLLAR		6,500	2,813	74,62	107,08
		JAR		6,750	2,813	9,69	116,77
		DRILL COLLAR		6,500	2,813	28,12	144,89

BHA seq:	15	BHA category: Drilling	BHA description:	Coring assembly #7			
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BHA no:	20						
		String component		OD in	ID in	Length m	Acc length m
		CORE HEAD		8,500	3,500	0,44	0,44
		CORE BARREL		6,750	5,375	30,42	30,86
		FLOAT SUB		6,750	5,375	1,02	31,88
		CIRCULATION SUB		6,750	5,375	0,58	32,46
		DRILL COLLAR		6,500	2,813	74,62	107,08
		JAR		6,750	2,813	9,69	116,77
		DRILL COLLAR		6,500	2,813	28,12	144,89
		H W DRILL PIPE		5,000	3,000	107,93	252,82

BHA seq:	16	BHA category: Drilling	BHA description:	8 1/2" packed assy w/rollerreamer			
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BHA no:	21						
		String component		OD in	ID in	Length m	Acc length m
		BIT, PDC		8,500		0,29	0,29
		R.REAMER NB W/FLOAT		8,500		2,45	2,74
		PONY COLLAR		6,875		2,75	5,49
		IN LINE STAB (ILS)		8,500		1,49	6,98
		MWD				12,93	19,91
		IN LINE STAB (ILS)		8,500		1,87	21,78
		DRILL COLLAR		6,500	2,813	74,62	96,40
		JAR		6,750	2,750	9,69	106,09
		DRILL COLLAR		6,500	2,813	28,12	134,21
		HW DRILL PIPE		5,000	3,000	107,93	242,14

BHA seq:	17	BHA category: Drilling	BHA description:	8 1/2" packed assy w/rollerreamer			
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BHA no:

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String component	OD in	ID in	Length m	Acc length m
BIT, TRI CONE	8,500		0,25	0,25
MUD MOTOR	6,250		7,84	8,09
FLOAT SUB	6,750		0,97	9,06
BAT SONIC	6,750		6,69	15,75
STABILIZER	8,500		1,56	17,31
MWD, TRIPLE-COMBO	6,750		22,65	39,96
DRILL COLLAR	6,500	2,813	74,62	114,58
JAR	6,750	2,750	9,50	124,08
DRILL COLLAR	6,500	2,813	28,12	152,20
HW DRILL PIPE	5,000	3,000	107,93	260,13

BHA seq: 19 BHA category: BHA description:

BHA no:

String component	OD in	ID in	Length m	Acc length m
EZSV	9,625		2,37	2,37
X-OVER	6,250	2,313	1,10	3,47
DP 3 1/2"	3,500		410,18	413,65
X-OVER,	7,188	2,250	0,83	414,48

BHA seq: 20 BHA category: BHA description: 13 3/8 cutting and retrieving assy

BHA no:

String component	OD in	ID in	Length m	Acc length m
BULL NOSE	8,000	1,500	0,37	0,37
CUTTER	12,000	2,000	1,83	2,20
TOP SUB	10,000	3,500	0,97	3,17
X-OVER	8,000	2,875	0,24	3,41
MOTOR	8,000	2,813	7,33	10,74
BUMBER SUB	8,000	3,000	4,40	15,14
X-OVER	8,250	3,250	1,08	16,22
PUP JOINT	5,500		2,42	18,64
DP 5 1/2"	5,500		287,86	306,50
X-OVER	8,000	3,000	1,00	307,50
SPEAR	12,250	3,000	2,68	310,18
BUMPER SUB	8,000	3,000	4,40	314,58
FISHING JAR	8,000	3,000	4,50	319,08
MONEL COLLAR	8,000	3,000	8,48	327,56
DRILL COLLAR	8,000	3,000	18,22	345,78
ACCELERATOR,	8,000	3,000	5,20	350,98
XO PLUG	7,875	3,000	1,00	351,98
DP 5 1/2"	7,250	3,500	9,55	361,53

BHA seq: 21 BHA category: BHA description: Fishing assy for 13 3/8" casing

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BHA no:

String component	OD in	ID in	Length m	Acc length m
OVERSHOT	8,375	6,000	1,20	1,20
BUMBER SUB	6,500	2,250	2,40	3,60
X-OVER	7,250	2,250	0,93	4,53
DP 5 1/2"	5,500	3,500	9,41	13,94
DP 5 1/2"	5,500	3,500	9,45	23,39

BHA  
seq:

23

BHA  
category:

BHA description:

BHA no:

String component	OD in	ID in	Length m	Acc length m
BIT	17,500	3,000	0,42	0,42
BIT SUB,	9,563	3,000	0,93	1,35
DRIL COL	9,594	3,000	9,36	10,71
X-OVER		3,000	1,10	11,81
STABILIZER		2,750	1,48	13,29
PONY COLLAR	8,000	2,813	2,42	15,71
FISHING JAR	8,000	3,000	4,50	20,21
DRIL COL	8,000	2,813	27,34	47,55
X-OVER	8,000	3,000	1,09	48,64
H W DRILL PIPE		3,500	140,16	188,80

**5.18.9 Bit record**

**Bit record**

Wellbore: NO 6405/7-1

Run No	Bit Size	Bit No	BHA No	Bit Type IADC code	Bit manufacturer	Serial No	Nozzles (n/32")				Flow Area in2								
							no	x	n	no									
1	17 1/2"	1RR	1	135	REED	D83488	4	x	16	x	x	x	,786						
2	26"	2	2	115M	Security	10376107	4	x	18	x	x	x	,995						
3	17"	3	3	115M	Security DBS	755857	3	x	20	1	x	18	1,169						
4	12 1/4"	4RR	6	115	Smith Bits	MM2546	1	x	18	1	x	20	1	x	22	1	x	16	1,123
5	12 1/4"	4RR	6	115	Smith Bits	MM2546	1	x	18	1	x	20	1	x	22	1	x	16	1,123
6	12 1/4"	4	4	115	Smith Bits	MM2546	1	x	18	1	x	20	1	x	22	1	x	16	1,123

Wellbore: NO 6405/7-1 T2

Run No	Bit Size	Bit No	BHA No	Bit Type IADC code	Bit manufacturer	Serial No	Nozzles (n/32")				Flow Area in2								
							no	x	n	no									
5	12 1/4"	4RR	6	115	Smith Bits	MM2546	1	x	18	1	x	20	1	x	22	1	x	16	1,123
6	10 5/8"	5	6	116	Hughes Christensen	5000143	1	x	16	1	x	16	1	x	16	1	x	16	,786
7	10 5/8"	5RR	8	116	Hughes Christensen	5000143	1	x	16	1	x	16	1	x	16	1	x	16	,786
8	8 1/2"	6	9	M437	Hughes Christensen	7200238		x		x	x	x	x						1,600
9	8 1/2"	7	10		Hughes Christensen	7100435		x		x	x	x	x						,940
10	8 1/2"	6RR	11	517	Hughes Christensen	7200238		x		x	x	x	x						1,600
11	8 1/2"	7RR	12		Hughes Christensen	7100435		x		x	x	x	x						,940
12	8 1/2"	8	13	517	Hughes Christensen	1214131		x		x	x	x	x						1,540
13	8 1/2"	9	14	M323	Hughes Christensen	7000102	5	x	13	x	x	x	x						,649
14	8 1/2"	9RR1	15	M323	Hughes Christensen	7000102	5	x	13	x	x	x	x						,649
15	12 1/4"	10	16		Andergauge	RB 1008	1	x	8	x	x	x	x						,050
15	10 5/8"	10	15	116	Hughes Christensen	5000143	2	x	16	2	x	20	x	x					1,007
16	10 5/8"	5RR2	17	116	Hughes Christensen	5000143	2	x	16	2	x	20	x	x					1,007
17	8 1/2"	RR	18	M323	Hughes Christensen	7000102	5	x	13	x	x	x	x						,649
18	8 1/2"	11	21		Hughes Christensen	7201808		x		x	x	x	x						1,600
19	8 1/2"	11RR	20		Hughes Christensen	7201808		x		x	x	x	x						1,600
20	8 1/2"	9RR2	21	M323	Hughes Christensen	7000102	5	x	13	x	x	x	x						,649
21	8 1/2"	11	22	137	Smith Bits	MM 5358	1	x	20	1	x	18	1	x	14	x			,706
22	17 1/2"	12RR	23	115	Hughes Christensen	6012676		x		x	x	x	x						

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Wellbore: NO 6405/7-1

Run No	Bit Size	Pump Rate l/min	Pump Press bar	Depth in mMD	Depth out mMD	Form drld m	Total drld m	Drlid hrs	Circ hrs	ROP m/hr	Min WOB ton	Max WOB ton	Min RPM	Torque Min Nm	Torque Max Nm	Con drag Min 1000 daN	Con drag Max 1000 daN
1	17 1/2"	4350	162	1242	1310	68,0		4,3		15,8	1	2	50	5000	25000		
2	26"	4500	132	1312	1910	598,0		21,2		28,2	2	12	100	6000	30000		
3	17"	3350	170	1910	2425	515,0		41,3		12,5	2	15	54	4000	11000		
4	12 1/4"																
5	12 1/4"	3500	220								3	8	115				
6	12 1/4"	3500	196	2425	2716,5	291,5		29,1		10,0	0	4	50	3000	8000		

Wellbore: NO 6405/7-1 T2

Run No	Bit Size	Pump Rate l/min	Pump Press bar	Depth in mMD	Depth out mMD	Form drld m	Total drld m	Drlid hrs	Circ hrs	ROP m/hr	Min WOB ton	Max WOB ton	Min RPM	Torque Min Nm	Torque Max Nm	Con drag Min 1000 daN	Con drag Max 1000 daN
5	12 1/4"	3500	227	2440	2742,4	302,4		12,4		24,4	1	18	113	3	14		
6	10 5/8"	3500	270	2425	2741	316,0		6,2		51,0	0	7	80	4	20		
7	10 5/8"	3000	200	2743	2754	11,0		0,3		36,7	2	6	20	4000	20000		
8	8 1/2"	1000	60	2754	2781	27,0		3,7		7,3	1	6	60	5	7		
9	8 1/2"	1400	80	2781	2808	27,0		3,0		9,0	3	5	60	8	8	0	0
10	8 1/2"	1000	70	2808	2835	27,0		3,0		9,0	1	5	48	3	7		
11	8 1/2"	980	80	2835	2862	27,0		4,0		6,8	3	6	60	6000	8000		
12	8 1/2"	800	75	2862	2880	18,0		3,0		6,0	3	6	60	6000	8000		
13	8 1/2"	2550	255	2880	3200	320,0		12,6		25,4	2	10	90	5	9		
14	8 1/2"	3200	310	3200	3200	0,0		0,0			0	0	70	5000	8000		
15	12 1/4"																
15	10 5/8"																
16	10 5/8"	3400	305														
17	8 1/2"	2500	290	3200	3750,9	550,9		43,2		12,8	4	13	54	6000	17000		
18	8 1/2"	1000	105	3751	3757	6,0		3,9		1,5	8	12	80	6	11		
19	8 1/2"	1000	92	3757	3784	27,0		16,3		1,7	8	14	70	8	11		
20	8 1/2"	2500	270	3784	4300	516,0		28,8		17,9	4	8	60	10	20		
21	8 1/2"	2200	135	1242	1920	678,0		37,2		18,2	0	5	40	2	4	0	0
22	17 1/2"	3500	102	1039							2	7	20	2	20		

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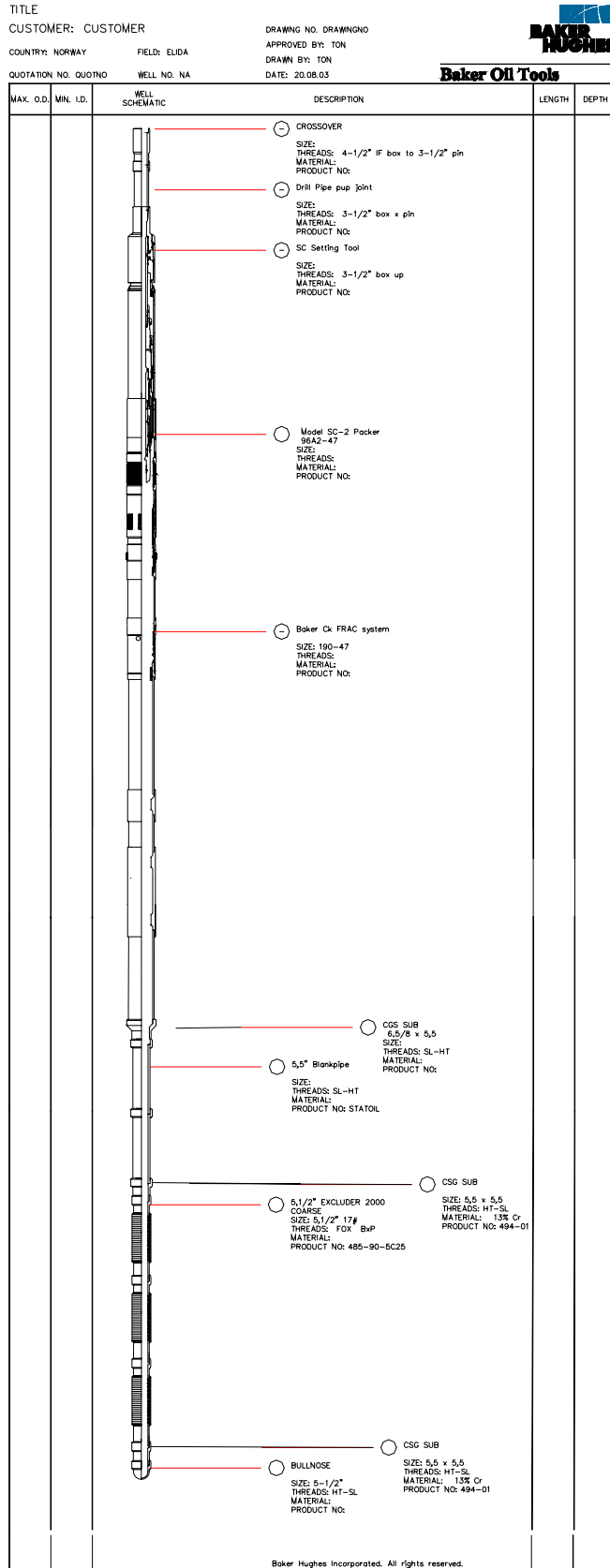
Wellbore: NO 6405/7-1

Run No	Bit Size	IADC dull grading						Remarks
		I	DC	L	G	OC	RP	
1	17 1/2"	6	BT	Q	2	WT	TD	
2	26"	4	WT	Q	2	WT	TD	Bit RR from Borgland Dolphin well 16/1-6S.
3	17"	2	WT	E	1	NO	LOG	Controlled ROP to + 15 m/hr due to mud losses.
4	12 1/4"							
5	12 1/4"							Drilled cement from 2322 m to 2440 m in 5,5 hrs.
6	12 1/4"	0	NO	E	I	NO	HP	Drilled cement and shoetrack. Controlled ROP to max. 30 m/hr.


Wellbore: NO 6405/7-1 T2

Run No	Bit Size	IADC dull grading						Remarks
		I	DC	L	G	OC	RP	
5	12 1/4"	2	NO	E	1	WO	TD	5,3 hrs drilling cement from 2322 m to 2440 m
6	10 5/8"	1		E	0		TD	10 5/8" bit x 12 1/4" stb x 14 Anderreamer with PDC cutters 4,7 m behind bit. Anderreamer not worn, no broken or chipped PDC (teeth)
7	10 5/8"	1	NO	E	0	NO	CP	Drilled cement from 2713m. to shoe at 2741m. 4,7 hrs and 20K revs drilling 28 m. cement and floats
8	8 1/2"	0	RR	0	0	RR	CP	Core no 1. 27 m. Recovered 10 m. (37%)
9	8 1/2"	0	RR	0	0	RR	CP	Core no 2. 27m. Recovered 25,6 m (95%)
10	8 1/2"	1	RR	0	0	RR	CP	Core no 3. Cut 27 m. Recovered 23,6 m. (87,4%)
11	8 1/2"	0	RR		0	RR	CP	Cut core no 4. Recovered 26.8 m (99%).
12	8 1/2"	0	RR		0	RR	BHA	Cut core no 5. 4" conventional core. Recovered 7,37 m (40,9%).
13	8 1/2"	1	RR	X	0	RR	TD	ROP restricted to 30 m/hr due to pore pressure monitoring. ROP decreased to appr. 20 m/hr. from appr. 3150 m to 3180 m. Bit did not show any cutter wear or damage.
14	8 1/2"	1	RR	X	0	RR	CM	Circulating during wiper trip. No reaming.
15	12 1/4"	1	BT	X	0	CT	TD	
15	10 5/8"	1	WT	X	0	NO	TD	Rerun.
16	10 5/8"	1	NO	E	0	NO	TD	Washed/ reamed from 2644 - 2761 m inside 11 3/4" liner without any obstruction. Bit grading before RIH: 1,1,NO, , E,0,NO,CP
17	8 1/2"	1	ER	X	1	RR	CP	Rerun bit.
18	8 1/2"	0	WT	X	I	PN	PR	
19	8 1/2"	1	WT	X	I	PN	TD	
20	8 1/2"	1	CT	X	1	RR	TD	ROP restricted due to need for constant parameters (5 tons and 120 RPM)
21	8 1/2"	1	WT	E	0	NO	TD	Motor RPM 120-130. Pilot hole alongside main hole, only for logging purpose.
22	17 1/2"							Drilled 20" EZSV in 51 min. RR fra en annen rigg.

**5.18.10 FracPac completion assembly**

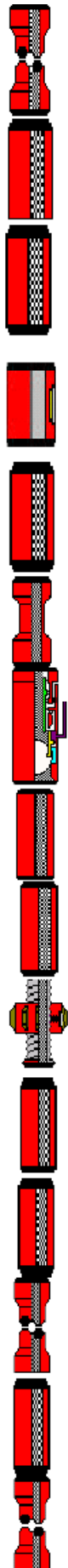


**5.18.11 Production test string configuration**

































	5.75" 4SA Box	Handling Sub
	5.75" 4SA Pin	
	5.75" 4SA Box	10k Flow Head
	5.75" 4SA Pin	
	5.75" 4SA Pin	Swivel
	5.75" 4SA Box	
	5.75" 4SA Box	LMW, Manual
	5.75" 4SA Pin	
	5.75" 4SA Pin	Crossover
	5 1/2" Buttress, Pin	
	5 1/2" Buttress, Box	Thermo Tubing 750RT 42,2 lb/ft L80 (Buttress)
	5 1/2" Buttress, Pin	
	5 1/2" Buttress, Box	Thermo Tubing Pup Joint, 750RT 42,2 lb/ft L80 (Buttress)
	5 1/2" Buttress, Pin	
	5 1/2" Buttress, Box	Collar (crossover)
	5 1/2" Buttress, Pin	
	5 1/2" Buttress, Box	Crossover
	5 1/2" Buttress, Pin	
	4.5" 4A Pin	Centralizer
	4.5" 4A Box	
4.5" 4A Pin	10k Lub. Valve	
4.5" 4A Box		
4.5" 4A Box	Crossover	
4.5" 4A Pin		
5 1/2" Buttress, Pin	Thermo Tubing 750RT 42,2 lb/ft L80 (Buttress)	
5 1/2" Buttress, Box		
5 1/2" Buttress, Pin		




5 1/2" New vam, Box	Thermo Tubing 750RT 42,2 lb/ft L80 (New Vam)
5 1/2" New Vam, Pin	
5 1/2" New vam, Box	Collar (crossover)
5 1/2" New Vam, Box	
5 1/2" New Vam, Pin	Crossover
5 1/2" New Vam, Pin	
4.5" 4A Pin	Centralizer
4.5" 4A Box	
4.5" 4A Pin	10k Retainer Valve
4.5" 4A Box	
4.5" 4A Box	Crossover
4.5" 4A Pin	
5 1/2" New vam, Pin	Thermo Tubing 750RT 42,2 lb/ft L80 (New Vam)
5 1/2" New vam, Box	
5 1/2" New Vam, Pin	Metrol Gauge Carrier
5 1/2" New vam, Box	
5 1/2" New vam, Pin	<i>Metrol</i>



5 1/2" New Vam, Box	Thermo Tubing Pup Joint 750RT 42,2 lb/ft L80 (New Vam)
5 1/2" New Vam, Pin	
5 1/2" New Vam, Box	Collar (crossover)
5 1/2" New Vam, Box	
5 1/2" New Vam, Pin	Crossover
3.5" PH6 Pin	
3.5" PH6 Box	Chemical Injection Sub
3.5" PH6 Pin	HES
3.5" PH6 Box	Crossover
4.5" 4A Pin	
4.5" 4A Box	Shearable H. Sub
4.5" 4A Pin	
4.5" 4A Box	10k Super Tree II
4.5" 4A Box	
4.5" 4A Pin	Slick Joint
4.5" 4A Pin	Metrol
4.5" 4A Box	Spacer joint
4.5" 4A Pin	HES
4.5" 4A Box	
(Hang-off point)	Adjustable Mandrel
4.5" 4A Pin	
4.5" 4A Box	Crossover
3.5" PH6 Pin	HES
3.5" PH6 Box	Crossover
5 1/2" TC2 Pin	Weatherford
5 1/2" TC2 Box	Thermotubing 5 1/2" TC2, L80 44.5 lbs/ft
5 1/2" TC2 Pin	Weatherford
5 1/2" TC2 Box	Crossover
3.5" PH6 Pin	Weatherford
3.5" PH6 Box	Tubing 3,5" PH6 P110 12.95 lbs/ft
3.5" PH6 Pin	

	3.5" PH6 Box	Crossover
	3.875" CAS Pin	RD Safety Circ. Valve <i>Annulus operated tool Operating pressure 230 bar</i>
	3.875" CAS Box	
	3.875" CAS Pin	Sliding Sleeve Drain Valve
	3.875" CAS Box	
	3.875" CAS Pin	OMNI Circ. Valve <i>Annulus operated tool Operating pressure 100 bar</i>
	3.875" CAS Box	
	3.875" CAS Pin	Crossover
	3.875" CAS Box	
	3.5" PH6 Pin	Tubing 3,5" PH6 P110 12.95 lbs/ft (1 joint)
	3.5" PH6 Box	
	3.5" PH6 Pin	Crossover
	3.5" PH6 Box	
	3.875" CAS Pin	Sliding Sleeve Drain Valve
	3.875" CAS Box	
	3.875" CAS Pin	LPR-N <i>Operating pressure 120 bar</i>
	3.875" CAS Box	
	3.875" CAS Pin	Crossover <i>HES</i>
	3.875" CAS Box	
	3.5" PH6 Pin	Command Carrier <i>Metrol</i>
	3.5" PH6 Box	
	3.5" PH6 Pin	Gauge Carrier w/ P/T Gauges <i>Metrol</i>
	3.5" PH6 Box	
	3.5" PH6 Pin	Crossover <i>Metrol</i>
	3.5" PH6 Box	
	5" New Vam Pin	Sampler Carrier <i>Metrol Opr press: 14-20 bar pulses</i>
	5" New Vam Box	
	5" New Vam Pin	Crossover
	5" New Vam Box	
	3.5" PH6 Pin	<i>Metrol</i>
	3.5" PH6 Box	Crossover
	3.875" CAS Pin	

	3.875" CAS Box	<b>RD By-pass</b>  <i>Annulus operated tool        Operating pressure 50 bar</i>
	3.875" CAS Pin	
	3.875" CAS Box	<b>Crossover</b>
	3.5" PH6 Pin	<i>Hes</i>
	3.5" PH6 Box	<b>Seal Stem</b>  <i>Baker</i>

## **6 Appendix A**

### **6.1 Extract of daily activities (DBR summary of activities)**

- 19.06.2003 West Navigator in transit to Ellida location.
- 20.06.2003 Moved West Navigator to Ellida location. (Arrived at 1232 hrs. June 19, 2003). Picked up 42" BHA in Main rig and prepared to run 30" x 36" conductor from Aux rig. Located and took position fixes on the current meter system. Deployed two out of seven transponders.
- 21.06.2003 Finished deploying transponders and calibrated array. Spudded well and drilled to 1312 m. Marked well location, prepared to stab conductor and POOH with drilling assembly.
- 22.06.2003 Stabbed conductor and landed with shoe at 1310 m. Cemented conductor, WOC and POOH with landing string. RIH to perform grouting job on 36" conductor.
- 23.06.2003 RIH with cementing string. Grouted crater around top of 36" conductor with 31 m3 DWFS slurry. POOH and PU 26" BHA. RIH, tagged cement at 1307 m, drilled out cement and shoe and drilled to 1421 m. Recovered complete current measuring system. RU to run BOP and riser, skidded BOP into the moon pool, lowered BOP into moon pool guide arms and prepared to pressure test same.
- 24.06.2003 Drilled and surveyed 26" hole from 1312 m to 1910 m in Aux rig while running BOP and riser in Main rig. Troubleshoot and repaired riser crane for Main rig operations. Continued running riser and BOP to 460 m while POOH in Aux rig to 1742 m.
- 25.06.2003 POOH 26" drilling assy. while continued to run BOP and riser. RU to run casing. Ran 54 jts. 20" casing. Picked up well head and ran 20" string on DP landing string to 1229 m. Positioned rig to stab casing. Continued to run BOP and riser to 1150 m.
- 26.06.2003 Stabbed 20" casing and filled 20" with 1.35 sg mud. Held safety stand down and discussed incident with 15 ton winch wire. Continued RIH with 20" and landed same in the 36" WH housing. Performed cement job, performed over pull on the WH and POOH landing string. Continued rigging up in the moon pool for landing of the BOP stack.
- 27.06.2003 Finished rigging up to land BOP. Moved vessel over well head, landed BOP, latched connector and took over pull test. Installed diverter and rigged down riser running equipment. Picked up 17" BHA and RIH. Tested MWD at 1004 m. Continued RIH to 1747 m. Function tested BOP.
- 28.06.2003 RIH with 17 BHA to top of cement at 1849 m. Drilled shoe at 1899 m, cleaned rat hole from 1899 m to 1910 m and drilled 3 new formation to 1913 m. Conditioned hole and performed LOT to 1.33 sg EMW. Drilled new formation from 1913 m to 1956 m started to lose circulation. Mixed and pumped LCM pill.
- 29.06.2003 Mixed 20 m3 LCM and pumped 2 pills 10 m3 each due to lost returns. Reduced mud weight from 1.25 sg to 1.23 sg. Drilled 17 " hole with controlled ROP +/-15 m/ hr. Drilled 17 " hole from 1956 m to 2096 m.
- 30.06.2003 Drilled with limited ROP to prevent lost returns. Drilled from 2096 m to 2250 m. Found choke line plugged. Attempted to unplug line by pumping 400 bar / 150 bar / 15 min down choke line. No success. POOH to 627 m and PU DQ Multipurpose BOP test tool and RIH with same. Bit depth 1500 m.
- 01.07.2003 Landed DQ Multipurpose test tool in well head. Opened plugged choke line by pumping with 40 bar down kill line, through Lower inner choke line and into riser at upper Annular. Flushed all BOP lines and valves. Drilled 17" hole from 2250 m to 2346 m.
- 02.07.2003 Drilled 17" hole from 2346 m to 2425 m. Flow checked and POOH w / one single. Gained / swabbed 500 l. RIH and circ 5000 str. Closed BOP and circ. through choke line until bottoms up. No gas / salt water in returns. Opened BOP and circ. bottoms up / cond mud. Pumped out of hole from 2425 m to 2385 m.
- 03.07.2003 Reamed out of hole to 20" shoe. Circ. three times bottoms up while boosting the riser. POOH. Cleaned rig floor, held TBRA and performed safety meeting prior to RU wireline. RIH with logging run #1 to 2418 m (7 m fill). Logged OK. POOH and RD wireline.
- 04.07.2003 Finished RD wire line. PU WB retrieving tool and wash sub. RIH and washed WH and BOP area. Latched on to bore protector, pulled with 10 ton over pull and POOH. RU casing crew and ran 13 3/8" casing to 1005 m.
- 05.07.2003 RIH with 13 3/8" casing to 2370 m. Took weight at 2370 m. Circulated and worked 13 3/8" casing down from 2370 m to 2417 m. Landed hanger in WH. Established circulation prior to cementing.
- 06.07.2003 R/U cement hose, tested surface lines and performed cementing of 13 3/8" CSG. Set seal assy and tested same. Released running tool and POOH w/ same. Ran and set wear bushing. Tested BOP.
- 07.07.2003 Continued to test BOP, inside BOP and kelly hose. Made up 12 1/4" BHA and RIH. Tagged cmt at 2368 m. Drilled cement and plugs from 2368 m to 2386,9 m.
- 08.07.2003 Drilled cement, plugs, float collar, shoetrack and shoe. Cleaned out rat hole and drilled 3 m new formation to 2428 m. Performed LOT equivalent to 1,42 SG. Circulated and rised MW to 1,30 SG. Drilled 12 1/4" hole from 2428 m to 2545 m.
- 09.07.2003 Drilled 12 1/4" hole from 2545 m to 2716,5 m. Had sharp increase in gas level. Circulated and observed well to evaluate pore pressure. Drilled from 2716,5 m to 2717,5 m. Circulated and increased MW from 1,30 SG to 1,33 SG.
- 10.07.2003 Continued to circulate and increased mud weight from 1,30 sg to 1,33 sg. Evaluated hole stability and drilled from 2717,5 m to 2742 m. Circulated and increased mud weight from 1,33 SG to 1,35 SG. Drilled from 2742 m to 2767 m. Evaluated hole stability and circulated bottoms up for samples. Drilled from 2767 m to 2816 m. Circulated and rised mud weight from 1.35 SG to 1,37 SG. Closed in well at BOP and circulated out riser due to high gas level in mud.

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- 11.07.2003 Continued to circulate out riser through booster line. Circulated annulus volum up chokeline due to gain in active system. Opened well and circulated down gas content. Gas content increased later and after a stop to restart MWD tool there were noticed another gain. Closed in well and circulated out annulus volume.
- 12.07.2003 Opened up BOP and flow checked well. Gained 200 lpm in 30 min. Circulated up riser with 3500 lpm. Gas content in mud increased to 50 %. Max 65 % at 10 min flowcheck. Increased mudweight in steps from 1,37 sg to 1,42 SG. Max ECD 1,448 sg. Gas content decreased to 0,5 %. Flow checked well, static, and circulated bottoms up. Pooh to 2535 m. Got 10 ton overpull and observed packing off tendency. Rih to 2560 m.
- 13.07.2003 Established circulation with 1900 lpm. Worked tight hole from 2535 m into shoe. Pumped out from shoe at 2417 m into riser with 400 lpm. Pulled out from BOP.
- 14.07.2003 Pulled out with drilling assy. Rih with cement stinger, circulated and set cement plug 2816 - 2630 m and 2573 - 2360 m.
- 15.07.2003 Circulated and pulled out with cement stinger. Rih with 12 1/4" motor kick off assy. Troubleshooted and repaired ram rig position indicator system (SIMS). Tagged cement at 2322 m. Drilled cement to 2328 m. Changed out SIMS.
- 16.07.2003 Sidetracked 12 1/4" hole at 2440 m and drilled to 2674 m.
- 16.07.2003 Repaired rig. Drilled out cement and sidetracked well at 2440 m.
- 17.07.2003 Drilled 12 1/4" hole from 2674 m to 2742,4 m with motor. Circulated hole clean. Increased mudweight to 1,38 sg. Pumped out of open hole to 2417 m. Pumped slug and pooh to 2353 m. Repaired rig and cont pooh.
- 18.07.2003 Pulled out with 12 1/4" BHA assy. Ran in hole with 12 1/4" x 14" Andergauge underreamer. Underreamed 12 1/4" hole to 14" from 2420 m to 2736 m.
- 19.07.2003 Circulated the 14" well clean. Flowcheck OK. POOH. Riggged up and ran 11 3/4" liner.
- 20.07.2003 Ran 11 3/4" liner
- 21.07.2003 Completed running 11 3/4" liner, cemented and tested same.
- 22.07.2003 POOH liner landing string. Tested BOP. RIH with 10 5/8" drilling assy to drill out of 11 3/4" liner.
- 23.07.2003 Drilled cement, shoe track and 11 3/4" shoe at 2741 m. Performed leak off test to 1,60 sg. Drilled to core point at 2754 m. Preformed FIT to 1,55 sg. POOH to pick up Corebarrel #1.
- 24.07.2003 RIH and cut core no 1.( 27 m.) POOH. Racked it in Aux. rig.
- 25.07.2003 Recovered core no 1. 37% RIH and cut core no 2 (27 m.) POOH. Transferred core no. 2 to Aux. rig and recovered 95%.
- 26.07.2003 RIH and cut core no 3. (27 m.) POOH. Transferred core no. 3 to Aux rig and recovered 87 %. RIH with corebarrel no. 4.
- 27.07.2003 Circulated bottoms up prior to cutting core no. 4. Observed 4.8% max. gas on bottoms up. Cut core no. 4 from 2835 m to 2862 m. POOH and LD core (total recovery 26.8 m / 99%). RIH to cut core no. 5. Washed to bottom and CBU prior to start coring.
- 28.07.2003 Washed to bottom at 2862 m and circulated bottoms up. Observed maximum 1.6% gas on bottoms up. Cut core no. 5 from 2862 m to 2880 m. POOH and LD core. Recovered 7.39 m (40.9% recovery). PU 8 1/2" drilling assembly and RIH to 2723 m. Performed weekly function test on the BOP.
- 29.07.2003 Finished function testing BOP on Blue and Yellow pods. Function tested lower pipe rams on acoustic system. Logged with MWD / LWD from 2740 m to 2880 . Drilled 8 1/2" hole from 2880 m to 3200 m.
- 30.07.2003 Circulated bottoms up. Pulled and backreamed to 11 3/4" shoe. Several tight spots experienced. Circulated and conditioned mud at the shoe. RIH to 3200 m. Circulated and condition mud. POOH to 11 3/4" shoe, CBU and POOH for wire line logs. RU wire line and PU logging string no. 1.
- 31.07.2003 Finished installation of radiocative sources and RIH with tool string no. 1 (MLL/DLL/X-MAC/ORIT/ZDL/CN/SL/TTRM). Logged from 3200 m (loggers TD 3198 m) to 11 3/4" shoe. POOH and LD tool string no 1. PU tool string no. 2 (MRIL) and RIH. Logged from 2950 m to 2756 m.
- 01.08.2003 Finished log run no. 2 (MRIL) and POOH. PU logging string no 3 (RCI). RIH and collected pressure points as directed.
- 02.08.2003 Ran logging run no 3: RCI for pressure points and samples.
- 03.08.2003 Completed wire line run no. 3 (RCI). RU and ran wire line run no. 4 (RCI straddle packer).
- 04.08.2003 Continued sampling with RCI straddle packer (wire line run no. 4).
- 05.08.2003 Completet wire line run no. 4 (RCI straddle packer). POOH and RD same.
- 06.08.2003 RD tools from wire line run no. 4 (RCI straddle packer). Made wiper trip to TD at 3200 m. Circulated and conditioned hole.
- 07.08.2003 Completed circulating and conditioning hole. POOH with 8 1/2" BHA. RU wire line and performed run no 5 with RCOR. Took 29 side wall cores.
- 08.08.2003 POOH with logging string no. 5 (RCOR). Performed logging run no. 6 (STAR). RIH and started run no 7 (RCI with straddle packer).
- 09.08.2003 Performed logging run no. 7 (RCI with straddle packer).
- 10.08.2003 POOH with logging run no. 7 (RCI with straddle packer). RIH with 10 5/8" x 12 1/4" UR. Circulated BU at 2740 m. Underreamed 10 5/8" hole to 12 1/4" from 2741 - 2906 m.
- 11.08.2003 Underreamed hole from 10 5/8" to 12 1/4" from 2898 - 3192 m. Circulated hole clean. POOH to 1432 m.
- 12.08.2003 POOH with 12 1/4" UR BHA. Performed wiper trip with 10 5/8" BHA to clean up 11 3/4" liner. POOH to 112 m.

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- 13.08.2003 POOH. RU and ran 9 5/8" liner to 2750 m.
- 14.08.2003 Ran 9 5/8" liner. Circulated. Set hanger. Cemented liner. Tested liner and TSP packer. POOH with landing string. Tested BOP.
- 15.08.2003 Pressure and function tested and BOP. Tested DDM IBOP and mud hose. RIH with 8 1/2" BHA to 3140 m. Drilled excess cmt, shoetrack and 3 m new formation to 3203 m. Circulated hole clean. Prepared for LOT.
- 16.08.2003 Performed leak off test equivalent to 1,70 SG. Drilled 8 1/2" hole from 3203 m to 3411 m. Had DP problems and checked out same. Pulled bit into casing shoe while troubleshooting DP system.
- 17.08.2003 Troubleshooting DP system. Pulled BHA up above BOP while waiting on DP system.
- 18.08.2003 Troubleshooting DP system. Rig std. by.
- 19.08.2003 Continued troubleshooting DP system. Found some faulty computer hardware and changed out same. Loaded upgraded software into system. Rig waiting with BHA 2 stands above BOP.
- 20.08.2003 RIH from 1164 m to 3411m. Washed last stand to TD. Drilled 8 1/2" hole from 3411 m to 3586 m.
- 21.08.2003 Drilled 8 1/2" hole from 3586 m to 3751 m. Circulated up samples from drilling breaks at 3611 m and 3687 m. Picked corepoint at 3751 m. POOH for coring.
- 22.08.2003 POOH w/ 8 1/2" drilling assembly. Stopped inside casing at 3155 m and function tested BOP. Cont POOH and racked back BHA. Broke bit and transferred MWD to AUX rig. P/U 8 1/2" core head and M/U to 6 3/4"x3 1/2"x 27 m core barrel and RIH to 3550 m.
- 23.08.2003 Rih with 8 1/2" coring assy. Circulated bottoms up and cut core no 6 from 3751 m to 3756 m. Pooh due to low ROP. Recovered 5,01 m core, 83,5 % recovery. Prepared for SBT log in 9 5/8" casing.
- 24.08.2003 Ran cement bond log in 9 5/8" liner. Rih with 27 m, 6 3/4" x 3 1/2" corebarrel and cut core no 7 from 3757 m to 3763 m.
- 25.08.2003 Cut core no 7 from 3763 m to 3784 m. Pooh to 590 m.
- 26.08.2003 Pulled out with coring assy and recovered 26,15 m core. Rih with 8 1/2" drilling assy and logged cored interval. Drilled 8 1/2" hole from 3784 m to 3791 m.
- 27.08.2003 Drilled 8 1/2" hole from 3791 m to 3986 m. Circulated bottoms up for samples. Continued drilling 8 1/2" hole from 3986 m to 4062 m.
- 28.08.2003 Drilled 8 1/2" hole from 4062 m to TD at 4300 m. Circulated hole clean and pumped out of hole to 3750 m. Pulled out from 3750 m to 3640 m.
- 29.08.2003 Made wiper trip to shoe. Circulated hole clean. Pooh. Rih with jet sub and 3 stands HWDP below BOP test tool.
- 30.08.2003 Tested BOP and rigged up for Wireline Logging on TD. Ran log #1 TTRM-DSL-ORIT-XMACII-HDLL MLL. Prepared to drill 8 1/2" Pilot Hole. RIH with 8 1/2" bit MWD/LWD from Aux Rig. Spudded 14,92 m from old well at 350 deg.
- 31.08.2003 Main rig completed logging run #1:TTRM-DSL-ORIT-XMACII-HDLL MLL, #2: TTRM-DSL-CN-ZDL-DLL. and #3 MRIL-GR not completed. Aux. rig drilled 8 1/2" pilot hole from seabed to 1707 m.
- 01.09.2003 Main rig: Completed logging run #3; MRIL-GR. Prepared for logging run #4; VSP. Aux rig: Completed drilling 8 1/2" pilot hole to 1920 m. Pooh.
- 02.09.2003 Prepared for and ran logg #4: VSP- walk away.
- 03.09.2003 Main rig: Completed logging run #4: VSP-GR- walk away. Ran loggerun #5: RCI-GR, not completed.
- 04.09.2003 Ran RCOC-GR.
- 05.09.2003 Reran logg #5: RCI-GR
- 06.09.2003 Finished POOH with RCI-GR tool. RD loggers. Pressure tested mud hose and RIH with cementing string. Function tested BOP and RIH and set Cement Support Tool at 3805 m. CBU and set cement plug no. 1 from 3800 m to 3550 m.
- 07.09.2003 Set P&A plug no 2 and no. 3 from 3445 m to 3000 m. POOH and PU dummy hanger and riser brush assy. RIH with same while boosting the riser.
- 08.09.2003 RIH and cleaned riser. Spaced out with dummy hanger and POOH. PU and RIH with liner hanger dressing mill and 13 3/8" and 9 5/8" casing scrapers. Pressure tested casing and cement plug to 260 bar. Continued RIH to 2649 m.
- 09.09.2003 Reciprocated DP and rotated at 50 rpm while scraping packer setting areas at 2817 m and at 2649 m. Displaced well to sea water and performed inflow test. Continued displacing the riser to sea water and cleaned the surface system. Washed surface system with 20 m3 soap pill prior to displacing well to brine.
- 10.09.2003 Cleaned surface equipment with soap pill. Displaced well with CaCl2/CaBr2 brine. Pumped slug and POOH at 2700 m.
- 11.09.2003 Finished POOH with casing scraper and PBR dressing mill. Ran and set 9 5/8" EZSV on wire line at 2817 m. RIH with BOP test plug and set same. Held safety stand down and commenced BOP testing to 20 bar low and 395 bar high.
- 12.09.2003 Finished testing the BOP. POOH BOP test plug. Broke out XO's from dummy hanger run. PU surface test tree and MU tubing jt. LD same. PU and ran perforation guns. Tagged EZSV plug and perforated well from 2758 m to 2811.7 m. Checked for flow/losses and POOH.
- 13.09.2003 POOH with perforating assembly. LD guns. PU and RIH with 15 jts 5" HWDP. Cleaned same. POOH. Prepared and ran gravel pack string to 570 m.
- 14.09.2003 RIH with gravel pack assy to 1156 m. WOW.
- 15.09.2003 WOW.
- 16.09.2003 WOW. RIH with frac pack string to 2504 m.

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- 18.09.2003 Performed fracpack. Circulated hole clean. Attempted to perform top up gravel pack job. Circulated BU. POOH with fracpack assembly to 2161 m.
- 19.09.2003 POOH with fracpack string. Held safety stand down. Prepared rigfloor for running test string. Experienced problems with riser tensioner support ring rotation system. RIH with 6 1/2" DC and 5" HWDP to 219 m. Waited on boat with RTTS packer/ storm valve.
- 20.09.2003 Waited for/ prepared RTTS-packer/ storm valve. RIH with same to 690 m (tailpipe to 2080 m). Meanwhile managed to repair tensioner support ring rotation system. POOH with RTTS and tail pipe. Prepared for PU DST.
- 21.09.2003 RU and ran DST BHA to 65 m. Tested same to 400 bar. RIH with 3 1/2" tbg to 1119 m. Tested string to 400 bar. RIH with 5 1/2" thermo tbg to 1326 m.
- 22.09.2003 RIH to 1346 m.
- 23.09.2003 WOW. Meanwhile LD 42 jts 5" tbg and 2 stands of corebarrels from set back.
- 24.09.2003 WOW (meanwhile LD 3 1/2" tbg from setback and RIH w 5 1/2" DP to 1163 m).
- 25.09.2003 WOW. Engaged string to hang off tool. POOH with same. Performed spaceout run.
- 26.09.2003 Ran DST string incl SSTT and RV to 1452 m.
- 27.09.2003 RIH with DST string to 2020 m. Tested same at 1451m and at 1885 m.
- 28.09.2003 Cont RIH w/ test string from 2020 m to 2623 m. Installed sub sea lubricator valve and tested same. Cont RIH from 2623 m to 2667 m. P/U surface test tree and started to p/u kill and flowlines.
- 29.09.2003 Cont R/U kill and flow lines to flowhead. Pressure tested hook up on flowhead and towards choke manifold. Pressured up annulus to close RD bypass and open RD ball valve. Pumped 10 m3 diesel cushion. Preparing to flow the well.
- 01.10.2003 Flowed well through 14,3 mm choke. Flow decreased from 60 m3/day to 30 m3/day. Flow directed to calibration tank from 22:13 hrs.
- 02.10.2003 Flowed well through 14,3 mm choke at 35 m3/day. Total production 167,1 m3.
- 03.10.2003 Flowed well to stock tank. Rate decreased to 13 m3/day w/ WOR 0,1. At 10:15 hrs closed well in at LPR-N valve for final build-up. BHP increased from 134,5 bar to 338,5 bar at 0600 hrs.
- 04.10.2003 Well shut in for final build up.
- 05.10.2003 Killed well. Opened circulating valve and circulated up choke line, max gas 3,4 %. WOW to lay down surface test tree.
- 06.10.2003 WOW. Laid down surface test tree and pulled out with test string from 2670 m to 1773 m.
- 07.10.2003 Pooh with test string. Laid down 5 1/2" thermotubing and racked 3 1/2" PH6 tubing. Repaired pipehandling system (HTV) and laid down DST BHA. Cleaned rigfloor and prepared for running 9 5/8 EZSV.
- 08.10.2003 Ran in hole with 9 5/8 EZSV bridge plug. Function tested BOP on way in. Set bridge plug at 2636 m. Circulated bottoms up, max gas 19 %. Pressure tested plug to 152 bar. Set 100 m cement plug on top of bridge plug. Pooh.
- 09.10.2003 Ran in hole with bridge plug and wearbushing retrieving tool. Retrieved wearbushing and set 13 3/8" bridge plug at 2206 m. Pressure tested bridgeplug to 63 bar. Displaced well from 1,45 sg brine to 1,28 sg mud. Set a 60 m cement plug on top of bridge plug. Pulled out to 2000 m and flushed drillstring. Pumped 26,3 m3 interface mud/brine and set same from 2000 m to 1660 m. Pooh.
- 10.10.2003 Pulled out wearbushing and bridge plug RT. Rih with 13 3/8" cutting and retrieving assy. Cut 13 3/8" casing at 1553 m with annular closed. Circulated bottoms up and checked for gas, 6 %. Pooh with casing to 360 m. Lost casing and workstring in hole when DP elevator accidentally opened. Rih to fish.
- 11.10.2003 Successfully fished the lost 13 3/8" casing and landing string. POOH. WOW to set EZSV mechanical plugg on DP. Picked up EZSV plug and RIH to 60m.
- 12.10.2003 Accidentally sat 20" EZSV plug inside riser at 1033 m. Drilled out same with a 17 1/2" bit. Displaced riser to seawater, and disconnected LMRP:
- 13.10.2003 From Aux. rig stabbed cementing string into the well and cemented from 1500 m to 1290 m. From Main rig prepared to connect LMPR and pull riser and BOP.
- 14.10.2003 Disconnected BOP and pulled riser. Cut WH at 1247 m and attempted to pull, no go. Released MOST tool. POOH and changed cutters. RIH to cut at 1243,5 m (app 2 m below seabed)
- 15.10.2003 Pulled riser and BOP. Cut and retrieved WH. Performed seabed survey and retrieved transponders. West Navigator off contract at 02:40 hrs.

## **7 Appendix B – Directional data, survey listing**

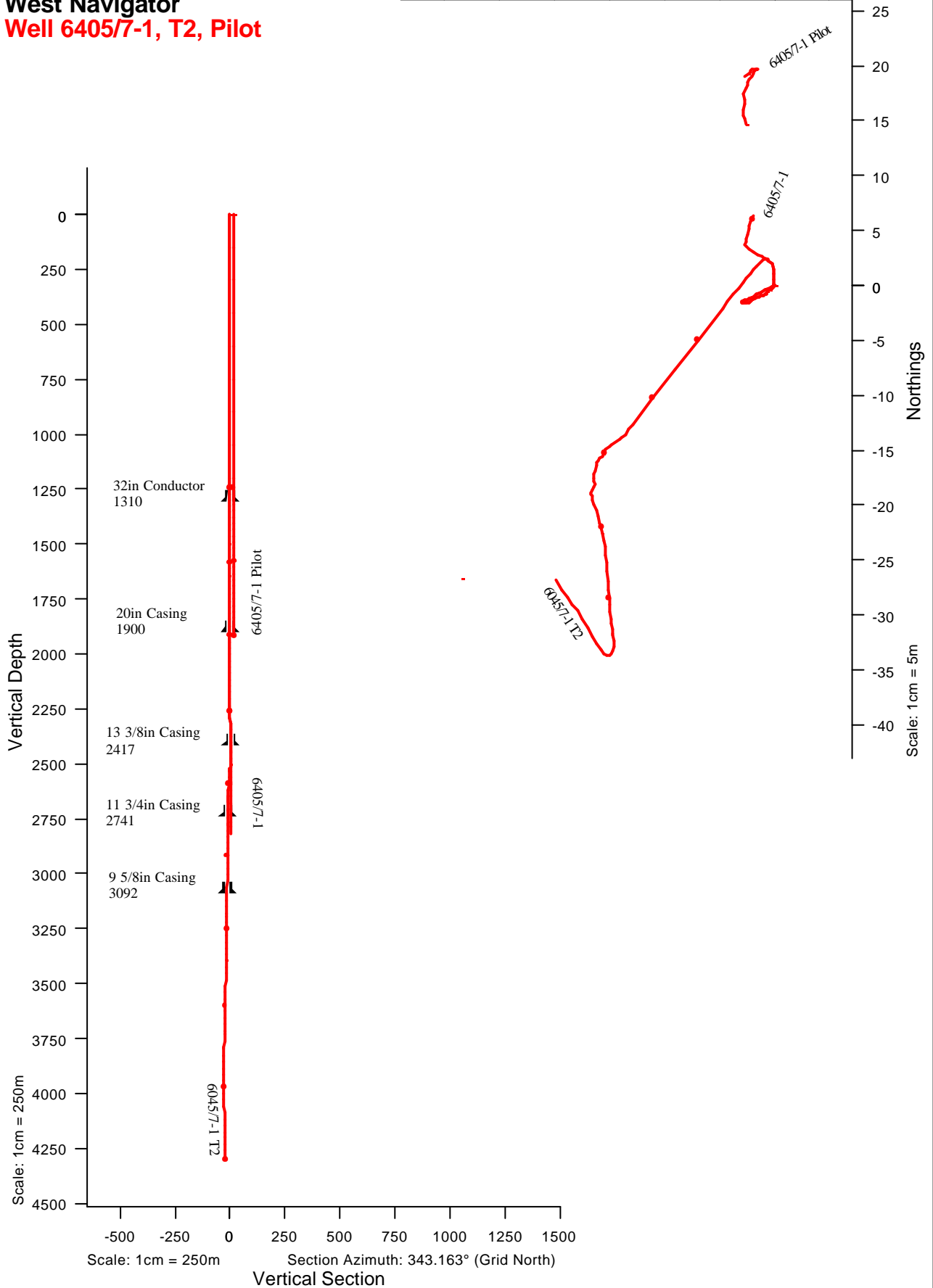
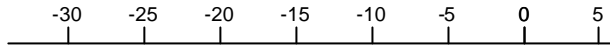
### **7.1 Well plot**

*Fig. 6.1 Well path plot*

**Block 6405/7**  
**ELLIDA**  
**West Navigator**  
**Well 6405/7-1, T2, Pilot**

Scale: 1 cm = 5m

Eastings



## **7.2 Well survey listing**

*Table 6.1 Well survey listing*

**Survey Report for West Navigator - Well 6405/7-1**  
**Your Ref: Definitive 6405/7-1 T2**

Measured Depth (m)	Incl. (Deg)	Azim. (Deg)	Station Coordinates			Vertical Section (m)	Dogleg Rate (°/30m)	Comment
			TVD (m)	Northings (m)	Eastings (m)			
<b>6405/7-1_MWD 36"</b>								
0.00	0.000	0.000	0.00	0.00 N	0.00 E	0.00		
1242.00	0.000	0.000	1242.00	0.00 N	0.00 E	0.00	0.00	
1310.00	1.047	242.470	1310.00	0.29 S	0.55 W	0.56	0.46	30in Conductor
1324.50	1.270	242.470	1324.49	0.42 S	0.81 W	0.82	0.46	
<b>6405/7-1_MWD 26"</b>								
1382.60	0.650	245.910	1382.58	0.85 S	1.68 W	1.69	0.32	
1411.50	0.690	242.340	1411.48	1.00 S	1.99 W	1.99	0.06	
1440.90	0.570	244.650	1440.88	1.15 S	2.28 W	2.28	0.13	
1468.50	0.550	240.030	1468.48	1.27 S	2.51 W	2.52	0.05	
1498.60	0.550	255.530	1498.58	1.38 S	2.78 W	2.76	0.15	
1527.90	0.180	246.240	1527.88	1.43 S	2.96 W	2.91	0.38	
1557.00	0.130	237.770	1556.98	1.47 S	3.03 W	2.98	0.06	
1584.80	0.070	121.690	1584.78	1.50 S	3.04 W	3.01	0.19	
1612.80	0.130	148.420	1612.78	1.53 S	3.01 W	3.02	0.08	
1643.00	0.290	82.590	1642.98	1.55 S	2.91 W	2.98	0.26	
1672.70	0.320	107.280	1672.68	1.57 S	2.76 W	2.90	0.14	
1729.80	0.480	68.440	1729.78	1.53 S	2.39 W	2.65	0.16	
1759.60	0.370	45.400	1759.57	1.41 S	2.20 W	2.45	0.20	
1788.30	0.580	74.310	1788.27	1.31 S	2.00 W	2.24	0.33	
1844.70	0.460	56.440	1844.67	1.11 S	1.53 W	1.80	0.11	
1891.90	0.390	70.970	1891.87	0.95 S	1.22 W	1.49	0.08	
1899.50	0.331	73.372	1899.47	0.93 S	1.18 W	1.45	0.24	20in Casing
1914.30	0.220	81.690	1914.27	0.92 S	1.11 W	1.40	0.24	
<b>6405/7-1_MWD 17"</b>								
2001.10	0.250	50.360	2001.07	0.77 S	0.80 W	1.10	0.04	
2088.10	0.250	32.750	2088.07	0.49 S	0.55 W	0.72	0.03	
2174.70	0.220	104.410	2174.67	0.37 S	0.29 W	0.47	0.10	
2259.00	0.770	5.310	2258.97	0.15 N	0.08 W	-0.07	0.30	
2345.40	1.000	352.550	2345.35	1.48 N	0.12 W	-1.11	0.10	
2413.30	0.900	301.960	2413.25	2.34 N	0.65 W	-1.50	0.36	
<b>6405/7-1T2_MWD 12-1/4"</b>								
2446.90	0.960	228.730	2446.84	2.30 N	1.08 W	-1.20	0.99	
2476.80	2.330	223.320	2476.73	1.69 N	1.69 W	-0.35	1.38	
2504.80	5.090	219.280	2504.67	0.32 N	2.87 W	1.45	2.97	
2533.40	7.250	216.720	2533.10	2.11 S	4.75 W	4.53	2.28	
2563.30	6.800	219.030	2562.78	5.00 S	6.99 W	8.18	0.53	
2591.90	6.700	218.590	2591.18	7.62 S	9.10 W	11.54	0.12	
2619.90	6.620	215.880	2618.99	10.20 S	11.06 W	14.79	0.35	
2648.70	5.320	217.150	2647.63	12.61 S	12.84 W	17.78	1.36	
2677.80	2.320	231.360	2676.67	14.06 S	14.12 W	19.70	3.22	
2704.50	1.250	245.090	2703.35	14.52 S	14.80 W	20.48	1.29	

**Survey Report for West Navigator - Well 6405/7-1**  
**Your Ref: Definitive 6405/7-1 T2**

Measured Depth (m)	Incl. (Deg)	Azim. (Deg)	Station Coordinates			Vertical Section (m)	Dogleg Rate (°/30m)	Comment
			TVD (m)	Northings (m)	Eastings (m)			
2714.50	1.050	235.260	2713.35	14.62 S	14.98 W	20.66	0.84	11 3/4in Casing
2741.00	0.812	220.871	2739.85	14.90 S	15.30 W	21.08	0.38	
2777.16	0.640	187.070	2776.00	15.29 S	15.49 W	21.51	0.38	
2803.75	0.700	226.070	2802.59	15.55 S	15.63 W	21.80	0.51	
2832.67	0.640	232.660	2831.51	15.77 S	15.88 W	22.13	0.10	
2889.26	0.310	178.290	2888.10	16.12 S	16.13 W	22.55	0.28	
2919.00	0.870	194.190	2917.84	16.41 S	16.18 W	22.82	0.58	
2976.56	0.800	194.840	2975.39	17.23 S	16.39 W	23.60	0.04	
3034.30	0.380	155.200	3033.13	17.79 S	16.42 W	24.07	0.29	
3062.90	0.800	167.990	3061.73	18.07 S	16.34 W	24.25	0.46	
3091.90	0.620	221.740	3090.72	18.39 S	16.40 W	24.54	0.68	

**6405/7-1T2\_MWD 8-1/2"**

3196.60	0.430	155.780	3195.42	19.17 S	16.61 W	25.29	0.17
3225.50	0.870	174.070	3224.32	19.48 S	16.55 W	25.51	0.50
3254.30	1.030	157.150	3253.12	19.94 S	16.42 W	25.80	0.33
3283.50	1.140	165.220	3282.31	20.46 S	16.25 W	26.12	0.19
3341.40	1.240	157.200	3340.20	21.60 S	15.86 W	26.79	0.10
3365.70	0.860	173.740	3364.49	22.02 S	15.74 W	27.06	0.60
3397.60	1.340	163.240	3396.39	22.62 S	15.60 W	27.46	0.49
3426.40	1.020	177.690	3425.18	23.20 S	15.50 W	27.86	0.45
3455.10	1.430	174.220	3453.87	23.81 S	15.45 W	28.32	0.44
3512.00	1.490	175.700	3510.76	25.25 S	15.32 W	29.41	0.04
3600.70	1.750	174.760	3599.42	27.75 S	15.11 W	31.29	0.09
3627.60	1.330	170.330	3626.31	28.47 S	15.02 W	31.81	0.49
3656.40	1.160	181.900	3655.10	29.09 S	14.98 W	32.28	0.32
3685.10	1.460	177.140	3683.80	29.74 S	14.97 W	32.81	0.33
3733.60	0.920	167.810	3732.29	30.74 S	14.85 W	33.54	0.35
3800.00	1.060	173.140	3798.68	31.87 S	14.67 W	34.34	0.08
3857.30	0.880	186.640	3855.97	32.83 S	14.66 W	35.10	0.15
3886.40	0.800	196.360	3885.07	33.25 S	14.74 W	35.49	0.17
3915.40	0.560	212.420	3914.06	33.57 S	14.87 W	35.82	0.31
3973.90	0.470	292.540	3972.56	33.71 S	15.25 W	36.16	0.34
4031.10	1.140	324.190	4029.76	33.16 S	15.80 W	36.05	0.41
4088.80	1.770	330.610	4087.44	31.92 S	16.57 W	35.51	0.34
4117.70	1.780	330.480	4116.32	31.14 S	17.01 W	35.15	0.01
4202.80	1.610	323.460	4201.39	29.03 S	18.37 W	34.26	0.09
4260.70	1.570	326.620	4259.26	27.72 S	19.29 W	33.75	0.05

**Definitive 6405/7-1 T2**

4300.00	1.570	326.620	4298.55	26.82 S	19.89 W	33.38	0.00
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All data is in Metres unless otherwise stated. Directions and coordinates are relative to Grid North. Vertical depths are relative to RKB. Northings and Eastings are relative to Structure.

The Dogleg Severity is in Degrees per 30 metres.

Vertical Section is from Wellhead and calculated along an Azimuth of 216.558° (Grid).

Coordinate System is UTM Zone 31 on ED50 Datum, Meters.

Grid Convergence at Surface is 1.922°. Magnetic Convergence at Surface is 4.254° (23-Jun-03)

Based upon Minimum Curvature type calculations, at a Measured Depth of 4300.00m., The Bottom Hole Displacement is 33.38m., in the Direction of 216.558° (Grid).

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**Survey Report for West Navigator - Well 6405/7-1**  
**Your Ref: Definitive 6405/7-1 T2**

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\* Grid Coordinate Scale Factors have been applied to all local coordinates.

**Casing details**

From		To		Casing Detail
Measured Depth (m)	Vertical Depth (m)	Measured Depth (m)	Vertical Depth (m)	
<Surface>	<Surface>	1310.00	1310.00	30in Conductor
<Surface>	<Surface>	1899.50	1899.47	20in Casing
<Surface>	<Surface>	2741.00	2739.85	11 3/4in Casing
<Surface>	<Surface>	3091.90	3090.72	9 5/8in Casing

**Survey Report for West Navigator - Well 6405/7-1Pilot**  
**Your Ref: Definitive 6405/7-1 Pilot**

Measured Depth (m)	Incl. (Deg)	Azim. (Deg)	Station Coordinates			Vertical Section (m)	Dogleg Rate (°/30m)	Comment
			TVD (m)	Northings (m)	Eastings (m)			
<b>6405/7-1Pilot_ MWD 8-1/2"</b>								
0.00	0.000	0.000	0.00	14.67 N	2.59 W	0.00		
1242.00	0.000	0.000	1242.00	14.67 N	2.59 W	0.00	0.00	
1248.70	0.930	342.200	1248.70	14.72 N	2.61 W	0.05	4.16	
1290.90	1.030	346.350	1290.89	15.42 N	2.80 W	0.75	0.09	
1318.70	1.100	7.890	1318.69	15.92 N	2.82 W	1.26	0.44	
1347.30	1.090	6.530	1347.28	16.47 N	2.75 W	1.80	0.03	
1376.30	0.890	345.310	1376.28	16.96 N	2.78 W	2.29	0.43	
1405.10	1.060	10.720	1405.08	17.44 N	2.79 W	2.77	0.48	
1433.90	0.970	22.930	1433.87	17.92 N	2.64 W	3.25	0.24	
1462.30	0.500	34.740	1462.27	18.25 N	2.48 W	3.57	0.52	
1491.50	0.370	10.160	1491.47	18.44 N	2.39 W	3.76	0.23	
1520.30	0.830	30.220	1520.27	18.71 N	2.27 W	4.03	0.52	
1548.92	0.780	26.470	1548.88	19.07 N	2.08 W	4.38	0.08	
1577.70	0.370	35.950	1577.66	19.32 N	1.93 W	4.63	0.44	
1605.58	0.170	25.350	1605.54	19.43 N	1.86 W	4.73	0.22	
1635.20	0.250	51.850	1635.16	19.51 N	1.79 W	4.81	0.13	
1664.20	0.410	31.360	1664.16	19.64 N	1.69 W	4.94	0.20	
1692.90	0.170	77.900	1692.86	19.73 N	1.60 W	5.03	0.33	
1722.50	0.140	177.160	1722.46	19.71 N	1.55 W	5.00	0.24	
1751.20	0.610	267.420	1751.16	19.66 N	1.70 W	4.96	0.65	
1780.30	0.660	259.380	1780.26	19.63 N	2.02 W	4.94	0.11	
1809.10	0.310	186.220	1809.06	19.52 N	2.19 W	4.83	0.67	
1838.10	0.190	184.140	1838.06	19.39 N	2.21 W	4.71	0.12	
1879.30	0.570	237.900	1879.26	19.22 N	2.38 W	4.54	0.35	

**Definitive 6405/7-1 Pilot**

1920.00	0.570	237.900	1919.95	19.00 N	2.73 W	4.33	0.00	
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All data is in Metres unless otherwise stated. Directions and coordinates are relative to Grid North. Vertical depths are relative to Well. Northings and Eastings are relative to Structure.

The Dogleg Severity is in Degrees per 30 metres.  
Vertical Section is from Well and calculated along an Azimuth of 358.193° (Grid).

Coordinate System is UTM Zone 31 on ED50 Datum, Meters.  
Grid Convergence at Surface is 1.922°. Magnetic Convergence at Surface is 4.254° (23-Jun-03)

Based upon Minimum Curvature type calculations, at a Measured Depth of 1920.00m.,  
The Bottom Hole Displacement is 4.33m., in the Direction of 358.193° (Grid).

\* Grid Coordinate Scale Factors have been applied to all local coordinates.

## **8 Appendix C – List of contractors**

<b>SERVICE</b>	<b>COMPANY</b>
Casing	Weatherford
Cementing	Halliburton
Coring	Hughes Christensen
Directional Drilling	Halliburton Sperry Sun
Diving	Oceaneering AS
Drilling Contractor	Smedvig offshore AS
Electric Logging	Baker Atlas
Helicopter	Norsk helikopter
Helicopter Booking	Lufttransport (Statoil)
Mud	M-I Norge AS
Mud Logging	Halliburton
MWD	Baker Hughes INTEQ and Halliburton Sperry Sun
Wellhead System	Dril-Quip

## 9 Appendix D - RCI pressure measurements

Run 2A: RCI with single probe									
Test #	Formation name	Depth m MD RKB	Depth m TVD RKB	Formation Pressure (bar)	Hydro, Before (bar)	Hydro, After (bar)	Form. Temp, (°C)	Mobility (mD/cP)	Comments
1	Nise	2761	2760		398,68	398,72	61		Tight-aborted
2	Nise	2761	2760		398,68	398,72	61		Tight-aborted
3	Nise	2763	2762		398,91	398,99	60,5		Tight-aborted
4	Nise	2763	2762		398,91	398,99	60,5		Tight-aborted
5	Nise	2764	2763	387,64	399,08	399,08	59,9	4,765	Good
6	Nise	2764	2763	387,51	399,08	399,08	59,9	5,615	Good
7	Nise	2764	2763	387,42	399,08	399,08	59,9	2,407	Good
8	Nise	2768,1	2767,1	398,15	399,70	399,69	59,6	1,927	Good
9	Nise	2780,1	2779,1	389,23	401,54	401,56	59,7	2,022	Good
10	Nise	2780,1	2779,1	388,56	401,54	401,56	59,7	1,052	Good
11	Nise	2782,1	2781,1	389,83	401,74	401,82	61,4	2,508	Good
12	Nise	2786,1	2785,1	389,11	402,38	402,36	62,1	1,484	Good
13	Nise	2794,1	2793,1		403,53	403,67	62,7		Tight-aborted
14	Nise	2798,1	2797,1		404,05	404,07	63,13		Tight-aborted
15	Nise	2798,1	2797,1		404,05	404,07	63,13		Tight-aborted
16	Nise	2807	2806	394,92	405,36	404,07	63,6	2,319	Good
17	Nise	2807	2806	394,76	405,36	405,21	63,6	1,725	Good
18	Nise	2827	2826	391,75	408,26	408,19	64,91	3,297	Good
19	Nise	2828	2827		408,40	408,94	65,9		Tight-aborted
20	Nise	2828	2827	392,33	408,40	408,94	65,9	4,191	Good
21	Nise	2828,9	2827,9	392	409,13	408,94	66,7	4,171	Good
22	Nise	2828,9	2827,9	391,91	409,13	408,49	66,7	4,043	Good
23	Nise	2828,9	2827,9	391,92	409,13	408,49	66,7	0,07923	Good
24	Nise	2830,5	2829,5	392,37	408,81	408,48	67,1	1,645	Good
25	Nise	2830,5	2829,5		408,81	408,48	67,1		Recharged
26	Nise	2830,5	2829,5	392,32	408,81	408,48	67,1	1,388	Good
27	Nise	2836,2	2835,2		409,57	409,54	67,93		Tight-aborted
28	Nise	2836,2	2835,2		409,40	409,34	68,03		Tight-aborted
29	Nise	2838,9	2837,9		409,80	409,71	68,01		Tight-aborted
30	Nise	2838,9	2837,9		409,61	409,86	68,14		Tight-aborted
31	Nise	2840,1	2839,1	396,04	409,94	409,98	68,4	5,924	Good
32	Nise	2840,1	2839,1	395,74	409,94	409,98	68,4	3,378	Good
33	Nise	2840,1	2839,1	395,5	409,94	409,98	68,4	1,342	Good
34	Nise	2835,1	2834,1		409,21	409,13	68,06		Tight-aborted
35	Nise	2843,8	2842,8	397	410,45	410,36	67,9	2,543	Good
36	Nise	2846,1	2845,1	395,09	410,82	410,76	68,2	0,87	Good
37	Nise	2845,7	2844,7	395,01	410,78	410,8	68,7	0,8699	Good

**Run 2A: RCI with single probe**

Test #	Formation name	Depth m MD RKB	Depth m TVD RKB	Formation Pressure (bar)	Hydro, Before (bar)	Hydro, After (bar)	Form. Temp, (°C)	Mobility (mD/cP)	Comments
38	Nise	2849,8	2848,8		411,30	411,3	68,88		Tight-aborted
39	Nise	2855,9	2854,9	412,13	412,14	412,13	69,1	1,576	Good
40	Nise	2862,8	2861,8		413,29	413,16	69,87		Tight-aborted
41	Nise	2880,5	2879,5		415,79	415,63	70,57		Tight-aborted
42	Nise	2881	2880	403,2	415,82	415,85	70,86	2,94	Good
43	Nise	2896	2895	399,95	418,03	417,94	71,9	1,189	Good
44	Nise	2906,9	2905,9		419,39	418,71	73		Tight-aborted
45	Nise	2910,2	2909,2		420,00	419,87	73,3		Tight-aborted
46	Nise	2910	2909		419,98	419,96	73,67		Tight-aborted
47	Nise	2919	2918		421,40	421,12	73,95		Tight-aborted
48	Nise	2921,6	2920,6		421,57	421,63	74,41		Tight-aborted
49	Nise	2922	2921		421,60	421,62	74,79		Tight-aborted
50	Nise	2935,2	2934,2		423,52	423,56	75,07		Tight-aborted
51	Nise	2940,2	2939,2		424,21	424,28	76,78		Tight-aborted
52	Nise	2951	2950	411,35	425,90	425,6	76,7	1,597	Good dp/dt = 0,5 psi/min
53	Nise	2989,2	2988,2	416,88	431,41	431,26	77,1	2,327	Good
54	Nise	2997,7	2996,7		432,37	432,52	78,04		Tight-aborted
55	Nise	2998	2997		432,63	432,48	78,42		Tight-aborted
56	Nise	3027,7	3026,7		436,90	436,86	79,8		Tight-aborted
57	Kvitnos	3081,5	3080,5	420,2	444,45	44,53	81,5	1,236	Good
58	Kvitnos	3086	3085	420,93	445,18	445,03	82,8	1,395	Good
59	Kvitnos	3092,8	3091,8		446,22	446,19	83,27		Tight-aborted
60	Kvitnos	3097,5	3096,5		446,94	446,79	83,4		Tight-aborted
61	Kvitnos	3088	3087		445,53	445,18	83,9		Tight-aborted
62	Kvitnos	3083,5	3082,5		444,92	444,78	84		Tight-aborted
63	Kvitnos	3082,2	3081,2	420,09	444,69	444,71	84	1,649	Good
64	Kvitnos	3082,2	3081,2	419,8	444,69	444,71	84	1,13	Good
65	Kvitnos	3111	3110	421,48	448,75	448,76	83,9	3,196	Good
66	Kvitnos	3111	3110	421,43	448,75	448,76	83,9	2,419	Good
67	Kvitnos	3128	3127		451,25	451,28	84,4		Tight-aborted
68	Kvitnos	3134	3133		452,17	451,93	84,8		Tight-aborted
69	Kvitnos	3147,9	3146,9		454,30	454,06	89,1		Tight-aborted
70	Kvitnos	3159	3158		455,67	455,67	85,6		Tight-aborted
71	Kvitnos	3159	3158		455,67	455,67	85,4		Tight-aborted
72	Nise	2892	2891		417,22	417,14	80,1		Tight-aborted
73	Nise	2903,2	2902,2		418,93	418,99	76,8		Tight-aborted
74	Nise	2852	2851	399,72	411,44	412	75,7	1,336	Good
75	Nise	2846	2845	395,15	411,05	410,98	72,2	0,9678	Good
76	Nise	2836,3	2835,3		409,76	409,9	70,3		Tight-aborted
77	Nise	2837	2836	400,45	409,73	409,31	69,7	0,7414	Good
78	Nise	2833,7	2832,7		408,95	408,91	68,6		Tight-aborted

**Run 2A: RCI with single probe**

Test #	Formation name	Depth m MD RKB	Depth m TVD RKB	Formation Pressure (bar)	Hydro, Before (bar)	Hydro, After (bar)	Form. Temp, (°C)	Mobility (mD/cP)	Comments
79	Nise	2833	2832		408,85	408,59	68,5		Tight-aborted
80	Nise	2833,1	2832,1		408,85	408,98	68,6		Tight-aborted
81	Nise	2831,5	2830,5	392,25	408,66	408,59	68,6	1,514	Good dp/dt = 0,4 psi/min
82	Nise	2831,5	2830,5	392,18	408,66	408,59	68,6	3,117	Good dp/dt = 0,4 psi/min
83	Nise	2790,5	2789,5	392,62	402,74	402,83	69,1	0,6829	Good
84	Nise	2793	2792		403,10	402,89	65,7		Tight-aborted
85	Nise	2799	2798		403,91	403,8	66,17		Tight-aborted
86	Nise	2805,4	2804,4		404,76	404,67	67,94		Tight-aborted
87	Nise	2809	2808		405,08	405,26	68,18		Tight-aborted
88	Nise	2840,1	2839,1		409,66	409,66	68,39		Tight-aborted
89	Nise	2840	2839		409,52	409,56	72,4		Tight-aborted
90	Nise	2828,1	2827,1		407,93	408,05	72,05		Tight-aborted
91	Nise	2828,5	2827,5		408,04	407,96	71,2		Tight-aborted
92	Nise	2830,1	2829,1		408,46	408,19	70,8		Tight-aborted
93	Nise	2830,1	2829,1		408,56	408,8	69,95		Tool Plugged
94	Nise	2830	2829			408,51			No seal
95	Nise	2830	2829		408,45	408,34			No seal
96	Nise	2828,8	2827,8		408,21	408,45	70,7		Tight-aborted

**Run 2B RCI with straddle packer and single probe (sampling and mini-DST)**

Test #	Formation name	Depth m MD RKB	Depth m TVD RKB	Formation Pressure (bar)	Hydro, Before (bar)	Form. Temp, (°C)	Mobility (mD/cP)	Comments
1	Nise	2775.0	2774.0					Aborted
2	Nise	2776.0	2775.0				0.2	Low permeability, test aborted (single probe)
3	Nise	2776.0	2775.0				0.2	Low permeability, test aborted (single probe)
4	Nise	2774.0	2773.0					Tight aborted (single probe)
5	Nise	2781.1	2780.1			67.6	1.1	Good (single probe)
6	Nise	2781.6	2780.6			67.3	0.9	Tight aborted (single probe)
7	Nise	2780.6	2779.6			67.4		Tight aborted (single probe)
8	Nise	2781.1	2780.1					Start clean up, lost seal, low pump rate, abort clean up
9	Nise	2785.0	2784.0				2.4	Good (single probe)
10	Nise	2806.0	2805.0	390.18	404.94			Sample 2x840cc, 1x 450cc, 1x 4 litre, straddle packer
11	Nise	2806.0	2805.0					Mini DST (build up 2hrs and 17 min)
12	Nise	2806.0	2805.0					Tight aborted (single probe)
13	Nise	2823.0	2822.0					Tight aborted (single probe)
14	Nise	2823.0	2822.0					Tight aborted (single probe)
15	Nise	2823.5	2822.5					Tight aborted (single probe)
16	Nise	2824.0	2823.0					No seal
17	Nise	2822.0	2821.0					Not representative, gas in gauge-line
18	Nise	2822.5	2821.5					Not representative, gas in gauge-line
19	Nise	2820.0	2819.0					Not representative, gas in gauge-line
20	Nise	2781.1	2780.1					No seal
21	Nise	2763.0	2762.0					Pressure test with straddle packer (depth ref. pressure gauge)
22	Nise	2768.7	2767.7	387.21	399.94			Sample 1x 4 litre, 1x 450cc, 1x840cc, straddle packer
23	Nise	2770.5	2769.5					Mini DST
24	Nise	2770.5	2769.5					

**Run 2C RCI with straddle packer and single probe (sampling and mini-DST)**

Formation name	Depth m MD RKB	Depth m TVD RKB	Formation Pressure (bar)	Hydro, Before (bar)	Form. Temp, (°C)	Mobility (mD/cP)	Comments
Nise	2850.0	2849.0	393.37		73.2		Sample 1x840 cc with packer, depth ref. is packer depth. Sampling aborted due to tool failure.
Nise	2866.0	2865.0					Tight (used probe)
Nise	2881.0	2880.0					Tight (used probe)
Nise	2886.5	2885.5	405.40				Good (used probe)
Nise	2754.5	2753.5					Tight even with packer. Abort sampling
Nise	2763.0	2762.0	382.00		68.5		Sampled oil with packer (4x840 cc, 1x4 l), packer depth, Mini DST

**Run 3D RCI with single probe**

Test #	Formation name	Depth m MD RKB	Depth m TVD RKB	Formation Pressure (bar)	Hydro, Before (bar)	Hydro, After (bar)	Form. Temp, (°C)	Mobility (mD/cP)	Comments
1		3227.2	3226.2		455.30	455.3	86.5		Tight
2		3232.1	3231.1		455.90	456.1	86.5		Tight
3		3240.7	3239.7		457.10	457.4	86.6		Tight
4		3284.3	3283.3		463.40	463.4	87.0		Tight
5		3669.7	3668.7		516.20	516.2	99.5		Tight
6		3736.9	3735.9		525.40	525.5	101.0		Tight
7		3758	3757.0		528.50	528.5	102.8		Tight
8		3758.5	3757.5		528.30	528.5	104.6		Tight
9		3759.2	3758.2		528.30	528.40	106.0		Tight
10		3766.6	3765.6		529.60	529.60	106.4		Tight
11		3778.5	3777.5		531.40	531.4	106.8		Tight
12		3791	3790.0		533.10	533.1	107.3		Tight
13		3800.6	3799.6		534.20	534.2	108.0		Tight
14		3801.7	3800.7		534.40	534.4	108.5		Tight
15		3843.5	3842.5		540.10	540.2	109.2		Tight

**Run 3E: RCI with single probe and straddle packer**

Test #	Formation name	Depth m MD RKB	Depth m TVD RKB	Formation Pressure (bar)	Hydro, Before (bar)	Hydro, After (bar)	Form. Temp, (°C)	Mobility (mD/cP)	Comments
1		3755.7	3754.7		527,9	527,7			
2		3758.9	3757.9	504.5					No sample, pressure still building up

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## 10 Appendix E - NPD standard form for reporting shallow gas (in Norwegian)

1. *Avstand fra boredekk til havnivå:* 36m

2. *Vannndyp:* 1206m

3a. *Settedyp for lederør:* 1310 mRKB

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

4a. *Settedyp for foringsrør hvorpå BOP settes:* 1900 mRKB

4b. *Formasjonstyrketest (g/cc):* 1.33 g/cc

5. *Dyp (mRKB og TVG) til formasjon-/ledd-/lagtopper:*

Topp Naust Fm (topp Nordland Gp): 1242 mRKB, 1629.8 msTVG

Topp Kai Fm: 1854 mRKB, 2235 msTVG

Topp Brygge Fm (topp Hordaland Gp): 1936 mRKB, 2360msTVG

6. *Dybdeintervall (mRKB og TVG) og alder for sandlag grunnere enn 1000 m under havbunnen:*

1306 - 1360 mRKB (ca 1700 msTVG) (ingen check shots så grunt) Kwartær

1427 - 1504 mRKB (ca 1830 msTVG) (ingen check shots så grunt) Kwartær

1549 - 1567 mRKB (ca 1970 msTVG) (ingen check shots så grunt) Kwartær

1622 - 1684 mRKB (ca 2050 msTVG) (ingen check shots så grunt) Kwartær

1779 - 1791 mRKB (2235 msTVG) Tertiær?

1871 - 1875 mRKB (2312 msTVG) Tertiær.

Alle sandlag er tolket fra LWD logger. All retur av borekaks til havbunnen.

7. *Oppgi hvilke lag som evt. inneholder gass.*

(eks. Kwartær 175-177 mRKB, Pliocene 341-343 mRKB): Ingen grunn gas påvist.

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

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

10. *Angi dyp (mRKB og TVG) til inkonformiteter i borehullsposisjonen:* Mulige inkonformiteter er svært lokale på grunn av tidligere rasaktivitet. Ingen dateringer utført i seksjonen (retur av cuttings til havbunnen)

11. *Angi utbredelsen av sandlagene (kommunikasjon, kontinuitet, trunkering, etc.):* Ikke mulig å fastslå. Brønnen er boret i området for Storeggaraset

12. *Angi utbredelsen av eventuell gass- skygging ("gas blanking"):* Ingen

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

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

- *grunn gass:* Ingen grunn gass prognosert. Ingen grunn gass observert.

- *sandlag:* Ikke samsvar mellom tolkingen av sandlag og observerte sandlag

- *inkonformiteter:* Inkonformiteter er svært lokale på grunn av tidligere rasaktivitet.

- *korrelasjon til nærliggende borehull:* Nærmeste borehull ligger ca 40km mot vest. Ikke mulig å korrelere sandlag. Begge brønner boret i området for Storeggaraset

## **11 Appendix F - Other reports**

End of Well Report, MWD & Dir.Drilling: **BAKER HUGHES**

End of Well Report ( Directional Drilling & MWD ), Well 6405/7-1, 6405/7-1 T2, 6405/7-1 Pilot: **HALLIBURTON**

End of Well Report, Measurement While Drilling, Well 6405/7-1, 6405/7-1 T2, 6405/7-1 Pilot: **HALLIBURTON**

End of Well Report, Surface Data Logging, Mudlogging Well 6405/7-1, 6405/7-1 T2, 6405/7-1 Pilot: **HALLIBURTON**

Water analysis, RCI samples from Nise formation - Well 6405/7-1 Ellida: **STATOIL**

Wireline Formation Testing, Reservoir Fluid Analysis, - Well 6405/7-1 Ellida + CD-rom: **ALTINEX**

Final Drilling Report Well 6405/7-1 & 7-1 T2: **STATOIL**

Geochemical Interpretation Report, Special Geochemical Evaluation of Two 6405/7-1 T2 Oils, Ellida: **GEOLAB NOR**

End of Well Report, Coring, Well 6405/7-1 T2: **BAKER HUGHES**

Reservoir Fluid Study, 6405/7-1 T2 RCI m/diskette: **CORE LAB**

Hydrocarbon Core Scanning ( HCS TM ) m/CD-rom. 6405/7-1 T2 : **APT**

PVT Analysis of Bottom Hole Samples, Nise Fm.: **RESLAB**

Water analysis of DST samples – Well 6405/7-1T2 Ellida : **STATOIL**

Drill Stem Testing (DST), Well Test Data Acquisition, Sampling and Memory Gauge Report, DST 1, **ALTINEX**

Core Photographs, Core 1-7, White-/ UV light: **RESLAB**

## **12 Enclosures**

### **12.1 Wellsite sample descriptions**

### **12.2 Conventional core descriptions**

### **12.3 Sidewall core descriptions**

### **12.4 Composite log, well 6405/7-1**

### **12.5 Composite log, well 6405/7-1T2**

### **12.6 Formation evaluation log (mudlogging) well 6405/7-1**

### **12.7 Formation evaluation log (mudlogging) well 6405/7-1T2**

WELLSITE SAMPLE DESCRIPTION				Page 1
Country: Norway		Area: Norwegian Sea		Field: Ellida
Well no: 6405/7-1		Company: Statoil, Petro, Norske Shell, BP Norge, ConocoPhillips		
RKB: 36 meters		Geologist: J. Basset, N. Townley, P. Skjervheim		
Hole size: 17 "		Cut solvent: Iso-Propanol		Date: 27 June 2003
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.
1912	70	Sd:	clr, transp, lt gn gry, transl, m-v crs, occ pbl, ang-sbrnd, elg-sbsph, pr srted, lse, v occ lt gn gry, yel gry, gd hd, Calc cmt, abdt Glauc Pel, crs >Mic :musc+biot, abdt Forams : Globigerina Sp+Lenticulina Sp, Pyr wrm tbs, occ diss nod pyr, Ech spines	No Shows
	30	Clst:	lt-med gry, gn gry, frm, blk, occ amor, abdtvf-m qtz, occ vf carb frags.	
1920	70	Sd:	a.a	Abundant LCM material
	10	Clst:	a.a	
	20	Cmt:		
1930	95	Clst:	med dk gry, sft, slty, amor – sbblky, calc i.p., tr carb matr, sl sdy i.p.	
	5	Sd:	transl – mlky wh qtz, m – crs, ang – sbang, mod srt	
	Tr	Foram		
1940	60	Sd:	clr – transl mlky wh qtz, f – crs, pred m, sbang – sbrnd, mod srt, lse	No shows
	40	Clst:	a.a.	
	Tr	Lst:	off wh – pl yel wh, mod hd, micr, xln i.p.	
	Tr	Mic, Pyr		
1950	80	Clst:	a.a.	a.a.
	20	Sd:	a.a.	
	Tr	Lst, Foram, Glau		
1960	95	Clst:	dk grn gry, sft, amor – sbblky, calc i.p., micromic, sl sdy&slty, occ glau	Abnd LCM matr.
	5	Sd:	f – m, occ crs – v crs, else a.a.	
1970	a.a.			
1980	100	Clst:	dk grn gry, olv gry, brn gry, occ med dk gry, sft-occ hd, amor-occ blk, stky, micrmic, occ micrpyr, v occ carb matl.	Abnd LCM matr.
	Tr	Lst:	gry orng, lt gn gry, frm, splty, micr-cryptxln.	
	Tr	Sd:	pa brn, occ dsky yel brn, w/ clr, transp, m-crs, ang-sbsng, sbsph, prly srted Qtz, gd, hd silc cmt, no vis por, abdt crs biot mic 'pckgs', blk/brn mafic mins, Pyr, carb matl.	
1990	100	Clst:	a.a occ diss nod pyr.,	Abnd LCM matr.
	Tr	Lst:	a.a occ blu wh, sft, amor, occ clr, transl, acic calc xls.	
2000	100	Clst:	a.a.	Abnd LCM matr.
	Tr	Lst:	a.a	
	Tr	Sd:	a.a	
2010	100	Clst:	a.a.	Abnd LCM matr.
2020	100	Clst:	dk grn gry, olv gry, brn gry, occ med dk gry, sft-occ hd, amor-occ blk, stky, micrmic, occ micrpyr, v occ carb matl.	Abnd LCM matr.
	Tr	Lst:	gry orng, lt gn gry, frm, splty, micr-cryptxln.	

WELLSITE SAMPLE DESCRIPTION			Page 2
Country: Norway		Area: Norwegian Sea	Field: Ellida
Well no: 6405/7-1		Company: Statoil, Petro, Norske Shell, BP Norge, ConocoPhillips	
RKB: 36 meters	Geologist: J. Basset, N. Townley, P. Skjervheim		
Hole size: 17 "	Cut solvent: Iso-Propanol		Date: 27 June 2003
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.
2030	100	Clst: dk grn gry, olv gry, frm-occ mod hd, blk, stky ip, micrmic, occ mic, v occ carb matl, sl calc ip,	Abnd LCM matr.
	Tr	Lst: a.a	
2040	100	Clst: dk grn gry, olv gry, frm-occ mod hd, blk, stky ip, micrmic, occ mic, v occ carb matl, sl calc ip,	Abnd LCM matr.
	Tr	Lst: gry orng, lt gn gry, frm, splty, micr-cryptxln.	
2050	100	Clst: a.a occ diss nod pyr, calc ip.	Abnd LCM matr.
	Tr	Lst: a.a.	
2060	100	Clst: dk grn gry, olv gry, brn gry, occ med dk gry, sft-occ hd, amor-occ blk, stky, micrmic, occ micrpyr, v occ carb matl.	Abnd LCM matr.
	Tr	Sd: clr, transp, vf, sbang, sbsph, lse. (from Claystone)	No shows
2070	100	Clst: a.a.	
	Tr	Lst: a.a.	
	Tr	Sd: a.a.	
2080	100	Clst: a.a.	
	Tr	Lst: a.a.	
2090	100	Clst: sft – frm, sbblk – blk, occ calc, else a.a.	
	Tr	Lst: a.a.	
2100	100	Clst: frm, blk, micropyr, micromic, else a.a.	
	Tr	Pyr	
2110	100	Clst: a.a.	
2120	100	Clst: non – sl calc, sl slty, tr micropyr, else a.a.	
2130	100	Clst: sl slty, occ slty, micropyr – pyr i.p., micromic i.p., occ calc, pred non calc, else a.a.	
2140	100	Clst: a.a.	
2150	100	Clst: a.a.	
2160	100	Clst: a.a.	
2170	100	Clst: dk grn gry, grn gry, sft-frm, amor-blk, micrmic, occ mic:Musc + Biot, occ Glauc pellets, sl Calc ip, occ vf qtz	
2180	100	Clst: dk grn gry, grn blk, frm, gen a.a v occ silc cmt?/lustre to grains.	
2190	100	Clst: dsky grn , dsky yel grn, grd-gdk grn gry, sft-frm, amor-occ blk, micrmic, occ mic:Musc, microcarb, v.v. occ vf, clr, transp, acic Sponge spicules.	
2200	100	Clst: a.a tr vf qtz.	
	Tr	Lst: pa olv, pa yel brn, lt olv brn, frm-hd, blk-splty, crypto-occ vf xln, No Shows.	

WELLSITE SAMPLE DESCRIPTION			Page 3
Country: Norway		Area: Norwegian Sea	Field: Ellida
Well no: 6405/7-1		Company: Statoil, Petero, Norske Shell, BP Norge, ConocoPhillips	
RKB: 36 meters	Geologist: J. Basset, N. Townley, P. Skjervheim		
Hole size: 17 "	Cut solvent: Iso-Propanol		Date: 27 June 2003
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.
2210	100 Tr	Clst: a.a occ aggl worm tubs/Forams, tr vf, sbang fltg Qtz. Lst: pa olv, pa yel brn, lt olv brn, frm-hd, blkly-splty, crypto-occ vf xln,	No Shows.
2220	100	Clst: dsky grn , dsky yel grn, grdg-dk grn gry, sft-frm, amor-occ blkly, micrmic, occ mic:Musc, microcarb, v.v. occ vf, clr, transp, acic Sponge spicules occ aggl worm tubs/Forams, tr vf, sbang fltg Qtz	
2230	100	Clst: a.a	
2240	100	Clst: dk grn gry, dsky grn, frm, blkly, micrmic, mic:Musc, microcab ip, sl Calc ip..	
2250	100	Clst: a.a.	
2260	100	Clst: a.a. tr vf-f Qtz, occ v Calc, grdg – gry brn, brn gry Clst ip	
2270	60 40	Clst(1):dk grn gry, med blu gry, sft, amor-cmbly, tky ip, micro mic, occ micrpyr. Clst(2):gry brn, brn gry, frm, blkly, micromic, occ vf Carb frags, microcarb.	
2280	80 20	Clst(1):a.a, occ sl Calc Clst(2):a.a	
2290	90 10 Tr	Clst(1):gry grn, dk grn gry, occ med dk gry, sft – frm, crmbly, occ blkly, micromic i.p., microcarb i.p., non – sl calc i.p. Clst(2):a.a. Lst: lt grn gry, blu wh, occ yel gry, sft – frm, amor – crmbly, cryptoxln	
2300	80 20 Tr	Clst(1):a.a. Clst(2):a.a. Lst: occ gry org, else a.a.	
2310	100	Clst: gry grn, dk grn gry, grd gry blu grn, med dk gry i.p., sft – v occ frm, amor – cmbly, stky, micromic, micropyr	abnd cvngs .
2320	70 30 Tr	Clst(1):a.a. Clst(2):a.a. Lst: a.a.	
2330	100 Tr	Clst: dk grn gry, grn gry, olv gry, sft – frm, blkly, non calc, micromic, micropyr – pyr Lst: a.a.	
2340	100	Clst: a.a. Tr Pyr	
2350	100	Clst: a.a.	
2360	100	Clst: a.a.	
2370	100 Tr	Clst: a.a. Lst: lt gry, sft, amor	

WELLSITE SAMPLE DESCRIPTION			Page 4
Country: Norway	Area: Norwegian Sea	Field: Ellida	
Well no: 6405/7-1	Company: Statoil, Petro, Norske Shell, BP Norge, ConocoPhillips		
RKB: 36 meters	Geologist: J. Basset, N. Townley, P. Skjervheim		
Hole size: 17 "	Cut solvent: Iso-Propanol	Date: 27 June 2003	
Depth (m RKB)	Lithology (%)	Lithological Description	
		Rock name, mod.lith, colour, grain size, sorting, roundness, matrix, cementation, hardness, sed.structures, accessories, fossils, porosity, contamination	Remarks

2380	100	Clst: dk grn gry, grn gry, also olv gry, sft – frm, blk, non calc, micromic, micropyr – pyr	
2390	100 Tr	Clst: a.a. Lst: lt gry, sft, amor	
2400	100 Tr	Clst: a.a. Dol: grysh or, mod hd, blk, xln	
2410	100 Tr	Clst: a.a. Lst: a.a.	
2418	100 RrTr	Clst: a.a. Sst: yel brn, f – m, mod hd, sil cmt, sbrnd	No shows
2420	100 Tr Tr	Clst: a.a. Sst: a.a. Dol: a.a.	
2425	100 Tr	Clst: a.a. Dol: v pl or, hd, blk, slty, grd to Lst, xln	

#### TD of 17" hole section

2430	70 30	Clst: dk grn gry, olv gry, sft – hd, cmbly -blk, non calc, micromic, micropyr – pyr Cmt	
2440	80 10 10	Clst: dk grn gry, olv gry, grdg . brg gry, occ dk brn, med blu gry, sft – hd, cmbly -blk, occ blk Sed lams, micromic, micropyr – pyr Sd: clr, transp, vf-f, sbang-sbrnd, sbsph, w srted, lse. Cmt.	
2450	100 Tr Tr Tr	Clst: pred med blu gry, grdg-dk grn gry, Sft-frm, cmbly-occ blk, micropyr, occ diss pyr. Lst: blu wh, sft, amor. Sd: a.a Tuff: lt blu gry, pa blu grn, pa blu, sft, cmbly, ashy txt, occ blk rnd incls.	
2460	100	Clst: a.a.	
2470	100	Clst: a.a. lt blu gry, occ dk grn gry.	
2480	100 Tr	Clst: a.a. occ – loc abdt vf pyr. Lst: blu wh, sft, amor.	
2490	90 Tr	Clst: a.a. occ sl-mod calc ip, occ dk sed lams. Lst: blu wh, pa grn yel, sft-frm, amor-occ blk, cryptxln ip.	

WELLSITE SAMPLE DESCRIPTION			Page 5
Country: Norway		Area: Norwegian Sea	Field: Ellida
Well no: 6405/7-1		Company: Statoil, Petro, Norske Shell, BP Norge, ConocoPhillips	
RKB: 36 meters		Geologist: N. Townley, D. Akpovwa, T.F. Kristensen	
Hole size: 12 1/4 "		Cut solvent: Iso-Propanol	Date: 07 July 2003
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.
2500	90	Clst: med gry, dk grn gry, intbd w/+grdg-dk gry, brn gry, sft-mod hd, rthy-blky ip, micrmic, micrpyr, sl calc ip.	
	10	Lst: a.a	
2510	90	Clst: a.a grdg- med gry-lt blu gry, sft ip.	
	10	Sd: clr , transp, vf-f, sbang-sbrnd, sbsph, w srted, lse.	
2520	90	Tuff Clst: lt blu gry, grdg-+intbd w/ med gry, dk brn gry, occ med dk gry, sft in lighter parts grdg-mod hd, rthy-blky, occ micrmic i/darker parts, pyr, occ blk, rnd-ang icls..	
	10	Tuff: med lt gry, lt blu gry, yel gry, sft-occ frm, cmbly-occ frm, ashy txt, w/vf lt grn gry/off wh Feldspar laths+dk gry, yel gry, transl, rnd glssy incls+ang glssy shrds, occ yel gry calc mtx.	
2530	100	Clst: lt bl gry, gn gry – dk gn gry, dk brn gry, occ med gry, frm – mod hd, amor – blk, tuff i.p., spkld dk and lt frags, occ micromic, micropyr i.p., pred non calc	
	Gd tr	Tuff: a.a.	
	Tr	Sst: clr – trnsl qtz, v f – f, sbang – sbrndd, app as lse grns	
2540	100	Clst: varic a.a.	
	Tr	Tuff: a.a.	
	Tr	Sst: a.a.	
	S1 tr	Ls: lt gry, frm, micr, slily arg	
2550	80	Clst: varic, bl gry, gn gry – dk gn gry, brn blk – dk brn gry, occ purp gry, frm – mod hd, sbblky – blk, com tuff, spkld, occ micromic, occ micropyr, pred non calc	
	20	Tuff: med gry – med dk gry, olv gry, gn gry – dk gn gry, sft – frm, grny text, spkld, non – occ slily calc	
2560	90	Clst: varic a.a., less tuff, else a.a.	
	10	Tuff: a.a.	
2570	90	Clst: varic, bl gry, gn gry – dk gn gry, olv gry, dk brn gry – brn blk, frm – mod hd, sbblky – blk, tuff i.p., micromic i.p., micropyr i.p., pred non calc	
	10	Tuff: a.a.	
	Tr	Ls: lt gry, pa yel brn, sft – frm, micr, slily arg	
	Tr	Pyr	
2580	90	Clst: varic, bl gry, gn gry – dk gn gry, olv gry, dk brn gry – brn blk, frm – mod hd, sbblky – blk, tuff i.p., micromic i.p., micropyr i.p., pred non calc	
	10	Tuff: a.a.	
	Tr	Ls: lt gry, pa yel brn, sft – frm, micr, slily arg	
	Tr	Pyr	
2590	90	Clst: a.a.	
	10	Tuff: a.a.	
	Tr	Ls: a.a.	
	Tr	Pyr	

WELLSITE SAMPLE DESCRIPTION			Page 6
Country: Norway		Area: Norwegian Sea	Field: Ellida
Well no: 6405/7-1		Company: Statoil, Petro, Norske Shell, BP Norge, ConocoPhillips	
RKB: 36 meters	Geologist: N. Townley, D. Akpovwa, T.F. Kristensen		
Hole size: 12 ¼ "	Cut solvent: Iso-Propanol		Date: 08 July 2003
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.
2600	100	Clst: gn gry – dk gn gry, lt bl gry, frm – mod hd, sbblky – blk, slily micropyr, non calc	
	Tr	Tuff: a.a.	
	Tr	Ls: lt gry, pa yel brn, sft – frm, micr, slily arg	
	Tr	Sst: clr – trnsl qtz, v f, sbang – sbrnrd, app as lse grns	
2610	90	Clst: pred gn gry, med bl gry, dk brn gry – brn blk, frm – mod hd, sbblky – blk, slily micropyr, non calc	
	10	Ls : lt gry, sft, micr, occ yel gry, hd, xln nod	
	Tr	Sst : a.a.	
	Tr	Tuff : a.a.	
2620	100	Clst: gn gry – dk gn gry, else a.a.	
	Tr	Ls: a.a.	
	Tr	Sst: a.a.	
2630	100	Clst: gn gry, else a.a.	
	Tr	Ls: a.a.	
2640	100	Clst: gn gry – dk gn gry – med bl gry, frm – mod hd, sbblky – blk, i.p. micropyr – pyr, non calc	
	Tr	Ls: yel gry, brn gry, clr, hd, xln	
	Tr	Pyr	
2650	100	Clst: a.a.	
	Tr	Ls: lt gry – yel gry, frm, micr, med gry, brn gry – yel brn, hd xln	
	Tr	Pyr	
2653	Lost		
2656	100	Clst: also dk brn gry, else a.a.	
	S1 tr	Ls: a.a.	
	Tr	Pyr	
2659	Lost		
2662	Lost		
2665	Lost		
2668	100	Clst: a.a.	Pr sample, cleaning headerbox
2671	100	Clst: med gry – bl gry – gn gry, dk brn gry – brn blk, frm – mod hd, sbblky – blk, micropyr i.p., non calc	
	Tr	Pyr	
2674	Lost		

WELLSITE SAMPLE DESCRIPTION				Page 7
Country: Norway		Area: Norwegian Sea		Field: Ellida
Well no: 6405/7-1		Company: Statoil, Petro, Norske Shell, BP Norge, ConocoPhillips		
RKB: 36 meters		Geologist: N. Townley, D. Akpovwa, T.F. Kristensen		
Hole size: 12 1/4 "		Cut solvent: Iso-Propanol		Date: 08 July 2003
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.
2677	90	Clst: brn blk, dk gry, med gry, gn gry, lt gn gry, med bl gry, frm – mod hd, blk, micromic, micropyr, microcarb, slily calc i.p.		
	10	Ls: yel gry, lt gn gry, sft – mod hd, amor – blk, variable arg, grdg calc Clst i.p.		
2680	90	Clst: occ v f – crs Glauc pellets, else a.a.		
	10	Ls: a.a.		
	Tr	Sst: clr qtz, v f, app as lse grns		
2686	80	Clst: 50% med gry – gn gry, 50% dh gry, brn blk, frm – hd, blk – occ sbfis, abund pyr nods, non – v calc, i.p. grdg arg Ls		
	20	Ls: a.a.		
2689	80	Clst: i.p. olv gry, mod – v calc, else a.a.		
	20	Ls: i.p. pa olv, hd, splin, cryptoxln – micr		
	Tr	Sst: clr qtz, v f, app as lse grns		
2692	80	Clst: 80% med gry, gn gry, 20% dk gry, sft – mod hd i.p., amor – blk/sbfis, micromic, microcarb i.p., non – v calc, i.p. grdg arg Ls		
	20	Ls: pred lt gn gry, pa olv, sft – hd, amor – splin, variably arg,		
	Tr	Sst: a.a.		
2695	80	Clst: pred med gry, med bl gry, else a.a.		
	20	Ls: a.a.		
	Tr	Sst: a.a.		
2698	Lost			
2701	80	Clst: occ glauc, else a.a.		
	20	Ls: a.a.		
2704	90	Clst: occ pyr, else a.a.		
	10	Ls: arg a.a.		
	Tr	Sst: a.a.		
2707	90	Clst: pred brn gry, grdg med gry, occ dk gry, sft . mod hd, amor – blk, occ sbfis, micromic, occ v f – med pyr nods, non calc – v calc i.p.		
	10	Ls: a.a.		
2710	90	Clst: calc a.a.		
	10	Ls: arg a.a.		
2713	Lost while circ well over choke			
2716	80	Clst: a.a.		Not representative due to well control
	20	Ls: a.a.		
	Tr	Sst: clr – trnsl qtz, v f, sbang, app as lse grns		

WELLSITE SAMPLE DESCRIPTION			Page 8
Country: Norway		Area: Norwegian Sea	Field: Ellida
Well no: 6405/7-1		Company: Statoil, Petero, Norske Shell, BP Norge, ConocoPhillips	
RKB: 36 meters	Geologist: N. Townley, D. Akpovwa, T.F. Kristensen		
Hole size: 12 ¼ "	Cut solvent: Iso-Propanol		Date: 09 July 2003
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.
2719	100	Clst: med dk gry – olv gry, frm – mod hd, sbblky – blkly, slily slty/sdy i.p., occ micromic, occ slily pyr, occ slily glauc, mod – v calc, Tr Ls: lt gry, frm, micr Tr Pyr, Glauc	
2722	100	Clst: i.p. med gry – occ med lt gry, else a.a. Gd tr Ls: lt gry – lt olv gry, frm, micr, slily arg Tr Pyr, Glauc	
2725	90	Clst: med dk gry – med gry, olv gry, occ med lt gry, sft – mod hd, amor – blkly, occ slily slty/sdy, occ pyr, occ slily glauc, mod – v calc, loc grdg arg Ls 10 Ls: lt gry – lt olv gry, frm, micr, slily arg i.p. Tr Pyr, Glauc	
2728	90	Clst: gn gry i.p., else a.a. 10 Ls: lt gry – lt olv gry – gn gry, frm, micr, arg Tr Pyr, Glauc	
2731	100	Clst: a.a. Tr Ls: a.a. Tr Glauc, Pyr	
2734	90	Clst: a.a. 10 Ls: a.a. Tr Glauc, Pyr	
2737	90	Clst: a.a. 10 Ls: a.a. Tr Glauc, Pyr	
2740	90	Clst: a.a. 10 Ls: a.a. Tr Glauc, Pyr	
2743	90	Clst: a.a. 10 Ls: a.a. Tr Glauc, Pyr	
2746	100	Clst: med dk gry – med gry, olv gry, sft . mod hd, amor – blkly, occ slily slty/sdy, pyr i.p., occ slily glauc, mod – v calc, i.p. grdg arg Ls Tr Ls: lt gry – lt olv gry, frm, micr, arg Tr Pyr, Glauc	
2749	a.a.		
2752	a.a.		
2755	a.a.		

WELLSITE SAMPLE DESCRIPTION				Page 9
Country: Norway		Area: Norwegian Sea		Field: Ellida
Well no: 6405/7-1		Company: Statoil, Petro, Norske Shell, BP Norge, ConocoPhillips		
RKB: 36 meters		Geologist: N. Townley, D. Akpovwa, T.F. Kristensen		
Hole size: 12 ¼ "		Cut solvent: Iso-Propanol		Date: 09 July 2003
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.
2758	100	Clst: med dk gry – olv gry, med gry – gn gry, sft – mod hd, amor – blk, tr slty/sdy, micropyr, slily glauc i.p., slily calc – v calc, i.p. grd g arg Ls		
	Tr	Ls: lt gry – lt olv gry, frm – mod hd, micr, arg		
	Tr	Pyr, Glauc		
2761	100	Clst: a.a.		
	Tr	Ls: a.a.		
	Tr	Pyr, Glauc		
2764	80	Clst: a.a.		
	20	Sst: clr – trnsl qtz, v f – f, occ med grns, mod srted, ang – sbrn d, app as lse grns, tr Sst: med dk gry arg mtrx, sft, glauc		Sst: gn yel fluor, no cut fluor
	Tr	Ls: a.a.		
	Tr	Glauc		
2767	50	Clst: a.a.		a.a.
	50	Sst: a.a.		
	Tr	Ls, Glauc, Pyr		
2770	70	Clst: a.a.		a.a.
	30	Sst: a.a.		
	Tr	Ls, Glauc, Pyr		
2773	60	Sst: a.a.		a.a.
	40	Clst: a.a.		
	Tr	Glauc, Pyr		
2776	70	Sst: a.a.		a.a.
	30	Clst: a.a.		
	Tr	Glauc, Pyr		
2779	Lost			
2782	70	Sst: a.a.		a.a.
	30	Clst: a.a.		
	Tr	Glauc, Pyr		
2785	70	Sst: a.a.		a.a.
	30	Clst: a.a.		
	Tr	Glauc, Pyr		
2788	Lost			
2791	70	Sst: a.a.		a.a.
	30	Clst: a.a.		
	Tr	Glauc, Pyr		
2794	a.a.			a.a.
2797	a.a.			a.a.

WELLSITE SAMPLE DESCRIPTION			Page 10
Country: Norway		Area: Norwegian Sea	Field: Ellida
Well no: 6405/7-1		Company: Statoil, Petro, Norske Shell, BP Norge, ConocoPhillips	
RKB: 36 meters		Geologist: N. Townley, D. Akpovwa, T.F. Kristensen	
Hole size: 12 1/4 "		Cut solvent: Iso-Propanol	Date: 09 July 2003
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.
2800	60	Slst: brn gry, olv gry, med gry – med dk gry, sft, amor – crumbly, fri i.p., v sdy v f – f sbang qtz, grdg to Sst, loc glauc, pyr, mic, calc i.p.	Sst/Slst: brt yel – gn yel fluor, v slow – blooming bl wh cut fluor, no res fluor
	20	Sst: clr – trnsl qtz, v f – f, occ med grns, ang – sbrndd, wl srt, pred as lse grns, occ w/ med dk gry, brn gry arg mtrx and clr sil/calc cmt, glauc, mic, pyr, grdg Slst	
	20	Clst: gn gry, lt gn gry, grdg brn gry, olv gry, frm – mod hd, blkly – occ sbfis, micromic, micropyr, slty grdg Slst	
2803	40	Slst: grdg arg v f – f Sst a.a.	a.a.
	30	Sst: pred lse a.a.	
	30	Clst: a.a.	
2806	40	Clst: a.a.	Sst: brt yel fluor, v sl blmg bl wh cut fluor, no res fluor
	40	Slst: a.a.	
	20	Sst: pred lse a.a.	
	Tr	Ls: a.a.	
2809	50	Sst: lse a.a.	a.a.
	40	Slst: a.a.	
	10	Clst: a.a.	
2812	60	Sst: lse a.a., abund glauc, mic, pyr	a.a.
	40	Slst: brn gry, olv gry, med gry, sft – frm, crmbly – fri, grdg v f - f Sst w/ abund glauc, pyr, mic	
2815	60	Slst: sdy a.a.	a.a.
	30	Clst: a.a.	
	10	Sst: a.a.	
2816		Bottoms up sample	
	60	Slst: a.a.	a.a.
	20	Clst: a.a.	
	20	Sst: lse a.a.	

**TD 12 1/4" section (original hole)**

WELLSITE SAMPLE DESCRIPTION			Page 1
Country: Norway		Area: Norwegian Sea	Field: Ellida
Well no: 6405/7-1 T2		Company: Statoil, Petro, Norske Shell, BP Norge, ConocoPhillips	
RKB: 36 meters		Geologist: A. King, J. Rasmussen, T.F. Kristensen	
Hole size: 12 1/4" "		Cut solvent: Iso-Propanol	
		Date: 15 July 2003	
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.
2430	70	Cmt	
	30	Clst : gn gry – med bl gry, dk gn gry, frm, sbblky – blky, slily – mod micropyr, slily micromic, non calc	
2440	60	Cmt	
	40	Clst : a.a.	
2450	50	Cmt	
	50	Clst: a.a.	
2460	50	Cmt	
	50	Clst : med dk gry, med bl gry, frm, sbblky – blky, non calc.	
2470	40	Cmt	
	60	Clst : a.a Tr Mica.	
2480	20	Cmt	
	80	Clst : med dk gry, bl gry-bl grn, frm, sbblky-blky, tr micropyr, tr Mica (biotite).	
2490	90	Clst : med gry – v pa gry – pa bl gry, sft-mod frm, amor-blky.	
	10	Cmt	
	Tr	Tuff : bl gry, speckled, sft-frm, blky	
	Tr	Ls : wh, fri, amor.	
2500	100	Clst : bl gry-pa bl gry, r gry, sft-frm amor-blky, Tuffaceous I/P ,	
	Tr	Tuff : bl-grn, spkld, sft-frm, blky	
2510	100	Clst : a.a.	
2520	100	Clst : a.a.	
2530	100	Clst : bl gry-pa bl gry, med dk gry, v.sft-frm, amor-blky, Tuffaceous I/P.	
	Tr	Slstst : med brn, v fri, amor, v.org	
2540	20	Clst : med gry, pa bl-gn, frm, amor-sb blky,	
	80	Tuff : pa gry-med gry, med bl gry, occ dk gry, spkld sft, r frm, amor, occ blky, pred withrd.	
2550	40	Clst : a.a.	
	60	Tuff : a.a.	
2560	20	Clst : a.a.	
	80	Tuff : a.a.	
	Tr	Ls : wh-pa gn, microxln, hd.	
2570	20	Clst : med gry, med gry brn, fri-sft, occ frm, amor-blky, slty I/P	
	80	Tuff : a.a.	
2590	90	Clst : pa gry-pa bl gry, sft-frm, amorph-sbblky, Tuffaceous	
	10	Tuff : a.a. Gd Tr Mica	

WELLSITE SAMPLE DESCRIPTION			Page 2
Country: Norway		Area: Norwegian Sea	Field: Ellida
Well no: 6405/7-1 T2		Company: Statoil, Petro, Norske Shell, BP Norge, ConocoPhillips	
RKB: 36 meters		Geologist: A. King, J. Rasmussen, T.F. Kristensen	
Hole size: 12 1/4" "		Cut solvent: Iso-Propanol	
		Date: 15 - 16 July 2003	
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.
2600	100	Clst : a.a.	
		Tr Tuff : a.a.	
		Tr Ls : wh, fri, amor sft.	
2610	100	Clst : pa bl gry-pa gry, sft frm, amor-subblky, Tuffaceous.	
		Tr Ls : wh, fri, amor, sft.	
2620	90	Clst : a.a.	
	10	Ls : wh, sft-fri, amor-blky, w occ xln pyr incl.	
		Tr Sltst : dk brn, frm, blky, sli calc.	
2630	100	Clst : pa gry-pa bl gry, spkld, sft, amor-sbblky.	
		Tr Ls : a.a.	
		Tr Tuff : a.a.	
2640	100	Clst : a.a.	
		Tr Ls : a.a.	
		Tr Tuff: a.a.	
2650	90	Clst: a.a.	
	10	Ls : wh-pa gry, spkld dk gry, blky frm-fri.	
2660	90	Clst: gn gry – med bl gry, med dk gry – dk gry – olv blk, sft – frm, amor – sbblky, com slily micropyr – micropyr, occ slily micromic, non calc	
	10	Ls: lt gry – med gry, occ pa yel brn, sft – frm, micr, occ w/ clr xln incl	
		Tr Pyr xls	
2670	100	Clst: varic a.a., sft – frm, amor – sbblky, occ micropyr, tr glauc, olv blk Clst slily slty, pred non calc, occ mod calc	
	Gd tr	Ls: a.a.	
	Gd tr	Sst: clr – trnsl qtz, v f – f, occ med grns, wl srt, sbang – rndd, app as lse grns	
	Tr	Pyr xls	
	S1 tr	Glauc nod	
2680	100	Clst: slily calc – v calc, i.p. grd to arg Ls, else a.a.	
	Gd tr	Ls: lt gry – med gry, sft i.p., hd i.p., micr i.p., microxln i.p., slily arg – v arg	
	Tr	Sst: a.a.	
	Tr	Pyr, Glauc	
2690	100	Clst: gn gry – med bl gry, med dk gry – dk gry, olv blk, sft – frm, amor – sbblky, slily micropyr – occ micropyr, glauc i.p., olv blk Clst micromic, i.p. slily – mod calc, i.p. v calc grd arg Ls	
	Tr	Ls: lt gry, sft, amor, micr, slily arg	
	Tr	Glauc pel, Pyr xls	
2700	100	Clst: med gry – med dk gry, dk gn gry, olv blk, sft – frm, amor – sbblky, micropyr i.p., com glauc, calc – v calc, i.p. grd arg Ls	
	Tr	Ls: lt gry – med gry, occ yel gry, sft – frm, amor, micr, slily arg – arg	
	S1 tr	Dol: yel brn – dk yel brn, hd, microxln, calc	
	Tr	abund f – v crs Glauc pel	

WELLSITE SAMPLE DESCRIPTION			Page 3
Country: Norway		Area: Norwegian Sea	Field: Ellida
Well no: 6405/7-1 T2		Company: Statoil, Petro, Norske Shell, BP Norge, ConocoPhillips	
RKB: 36 meters	Geologist: A. King, J. Rasmussen, T.F. Kristensen		
Hole size: 12 ¼" "	Cut solvent: Iso-Propanol		Date: 15 - 16 July 2003
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	100	Clst: med gry – med dk gry, dk gn gry, olv blk, sft – frm, amor – sbblky, micropyr i.p., com glauc, calc – v calc, i.p. grdg arg Ls	
	Tr	Ls: lt gry – med gry, occ yel gry, sft – frm, amor, micr, slily arg – arg, occ med gry, mod hd, xln – microxln, else a.a.	
	Tr	Sst: clr – trnsl qtz, v f – f, wl srt, sbang – sbrnndd, app as lse grns	
	Tr	abund f – v crs Glauc pel	
	Tr	Pyr xls	
2720	100	Clst: dk gn gry, med gry – med dk gry, olv gry, olv blk, else a.a.	
	Tr	Ls: a.a.	
	Tr	v f – f Glauc pel, Pyr xls	
2730	100	Clst: a.a.	
	Tr	Ls: a.a.	
	Tr	f Glauc nod, Pyr xls	
2740	100	Clst: med gry – med dk gry, dk gn gry, olv gry, olv blk, sft – frm, amor – sbblky, slily micropyr, com glauc, calc – v calc, i.p. grdg arg Ls	
	Tr	Ls, Glauc, Pyr	

**TD of 12 ¼" section, 2742m (T2)**

WELLSITE SAMPLE DESCRIPTION			Page 4
Country: Norway		Area: Norwegian Sea	Field: Ellida
Well no: 6405/7-1 T2	Company: Statoil, Petero, Norske Shell, BP Norge, ConocoPhillips		
RKB: 36 meters	Geologist: A. King, O. Hunnes		
Hole size: 8 1/2" "	Cut solvent: Iso-Propanol		Date: 22 July 2003
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.
2749	100	Clst: med gry – med dk gry, dk gn gry, sft – frm, blocky, micropyr i.p, tr silty, calc i.p. Tr Pyr: microxln	Cmt. & barite contam
2752	100	Clst: a.a. Tr Pyr: microxln	a.a.
2754	100	Clst: a.a. Tr Pyr: microxln	a.a.
Cut core # 1–5: 2754 – 2880 mMD.			
2882	100	Clst: med dk gry, sft-frm, gen blk, also amor, slty, occ v slty, grdg arg sltst, occ sdy, vf grns, gd tr glauc nodls, tr blk spks (org mat?), sl tr mika, tr lst and vf snd in sample tray (overrep by washing)	
2888	100	Clst: gen a.a also grnsh gry, frm-mod hd, blk clst	
2894	100 Gd tr	Clst: a.a but also sltst/clst w/ wh mtx (kaol?) Pyr: xln pyr	
2900	100	Clst/slts: gen a.a but increase in slt/snd content. (Sltst/vf sst disintegrates when washed, hence overrepresented in sample )	
2906	100	Clst: gen a.a	
2912	100	Clst: gen a.a	
2918	100	Clst: a.a but one pebble og rnd transl qtz (diam 5mm) seen in sample	
2924	100	Clst: a.a	
2930	60	Clst: med dk –dk gry, frm-mod hd, blk, micmica, micpyr i/p, glauc pellets i/p, tr carb mat, occ crs mica: musc/biot	
	40	Ls sd: clr, transp, lt grn gry transl, vfn, occ med, sub ang-subrnd, subelon, w srtd, lse qtz grns, glauc, carb mat, crs mica (musc/biot) pyr nodls	
	Tr	Lst/dol: bl wh, grn gry-lt grn gry, pa olv, occ lt brn, dk yel orng, sft-mod hd, microxln-cryptxln sid i/p?	
2936	20	Clst: a.a	
	50	Slts: med dk gry, sft, amor-crbly, stky i/p, abund vfn-fn subang, sub sph, qtz, glauc pellets, mica, carb mat, grdg vfn sst i/p w med dk gry org mat	
	30	Lse sd: a.a	
	Tr	Lst/dol: a.a	

WELLSITE SAMPLE DESCRIPTION			Page 5
Country: Norway		Area: Norwegian Sea	Field: Ellida
Well no: 6405/7-1 T2		Company: Statoil, Petero, Norske Shell, BP Norge, ConocoPhillips	
RKB: 36 meters		Geologist: N. Townley, Ø. Hovden	
Hole size: 8 1/2" "		Cut solvent: Iso-Propanol	Date: 28 July 2003
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.
2942	20 40 40 Tr	Clst: a.a Slst: a.a Lse sd: a.a Lst/dol: a.a	
2948	30 40 30 Tr	Clst: a.a Slst: grdg vfn arg med dk gry sst, occ lt grn gry, kaol mtx, glauc, mica Lse sd: a.a Lst/dol: a.a	
2954	30 40 30 Tr	Clst: pred med dk gry, dk gry, sft frm, blk, pyr nod, micromic, occ crs mica, glauc, grdg sltst Slst: a.a, grdg vfn-fn arg sst Lse sd: a.a Lst/dol: a.a	
2960	40 30 30 Tr	Clst: a.a Slst: a.a Lse sd: a.a Lst/dol	
2966	30 30 30 10 Tr Tr	Clst: med dk gry sft frm, blk, micromic, occ glauc, pyr nods, grdg sltst Slst: a.a Lse sd: a.a Sst: med gry, grdg lt gry, lt grn gry, w/clr transp, vfn, subang-subrnd w srtd qtz+blk glauc, carb mat, stf frm, silc cmt + med gry org mtx + lt grn gry kaol? Cmt. No vi por Lst/dol: a.a Coal: blk, hd, brtl	No shows
2972	10 30 40 10 Tr	Clst: a.a Slst: a.a grdg vfn sst Sst: a.a grdg sltst Lse sd: a.a Lst/dol: a.a	
2978	20 30 40 10 Tr	Clst: a.a Slst: a.a Sst: a.a grdg sltst Lse sd: a.a Lst/dol: a.a	
2984	20 40 30 10	Clst: a.a Slst: a.a Sst: a.a Lse sd: a.a	

WELLSITE SAMPLE DESCRIPTION			Page 6
Country: Norway		Area: Norwegian Sea	Field: Ellida
Well no: 6405/7-1 T2		Company: Statoil, Petero, Norske Shell, BP Norge, ConocoPhillips	
RKB: 36 meters		Geologist: N. Townley, Ø. Hovden	
Hole size: 8 1/2" "		Cut solvent: Iso-Propanol	Date: 28 July 2003
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.
2990	50	Clst: a.a	
	20	Slst: a.a	
	20	Sst: a.a	
	10	Lse sd: a.a	
2996	40	Clst: med dk gry, dk gry, dsky yel brn,frm-mod hd, blkly, micromic, mica, pyr i/p, occ glauc, tr vfn carb mat, occ plant mat	
	30	Slst: a.a	
	20	Sst: v fn, grdg sltst	
	10	Lse sd	
3010	30	Clst: a.a	
	30	Slst: med dek gry, sft-frm, glauc, grdg vfn sst	
	30	Sst: a.a, occ gd hd, calc cmt	
	10	Lse sd: a.a	
	Tr	Dol/lst	
3020	40	Clst: a.a	
	40	Slst: a.a	
	20	Sst: a.a	
	Tr	Lse sd: a.a	
	Tr	Dol/lst	
3030	30	Clst: a.a	
	40	Slst: a.a	
	20	Sst: a.a	
	10	Lse sd: a.a	
3040	50	Clst: med dk gry, dk gry, sft-frm, crbly-blky, micromic, crs mica, occ glauc	No shows
	40	Slst: med dk gry, sft-frm, crbly, abund glauc, mica, carb mat, occ plant mat, occ abund Vfn subang-subrnd qtz, grdg vfn sst w/ med dk gry dk gry arg matx	
	10	Sst: lt med gry-med gry, occ lt grn gry, pa grn yel i/p, w clr transp occ lt grn gry transl vfn-fn, occ sub ang-subrnd, subsph, wll cmted qtz, w med gry org+lt grn gry kaol? Mtx, sft-frm silic + occ hd, calc cmt, occ-abund vfn-fn dk gry blk rnd glauc pellets, crs mica, carb mat, pr vis por	
	Tr	Lse sd	
3050	40	Clst: a.a	
	30	Slst: a.a	
	20	Sst: a.a	
	10	Lse sd: a.a	
	Tr	Lst/dol: a.a	
3060	40	Clst: a.a	
	40	Slst: a.a	
	10	Sst: a.a	
	10	Lse sd: a.a	
	Tr	Lst/dol: a.a	

WELLSITE SAMPLE DESCRIPTION			Page 7
Country: Norway		Area: Norwegian Sea	
Well no: 6405/7-1 T2		Company: Statoil, Petero, Norske Shell, BP Norge, ConocoPhillips	
RKB: 36 meters		Geologist: N. Townley, Ø. Hovden	
Hole size: 8 1/2" "		Cut solvent: Iso-Propanol	Date: 29 July 2003
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	50	Clst: a.a	
	30	Slst: a.a	
	10	Sst: a.a	
	10	Lse sd: a.a	
3080	60	Clst: a.a	
	30	Slst: a.a	
	10	Lse sd: a.a	
	Tr	Lst/dol: a.a	
3090	70	Clst: a.a	
	30	Slst: a.a	
	Tr	Lse sd: a.a	
3100	50	Clst: a.a, med gry	
	30	Slst: a.a	
	20	Sst: a.a	
	Gd tr	Lse sd: a.a	
	Tr	Lst/dol	
3110	50	Clst: med dk gry, med gry, frm, blk, micromic, microcarb, micropyr, occ vfn glauc	
	40	Slst: med gry-med lt gry, sft-frm, crmbly-blk, micromic, tr mica, vfn glauc, carb mat, plant mat, occ-abund vfn qtz	
	10	Sst: a/a 3040m	
	Tr	Dol: pl olv, grdg lt olv gry	
3120	60	Clst: a.a	
	30	Slst: a.a	
	10	Sst: a.a	
	Tr	Dol/lst: a.a	
3130	50	Clst: a.a	
	40	Slst: a.a	
	10	Ls sd: a.a	
3140		Missed	
3150	50	Clst: a.a	
	50	Slst: a.a	
	Tr	Sst: a.a	
	Tr	Lse sd: a.a	
3160	60	Clst: a.a	
	30	Slst: a.a	
	10	Sst: a.a	
	Tr	Dol/lst: a.a	
3170	60	Clst: a.a	
	30	Slst: a.a	
	10	Sst: a.a	

WELLSITE SAMPLE DESCRIPTION			Page 8
Country: Norway		Area: Norwegian Sea	
Well no: 6405/7-1 T2		Company: Statoil, Petero, Norske Shell, BP Norge, ConocoPhillips	
RKB: 36 meters		Geologist: N. Townley, Ø. Hovden	
Hole size: 8 1/2" "		Cut solvent: Iso-Propanol	Date: 29 July 2003
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.

3180	60	Clst: a.a	No shows
	30	Sltst: a.a	
	10	Sst: a.a	
3190	a.a		
3200	a.a		

**TD of 8 1/2" section, T2 (2749-3200m)**

WELLSITE SAMPLE DESCRIPTION				Page 9
Country: Norway		Area: Norwegian Sea		Field: Ellida
Well no: 6405/7-1T2		Company: Statoil, Petoro, Shell, BP, ConocoPhillips		
RKB: 36 meters		Geologist: A.King, D. Akpovwa, S.F.Nilsson, L.Rasmussen		
Hole size: 8 1/2 "		Cut solvent: Iso-Propanol		Date: 15 August 2003
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.
3210	50	Clst: med dk gry – med gry, also med lt gry, occ lt olv gry, sft – frm, blkly, slty grdg Slstst, micromic, occ microglauc, non – slily calc		No shows
	40	Slstst: lt brn gry, med gry – med dk gry, sft – frm, blkly – sbblkly, occ slily sdy, occ microglauc, micromic, sli calc		
	10	Sst: lt gry – lt med gry, also as lse clr – transl Qtz grains, v f – slty, wl srted, sbrnd – sbang, glauc I.P., micromic		
	Tr	Mica		
3220	50	Slstst: also micropyr, else a.a.		a.a.
	30	Sst: a.a.		
	20	Clst: a.a.		
	Tr	Pyr, Glauc, Mica		
3230	50	Slstst: a.a.		a.a.
	40	Sst: a.a.		
	10	Clst: a.a.		
	Tr	a.a.		
3240	60	Slstst: a.a.		a few grains w/ min. fluor, else a.a.
	30	Sst: a.a.		
	10	Clst: a.a.		
	Tr	Ls: lt gry, frm, arg, blkly		
	Tr	Mica, Pyr, Glauc		
3250	80	Slstst: a.a.		a.a.
	10	Sst: a.a.		
	10	Clst: a.a.		
	Tr	Ls, Mica, Pyr, Glauc		
3260	Lost			
3270	A.A.			
3280	80	Slstst: also med dk gry – med gry, else a.a.		No shows
	10	Sst: a.a.		
	10	Clst: a.a.		
	Tr	Pyr, Glauc, Mica, Ls		
3290	80	Slstst: med dk gry – med gry, occ v lt gry, sft – frm, stky, sbblkly, occ slily sdy, occ microglauc, micromic, slily calc		a.a.
	10	Clst: a.a.		
	10	Sst: a.a.		
	Tr	Glauc, Mica		
3300	80	Slstst: med dk gry – med gry, occ v lt gry, sft – frm, stky, sbblkly, occ slily sdy, occ microglauc, micromic, slily calc		a.a.
	10	Clst: a.a.		
	10	Sst: a.a.		
	Tr	Glauc, Mica		

WELLSITE SAMPLE DESCRIPTION				Page 10
Country: Norway		Area: Norwegian Sea		Field: Ellida
Well no: 6405/7-1T2		Company: Statoil, Petoro, Shell, BP, ConocoPhillips		
RKB: 36 meters		Geologist: A.King, D. Akpovwa, S.F.Nilsson, L.Rasmussen		
Hole size: 8 1/2 "		Cut solvent: Iso-Propanol		Date: 15 August 2003
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.
3310	80	Slst: med dk gry – med gry, occ v lt gry, sft – frm, stky, sbbly, occ slily sdy, occ microglauc, micromic, slily calc		a.a.
	10	Clst: a.a.		
	10	Sst: a.a.		
	Tr	Glauc, Mica		
3320	80	Slst: lt gry – med gry – olv gry, v sft, amor, stky, v arg, v sdy, grad arg Sst mod-v calc, tr glauc, org mat, gd tr shell frags		abd barite
	20	Sst: v lt gry – lt gry - med gry, vf – fg, sub ang – rndd, lse to fria, pr cmt, gd tr glauc, Tr carb mat		
	Tr	Calcite.		
3330	100	Clst: med gry – olv gry, sft-frm, amor, stky I/P, v slty – sdy, grad arg Slst/Sst, mod to sli calc, Tr foss frag, Tr micro mica, Tr glauc.		a.a.
3340	90	Clst: med gry – olv gry, spkld blk, v.sft – sft, amor, v slty – sdy, grad arg Sst, sli calc, gd tr Glauc, tr micro-mica,carb mat.		a.a.
	10	Sst: lt gry – med lt gry, vf – slty, sb ang – rnd, frm – fri – sft, arg I/P, gd tr Glauc.		
	Tr	Foss frags		
	Tr	Siderite.		
3350	90	Clst: med gry – olv gry, spkld blk, v.sft – sft, amor, v slty – sdy, grad arg Sst, mod – sli calc, gd tr Glauc, tr micro-mica,carb mat.		abd barite
	10	Sst: lt gry – med lt gry, vf-slty, ang – sb rnd, v wl srt, pred lse, fri – v pr cmt, gd tr glauc,		
	Tr	Foss frags.		
	Tr	Pyrite xls.		
3360	90	Clst: med gry – med lt gry –olv gry, spkld blk, v.sft – sft, amor, v slty – sdy, grad arg Sst, mod – sli calc, gd tr Glauc, tr micro-mica,carb mat.		abd barite
	10	Sst: lt gry – med lt gry, vf-slty, ang – sb rnd, v wl srt, pred lse, fri – v pr cmt, gd tr glauc,		
	Tr	Ls: wh, sft, amor.		
	Tr	Biotite mica.		
	Tr	Foss frags.		
3370	90	Clst: med gry – med lt gry –olv gry, spkld blk, v.sft – sft, amor, v slty – sdy, grad arg Sst, mod calc, gd tr Glauc, tr micro-mica, tr shl frags.		abd barite
	10	Sst: lt gry – med lt gry, spkld, vf, ang rnd, v wl srt, fri-frm, pr cmt, arg I/P. com glauc.		
	Tr	Dol : med brn, microxln, hd.		
3380	100	Clst: med gry – med lt gry –olv gry, spkld blk, v.sft – sft, amor, v slty – sdy, grad arg Sst, mod calc, gd tr Glauc, tr micro-mica, tr shl frags.		abd barite
	Tr	Ls: wh-v lt gry, sft, amor.		
3390	100	Clst: med gry – med lt gry –olv gry, spkld blk, v.sft – sft, amor, v slty – sdy, grad arg Sst, mod calc, gd tr Glauc, tr micro-mica, tr shl frags		abd barite
	Tr	Sst: lt gry – med lt gry, spkld, vf, ang rnd, v wl srt, fri-frm, pr cmt, arg I/P. com glauc.		

WELLSITE SAMPLE DESCRIPTION				Page 11
Country: Norway		Area: Norwegian Sea		Field: Ellida
Well no: 6405/7-1T2		Company: Statoil, Petoro, Shell, BP, ConocoPhillips		
RKB: 36 meters		Geologist: A.King, D. Akpovwa, S.F.Nilsson, L.Rasmussen		
Hole size: 8 1/2 "		Cut solvent: Iso-Propanol		Date: 15 August 2003
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.
3400	100	Clst: med lt gry – olive gry, spkld, v sft-sft, amor. r sb blocky, v slty, grad arg Slstst, mod calc, com shl frags		
	Tr	Sst: v lt gry, spkld, vf, ang rnd, v wl srt, fri-frm, pr cmt, com glauc.		
	Tr	Ls: wh-yel brn, fri-sft.		
3410	100	Clst: med lt gry – olive gry, spkld, v sft-sft, amor. r sb blocky, v slty, grad arg Slstst, mod calc, com shl frags		
	Tr	Sst: v lt gry, spkld, vf, ang rnd, v wl srt, fri-frm, pr cmt, com glauc.		
	Tr	Ls: wh-yel brn, fri-sft.		
3420	100	Clst: med gry – med dk gry, olv gry, occ med lt gry, sft, amor, v slty com grdg Slstst, com sdy, slily micropyr, slily calc – occ mod calc		No shows abd barite and v f qtz washed out from Clst
	Tr	Sst: lt gry, clr – trnsl qtz, v f, ang – sbang, wl srt, fri – mod hd, calc cmt, glauc		
	Tr	Ls: lt gry – yel gry, pa yel brn – yel brn, frm – hd, micr i.p., microxln – xln i.p.		
3430	100	Clst: a.a.		a.a.
	Gd tr	Sst: a.a.		
	Tr	Ls: a.a.		
3440	100	Clst: a.a.		a.a.
	Tr	Sst: a.a.		
	Tr	Ls: a.a.		
	Tr	Glauc, Pyr, Foss frags		
3450	100	Clst: lt med gry-med gry-olv gry, sft amor, slty, sdy, mod calc, grad arg Slstst,		a.a.
	Tr	Sst: wh-v.lt gry, mottled med lt gry, vf-f, sb ang-rnd,v wl srt, fri-lse, v pr cmt, mod calc, glauc.		
	Tr	Ls: v lt gry-yel gry, blk-amor, frm-fri-sft.		
	Tr	Shl frags.		
	Tr	Mica.		
3460	90	Slst: med gry-olv gry, spkld blk/brn, v sft-fri, sdy, arg, micro carbonaceous, mod-sli calc, v arg, grad slty Clst		a.a
	10	Clst: a.a.		
	Tr	Shl frags.		
3470	100	Clst: lt med gry-med gry-olv gry, v sft, amor, slty-v sdy, abd lse qtz vf, sb ang to ang, grad arg Slstst.		
	Tr	Ls: v lt gry-yel gry, blk-amor, frm-fri-sft.		
	Tr	Sst: wh-v.lt gry, mottled med lt gry, vf-f, sb ang-rnd,v wl srt, fri-lse, v pr cmt, mod calc, glauc.		
	Gd Tr	Shl frags.		
3480	100	Clst: lt med gry-med gry-olv gry, v sft, amor, slty-v sdy, abd lse qtz vf, sb ang to ang, grad arg Slstst.		
	Tr	Ls: v lt gry-yel gry, blk-amor, frm-fri-sft.		
	Tr	Sst: wh-v.lt gry, mottled med lt gry, vf-f, sb ang-rnd,v wl srt, fri-lse, v pr cmt, mod calc, glauc.		

WELLSITE SAMPLE DESCRIPTION				Page 12
Country: Norway		Area: Norwegian Sea		Field: Ellida
Well no: 6405/7-1T2		Company: Statoil, Petoro, Shell, BP, ConocoPhillips		
RKB: 36 meters		Geologist: A.King, D. Akpovwa, S.F.Nilsson, L.Rasmussen		
Hole size: 8 1/2 "		Cut solvent: Iso-Propanol		Date: 15 August 2003
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.
3490	100	Clst: lt med gry-med gry-olv gry, splkld blk, v sft, amor, v slty, sdy, microcarbonaceous, sli calc,		
	Tr	Ls: a.a.		
	Gd Tr	Shl frags		
3500	100	Clst: lt med gry-med gry-olv gry, splkld blk, v sft, amor, v slty, sdy, microcarbonaceous, sli calc,		
	Tr	Ls: a.a.		
	Gd Tr	Shl frags		
3510	90	Slstst: lt med gry-olv gry, splkld, v sft, amor, r sb blk, mod calc, sdy, arg, grad slty clyst,		
	10	Clst: lt med gry-med gry-olv gry, splkld blk, v sft, amor, v slty, sdy, microcarbonaceous, sli calc,		
	Tr	Ls: a.a.		
3520	90	Slstst: lt med gry-olv gry, splkld, v sft, amor, r sb blk, mod calc, sdy, arg, grad slty clyst,		
	10	Clst: lt med gry-med gry-olv gry, splkld blk, v sft, amor, v slty, sdy, microcarbonaceous, sli calc,		
	Gd Tr	Ls: wh-lt brn, blk, firm, microxln. Dolic.		
3530	100	Clst: lt med gry-med gry-olv gry, splkld blk, v sft, amor, v slty, sdy, microcarbonaceous, sli calc grad arg Slstst.		
3540	100	Clst: lt med gry-med gry-olv gry, splkld blk, v sft, amor, v slty, sdy, microcarbonaceous, sli calc grad arg Slstst.		
3550	100	Clst: med gry-olv grey, v sft, amor, r sb blk, sdy-v slty, tr micromica, sli-mod calc, grad arg Slstst.		
	Tr	Sst: wh-lt gry splkld, vf-slty, frm-fri, glauc.		
	Tr	Ls: wh-yel brn, blk, occ xln, firm, dolic I/P.		
	Tr	Aragonite.		
3560	100	Clst: med gry-olv grey, v sft, amor, r sb blk, sdy-v slty, tr micromica, sli-mod calc, grad arg Slstst.		
	Tr	Ls: wh-yel brn, blk, occ xln, firm, dolic I/P.		
3670	100	Clst: med gry – olv gry, sft, amor, sol, v slty com grd g Slstst, sdy, slily micromic, slily micropyr, slily – mod calc		No shows
	Tr	Ls: med lt gry – pa yel brn, frm – mod hd, micr, occ xln, tr suc, dol i.p.		
	Tr	Sst: med lt gry – med gry, clr – trns qtz, v f, sbang – sbrndd, wl srt, lse – fri – Occ mod hd, calc cmt, com glauc, no vis por in Sst cuttings		
3680	100	Clst: a.a.		a.a.
	Tr	Ls: a.a.		
	Sl tr	Sst: a.a.		

WELLSITE SAMPLE DESCRIPTION				Page 13
Country: Norway		Area: Norwegian Sea		Field: Ellida
Well no: 6405/7-1T2		Company: Statoil, Petoro, Shell, BP, ConocoPhillips		
RKB: 36 meters		Geologist: A.King, D. Akpovwa, S.F.Nilsson, L.Rasmussen		
Hole size: 8 1/2 "		Cut solvent: Iso-Propanol		Date: 20 August 2003
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.
3590	100	Clst:	med gry – med dk gry – olv gry, sft, amor, sol, v slty com grdg Slstst, sdy, slily micromic, slily micropyr, slily – mod calc	No shows
	Gd tr	Ls:	med lt gry – pa yel brn, yel brn – dk yel brn, frm – hd, micr i.p., microxln – xln i.p., tr sucr, dol i.p.	
	Gd tr	Sst:	med lt gry, clr – trnsl qtz, pred v f, occ f grns, wl srt, sbang – sbrnidd, lse – fri, wk calc cmt, com glauc	
3600	100	Clst:	a.a.	a.a.
	Gd tr	Sst:	a.a.	
	Tr	Ls:	a.a.	
	Tr		Pyr, Foss frags	
3603	100	Clst:	a.a.	a.a.
	Sl tr	Sst:	a.a.	
	Sl tr	Ls:	a.a.	
3606	100	Clst:	a.a.	a.a.
	Sl tr	Sst:	a.a.	
	Sl tr	Ls:	a.a.	
3609	100	Clst:	a.a.	a.a.
	Tr	Sst:	a.a.	
	Sl tr	Ls:	a.a.	
3612	90	Clst:	a.a.	a.a.
	10	Sst:	med lt gry – med gry, clr – trnsl qtz, v f – slt, occ f grns, wl srt, ang – sbrnidd, lse – fri, occ mod hd, calc cmt, tr sil? Cmt, com glauc, arg i.p.	
	Sl tr	Ls:	med lt gry – pa yel brn, frm, micr, slily arg	
3615			Lost	
3618	100	Clst:	med gry – med dk gry – olv gry, sft, amor, sol, stky, slty – v slty com grdg to Slstst, sdy, slily micromic, slily micropyr, slily – mod calc	a.a.
	Gd tr	Sst:	a.a.	
	Tr	Ls:	a.a.	
3621	100	Clst:	a.a.	a.a.
	Gd tr	Sst:	med lt gry – med gry, lt gry, clr – trnsl qtz, v f – slt, occ f grns, ang – sbrnidd, wl srt, fri – mod hd, calc cmt, tr sil? cmt, com glauc, arg i.p.	
	Tr	Ls:	med lt gry – pa yel brn, med gry, yel brn – occ dk yel brn, frm – hd, micr i.p., microxln i.p., dol i.p.	
3624	100	Clst:	a.a.	a.a.
	Gd tr	Sst:	a.a.	
	Sl tr	Ls:	a.a.	
3627		Lost	Claystones are very sticky on shakers, hence cutting flow over shakers hampered. This affect the quality of the samples which are not always representative!!!!	

WELLSITE SAMPLE DESCRIPTION			Page 14
Country:	Norway	Area:	Norwegian Sea
Well no:	6405/7-1T2	Company:	Statoil, Petoro, Shell, BP, ConocoPhillips
RKB:	36 meters	Geologist:	A.King, D. Akpovwa, S.F.Nilsson, L.Rasmussen
Hole size:	8 1/2 "	Cut solvent:	Iso-Propanol
		Date:	20 August 2003
Depth (m RKB)	Lithology (%)	Lithological Description	
		Rock name, mod.lith, colour, grain size, sorting, roundness, matrix, cementation, hardness, sed.structures, accessories, fossils, porosity, contamination	Remarks
3630	80	Clst: med gry – med dk gry – olv gry, sft, amor, sol, stky, slty – v slty com grdg to Sltst, sdy, slily micromic, slily micropyr, slily – mod calc	No shows
	20	Sst: med lt gry – med gry, clr – trnsf qtz, v f – slt, occ f grns, wl srt, ang – sbrndd, fri – mod hd, calc cmtd, tr sil cmt, com glauc, arg i.p.	
	Tr	Ls: med lt gry – pa yel brn, med gry, yel brn – occ dk yel brn, frm – hd, micr i.p., microxln i.p., tr sucr, dol i.p.	
	Tr	Pyr, Shl frags	
3633		Lost	
3636	90	Clst: a.a.	No shows
	10	Sst: grdg Sltst a.a.	
	Tr	Ls: a.a.	
3639	a.a.	Poor sample due to cleaning shakers	a.a.
3642	90	Clst: a.a.	a.a.
	10	Sst: grdg Sltst a.a.	
	Tr	Ls: a.a.	
	Tr	Pyr, Shl frags	
3645	100	Clst: a.a.	a.a.
	Tr	Sst: a.a.	
	Tr	Ls: a.a.	
3648		Lost	
3651	100	Clst: a.a.	a.a.
	Tr	Sst: a.a.	
	Tr	Ls: a.a.	
3654	100	Clst: a.a.	a.a.
	Tr	Sst: a.a.	
	Tr	Ls: a.a.	
3657	100	Clst: a.a.	a.a.
	Tr	Sst: a.a.	
	Tr	Ls: a.a.	
3660	100	Clst: a.a.	a.a.
	Tr	Sst: a.a.	
	Tr	Ls: a.a.	
3663	100	Clst: a.a.	a.a.
	Tr	Sst: a.a.	
	Tr	Ls: a.a.	

WELLSITE SAMPLE DESCRIPTION				Page 15
Country: Norway		Area: Norwegian Sea		Field: Ellida
Well no: 6405/7-1T2		Company: Statoil, Petoro, Shell, BP, ConocoPhillips		
RKB: 36 meters		Geologist: A.King, D. Akpovwa, S.F.Nilsson, L.Rasmussen		
Hole size: 8 1/2 "		Cut solvent: Iso-Propanol		Date: 20 August 2003
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.
3675	100	Clst: medium lt gry-med gre-olv gry, spkld blk, v sft, amor r sb blk, com carb mat, tr micromica, mod calc, shl frags, calcite grades to argillaceous Slst.		
	Tr	Ls: wh, chlky, sft occ xln hd.		
3678	90	Slst: med lt gry-lt brn gry, sft, amor, v sdy, arg, microcarb,micromic, grad slty Clst, mod calc.		
	10	Clst: a.a.		
3687	100	Clst: medium lt gry-med gre-olv gry, spkld blk, v sft, amor r sb blk, com carb mat, tr micromica, mod calc, shl frags, calcite grades to argillaceous Slst.		
	Tr	Sst: mottled gry/wh, vf-slty, sb ang-rnd. hd-fri, glauc.		
3690	100	Clst: med lt gry-lt brn gry, amor, v sft, v slty-v sdy, micro mica, sli calc, grad arg Slst		
	Gd Tr	Ls: wh-lt yel brn, , sft-fri, chlky occ dk brn dolie hd.		
3692	100	Clst: a.a.		
3699	100	Slst: med lt gry-lt brn gry, v sft, amor, arg, v sdy, mod calc, micro-carb, micromic, glauc.grad slty Clst		
	Tr	Dol: brn-dk brn, xln, frm.		
	Tr	Ls: wh-lt yel brn, , sft-fri, chlky.		
	Tr	Sst: wh-lt gry, vf-slty, frm-hd, glauc, calc.		
3702	100	Slst: med lt gry-lt brn gry, v sft, amor, arg, v sdy, mod calc, micro-carb, micromic, glauc.grad slty Clst		
3705	100	Slst: a.a.		
3708	100	Slst: med lt gry-lt brn gry, spkld blk, v sft, amor, arg, v sdy, mod calc, micro-carb, micromic, glauc.grad slty/sdy Clst.		
3714	100	Slst/Sst clr trnsl lt gry, slty-vf, r m, sb ang, v wl srt, qtz, micromica, glauc, tr lith frag v calc.		
3717	100	Slst/Sst clr trnsl lt gry, slty-vf, r m, sb ang, v wl srt, qtz, micromica, glauc, tr lith frag v calc.		
	Tr	Pyrite.		
3720	100	Sst/Slst clr trnsl lt gry, slty-vf, r m, ang-sb rnd v wl srt, qtz, lse, r w cmt, micromica, glauc, tr lith frag mod calc.		
3723	100	Sst/Slst clr trnsl lt gry, slty-vf, r m, ang-sb rnd v wl srt, qtz,lse, r w cmt, micromica, glauc, tr lith frag mod calc.		
3726	100	Sst/Slst clr trnsl lt gry, slty-vf, r m, ang-sb rnd v wl srt, qtz,lse, r w cmt, micromica, glauc, tr lith frag mod calc.		
	Tr	Ls: wh, fri, xln I/P.		
3729	100	Sst/Slst: clr-trnsl gry-lt gry, spkld, slty-vf, r m, sb ang-sb rnd, v wl srt, lse-v pr cmt, tr mica, glauc, v calc.		
	Tr	Ls: wh, fri, xln I/P.		

WELLSITE SAMPLE DESCRIPTION				Page 16
Country: Norway		Area: Norwegian Sea		Field: Ellida
Well no: 6405/7-1 T2		Company: Statoil, Petoro, Shell, BP, ConocoPhillips		
RKB: 36 meters		Geologist: A.King, D. Akpovwa, S.F.Nilsson, L.Rasmussen		
Hole size: 8 1/2 "		Cut solvent: Iso-Propanol		Date: 20 August 2003
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.
3732	100	Sst/Slst:clr-trnsl gry-lt gry, spkld, slty-vf, r m, sb ang-sb rnd, v wl srt, lse-v pr cmt, tr mica, glauc, v calc.		
	Tr	Ls: wh, fri, xln I/P.		
3732	100	Sst/Slst:clr-trnsl gry-lt gry, spkld, slty-vf, r m, sb ang-sb rnd, v wl srt, lse-v pr cmt, tr mica, gd tr glauc, v calc.		
3738	100	Sst/Slst: a.a.		
3741	100	Sst/Slst:clr-trnsl gry-lt gry, spkld, slty-vf, r m, ang-sb rnd, v wl srt, lse-r wk cmt, tr mica, glauc, v calc.		
3744	100	Sst/Slst: a.a.		
3747	100	Sst/Slst:clr-trnsl gry-lt gry, spkld, slty-vf, r m, sb ang-sb rnd, v wl srt, lse-r cmt, tr mica, glauc, v calc.		
3750	100	Sst/Slst: a.a.		
Interval 3751 – 3784m covered with core 6 & 7				
3789	90	Sst: lt – med lt gry, clr – trnsl qtz, v f – med, occ crs grns, mod srt, ang – sbrnnd, app lse – fri – occ mod hd, sil cmt, com arg mtrx, glauc, mic, app pr – mod vis por		No fluor, v wk cloudy bl – bl wh cut fluor
	10	Clst: med gry – olv gry, sft, amor, sol, slty/sdy, non calc		
	Tr	Mic, Glauc		
3792	80	Sst: v f – crs, pr srt, else a.a.		a.a.
	20	Clst: med gry – olc gry, sft, amor, sol, slty/sdy, non calc		
	Tr	Mic, Glauc, Pyr		
3798	90	Sst: med lt gry – lt gry, clr – trnsl qtz, v f – f, occ med grns, mod srt, ang – sbrnnd, app lse – fri – occ mod hd, sil cmt, com arg mtrx, glauc, mic, app pr – mod vis por		a.a.
	10	Clst: a.a.		
	Tr	Mic		
3804	90	Sst: v f – med, mod srt, tr calc cmt, tr pyr, else a.a.		a.a.
	10	Clst: med gry – olv gry, sft, amor, sol, slty/sdy, non calc		
	Tr	Mic, Glauc		
3810	90	Sst: pred f, wl srt, else a.a.		a.a.
	10	Clst: a.a.		
	Tr	Mic, Glauc		
3816	100	Sst: v f – f, wl srt, else a.a.		Tr dull yel fluor, v wk tr v wk bl cut fluor
	Tr	Clst: a.a.		
	Tr	Glauc, Mic		

WELLSITE SAMPLE DESCRIPTION				Page 17
Country: Norway		Area: Norwegian Sea		Field: Ellida
Well no: 6405/7-1T2		Company: Statoil, Petoro, Shell, BP, ConocoPhillips		
RKB: 36 meters		Geologist: N. Townley, T.F.Kristensen		
Hole size: 8 1/2 "		Cut solvent: Iso-Propanol		Date: 26 August 2003
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.
3822	100	Sst:	med lt gry – med gry, clr – trnsl qtz, v f, occ grdg Sltst, occ f grns, tr crs grns, pr srt, sbang – sbrnidd, app lse – mod hd, sil cmt i.p., calc cmt i.p., com arg mtrx, glauc, mic, app pr – mod vis por	V dull orng fluor (min fluor), tr v wk bl cut fluor
		Tr	Clst: med gry – olv gry, sft, amor, sol, slty/sdy, micromic, non calc	
		Tr	Glauc, Mic, Pyr, Carb frags	
3828	100	Sst:	pred f, occ v f – slt, occ med – v crs grns, mod srt, else a.a.	a.a.
	Gd tr	Clst:	i.p. olv blk, else a.a.	
	S1 tr	Ls:	lt gry – yel gry, frm, micr,	
	Tr		Glauc, Mic, Pyr, Carb frags, Microfos	
3834	90	Sst:	med lt gry – med gry, clr – trnsl qtz, f – slt, occ med, mod srt, sbang – sbrnidd, app lse – fri – occ mod hd, calc cmti.p., sil cmt i.p., com arg mtrx, glauc, mic, pyr, app pr – occ mod vis por	No fluor, tr v wk bl cut fluor
	10	Clst:	med gry – olv gry, occ olv blk, sft, amor, sol, slty/sdy, micromic, non calc	
	S1 tr	Ls:	a.a.	
	Tr		Glauc, Mic, Pyr, Carb frags, Microfos	
3840	100	Sst:	med gry, clr – trnsl qtz, pred f, wl srt, sbang – sbrnidd, app pred as lse grns, occ sil/calc cmt, glauc, mic, app mod vis por	No shows
	Tr	Clst:	a.a.	
	Tr	Mic		
3846	50	Sltst:	olv gry, sft, amor, sol, v arg grdg Clst, sdy – v sdy, slily glauc, micromic, non calc	a.a.
	50	Sst:	med gry – olv gry, v f – slt, occ f, wl srt, app lse – frm – occ mod hd, wk calc/sil cmt, arg, glauc, pr vis por	
3852	50	Sltst:	a.a.	a.a.
	50	Sst:	med lt gry – med gry – olv gry, clr – trnsl qtz, v f – slt, occ f, wl srt, app lse – frm, occ mod hd, wk calc/sil cmt, glauc, arg – v arg, none – pr vis por	
	S1 tr	Ls:	lt gry – yel gry, frm, micr	
	Tr		Mic, Glauc	
3858	90	Sltst:	olv gry, sft, amor, sol, v arg grdg Clst, sdy – v sdy, loc grdg v f Sst, glauc, micropyr, non calc	a.a.
	10	Sst:	pred calc cmt, else a.a.	
	Tr	Ls:	a.a.	
3864	90	Sltst:	a.a.	a.a.
	10	Sst:	med lt gry – med dk gry, clr – trnsl qtz, v f – slt, fri – mod hd, calc cmt, glauc, app no vis por	
	Tr	Ls:	a.a.	
	Tr		Glauc	
3870	90	Sltst:	a.a.	a.a.
	10	Sst:	grdg Sltst a.a.	
	Tr	Ls:	a.a.	
	Tr		Glauc	

WELLSITE SAMPLE DESCRIPTION				Page 18
Country: Norway		Area: Norwegian Sea		Field: Ellida
Well no: 6405/7-1T2		Company: Statoil, Petoro, Shell, BP, ConocoPhillips		
RKB: 36 meters		Geologist: N. Townley, T.F.Kristensen		
Hole size: 8 1/2 "		Cut solvent: Iso-Propanol		Date: 26 August 2003
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.
3876	100	Slst:	olv gry, occ brn gry, sft, amor, sol, v arg grdg Clst, sdy – v sdy, glauc, non calc	No shows
	Tr	Sst:	med lt gry – med dk gry, clr – trnsl qtz, v f – slt, fri – mod hd, calc cmt, glauc, app no vis por	
	Sl tr	Ls:	lt gry – yel gry, frm, micr	
	Tr	Glauc		
3879	90	Slst:	olv gry, sft, occ mod hd & calc cmt, amor, sol, v arg grdg Clst i.p., sdy - v sdy, loc grdg Sst, glauc, micropyr, com blk carb spks, occ mic, non slily calc	a.a.
	10	Sst:	a.a.	
	Tr	Glauc		
3882	100	Slst:	a.a.	a.a.
	Tr	Sst:	a.a.	
	Tr	Ls:	lt gry – yel gry, pa yel brn, frm, micr, slily arg	
	Tr	Glauc		
3888	100	Slst:	a.a., grdg v slty Clst	a.a.
	Tr	Sst:	a.a.	
	Tr	Ls:	a.a.	
	Tr	Glauc		
3894	90	Slst:	olv gry, sft, amor, sol, v arg grdg Clst i.p., sdy – v sdy, loc grdg v f Sst, glauc – occ v glauc, micropyr, com blk carb spks, occ mic, non – slily calc	a.a.
	10	Sst:	med lt gry, v f – slt, fri – hd, sil/calc cmt, glauc – v glauc, app no vis por	
	Tr	Ls:	lt gry, frm, micr	
	Tr	Glauc		
3900	90	Slst:	a.a.	a.a.
	10	Sst:	a.a.	
	Tr	Ls:	a.a.	
	Tr	Glauc		
3906	90	Slst:	olv gry, brn gry, sft, amor-stky w/abdt vf-f, sbang-sbrnd qtz, occ glauc, occ blk carb matl, occ clr, transp, acic sponge spicules, sl calc ip, abdt vf, sbang, 'floating'Qtz grdg-slty Clst.	
	10	Lse SD:	Clr, transp, lt grn gry, transl, vf-f, sbang-sbrnd, sbsph, w srtd, lse, occ Glauc pellets, occ Carb matl, tr f-crs mica:musc+biot.	a.a.
3912	80	Slst:	a.a grdg - slty Clst.	
	20	Lse Sd:	a.a	a.a.
	Tr	Lst:	lt gry, pa olv, frm-hd, cmbly-blky, micrxln.	
3924	70	Slty Clst:	a.a grdg-Slst.	
	30	Lse Sd:	Clr, transp, lt grn gry, transl, vf-f, sbang-sbrnd, sbsph, w srtd, lse, occ Glauc pellets, occ Carb matl, tr f-crs mica:musc+biot	a.a.
	Tr	Lst:	a.a	
	Tr	Sst:	lt olv gry w/ vf sbamg qtz, glauc, gd hd silc cmt, lt olv gry mtx, no vis por.	

WELLSITE SAMPLE DESCRIPTION				Page 19
Country: Norway		Area: Norwegian Sea		Field: Ellida
Well no: 6405/7-1T2		Company: Statoil, Petoro, Shell, BP, ConocoPhillips		
RKB: 36 meters		Geologist: N. Townley, T.F.Kristensen		
Hole size: 8 1/2 "		Cut solvent: Iso-Propanol		Date: 27 August 2003
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	80	Slty Clst: dsky brn,dsky yel brn, gry brn, sft-frm, amor, stky – plast, occ-abdt vf qtz, occ glauc, occ mic:musc, tr pyr, cryptfiss – v sl calc ip.		No Shows
	20	Lse Sd: a.a		
3936	80	Slty Clst: a.a		a.a.
	20	Lse Sd: a.a		
	Tr	Lst: a.a.		
3942	70	Slty Clst: a.a		a.a.
	30	Lse Sd: a.a		
	Tr	Lst: a.a.		
3948	70	Clst: dsky brn,dsky yel brn, gry brn, sft-frm, amor, stky – plast, occ-abdt vf qtz, occ glauc, occ mic:musc, tr pyr, cryptfiss – v sl calc ip.		a.a.
	20	Lse Sd: a.a		
	10	Lst: lt grn gry, pa olv, yel gry, sft, cmbly, arg ip, micrxln.		
	Tr	Clst: blk, hd, brit, occ sbfiss, micrpyr.		
3960	80	Clst: gry brn, sft-frm, occ hd, amor-blky, pred stky, occ-abdt vf, sbang, sbrnd, 'floating' qtz, occ glauc, occ mic:musc, tr pyr, cryptfiss – v sl calc ip.		
	10	Lse Sd: Clr, transp, lt grn gry, occ dk gry transl, vf-f, sbang-sbrnd, sbsph, w srtd, lse qtz, occ Glauc pellets, occ vf Carb matl, tr f-crs mica:musc+biot.		a.a.
	10	Lst: lt grn gry, pa olv, yel gry, sft, cmbly, arg ip, micrxln.		
	Tr	Sst: a.a lt grn gry, pa grn yel, w cmtd w/ silc cmt.		
3966	70	Clst: gry brn, sft-frm, occ hd, amor-blky, pred stky, occ-abdt vf, sbang, sbrnd, 'floating' qtz, occ glauc, occ mic:musc, tr pyr, cryptfiss – v sl calc ip.		
	30	Lse Sd: a.a		a.a.
	10	Lst: lt grn gry, pa olv, yel gry, sft, cmbly, arg ip, micrxln.		
3972	80	Clst: a.a		
	20	Lse Sd: a.a		
3978	70	Clst: a.a		
	20	Sst: lt grn gry, pa olv w/ clr transp, lt grn gry, occ dk gry transl, vf – m, pred f, ang – sbrnd, sbelg – sbsph, w – mod srtd qtz. Gd hd silc, occ transl calc cmts, occ dk brn, gry brn Rk / Lith frags, mic:musc, occ obs/ a/ lt grn gry, off wh Rk Flour, also obs/ a/ lse grs, No Vis Por in cmtd prts		No shows
	10	Lst: a.a		
3984	80	Clst: a.a		
	20	Sst: a.a.		
3990	50	Sst: a.a 50% cmtd w/ abdt of wh, pa grn yel calc cmt. 50% lse vf-crs, pred f-m, ang-sbrnd, sbsph qtz, glauc, carb, No vis por.		
	50	Clst: gry brn, med dk gry, sft, amor, occ hd, blk, pred stky, occ-abdt vf qtz, mic, glauc		

WELLSITE SAMPLE DESCRIPTION				Page 20
Country: Norway		Area: Norwegian Sea		Field: Ellida
Well no: 6405/7-1T2		Company: Statoil, Petoro, Shell, BP, ConocoPhillips		
RKB: 36 meters		Geologist: N. Townley, T.F.Kristensen		
Hole size: 8 1/2 "		Cut solvent: Iso-Propanol		Date: 27 August 2003
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.
3996	30	Sst:	a.a	
	70	Clst:	a.a	
	10	Lst:	pa grn yel, hd, blk-y-splty, possibly cmt of Sst.	
4002	50	Sst:	a.a + abdt med gry arg mtx + lt grn gry Kaol mtx + pa grn yel calc cmt, No vis por.	
	50	Clst:	a.a	
4008	40	Sst:	a.a, pa olv, grdg-grn gry, lt olv brn w/ gd hd calc+sile cmts, glauc, carb, occ lt grn gry, gry orng kaol/chlorite mtx?	
	80	Clst:	a.a grdg-SLTST.	
4014	30	Sst:	a.a	
	50	Clst:	a.a	
	10	Lst:	lt grn gry, off wh, frm-mod hd, cmbly, possibly as calc cmt to Sst.	
4026	60	Sst:	a.a	
	40	Clst:	a.a	
4032	60	Clst:	med dk gry – brn gry, sft, amor, sol, stky, slty – v slty grdg Sltst i.p., i.p. sdy, mic, glauc, micropyr, occ carb, non – slily calc, occ mod calc	No shows
	40	Sst:	med lt gry – pa olv gry, gn gry, v f – slt, mod hd – hd, sil & calc cmt, glauc, com pyr, mic i.p., arg i.p., app none – pr vis por	
4038	80	Clst:	a.a.	a.a.
	20	Sst:	a.a.	
	S1 tr	Dol:	yel brn – dk yel brn, mod hd – hd, suc (siderire?)	
	Tr	Ls:	lt gry – yel gry, frm, micr	
4044	60	Clst:	a.a.	a.a.
	40	Sst:	a.a.	
	Tr	Dol:	a.a.	
	Tr	Ls:	a.a.	
4050	50	Clst:	brn gry – med dk gry, sft, amor, sol, stky, slty – v slty, grdg Sltst i.p., i.p. sdy v sdy, mic, glauc, micropyr, com blk carb spks, non – slily calc, occ mod calc	a.a.
	50	Sst:	med lt gry – med gry, gn gry, clr – trnsl qtz, pred v f – slt, occ f – med grns, mod srt, app fri – hd, sil & calc cmt, glauc, pyr i.p., mic i.p., arg i.p., non – pr vis por	
	Tr	Ls :	lt gry – yel gry, sft – frm, micr	
	S1 tr	Dol :	yel brn – dk yel brn, mod hd – hd, microxln, occ suc	
	Tr	Glauc		

WELLSITE SAMPLE DESCRIPTION				Page 21
Country: Norway		Area: Norwegian Sea		Field: Ellida
Well no: 6405/7-1T2		Company: Statoil, Petoro, Shell, BP, ConocoPhillips		
RKB: 36 meters		Geologist: N. Townley, T.F.Kristensen		
Hole size: 8 1/2 "		Cut solvent: Iso-Propanol		Date: 27 August 2003
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.
4056	70	Clst:	a.a.	No shows
	30	Sst:	a.a.	
	Tr	Ls:	a.a.	
	Tr	Glauc		
4062	70	Clst:	a.a.	a.a.
	30	Sst:	a.a.	
	Tr	Ls:	a.a.	
	Tr	Glauc		
4068	80	Clst:	a.a.	a.a.
	20	Sst:	a.a.	
	Tr	Ls:	a.a.	
	Tr	Dol:	a.a.	
4074	60	Clst:	a.a.	a.a.
	40	Sst:	v f – slt, occ f – med grns, tr crs grns, else a.a.	
	Gd tr	Ls:	a.a.	
4080	50	Clst:	a.a.	a.a.
	50	Sst:	pred v f – slt, occ f grns, else a.a.	
	Tr	Ls:	a.a.	
	Tr	Dol:	a.a.	
4086	50	Clst:	med dk gry – olv gry – brn gry, sft, amor, sol, stky, slty – v slty grdg Slstst i.p., sdy – v sdy, micromic, slily glauc, com carb frags, non – slily calc, occ mod calc	a.a.
	50	Sst:	med lt gry – med gry, gn gry, clr – trnsl qtz, pred v f, grdg Slstst i.p., occ f, fri – hd, sil & calc cmt, glauc/chlorite, tr pyr, mic i.p., slily – occ v arg, non – pr vis por	
	S1 tr Tr	Ls : Glauc/Chlorite, Mic	lt gry – yel gry, frm, micr	
4092	50	Clst:	a.a.	a.a.
	50	Sst:	a.a.	
	Tr	Ls:	a.a.	
	Tr	Glauc/Chlorite, Mic		
4098	80	Sst:	pred v f, a.a., app lse – fri, occ mod hd – hd, else a.a.	a.a.
	20	Clst:	a.a.	
	Tr	Ls:	a.a.	
	Tr	Mic, Glauc/Chlorite, Pyr		
4104	80	Sst:	pred med lt gry, med gry, clr – trnsl qtz, pred v f, occ f, wl srt, sbang – sbrnidd, app fri – mod hd, pred calc cmt, occ sil cmt, tr pyr, slily – v arg, glauc/chlorite, tr mic, app pr vis por	a.a.
	20	Clst:	a.a.	
	Gd tr	Ls:	lt gry – med lt gry, frm, micr, sdy i.p.,	
	Tr	Dol:	yel brn – dk yel brn, hd, microxln – occ sucr, calc i.p.	
	Tr	Mic, Glauc/Chlorite		

WELLSITE SAMPLE DESCRIPTION				Page 22
Country:	Norway	Area:	Norwegian Sea	Field: Ellida
Well no:	6405/7-1T2	Company:	Statoil, Petoro, Shell, BP, ConocoPhillips	
RKB:	36 meters	Geologist:	N. Townley, T.F.Kristensen	
Hole size:	8 1/2 "	Cut solvent:	Iso-Propanol	Date: 27 August 2003
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.

4110	90	Sst:	v f – f, occ med – crs grns, else a.a.	No shows
	10	Clst:	a.a.	
	Gd tr	Ls:	com sdy, else a.a., cmt from Sst??	
	Tr	Mic,	Glauc/Chlorite	
4116	80	Sst:	a.a.	a.a.
	20	Clst:	a.a.	
	Gd tr	Ls:	a.a.	
	Tr	Dol:	yel brn – dk yel brn, hd, microxln – occ sucr, calc i.p.	
	Tr	Mic,	Glauc/Chlorite	
4125	50	Clst:	brn gry – olv gry, med dk gry, sft, amor, sol, stky, v slty, grdg Slst i.p., sdy – v sdy, micromic, , micropyr, com blk carb frags, Non – slily calc, occ mod calc	a.a.
	50	Sst:	med lt gry – med gry – gn gry, clr – trns l qtz, v f – slt, wl srt, mod hd – hd, sil & calc cmt, chlorite/glauc, mic i.p., tr pyr, slily – occ v arg, non – pr vis por	
	Tr	Ls :	med lt gry, frm, micr, com sdy, cmt Sst ??	
	Tr	Dol :	yel brn – dk yel brn, mod hd – hd, microxln – occ sucr, slily calc	
	Tr	Mic,	Glauc/Chlorite	
4131	50	Clst :	a.a.	a.a.
	50	Sst:	a.a.	
	Tr	Ls:	a.a.	
	Tr	Dol:	a.a.	
	Tr	Mic,	Glauc/Chlorite	
4137	70	Clst :	a.a.	a.a.
	30	Sst:	a.a.	
	Tr	Ls:	a.a.	
	Tr	Mic,	Glauc/Clorite	
4140	70	Clst :	a.a.	a.a.
	30	Sst:	a.a.	
	Tr	Ls:	a.a.	
	Tr	Mic,	Glauc/Clorite	
4146	90	Clst:	med dk gry – olv gry, sft – frm, amor, stky, slily slty – slty, occ v slty, micromic, micropyr, non – slily calc	a.a.
	10	Sst:	a.a.	
4152	100	Clst:	a.a.	a.a.
	Tr	Sst:	a.a.	

WELLSITE SAMPLE DESCRIPTION				Page 23
Country: Norway		Area: Norwegian Sea		Field: Ellida
Well no: 6405/7-1T2		Company: Statoil, Petoro, Shell, BP, ConocoPhillips		
RKB: 36 meters		Geologist: N. Townley, T.F.Kristensen		
Hole size: 8 1/2 "		Cut solvent: Iso-Propanol		Date: 27 August 2003
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.
4158	90	Clst:	a.a.	No shows
	10	Sst:	med lt gry, v f – slt, fri – mod hd, pred calc cmt, mic, glauc/chlorite, slily pyr, slily arg – occ v arg, no vis por	
	Tr	Ls:	lt gry – med lt gry, frm, micr, com sdy, cmt Sst?	
4164	100	Clst:	a.a.	a.a.
	Tr	Sst:	a.a.	
4170	80	Clst:	a.a.	a.a.
	20	Sst:	a.a.	
	Tr	Ls:	lt gry – med lt gry, frm, micr	
	Tr	Dol:	yel brn – dk yel brn, hd, microxln – occ sucr, slily calc	
	Tr		Glauc/Chlorite	
4176	70	Clst:	med dk gry – olv gry, brn gry, sft – frm, amor, stky, slily slty – v slty, com sdy incl/lam, micromic, micropyr, non – slily calc	a.a.
	30	Sst:	med lt gry – med gry, v f – slt, fri – mod hd, calc & sil cmt, glauc/chlorite, mic, slily – v arg, non – pr vis por	
	Tr	Ls :	med lt gry – yel gry, frm, micr, sdy	
	Tr		Mic, Pyr, Glauc/Chlorite	
4182	80	Clst :	a.a.	a.a.
	20	Sst:	a.a.	
	Tr	Ls:	a.a.	
	Tr		Mic, Glauc/Chlorite	
4188	90	Clst:	a.a.	a.a.
	10	Sst:	a.a.	
	Tr	Ls:	a.a.	
	Tr	Dol:	yel brn – dk yel brn, hd, microxln – occ sucr, slily calc	
4194	90	Clst:	a.a.	a.a.
	10	Sst:	a.a.	
	Tr	Ls:	a.a.	
4200	70	Clst:	a.a.	a.a.
	30	Sst:	v f – f, else a.a.	
	Tr	Ls:	a.a.	
4206	60	Clst:	brn gry, sft, stky, amor, micrmic, miccarb ip, tr mic:musc.	
	40	Sst:	varic v lt gry, lt brn gry, brn gry,, w/clr transp, vf-f, sbang qtz grs, w srted, fri-gd hd calc + lesser silc cmts, dk brn arg + lt grn gry kaol mtxs, occ glauc + carb, oftn obs/ lt gry – brn gry, sft, cmbly silc/calc Rk Flour + abdt lse grs, No vis por, grdg – Slst.	a.a.
4212	50	Clst:	a.a	
	50	Ssr\st:	a.a grdg – Slst.	a.a.
4224	40	Clst:	a.a	
	60	Sst:	a.a grdg – Slst.	a.a.

WELLSITE SAMPLE DESCRIPTION				Page 24
Country: Norway		Area: Norwegian Sea		Field: Ellida
Well no: 6405/7-1T2		Company: Statoil, Petoro, Shell, BP, ConocoPhillips		
RKB: 36 meters		Geologist: N. Townley, T.F.Kristensen		
Hole size: 8 1/2 "		Cut solvent: Iso-Propanol		Date: 27 August 2003
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.
4230	40	Clst:	a.a	No shows
	60	Sst:	a.a grdg – Sltst.	
4236	50	Clst:	a.a	a.a.
	50	Sst:	pred vf – occ f, little arg mtx, grdg – Sltst.	
	Tr	Lst:	off wh, lt grn gry, sft – mod hd, cmbly, micrxln.	
4242	40	Clst:	a.a.	a.a.
	60	Sst/Sltst:	lt gry, lt olv gry, occ brn gry, w/ clr transp, slty – occ f, pred vf, w srtd qtz w/ abdt gd, fri – hd calc+trnsl silc cmts, occ sl dol, variable: occ-abdt lt grn gry kaol? + brn gry arg mtxs, micrmic, vf carb matl, grdg – Sltst, No vis por.	
4248	50	Clst:	brn gry, dk yel brn, sft, amor, micrmic, micrcarb, non – mod calc ip	a.a.
	50	Sst/Sltst:	a.a	
	Tr	Lst:	Pa orng, lt grn gry, sft, cmbly, micrpyr, micrxln.	
4254	30	Clst:	a.a	a.a.
	70	Sst/Sltst:	a.a slty – vf, abdt off wh, transl calc cmt, abdt Rk Flour + lse qtz grs.	
4260	30	Clst:	a.a	a.a.
	70	Sst/Sltst:	a.a	
4266	20	Clst:	a.a	a.a.
	80	Sst/Sltst:	pred lt gry, lt olv gry, lt brn gry, occ brn gry, dk yel brn, slty – f, pred vf.	
4272	30	Clst:	a.a	a.a.
	70	Sst/Sltst:	a.a.	
4278	40	Clst:	brn gry, dk yel brn, mod brn, sft – v oc frm, amor – v occ blkly, pred stky, micrmic, micrpyr	a.a.
	60	Sltst/Sst:	a.a	
4284	20	Clst:	a.a	a.a.
	80	Sltst/Sst:	a.a + abdt lse f, ang qtz grs, occ carb matl.	
4290	20	CLst:	a.a	a.a.
	80	Sltst/Sst:	pred yel gry, lt grn gry, yel gry grdg – pa olv, occ brn gry w/ clr transp, vf – occ crs, pred vf-f, sbang, sbrnd we srtd qtz. Abdt gd hd, pred wh calc cmt + occ transp silc cmt. Lt grn gry kaol? Mtx, occ brn gry arg mtx, vf carb matl, abdt lse qtz + suc Rk Flour, No vis por.	
4296	20	Clst:	a.a	a.a.
	80	Sltst/Sst:	a.a	
4300	20	Clst:	a.a	a.a.
	80	Sltst/Sst:	a.a	

TD of the well

## CONVENTIONAL CORE DESCRIPTION

<b>Country:</b> Norway	<b>Area:</b> Norwegian Sea	<b>Field:</b> Ellida- prospect
<b>Well no:</b> 6405/7-1	<b>Formation:</b> Nise Fm.	
<b>Core no:</b> 1	<b>Interval:</b> 2754 – 2781 mMD	<b>Cored:</b> 27m <b>Rec:</b> 10.0m 37 %
<b>Core size:</b> 3 1/2"	<b>Geologists:</b> Ottar Hunnes/ Andrew King	<b>Date:</b> 24.07.03

Depth (mRKB)	Lithology/Grain size cly slt vf f m c vc	APPARENT DIP	Shows					Lithological Description	Remarks	
			STAIN	FLUOR	CUT	POOR	FAIR			GOOD
2754									<b>CLST:</b> dk gn gry, olv gry, frm, mass, tr of micropyr, occ slty, occ tr glauc & micromic, non calc	No shows
2755									<b>CLST:</b> as above, also bands with micropyr	a.a
2756									<b>CLST:</b> as above	a.a
2757									<b>CLST:</b> as above	a.a.
2758									<b>CLST:</b> asd above, also sbblky	a.a.
2759									<b>CLST:</b> as above	a.a.
2760									<b>SST:</b> olv gry – med dk gry, pred v f, occ f, v arg, pr srted, frm, non calc cmt, tr mic, pyr & glauc, no vis por	HC odour, even brt, yel fluor, slow strmg bl wh cut fluor
2761									<b>CLST:</b> dk gn gry, frm, mass, tr of micropyr, occ slty, also gd tr of mic, pyr & glauc, non calc	No shows
2762									<b>CLST:</b> as above, slty, occ thin lam of vfn sst	No HC odour, weak shows
2763									<b>SST:</b> olv gry – med dk gry, pred v f, occ f, v arg, pr srted, frm, non calc cmt, tr mic, pyr, v gd tr of glauc, no vis por	HC odour, even brt, yel fluor, slow strmg bl wh cut fluor

cly slt vf f m c vc

## CONVENTIONAL CORE DESCRIPTION

<b>Country:</b> Norway	<b>Area:</b> Norwegian Sea	<b>Field:</b> Ellida- prospect
<b>Well no:</b> 6405/7-1	<b>Formation:</b> Nise Fm.	
<b>Core no:</b> 1	<b>Interval:</b> 2754 – 2781 mMD	<b>Cored:</b> 27m <b>Rec:</b> 10.0m 37 %
<b>Core size:</b> 3 1/2"	<b>Geologists:</b> Ottar Hunnes/ Andrew King	<b>Date:</b> 24.07.03

Depth (mRKB)	Lithology/Grain size <small>cly slt vf f m c vc</small>	APPARENT DIP	Shows					Φ	Lithological Description <small>Rock name, mod. lith., colour, grain size, sorting, round-ness, matrix, cementation, hardness, sed. struct., accessories, fossils, porosity, contamination</small>	Remarks <small>Shows, etc</small>
			STAIN	FLUOR	CUT	POOR	FAIR			
<div style="display: flex; align-items: center;"> <div style="margin-right: 10px;">2764</div> </div>								<p><b>SST:</b> olv gry – med dk gry, pred v f, occ f, v arg, pr srted, firm, non calc cmt, tr mic, pyr &amp; glauc, no vis por</p> <p><b>CLST:</b> olv gry, hd – vhd, mass, ang, occ slty, tr micropyr, glauc &amp; micromic off with thin streaks of <b>SST</b>: pred as a.a., but crammed. No vis structure</p>	<p>Ptchy dull yel fluor, wk bl wh – yel wh cut fluor</p> <p style="text-align: center;">No shows</p>	

cly slt vf f m c vc

## CONVENTIONAL CORE DESCRIPTION

<b>Country:</b> Norway	<b>Area:</b> Norwegian Sea	<b>Field:</b> Ellida- prospect
<b>Well no:</b> 6405/7-1	<b>Formation:</b> Nise Fm.	
<b>Core no:</b> 2	<b>Interval:</b> 2781 – 2808 mMD	<b>Cored:</b> 27m <b>Rec:</b> 25.6.m 95 %
<b>Core size:</b> 3 1/2"	<b>Geologists:</b> Ottar Hunnes/ Andrew King	<b>Date:</b> 25.07.03

Depth (mRKB)	Lithology/Grain size cly slt vf f m c vc	APPARENT DIP	Shows					Lithological Description	Remarks	
			STAIN	FLUOR	CUT	POOR	FAIR			GOOD
2781									<b>ARG SST:</b> lt gry, olv gry, slty – vf sd, frm, non calc cmt, gd tr xln pyr, tr glauc (blk), tr mic, no vis por	HC odour, brt yel fluor, weak slow strmg bl wh cut fluor
2782									<b>CLST:</b> pred a.a., incr arg cont, tr thin lam of pyr,	Very wk shows
2783									<b>ARG SST:</b> as above, v arg l.p.,	a.a
2784									<b>ARG SST:</b> pred a.a., high cont of blk min (glauc), also incl. of SST: clr – lt gry, fn, ang, mod srted, frm, non calc cmt, mod vis por	Ptchy brt yel fluor, weak slow strmg bl wh cut fluor
2785									<b>ARG SST:</b> lt gry, olv gry, slty – vf sd, frm, non calc cmt, gd tr xln pyr, gd tr glauc (blk), tr mic, no vis por	HC odour, bri yel gold fluor, strmg bl wh cut fluor
2786									<b>ARG SST:</b> lt gry, olv gry, slty – vf sd, frm, non calc cmt, gd tr xln pyr, gd tr glauc (blk), tr mic, no vis por	a.a.
2787									<b>ARG SST:</b> a.a., incr sand cont,	a.a
2788									<b>ARG SST:</b> pred a.a., less arg, incl of sst; lt gry, olv gry, vf – fn, wll srted, fri, sil cmt, gd tr glauc (blk)	a.a.
2789									<b>ARG SST:</b> as above,	a.a.
2790									<b>ARG SST:</b> v arg, grad sdy clst, else a.a.	Patchy wk shows a.a., no HC odour

cly slt vf f m c vc

# CONVENTIONAL CORE DESCRIPTION

<b>Country:</b> Norway	<b>Area:</b> Norwegian Sea	<b>Field:</b> Ellida- prospect
<b>Well no:</b> 6405/7-1	<b>Formation:</b> Nise Fm.	
<b>Core no:</b> 2	<b>Interval:</b> 2781 – 2808 mMD	<b>Cored:</b> 27m <b>Rec:</b> 25.6m 95 %
<b>Core size:</b> 3 1/2"	<b>Geologists:</b> Ottar Hunnes/ Andrew King	<b>Date:</b> 25.07.03

Depth (mRKB)	Lithology/Grain size cly slt vf f m c vc	APPARENT DIP	Shows					Lithological Description	Remarks
			STAIN	FLUOR	CUT	POOR	FAIR		
2791									HC odour, brt yel fluor, weak slow strmg bl wh cut fluor
2792									Ptchy wk shows a.a., no HC odour
2793									a.a
2794									Shows in arg sst a.a.
2795									Even dull yel fluor W/ vk cut fluor
2796									HC odour, even dull yel fluor, mod fst strmg yel wh cut fluor
2797									No shows
2798									HC odour, even dull yel fluor, mod fst strmg yel wh cut fluor
2799									Ptchy shows as above
2800									Shows (in clean sst) HC odour, even brt, yel fluor, slow strmg bl wh cut fluor

cly slt vf f m c vc

## CONVENTIONAL CORE DESCRIPTION

<b>Country:</b> Norway	<b>Area:</b> Norwegian Sea	<b>Field:</b> Ellida- prospect
<b>Well no:</b> 6405/7-1	<b>Formation:</b> Nise Fm.	
<b>Core no:</b> 2	<b>Interval:</b> 2781 – 2808 mMD	<b>Cored:</b> 27m <b>Rec:</b> 25.6m 95 %
<b>Core size:</b> 3 1/2"	<b>Geologists:</b> Ottar Hunnes/ Andrew King	<b>Date:</b> 25.07.03

Depth (mRKB)	Lithology/Grain size cly slt vf f m c vc	APPARENT DIP	Shows					Lithological Description	Remarks
			STAIN	FLUOR	CUT	POOR	FAIR		
2801									HC odour, brt yel fluor, weak slow strmg bl wh cut fluor
2802									a.a
2803									No shows
2804									HC odour, even – ptchy yel wh fluor, mod fst strmg yel wh cut fluor
2805									a.a
2806									a.a
2807	 Base of core # 2: 2806.6 mMD								Wk HC odour, tr brn stn, even brt, yel fluor, slow strmg bl wh cut fluor
2808									
2809									
2810									

cly slt vf f m c vc

## CONVENTIONAL CORE DESCRIPTION

<b>Country:</b> Norway	<b>Area:</b> Norwegian Sea	<b>Field:</b> Ellida- prospect
<b>Well no:</b> 6405/7-1	<b>Formation:</b> Nise Fm.	
<b>Core no:</b> 3	<b>Interval:</b> 2808-2835 mMD	<b>Cored:</b> 27m <b>Rec:</b> 23.6.m 87.4%
<b>Core size:</b> 3 1/2"	<b>Geologists:</b> Ottar Hunnes/ Andrew King	<b>Date:</b> 26.07.03

Depth (mRKB)	Lithology/Grain size cly slt vf f m c vc	APPARENT DIP	Shows					Lithological Description	Remarks	
			STAIN	FLUOR	CUT	POOR	FAIR			GOOD
2808				█	█	█			<b>SST:</b> lt gry, med gry, slty - vf-fn sd, frm, arg, wll cmt, no vis por, gd tr glauc, mica	Gd dir yel fluor, bl wh cut fluor
2809				█	█	█			<b>CLST:</b> olv gry-med gry, spkld blk, slity w/, frm, mica and micromica, micropyr, pyr, blk carb material	Strng yel wh dir fluor, v slow wk bl cut
2810			█	█	█	█			<b>SST:</b> med gry, olv gry, spkld, slty-v slty, arg, vf -fn gn, wll cmt, frm, no vi por, gdc tr mica, glauc, carb mat, gd tr pyr	V strg yel-wh direct fluor, mod bl wh cut (oil stain?)
2811				█	█	█			<b>CLST:</b> med gry-olv gry, slty-sndy, frm, v mica, abund pyr as fn diss pyr and as nodls, com blk carb mat	Patchy dir fluor, wh cut fluor
2812				█	█	█			<b>CLST:</b> dk grn gry, spkld blk, slty, a incl, frm, com glauc nodls, micromic, micropyr, comn Crs mica, com carb material, non calc	Strng patchy dir yel fluor, v wk bl cut
2813				█	█	█			<b>CLST:</b> gen a/a	V strng, patchy yel wh fluor, wk bl wh cut, tr oil stain
2814				█	█	█			<b>CLST:</b> brn gry -olv gry, med gry, v slty, frm,, sndy lam, , v mic, gd tr micropyr	Strng, vpatchy yel wh fluor in lamina, Mod bl wh cut,
2815				█	█	█			<b>CLST:</b> brn gry-olv gry, slty frm, sub fiss, occ sdy lam, micromic, abund micropyr	Patchy yel fluor, pr-v sl bl cut
2816				█	█	█			<b>CLST:</b> gen a/a,	a.a.
2817				█	█	█			<b>CLST:</b> gen a/a.	Br patchy yel fluor Mod bl wh cut

cly slt vf f m c vc

## CONVENTIONAL CORE DESCRIPTION

<b>Country:</b> Norway	<b>Area:</b> Norwegian Sea	<b>Field:</b> Ellida- prospect
<b>Well no:</b> 6405/7-1	<b>Formation:</b> Nise Fm.	
<b>Core no:</b> 3	<b>Interval:</b> 2808 – 2835 mMD	<b>Cored:</b> 27m <b>Rec:</b> 23.6m 87.4 %
<b>Core size:</b> 3 1/2"	<b>Geologists:</b> Ottar Hunnes/ Andrew King	<b>Date:</b> 26.07.03

Depth (mRKB)	Lithology/Grain size cly slt vf f m c vc	APPARENT DIP	Shows					Lithological Description	Remarks
			STAIN	FLUOR	CUT	POOR	FAIR		
2818								<b>CLST:</b> Brn gry-olv gry, slty, frm, sub fiss, micropyr, micromica	V pr dir yel fluor
2819								<b>CLST:</b> gen a.a	a.a
2820								<b>ARG SST:</b> grdg sdy clst, med lt gry-olv gry, spkld blk, slty-vfn, occ fn, pr-w cmtd, abun arg mtrx, abun glauc pellets, gd tr mica, , pred muscovite, ? Com crs carb frags-pyriti, plant remains	Patchy dir yel fluor, mod bl wh cut
2821								<b>CLST:</b> a.a	Pr patchy dir fluor, v pr cut
2822								<b>CLST:</b> a.a	a.a
2823								<b>CLST:</b> brn gry, sl spkld, slty, frm, sub fiss, v mi, abnd micropyr, tr carb mat	Strg dir yel fluor in lam, mod bl wh cut
2824								<b>SST:</b> (arg w/ clst lam) med lt gry-olv gry, spkld blk, vfn-fn, subrnd grns, slty- arg l/p, v mica, abn glauc pellets, tr carb mat, tr pyr, pr-non vis por	V strg yel wh dir fluor In snd parts, strg bl wh cut
2825								<b>SST:</b> a.a	a.a
2826								<b>SST:</b> med lt gry-olv gry-brn gry, spkld blk, v fn, arg, sb rnd, v wl strtd, slty/arg, wl cmtd, frm occ fri, com glauc pellets, slt tr mica, v arg, grd sdy clst, no vis por	Gd yel dir fluor, gd bl wh cut
2827								<b>CLST:</b> olv gry, frm-sb fiss, micro mic, v pyr	V pr dir fluor

cly slt vf f m c vc

# CONVENTIONAL CORE DESCRIPTION

<b>Country:</b> Norway	<b>Area:</b> Norwegian Sea	<b>Field:</b> Ellida- prospect
<b>Well no:</b> 6405/7-1	<b>Formation:</b> Nise Fm.	
<b>Core no:</b> 3	<b>Interval:</b> 2808 – 2835 mMD	<b>Cored:</b> 27m <b>Rec:</b> 23.6m 87.4 %
<b>Core size:</b> 3 1/2"	<b>Geologists:</b> Ottar Hunnes/ Andrew King	<b>Date:</b> 26.07.03

Depth (mRKB)	Lithology/Grain size cly slt vf f m c vc	APPARENT DIP	Shows					Lithological Description	Remarks	
			STAIN	FLUOR	CUT	POOR	FAIR			GOOD
2828			█	█	█	█			<b>SST:</b> med lt gry – olv gry, spkld blk, vf, sub rmd, arg, v wl srtd, v slty – v arg, grg sndy clst, frm, wl cmtd, com mica, com glauc pellets, tr plt remains, no vis por	Patchy strg yel dir fluor, mod bl wh cut Tr oil stain
2829				█	█	█			<b>CLST:</b> olv gry-med lt gry, spkld blk, v sndy, w/sst incl, frm, blkly, slty, v mica, v glauc	Patchy yel dir fluor, Mod bl wh cut
2830				█	█	█			<b>SLTST:</b> dk grn gry, med lt gry, spkld blk (glauc?) grdg v fn arg sst, lam of clst, frm, v mic, v glauc	Even br yel dir fluor V slw strmg blish cut
2831				█	█	█			<b>SLTST:</b> a.a	Even br yel dir fluor V slw strmg blish cut
2832	<div style="border: 1px solid black; padding: 2px; display: inline-block;">                     Base of core # 3: 2831.6 mMD                 </div>									
2833										
2834										
2835										
2836										
2837										

cly slt vf f m c vc

# CONVENTIONAL CORE DESCRIPTION

<b>Country:</b> Norway	<b>Area:</b> Norwegian Sea	<b>Field:</b> Ellida- prospect
<b>Well no:</b> 6405/7-1	<b>Formation:</b> Nise Fm.	
<b>Core no:</b> 4	<b>Interval:</b> 2835-2862 mMD	<b>Cored:</b> 27m <b>Rec:</b> 26.8m 99%
<b>Core size:</b> 3 1/2"	<b>Geologists:</b> M. Aslagnsen, N.Townley, Ø.Hovden	
<b>Date:</b> 27.07.03		

Depth (mRKB)	Lithology/Grain size cly slt vf f m c vc	APPARENT DIP	Shows					Lithological Description	Remarks	
			STAIN	FLUOR	CUT	POOR	FAIR			GOOD
2835				█	█	█			<b>CLST:</b> dk grn gry, med gry, frm-mod hd, blkly, occ subfiss, abnd micromic, abnd-mod glauc, occ vfn carb mat, pyr, occ veinings w sst lam, sst: clr transp, vfn subang grns, abund glauc, occ carb lams, no vis por	Br yel fluor in sst Inses, mod bl wh blmng cut, no res
2836				█	█	█			<b>CLST:</b> a.a w/ crs musc mica SST lamina: clr-transp, vf-fn, subang-subrnd qtz, abnd glauc pellets, occ blk carb mat, dk grn gry cly mtrx, occ lt grngry spkld blk, sl kaol cmt? No vis por	Br yel fluor, slow blmng bl wh cut
2837				█	█	█			<b>CLST:</b> dk gry, dk gnr gry, frm-mod hd, blkly, occ subfiss, micmic, abund crs musc mica, glauc l/p, carb mat, pyr, occ pyr veinings, w/vfn sst lam, a.a	In sst: a.a
2838				█	█	█			<b>CLST:</b> a.a, abund pyr weining/bioturb	In sst: a.a
2839									<b>CLST:</b> med gry, med dk gry, frm, micrmic, occ crs mica -musc/biot, vfn carb mat, pyr	
2840				█	█	█			<b>ARG SST:</b> pred med dk gry, olv gry, w/clr transp vfn subang-subrnd w srted qtz grns, abund glauc pellets, abund mica-musc/biot, med dk gry org cly mtrx, occ lt grn gry, sft, kao mtrx/cmt? Grdg v slty clst l/p	Br yel fluor, slow blmng bl wh cut
2841				█	█	█			<b>CLST:</b> as for 2839m w lt grn gry vf sst lenses	In sst: Br yel fluor, slow blmng bl wh cut
2842									<b>CLST:</b> a.a, but no sst lenses	
2843				█	█	█			<b>CLST:</b> med dk gry, med gry, olv gry, frm, subfiss, mica, glauc, w/carb/plt mat, pyr and infils w / lt grn gry, vfn sst lam, gauc, mica, occ pyr, kaol cmt, no vis por	In sst: br yel fluor, slow diff/strmng bl wh cut.
2844				█	█	█			<b>SST:</b> dk grn gry, med gry, w/clr-transp, occ lt grn gry tansl, vfn-fn, subang-subrnd, sub Elong-subsph, w srted grns/w med dk gry arg cly mtrx+occ lt grn gry kaol?cmt in lam, occ abund glauc pell, crs mica, occ carb mat, occ abund clyst lamina	br yel fluor, slow diff/strmng bl wh cut.

cly slt vf f m c vc

## CONVENTIONAL CORE DESCRIPTION

<b>Country:</b> Norway	<b>Area:</b> Norwegian Sea	<b>Field:</b> Ellida- prospect
<b>Well no:</b> 6405/7-1	<b>Formation:</b> Nise Fm.	
<b>Core no:</b> 4	<b>Interval:</b> 2835 – 2862 mMD	<b>Cored:</b> 27m <b>Rec:</b> 26.8m 99 %
<b>Core size:</b> 3 1/2"	<b>Geologists:</b> M.Asлагsen, N.Townley, Ø.Hovden	<b>Date:</b> 27.07.03

Depth (mRKB)	Lithology/Grain size cly slt vf f m c vc	APPARENT DIP	Shows					Lithological Description	Remarks	
			STAIN	FLUOR	CUT	POOR	FAIR			GOOD
2845									<b>CLST:</b> as 2843m, vf sst lams, no vis por	In sst: br yel fluor, slow diff/strmng bl wh cut.
2846									<b>SST:</b> dk grn gry, olv gry,w/clr- trans, lt grn gry transl, vfn-fn, subang-subrnd, wl srted qtz, abund lt gen gry kaol? Cmt, abund glauc, occ-abund blk carb/plant mat, crs mica, musc, mod vis por	br yel fluor, slow diff/strmng bl wh cut.
2847									<b>CLST:</b> as 2843m w vfn (2mm) sst lenses	
2848									<b>CLST:</b> gen a.a	
2849									<b>SST + CLST lams:</b> as 2846m	br yel fluor, slow diff/strmng bl wh cut.
2850									<b>SST:</b> as 2846m, grdg sltst/clst in/p	Strg dir yel fluor in lam, mod bl wh cut
2851									<b>CLST:</b> med dk gry, med gry, frm, blk, micromic, abund crs mica, musc/biot, glauc, plant debr, lam w/lt grn gry, clr qtz, abund glauc? sst lam	Br yel wh fluor, slow blooming bl wh cut
2852									<b>CLST:</b> a.a	a.a
2853									<b>CLST+SST lam:</b> a.a occ pyr veining and inffills, bioturb	a.a
2854									<b>CLST:</b> med dk gry, med gry, dk grn gry l/p, frm, blk, fiss, micromic, v fn pyr, mica (musc) v fn carb mat	

cly slt vf f m c vc

## CONVENTIONAL CORE DESCRIPTION

<b>Country:</b> Norway	<b>Area:</b> Norwegian Sea	<b>Field:</b> Ellida- prospect
<b>Well no:</b> 6405/7-1	<b>Formation:</b> Nise Fm.	
<b>Core no:</b> 4	<b>Interval:</b> 2835 – 2862 mMD	<b>Cored:</b> 27m <b>Rec:</b> 26.8m 99 %
<b>Core size:</b> 3 1/2"	<b>Geologists:</b> M.Asлагsеn, N.Townley, Ø.Hovden	<b>Date:</b> 26.07.03

Depth (mRKB)	Lithology/Grain size cly slt vf f m c vc	APPARENT DIP	Shows					Lithological Description <small>Rock name, mod. lith., colour, grain size, sorting, round-ness, matrix, cementation, hardness, sed. struct., accessories, fossils, porosity, contamination</small>	Remarks Shows, etc	
			STAIN	FLUOR	CUT	POOR	FAIR			GOOD
2855	M □ M								<u>CLST:</u> a.a, abund pyr worm tubes/bioturb	
2856	M □ M								<u>CLST:</u> a/a	
2857	M □ M * II M								<u>SST:</u> Gnsh gry, frm, vfn/fn, sub ang, wl srtd, abund glauc grns, occ clst incl, gd vis por	Even br yel dir fluor Fast strmg/blmng bl wh cut
2858	M □ M								<u>CLST:</u> a.a	
2859	M □ M								<u>CLST:</u> a.a	
2860	M □ M								<u>CLST:</u> a.a	
2861	M □ M								<u>CLST:</u> a.a	
2862	M □ M <span style="border: 1px solid black; padding: 2px;">Base of core # 4: 2861.8 mMD</span>								<u>CLST:</u> a.a	
2863										
2864										

# CONVENTIONAL CORE DESCRIPTION

<b>Country:</b> Norway	<b>Area:</b> Norwegian Sea	<b>Field:</b> Ellida- prospect
<b>Well no:</b> 6405/7-1	<b>Formation:</b> Nise Fm.	
<b>Core no:</b> 5	<b>Interval:</b> 2862-2880 mMD	<b>Cored:</b> 18m <b>Rec:</b> 7.37m 40.9%
<b>Core size:</b> 3 1/2"	<b>Geologists:</b> M. Aslagsen, N.Townley, Ø.Hovden	<b>Date:</b> 28.07.03

Depth (mRKB)	Lithology/Grain size cly slt vf f m c vc	APPEARANT DIP	Shows					Lithological Description	Remarks	
			STAIN	FLUOR	CUT	POOR	FAIR			GOOD
2862									<b>CLST:</b> med dk gry, med gry, frm-mod hd, blk, fiss, micmic, vf pyr, occ pyr wrm tubules, occ Glauc pellets, crs mic:musc+biot, silc xln cmt, conc frac.	
2863									<b>CLST:</b> a.a w/ abdt Glauc pellets, crs plnt matl, grd- + w/ <b>num f SST lams:</b> clr, transp, lt gn gry, transl, vf-f, sbang-sbrnd, sbsph, w srted Qtz + vf blk Glauc pellets, f-crs mic:musc + carb matl, lt gn gry kaol/silc? Cmt/mtx, Pr-mod vis por, occ Lam discordant to lamination	Bri yel/yel wh fluor, Inst stmg-slw diff bl wh cut in SST lam.
2864									<b>CLST:</b> a.a + v occ discrete <b>SST lam/lenses</b>	Bri yel/yel wh fluor, Inst stmg-slw diff bl wh cut in SST lam
2865									<b>CLST:</b> med dk gry, med gry, frm-mod hd, blk, fiss, micmic-occ m mic:musc+biot, vf diss pyr, occ pyr wrm/bioturbation.	
2866									<b>CLST:</b> a.asft-frm, stky-blky ip, w/ abdt Glauc pellets, crs plnt matl, grd- + <b>occ f SST lams:</b> clr, transp, lt gn gry, transl, vf-f, sbang-sbrnd, sbsph, w srted Qtz + vf blk Glauc pellets, f-crs mic:musc + carb matl, lt gn gry kaol/silc? Cmt/mtx, Pr-mod vis por,	Bri yel/yel wh fluor, Inst stmg-slw diff bl wh cut in SST lam.
2867									<b>CLST:</b> pred med dk gry, med gry, frm-mod hd, blk, sbfiss-fiss, abdt Glauc pellets, abdt crs mic:musc+biot, pyr vngs + infills (silc cmt of xln nature giving conc frac, + <b>num discrete SST lam + lenses:</b> clr, transp, lt gn gry+lt gry trns, vf-f, sbang-sbrnd, sbsph, w srted Qtz+crs blk Glauc, carb, crs mic, pr-mod vis por	Bri yel/yel wh fluor, Inst stmg-slw diff bl wh cut in SST lam.
2868									<b>SST:</b> as for lams above w med dk gry, med gry, frm, fiss, micmic, micrpyr, Glauc <b>CLST drapes.</b>	Bri yel/yel wh fluor, Inst stmg-slw diff bl wh cut
2869									<b>CLST:</b> as for 2862, <b>no SST lam/ lenses</b>	
2870									<b>CLST:</b> pred med gry, med dk gry, frm-hd, splty, Glauc, crs plnt laths/carb matl, crs mic:nusc, pyr ip, hd, v Calc cmt	
2871										

TD of recovered core at 2869.37 m MD

cly slt vf f m c vc

# CONVENTIONAL CORE DESCRIPTION

<b>Country:</b> Norway	<b>Area:</b> Norwegian Sea	<b>Field:</b> Ellida- prospect
<b>Well no:</b> 6405/7-1	<b>Formation:</b> Nise Fm.	
<b>Core no:</b> 5	<b>Interval:</b> 2862 – 2880 mMD	<b>Cored:</b> 18m <b>Rec:</b> 7.37m 40.9 %
<b>Core size:</b> 3 1/2"	<b>Geologists:</b> M.Asлагsen, N.Townley, Ø.Hovden	<b>Date:</b> 28.07.03

Depth (mRKB)	Lithology/Grain size							APPARENT DIP	Shows					Φ	Lithological Description <small>Rock name, mod. lith., colour, grain size, sorting, round-ness, matrix, cementation, hardness, sed. struct., accessories, fossils, porosity, contamination</small>	Remarks <small>Shows, etc</small>
	cly	slt	vf	f	m	c	vc		STAIN	FLUOR	CUT	POOR	FAIR			
2872																
2873																
2874																
2875																
2876																
2877																
2878																
2879																
2880																
2881																

TD of cored interval at 2880 m MD

cly slt vf f m c vc

## CONVENTIONAL CORE DESCRIPTION

<b>Country:</b> Norway	<b>Area:</b> Norwegian Sea	<b>Field:</b> Ellida- prospect
<b>Well no:</b> 6405/7-1	<b>Formation:</b> Lysing Fm?	
<b>Core no:</b> 6	<b>Interval:</b> 3751-3757 mMD	<b>Cored:</b> 6m <b>Rec:</b> 5.01m 83.5%
<b>Core size:</b> 3 1/2"	<b>Geologists:</b> N.Townley, T.F.Kristensen	<b>Date:</b> 23.08.03

Depth (mRKB)	Lithology/Grain size cly slt vf f m c vc	APPEARANT DIP	Shows					Lithological Description	Remarks	
			STAIN	FLUOR	CUT	POOR	FAIR			GOOD
3751						█			<p><b>CLST:</b> med dk gry, gry brn, hd, blk-splty, micmic, occ crs mic:musc+biot, occ-abdt f-crs Glauc faecal pellets, silc, w/ <b>lenses+lams</b> <b>SST:</b> clr, transp, lt gn gry, occ dk gry, transl, vf-occ crs, pred f-m, ang-sbsph, elg-sprnd, mod-pr srted, w gd hd sil, occ pyr cmt, lt gn gry, off wh Kaol mtz, occ-abdt Glauc, tr blk carb matl, No vis por.</p>	No Shows in SST
3752						█			<p><b>CLST:</b> a.a w/ <b>num f discordant SST lams</b>, + occ dk gry <b>CLST clasts</b></p>	No Shows in SST
3753						█			<p><b>CLST:</b> pred med dk gry, a.a + occ discordant <b>SST lam / lenses</b>, + occ dk gry, hd, blk-splty, Glauc <b>CLST clasts:</b> CLST laminations curved / drapped around SST lenses (Scours?) in parts, CLST clasts (Rip up/reworking?), SST often observed w/ lt gn gry, sft, Feldspar laths.</p>	No Shows in SST
3754						█			<p><b>CLST:</b> a/a with <b>occ</b> occ discordant <b>SST lam lenses</b>, abdt vf diss pyr, occ pyr wrm tubules/bioturbation.</p>	No Shows in SST
3755						█			<p><b>SST:</b> clr, transp, lt gn gry, occ dk gry, transl, vf-occ crs, pred f-m, ang-sbsph, elg-sbrnd, mod-pr srted, w gd hd sil, occ calc+pyr cmt, lt gn gry, off wh Kaol mtz, occ-abdt Glauc, tr blk carb matl, No vis por, w/ 10% med dk gry, Glauc, mic:musc+biot: <b>CLST</b> clasts</p>	No Shows in SST
3756						█			<p><b>SST:</b> a/a, occ observed as deforming CLST (soft sed deformation?), abdt Glauc, Carb matl.</p>	No Shows in SST
3757									<p><b>CORE CHIP from 3756 not recoverable due to position in core catcher</b></p>	

TD of recovered core at 3756.01 m MD

cly slt vf f m c vc

## CONVENTIONAL CORE DESCRIPTION

<b>Country:</b> Norway	<b>Area:</b> Norwegian Sea	<b>Field:</b> Ellida- prospect
<b>Well no:</b> 6405/7-1	<b>Formation:</b> Nise Fm.	
<b>Core no:</b> 7	<b>Interval:</b> 3757-3784 mMD	<b>Cored:</b> 27m <b>Rec:</b> 26.15.m 96.9%
<b>Core size:</b> 3 1/2"	<b>Geologists:</b> N.Townley, T.F.Kristensen	<b>Date:</b> 25.08.03

Depth (mRKB)	Lithology/Grain size cly slt vf f m c vc	AP- PARENT DIP	Shows					Lithological Description	Remarks	
			STAIN	FLUOR	CUT	POOR	FAIR			GOOD
3757					█	█			<p><b>SST w/CLst streaks, incl., patches, bioturbated</b></p> <p><b>SST:</b> med gry, clr – trnsl qtz, v f – f, occ med, mod srt, ang – sbrnrd, mod hd – hd, sil cmt, tr calc, glauc, mic, slily micropyr, com arg</p> <p><b>CLST:</b> olv blk, mod hd, sltysdy, glauc, mic, micropyr, non calc</p>	No dir fluor, cloudy v wk bl – bl wh cut fluor
3758					█	█			<p><b>SST: Bioturbated a.a.</b></p> <p><b>SST:</b> med lt gry, clr – trnsl qtz, f – med, mod srt, ang – sbrnrd, mod hd – hd, sil cmt, tr calc cmt, v glauc, mic, arg, carb frags(plt remains),</p> <p><b>CLST:</b> com pyritised worm tubes, else a.a.</p>	a.a.
3759									<p><b>CLST:</b> olv blk, mod hd, subfis, sltysdy incl / streaks, micropyr, slily glauc, mic, non calc</p>	No Shows in SST
3760					█	█			<p><b>SST w/ CLST patches, incl., streaks Bioturbated</b></p> <p><b>SST:</b> med lt gry – med dk gry, clr – trnsl qtz, v f – f, wl srt, ang – sbrnrd, mod hd – hd, sil cmt, v glauc, mic, micropyr, arg – v arg</p> <p><b>CLST:</b> olv blk, mod hd, sltysdy, glauc, mic, micropyr, non calc</p>	No fluor, cloudy v wk bl – bl wh cut fluor
3761					█	█			<p><b>SST:</b> med lt gry – med dk gry, clr – trnsl qtz, v f – occ f, wl srt, and – sbrnrd, fri, wk sil cmt, tr calc cmt, v glauc, v mic lam,</p>	a.a.
3762									<p><b>CLST:</b> olv blk, mod hd, subfis, abd sdy streaks/patches, slty/sdy, glauc, mic, micropyr, com pyritised worm tubes, carb frags(plt remains), non calc</p>	No Shows in SST
3763					█	█			<p><b>SST / CLST bioturbated:</b></p> <p><b>SST:</b> med lt gry – med dk gry, clr – trnsl qtz, v f – f, wl srt, ang – sbrnrd, mod hd – hd, sil cmt, v glauc, mic, micropyr, arg – v arg</p> <p><b>CLST:</b> olv blk, mod hd, sltysdy, glauc, mic, micropyr, non calc</p>	No fluor, cloudy v wk bl – bl wh cut fluor
3764					█	█	█		<p><b>SST w/ CLST patches, incl., streaks Bioturbated</b></p> <p><b>SST:</b> med gry, clr – trnsl qtz, v f – f, wl srt, ang – sbrnrd, mod hd – hd, sil cmt, v glauc, mic</p> <p><b>CLST:</b> olv blk, mod hd, slty/sdy, glauc, mic, micropyr, non calc</p>	Tr v dull yel fluor, wk cloudy bl wh cut fluor
3765									<p><b>CLST:</b> olv blk, mod hd, subfis, abd sdy streaks/patches, slty/sdy, glauc, mic, micropyr, com pyritised worm tubes, non calc</p>	No Shows in SST
3766					█	█	█		<p><b>SST w/abd CLST patces/streaks/incl Bioturbated</b></p> <p><b>SST:</b> med lt gry – med gry, clr – trnsl qtz, v f – occ f, wl srt, ang – sbrnrd, mod hd – hd, sil cmt, abd glauc, mic, arg</p> <p><b>CLST:</b> a.a.</p>	Tr v dull yel fluor, wk cloudy bl wh cut fluor

cly slt vf f m c vc

# CONVENTIONAL CORE DESCRIPTION

<b>Country:</b> Norway	<b>Area:</b> Norwegian Sea	<b>Field:</b> Ellida- prospect
<b>Well no:</b> 6405/7-1	<b>Formation:</b> Nise Fm.	
<b>Core no:</b> 7	<b>Interval:</b> 3757-3784 mMD	<b>Cored:</b> 27m <b>Rec:</b> 26.15m 96.9%
<b>Core size:</b> 3 1/2"	<b>Geologists:</b> N.Townley, T.F.Kristensen	<b>Date:</b> 25.08.03

Depth (mRKB)	Lithology/Grain size cly slt vf f m c vc	APPEARANT DIP	Shows					Lithological Description	Remarks	
			STAIN	FLUOR	CUT	POOR	FAIR			GOOD
3767									<p><b>CLST:</b> olv blk, mod hd, subfis, slty/sdy, mic, slily glauc, micropyr, com pyritised worm tubes, non calc</p> <p><b>SST w/abd CLST patces/streaks/incl</b> <b>Bioturbated</b></p>	No Shows in SST
3768									<p><b>SST:</b> med lt gry – med gry, clr – trnsl qtz, v f – occ f, wl srt, ang – sbrnrd, mod hd – hd, sil cmt, abd glauc, mic, arg</p> <p><b>CLST:</b> olv blk, mod hd, slty/sdy, glauc, mic, micropyr, non calc</p>	Tr v dull yel fluor, wk cloudy bl wh cut fluor
3769									<p><b>SST w/abd CLST patces/streaks/incl</b> <b>Bioturbated a.a.</b></p>	Tr v dull yel fluor, wk cloudy bl wh cut fluor
3770									<p><b>CLST w/abd sdy streaks/patches/incl</b> <b>CLST:</b> olv blk, mod hd, subfis, slty/sdy, mic, slily glauc, micropyr, com pyritised worm tubes, non calc</p> <p><b>SST:</b> med lt gry – med gry, clr – trnsl qtz, v f – occ f, wl srt, ang – sbrnrd, mod hd – hd, sil cmt, abd glauc, mic, arg</p>	No fluor, v wk cloudy bl wh cut fluor
3771									<p><b>CLST w/abd sdy streaks/patches/incl</b> <b>SST w/abd CLST patches/streaks/incl</b> <b>Bioturbated</b></p>	a.a
3772									<p><b>SST:</b> med lt gry – med gry, clr – trnsl qtz, v f – occ f, wl srt, ang – sbrnrd, mod hd – hd, sil cmt, abd glauc, mic, arg</p> <p><b>SST:</b> med lt gry – med gry, clr – trnsl qtz, v f – f, occ med, wl srt, ang – sbrnrd, mod hd – hd, sil cmt, abd glauc, mic, micropyr, arg</p>	Tr v dull yel fluor, wk cloudy bl wh cut fluor
3773									<p><b>CLST w/ occ SST lenses/lams+ Bioturdation infills</b> <b>CLST:</b> dk gry, frm-hd, blk, micmic, micpyr, occ-abdt Glauc, mic:musc+biot, abdt pyr wrm tubules w/</p>	
3774									<p><b>SST:</b> med dk gry, clr, lt grn gry, dk gry qtz, vf-f, sbang-sbrnrd, w srt, gd hd silc, occ calc cmt + lt grn gry kaol mtx in infills, abdt glauc, mic+occ lt grn gry Felds laths.</p> <p><b>Bioturbated SST w/occ CLST clasts/original texture.</b></p>	No fluor, v wk cloudy bl wh cut fluor
3775									<p><b>Silicious CLST w/ SST lenses/lams+burrowed infills</b> <b>CLST:</b> dk gry, frm-hd, blk, micmic, micpyr, occ-abdt Glauc, mic:musc+biot, abdt pyr wrm tubules, silc, <b>grdg-&gt;intbd w/</b></p> <p><b>SST:</b> a.a arg, abdt glauc, crs mic, + kaol mtx i burrow infills.</p>	No Shows in SST
3776									<p><b>CLST w/ occ SST Lenses/Incls/Infills</b> <b>CLST:</b> a.a, silc, w/ abdt pyr wrm tubules. <b>SST:</b> pred lt grn gry kaol infills</p>	No Shows in SST

cly slt vf f m c vc

# CONVENTIONAL CORE DESCRIPTION

<b>Country:</b> Norway	<b>Area:</b> Norwegian Sea	<b>Field:</b> Ellida- prospect
<b>Well no:</b> 6405/7-1	<b>Formation:</b> Nise Fm.	
<b>Core no:</b> 7	<b>Interval:</b> 3757-3784 mMD	<b>Cored:</b> 27m <b>Rec:</b> 26.15m 96.9%
<b>Core size:</b> 3 1/2"	<b>Geologists:</b> N.Townley, T.F.Kristensen	<b>Date:</b> 25.08.03

Depth (mRKB)	Lithology/Grain size cly slt vf f m c vc	APPEARANT DIP	Shows					Lithological Description	Remarks	
			STAIN	FLUOR	CUT	POOR	FAIR			GOOD
3777									<p><b>CLST:</b>dk gry, frm-hd, blk, micmic, micpyr, occ-abdt Glauc, mic:musc+biot, abdt pyr wrm tubules, tr carb matl</p> <p><b>Silc CLST w/ thin SST lenses/lams</b></p>	No Shows in SST
3778									<p><b>CLST:</b>dk gry, gry blk, hd, blk, micmic, micpyr, f-crs mic;musc+biot, car, occ glauc, abdt linear pyr worm tubules, grdg-+lam w/ lenses</p> <p><b>SST:</b> a.a+lt med gry arg mtx, abdt glauc, crs mic:musc+biot, blk carb, occ lt grn gry weathered Felds Xls, occ lt grn gry kaol mtx in worn burrows.</p>	No fluor, v slw diff blu wh cut/Mud fluor?
3779									<p><b>CLST w/ SST lenses/lams+burrow infills, CLST often a/ drapes/clasts?</b></p>	No fluor, v slw diff blu wh cut/Mud fluor?
3780									<p><b>CLST w/ SST lenses/lams+burrow infills, CLST often a/ drapes/clasts?: a.a</b></p>	No shows in SST
3781									<p><b>Biotubated SST + CLST</b></p> <p><b>CLST:</b>dk gry, gry blk, frm-hd, splty, abdt mic, vf carb matl, v silc, w/ abdt_SST lenses/lams, often bioturbated causing bedding disruption+mixing</p> <p><b>SST:</b>clr, transp, lt grn gry, dk gry transl, vf-f, sbang-sbrnd, w srted, hd silc cmt, lt grn gry kao mtx, abdt glauc pellets, abdt crs mic.</p>	No shows in SST
3782									<p><b>Biotubated SST w/ CLST clast: a.a</b></p>	No shows in SST
3783									<p><b>SST w/ CLSTclasts or original texture. Very bioturbated.</b></p> <p><b>SST:</b>clr, transp, lt grn gry, dk gry transl, vf-f, sbang-sbrnd, w srted, hd silc cmt, lt grn gry kaol mtx, abdt glauc pellets, abdt crs mic.</p>	No fluor, v slw diff blu wh cut/Mud fluor?
3784									<p><b>CLST:</b> as original texture, disrupted by bioturbation or as rip up clasts: a,a</p>	

cly slt vf f m c vc

**SIDEWALL CORE DESCRIPTION**

Page 1 of 2

Country: Norway		Area: Norwegian Sea		Prospect: Ellida	
Well no: 6405/7-1 T2		Company: Statoil, Petero, Norske Shell, BP Norge, Conoco Phillips			
Hole size: 12 1/4 "		Geologist: Described by Reslab personnel, in laboratory		R.T.: 36 meters	
Run no.: 2A		Reference log: 1A TTRM-DSL-CN-ZDL-ORIT-XMACii-DLL-MLL		Date: 07.08.2003	
Shot no.	Depth (m RT)	Rec. (mm)	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.

29	2765		Mdst.M-gry/gnsh.W-consol.Vf-sd(gr).Frac.w/Glauc – Chlor.Lt-C,Musc,Biot.		
28	2766.5		Lost		
27	2769.5		Lost		
26	2772		Sst.Lt-gry/gnsh.Vf-gr.Ang/Sbang.Mod-Consol.Mod-srt.w/Cl, Chlor.Lt-C,Musc/Biot.Scat-Pyr.		
25	2774		a.a.Mod/W-srt.		
24	2776		Mdst.M-gry/gnsh.W-consol.Vf-sd(gr).w/Glauc_ Chlor.Lt-C,Musc,Biot		
23	2777.5		a.a. Lt-gry/gnsh.Incr-C.Scat-Pyr.		
22	2831		a.a. w/o-Pyr.		
21	2832		Lost		
20	2833		a.a.Decr-Sd(gr).Incr-Consol,Chlor.		
19	2871		a.a. Lam.		
18	2874		a.a. Incr-Lam.w/o-Sd.		
17	2876		Mdst.Lt-gry/gnsh.W-consol.Scs-Sd(vf-gr).ClLam.w/Glauc-Chlor.Lt-C,Musc,Biot.		
16	2878		a.a.w/o-Lam.Nod.		
15	2880.5		Silt/Sst.Lt-gry/gnsh.VF-gr(sd).VW-consol.Lam.Abd-Cl.w/Chlor.Lt-C,Mic.		
14	2887		a.a.Incr-Lam.		
13	2892		Sst.Lt-gry/gnsh.VF-gr.Ang/Sbang.W-Consol.Mod-srt.w/Cl, Chlor.Lt-C,Mic		
12	2909		Clst.M-gry/gnsh.W-consol.		

**SIDEWALL CORE DESCRIPTION**

Page 2 of 2

Country: Norway		Area: Norwegian Sea		Prospect: Ellida	
Well no: 6405/7-1 T2		Company: Statoil, Petro, Norske Shell, BP Norge, Conoco Phillips			
Hole size: 12 ¼ "		Geologist: Described by Reslab personnel, in laboratory		R.T.: 36 meters	
Run no.: 2A		Reference log: 1A TTRM-DSL-CN-ZDL-ORIT-XMACii-DLL-MLL		Date: 07.08.2003	
Shot no.	Depth (m RT)	Rec. (mm)	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.

11	2921		Mdst.Lt-gry/gnsh.W-consol.Scat-Sd(vf-gr).Cl-Lam.w/Glauc-Chlor.Lt-C,Musc,Biot		
10	2930		a.a.Decr-Sd(gr).		
9	2937		Clst.M-gry/gnsh.W-consol.		
8	2961		a.a		
7	2971		Mdst.Lt-gry/gnsh.W-consol.Scat-Sd(vf-gr).Cl-Lam.w/Glauc-Chlor.Lt-C,Musc,Biot		
6	2992		a.a. Incr-Consol,Lam.		
5	3024		Clst.M-gry/gnsh.W-consol.		
4	3046		Silt/Sst.Lt-gry/gnsh.VF-gr(sd).VW-consol.Lam.Abd-Cl.w/Chlor.Lt-C,Mic.		
3	3064		Clst.M-gry/gnsh.W-consol.		
2	3132		Mdst.Lt-gry/gnsh.W-consol.Lam.w/Glauc_ Chlor.Lt-C,Musc,Biot		
1	3174		Lost		

**SIDEWALL CORE DESCRIPTION**

Country: Norway		Area: Norwegian Sea		Prospect: Ellida	
Well no: 6405/7-1 T2		Company: Statoil, Petero, Norske Shell, BP Norge, Conoco Phillips			
Hole size: 8 ½"		Geologist: Described by Reslab personnel, in laboratory		R.T.: 36 meters	
Run no.: 3B		Reference log: 1A TTRM-DSL-CN-ZDL-ORIT-XMACii-DLL-MLL		Date: 05.09.2003	
Shot no.	Depth (m RT)	Rec. (mm)	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.

4292.50	Siltst. Lt-gry. W/VF-gr. w/Calc. Lt-Cl,Mic.
4247.00	a.a.Lt- Glauc.Decr-Cl.
4246.00	a.a. Incr-Glauc, Decr-Calc.
4245.30	a.a.Lt-Calc,w/Glauc. Tr-C.
4189.50	MISSING
4189.00	a.a.Decr-Calc.Lt- Glauc.Incr-Mic. w/o-C.
4171.00	a.a.Incr-Calc,Glauc.Tr-C
4167.50	a.a.Decr-Calc,Glauc,Cl,Mic.w/o-C
4166.50	a.a.Frac.Tr-Calc.
4114.00	MISSING
4107.00	MISSING
4099.0	MISSING

Toolfailure. Not able to drill more than 12 of 29 SWC. Recovered 8.