CONFIDENTIAL

REPORT
Hydro Oil & Energy
Operations

Title:	**Final Well Report 35/2-1, Peon**	No.	:	
		Rev.	:	
		Page	:	A-1 of 35
		Date	:	06.04. 2006

Final Well Report 35/2-1, Peon

Licence	**PL-318**
Drilling permit	**1098-L**
Abandonment Date	**28.08.2005**

LIST OF CONTENTS

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Approved by: Jan Reidar Johnsen, Manager Operations Geology Sign:

TABLE OF CONTENTS

List of figures and tables

Summary of Well Data

LOCATION:	Geo: "61 53' 26,68"" N" "3 20' 34,36"" E" UTM: 6 862 221,3 mN 518 024,2 mE ED 50, UTM Zone31
OPERATOR: RIG: CONTRACTOR:	Hydro ASA Deepsea Trym Odfjell Drilling
KB ELEVATION (to MSL): WATER DEPTH (MSL):	25m 384m
START OF OPERATION: WELL SPUDDED: REACHED TD: OFF LOCATION: STATUS: FORMATION AT TD:	20.07.2005 21.07.2005 14.08.2005 28.08.2005 P&A Naust Fm.
Drilling depths (MD):	36” 409,0 m to 483,0 m 17 1/2” 483,0 m to 543,0 m 12 ¼” 543,0 m to 561,0 m 8 ½” 561,0 m to 713,0 m
Casing / Liner depths:	30” 409,0 m to 482,8 m 13 3/8” 409,0 m to 539,0 m 9 5/8” 486,0 m to 560,0 m Liner

0 SECTION A: GEOLOGY, GEOPHYSICS AND PETROPHYSICS

0.1 Objectives

Well 35/2-1 is an exploration well and will test the Peon prospect in PL318 (Figure 0.1). The target of the well is a Pleistocene glaciofluvial / glaciomarine sandbody. The Peon Prospect Model was defined based on its relationship with a regional angular unconformity, an important boundary formed by glacier ice, separating steeply dipping Pliocene strata from sub-horizontal strata of Pleistocene age.

The primary objectives were to test the presence- and type of hydrocarbons in the Pleistocene glacial deposits of the Peon prospect in western part of the 35/2 block to the west of the Agat discovery.

The chosen location was designed to test the Peon prospect close to the apex of a mound structure, in an area where there was good HC indication and leaving acceptable updip volumes. As a secondary objective, the underlying dipping R116 unit clinoform was to be penetrated to check for hydrocarbons.

0.2 Licence owners

Production License 318 was awarded by Royal Decree, the 18th of June 2004 with Norsk Hydro ASA as the operator.

The license percentage share of PL-318 is as follows:

Petoro AS	20.000000
Idemitsu Petroleum Norge AS	20.000000
Norsk Hydro Produksjon AS	60.000000

0.3 Results

The well was spudded 22nd July 2005 and reached a total depth of 713 m MD RKB in the Naust Fm. 14th August 2005.

The well proved commercial hydrocarbons; gas was observed in the target Peon sands from 576m to 608m. The Peon reservoir was encountered within the defined reservoir interval. From logs and MDT pressure test results, a gas / water contact was found at 595m TVD RKB giving a 18m thinner hydrocarbon column than expected.

The discovery scenario wireline logging programme was accomplished, but the sidewall coring logs were not successful as the reservoir sands were unconsolidated: Four sidewall cores out of 39 were recovered and comprised mainly clay from below the Peon sand.

The well was temporarily plugged and abandoned as a discovery well on the 28th August 2005.

Location Map

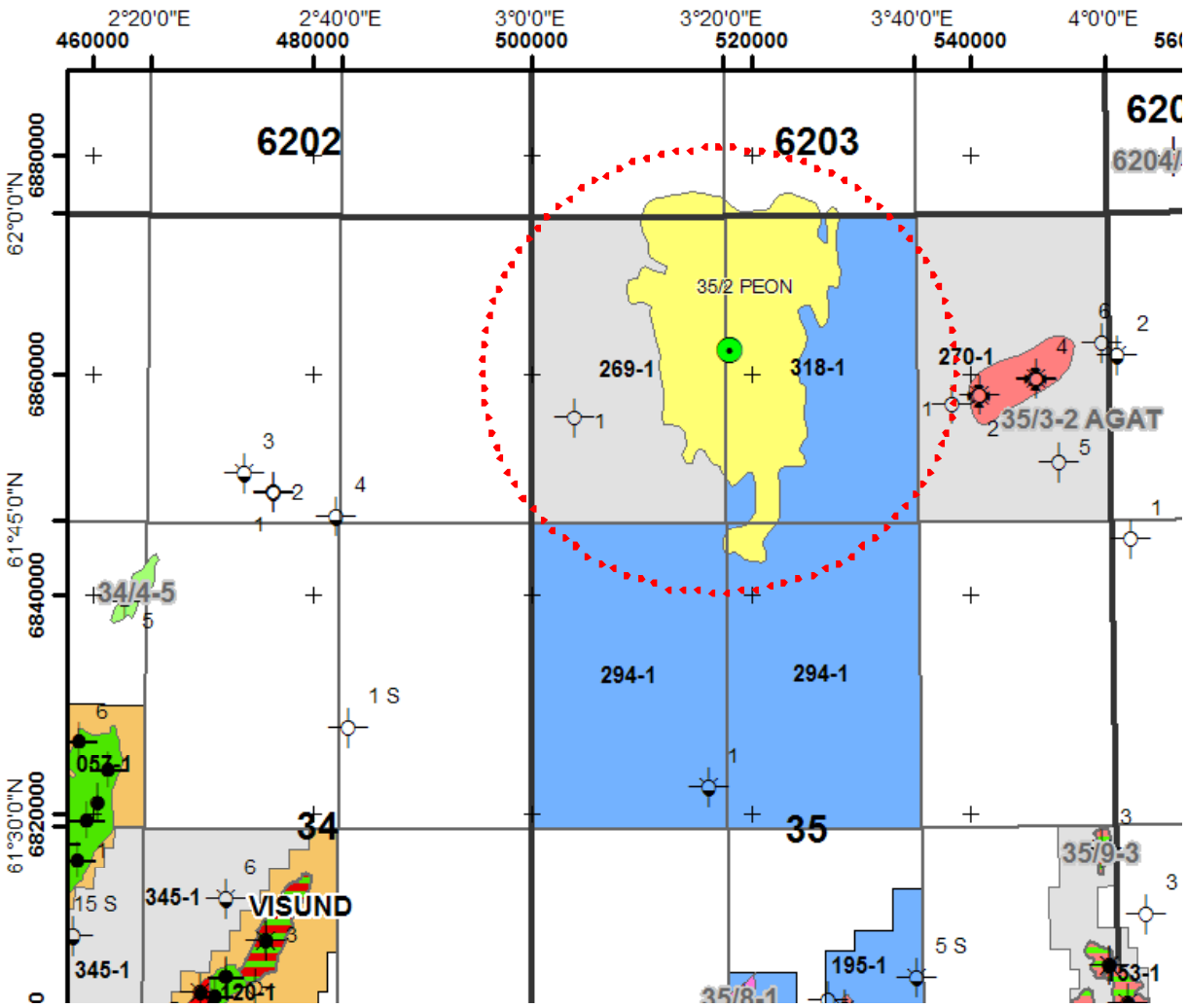


Figure 0.1 Location Map

Geological Summary

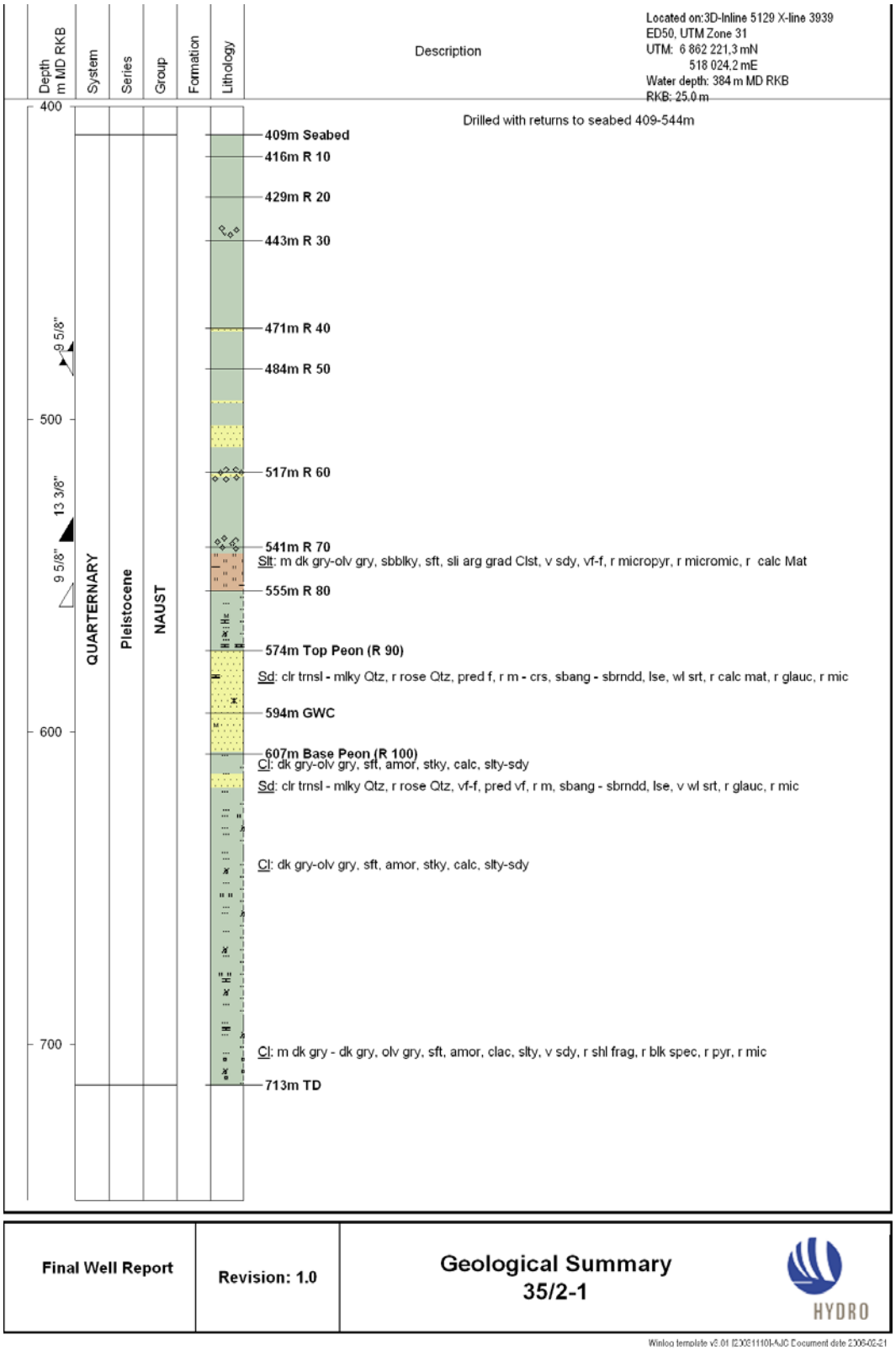


Figure 0.2 Geological Summary

Data Acquisition

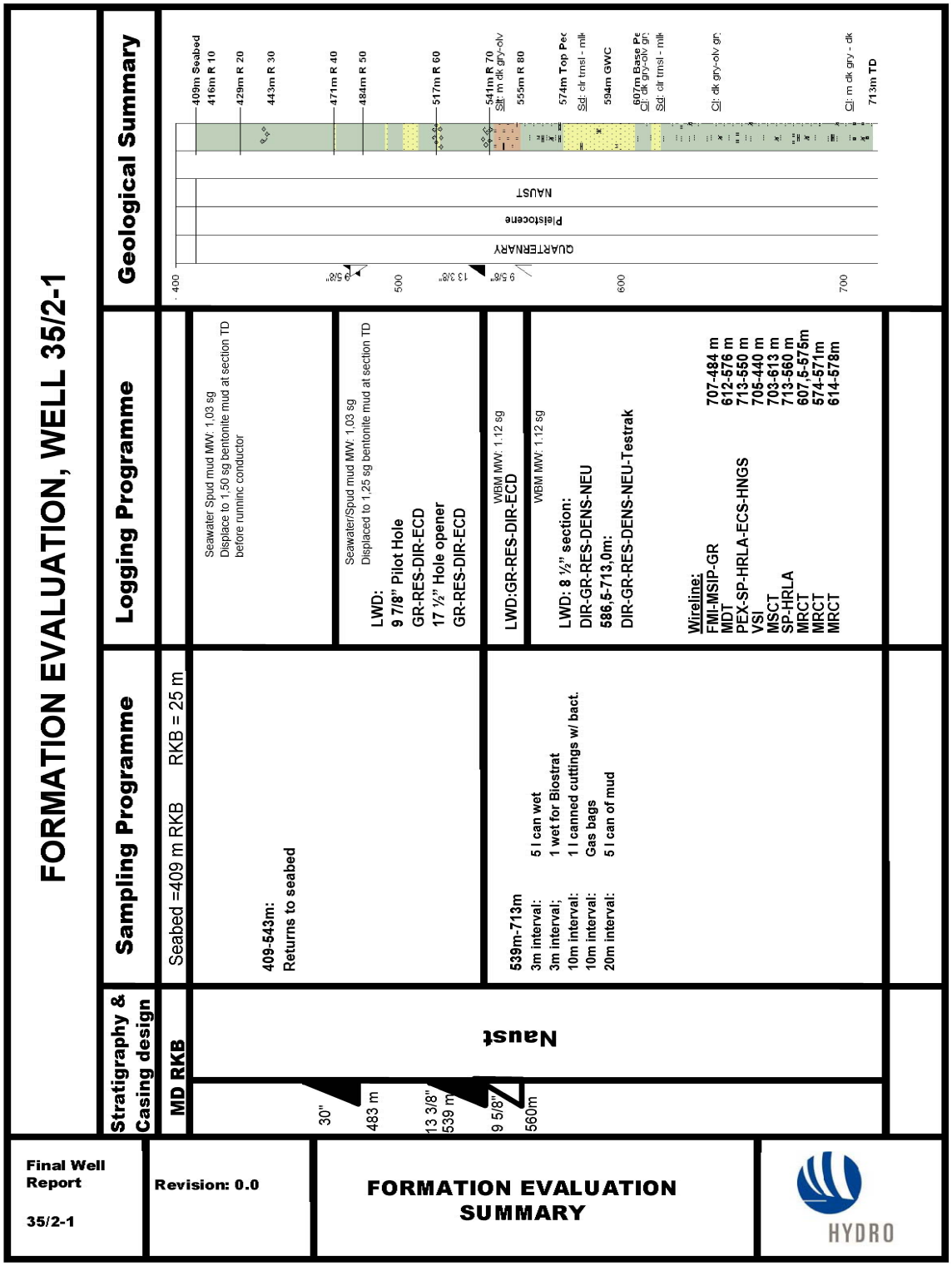


Fig. 0.3 Data Aquisition Summary

Logging table. MWD / LWD / Wireline

Run	Hole diam	Log type	Interval logged	Comments
		MWD / LWD		
1|	9 7/8	GR-RES-ECD-DIR	409,0 - 544,0 m	Pilot
2	36	GR-RES-ECD-DIR	409,0 - 463,0 m	Hole opener – broken drill string
3	36	GR-RES-ECD-DIR	409,0 - 483,0 m	Respud
4	17½	GR-RES-ECD-DIR	483,0 - 543,0 m	Section TD
5	12¼	GR-RES-ECD-DIR	543,0 - 561,0 m	Section TD
6	8½	GR-RES-ECD-DEN-NEU-TesTrak	561,0 - 586,0 m	LWD failure
7	8½	GR-RES-ECD-DEN-NEU-TesTrak	586,0 – 713,0 m	TD
		Wireline Logging		
		TD logging		
1A	8½	FMI-MSIP	484,0 - 707,0 m	
1A	8½	MDT	576,0 - 612,0 m	Pressure points and samples. Got stuck; skipped 3 deepest pressure points
1A	8½	SP-HRLA-PEX-ECS	550,0 - 709,0 m	HRLA failed
1A	8½	VSI	430,0 – 612,0 m	Station every 10m
1A	8½	MSCT	613,0 – 703,0 m	Tool failure. 8 cores, 3 “recovered”
1B	8½	SP-HRLA	560,0 – 709,0 m	HRLA rerun
1B	8½	MRCT	575,0 – 607,5 m	23 cores, 1 recovered
1C	8½	MRCT	571,0 – 574,0 m	3 cores, 0 recovered
1D	8½	MRCT	578,0 – 614,0 m	5 cores, 0 recovered

Table 0.1 Logging table. MWD / LWD / Wireline

Sidewall coring table

Depth.:	Depth	Recovery	Lithology
1	703	No	
2	698	Yes	Cly
3	693	No	
4	688	Yes	Cly
5	683	No	
6	617	No	
7	616	No	
8	613	Yes	Cly
9	607.5	Yes	Cly
10	607	No	
11	605	No	
12	602.5	No	
13	601	No	
14	599	No	
15	597	No	
16	595	No	
17	593	No	
18	592	No	
19	590	No	
20	589	No	
21	587.5	No	
22	586	No	
23	584	No	
24	583	No	
25	582	No	
26	581	No	
27	580	No	
28	579	No	
29	578	No	
30	576.5	No	
31	575	No	
32	574	No	
33	572	No	
34	571	No	
35	614	No	
36	612	No	
37	610	No	
38	609	No	
39	578	No	

Table 0.2 Sidewall Cores

1 GEOPHYSICAL AND GEOLOGICAL EVALUATION

1.1 Geophysical evaluation

Peon is *de facto* a shallow gas feature, however the following three key features transformed it into Hydro's first shallow gas discovery:

1. Structural four-way closure
2. Mounded morphology with a large volume potential
3. Distinct velocity push-down and AVO anomaly (AVO class III and IV)

The Peon Prospect Model was defined based on its relationship with a regional angular unconformity, an important boundary formed by glacier ice, separating steeply dipping Pliocene strata from sub-horizontal strata of Pleistocene age. As the seismic data indicates that Peon was deposited above the unconformity (being younger), strongly suggests that it was deposited in a glacial or glacial-marine environment, probably as a drumlin (sub-glacial) or as an outwash delta ridge (in front of a former glacier).

The Peon prospect was regarded as a huge sand depo-centre prior to drilling. Enormous quantities of well-sorted Eocene-to-Oligocene sands were available, outcropping 15-30 kilometres to the east and southeast at the time of deposition, and most likely transported by sub-glacial water and deposited in front of the glacier.

1.1.1 Seismic Data Analyses

The various geophysical observations prior to drilling suggested a high probability for Peon being a gas-filled sand with good reservoir properties:

"Bright Spot": - The prospect is characterized by a distinct seismic amplitude anomaly and well-defined phase-reversals towards east and west (Figure 3-1).

Class IV AVO anomaly: - The pre-stack analyses show a distinct AVO class IV anomaly at top and base of the reservoir interval. The seismic anomaly defining the prospect reflects a low acoustic impedance, low Vp/Vs and low acoustic velocity (Vp) body, typical for gasbearing sediments.

High porosity and high gas saturation: - A manual inversion study performed by Hydro in order to estimate the densities within the prospect showed that the estimated Peon densities are typically significantly lower than the 1.80 g/cc expected for 36% porosity and 80% gas saturation. The surprising results suggest that the calculations are based on incorrect assumptions and that significant changes must be made to the assumptions in order to produce realistic density estimates. Thus, to the best of our knowledge, the Peon anomaly appears to be consistent with high porosity and high gas saturation.

Velocity effects: - Velocity pushdown-effects and frequency-reduction are observed below

the prospect and acoustic masking within the thicker part of the prospect are convincing evidences for the presence of gas.

Lack of "flat spot": - In the pre-drilled prospect model the whole reservoir body within the amplitude anomaly was completely filled with gas, explaining the lack of flat spot.

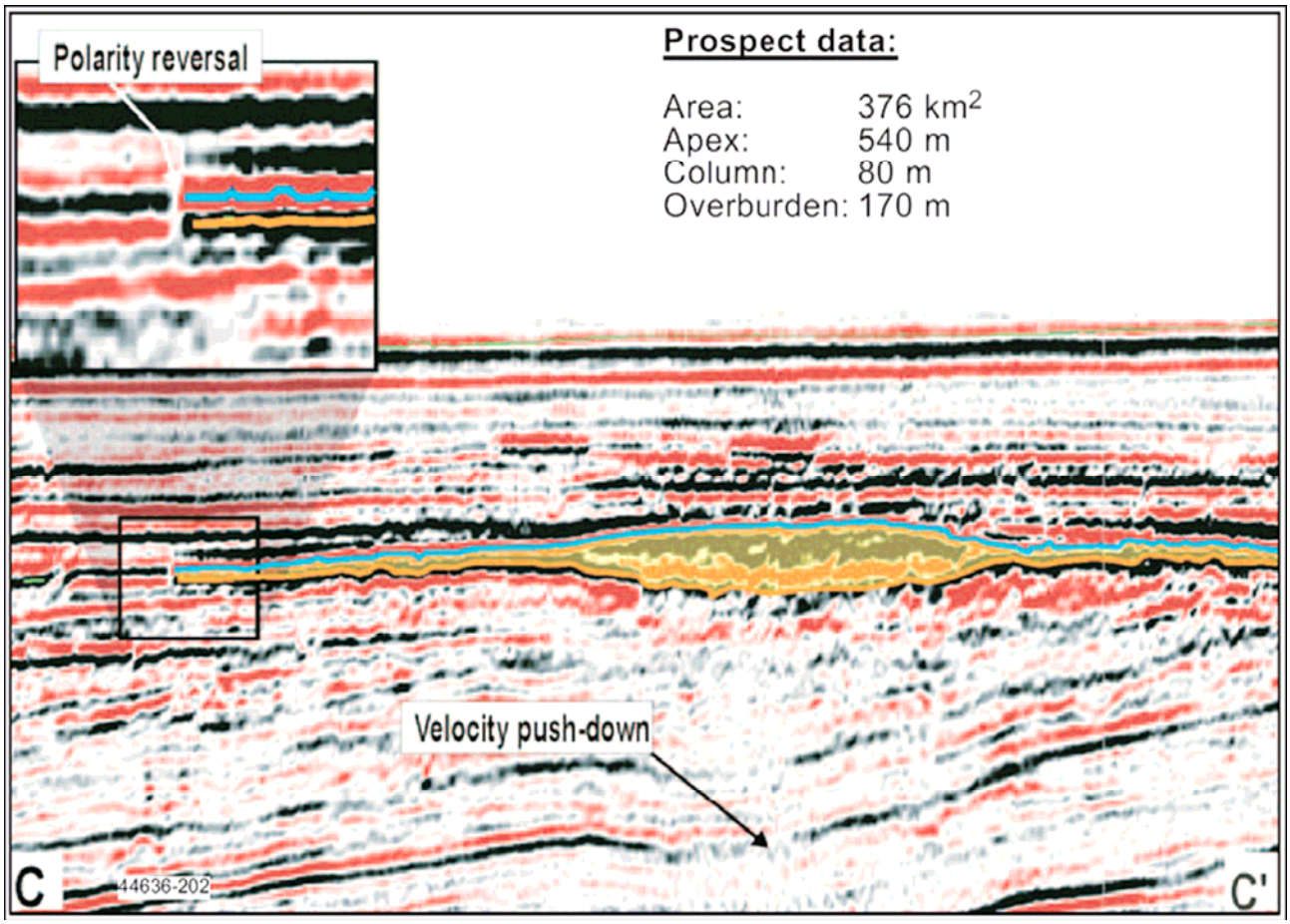


Figure 1-1. The Peon prospect shows every sign of shallow gas: Anomalously high amplitude, phase reversed reflections (bright spot), allied to a number of other characteristics, such as acoustic masking within and below, velocity push-down, structural closure, frequency reduction. No basal flat spot is observed, which prior to drilling was explained as a down-to situation (i.e. the prospect was completely filled with gas).

1.1.2 Seismic Prognosis compared with actual results

The pre-drill depth prognosis was reasonably good but with a consistent trend towards reflectors and contact being observed 0.5 to 13.5 m (increasing with depth) shallower than anticipated in the well area. This has been corrected by the post-drill depth conversion. Structural apex was encountered as expected. The GWC at 568 m MSL was 58 m shallower than the anticipated spill, while top of the reservoir section came in 2 m shallower than anticipated.

In terms of seismic interpretation, most reflectors in the Quaternary succession occurred as

anticipated (i.e. within the uncertainty bracket), and with the same approximate vertical separations as suggested before drilling. R116 (intra-Pliocene?) was outside the prognosis, appearing 13,5 m shallower than expected. The relatively large error is most likely caused by unexpectedly low reservoir velocity and the occurrence of a thin sand layer immediately below the main sand reservoir, also adding low velocities to the system.

	Expected	Actual
Phase	Gas	Gas
GOIP	53.5 GSm^3	36 GSm^3
Apex	544 m MSL	544 m MSL
Top res in well	551±6 m MSL	549 m MSL
GDT	588±7 m MSL	
GWC		568 m MSL
HC column in well	37 m	19 m

Table 1-1. Pre-drill prognosis compared with actual results from Well 35/2-1.

1.1.3 Synthetic seismogram and well tie

3D seismic exploration data are usually not suited for detailed analysis of shallow geological features, because of the typically large and variable near offset distances and low fold, and the sometimes reduced seismic resolution due to NMO-stretch. Highresolution 2D seismic (intended for site surveys) are designed for studying shallow features, and thus much better suited for seismic-to-well tie for the Peon discovery.

The quality of a seismic-to-well tie depends on the quality of both the seismic data and the well logs. A near offset seismic-to-well tie requires P-velocity and density logs, while additional S-velocity data are needed for far offset (AVO) ties.

All logs required for seismic-to-well ties are available for the Peon discovery well 35/2-1. Figure 1-2 shows the P-velocity, S-velocity, density, computed P-impedance, computed Vp/Vs ratio and resistivity logs, as well as the estimated lithology and saturation logs.

The high and low gas saturation parts of the reservoir are clearly visible in the P-velocity log. There is no contrast in P-velocity across the GWC (i.e. free water level), with logged values close to 860m/s for both the high gas saturation zone (above the GWC) and the low gas saturation zone (below the GWC). The P-velocity jumps to around 1800m/s in the brine sand below the low gas saturation zone.

The logged S-velocities are around 500m/s for the entire sand unit, with a variation of about +/-40ms, with the expected slightly higher values in the high gas saturation zone (because of the density effect), but no contrast at the base of the low gas saturation zone.

The logged densities (the black density curve in Figure 1-2) are clearly influenced by fluid invasion during drilling; the expected large increase in density at the GWC is barely visible. The red density curve in Figure 1-2 shows the results of Gassman fluid substitution back to the estimated *in-situ* properties, giving the expected significant increase in density at the GWC. A shallower increase in density in the middle of the high gas saturation zone is probably related to a change in porosity (and saturation as a second order effect), as there are no indications of significant changes in mineralogy though the reservoir.

The P-velocity and fluid substituted density logs have been used for seismic-to-well tie to the near offset version of site survey line NH0473-101, and the initial zero phase peak polarity wavelet was extracted from the near offset seismic data. Two contrasts completely dominate the P-impedance log; the top of the reservoir and the base of the low gas saturation zone.

The initial seismic tie is shown in Figure 1-3, after alignment of the top of the Peon reservoir. The red trace is the near offset seismic trace at the well location, and the blue trace is the synthetic response to contrasts in the P-impedance log. Note that the TWT thickness according to the logged P-velocities (~860m/s) does not match the seismic TWT thickness of the high and low gas saturation reservoir. The seismic TWT thickness suggests an average P-velocity of ~950m/s.

Figure 1-4 displays the final seismic-to-well tie after alignments of the reflections from the top of the reservoir and the base of the low saturation zone. The updated P-velocity log is shown in red. A wavelet phase rotation of -40deg. produces a symmetrical synthetic-to-real cross-correlation function for the time window 720-800 ms, and thus the near offset data appear to be about -40deg. from zero phase peak polarity. (The reflection from the top of the reservoir has been excluded from the phase estimation exercise since it sits so close to the start of the logs. Including the top reflection gives a phase deviation of about -10deg.). Note that a weak positive reflection is expected for the GWC.

In Figure 1-5 the P-impedance log is added to the near offset seismic section. A weak positive reflection coincides with the GWC at the well location. Where visible and continuous, this event appears to be parallel to the base reflection, and this is as expected for the GWC reflection since the P-velocity does not change across the GWC. The soft reflection from the top of the reservoir does not appear to be completely symmetrical, matching the phase prediction from the seismic-to-well tie.

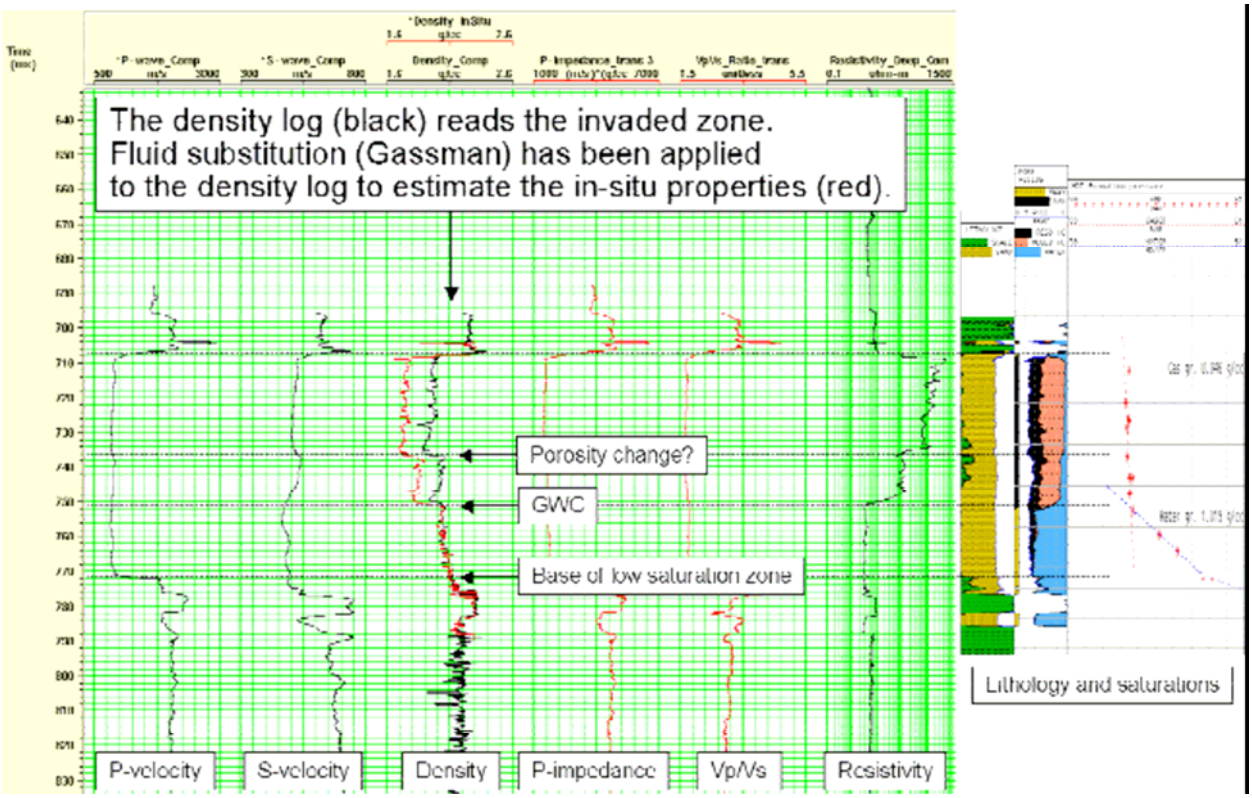


Figure 1-2. 35/2-1 well logs: P-velocity, S-velocity, density, computed P-impedance, computed Vp/Vs ratio and resistivity, as well as the estimated lithology and saturation logs. The red density curve shows the results of Gassman fluid substitution back to the estimated in-situ properties, giving the expected significant increase in density at the GWC.

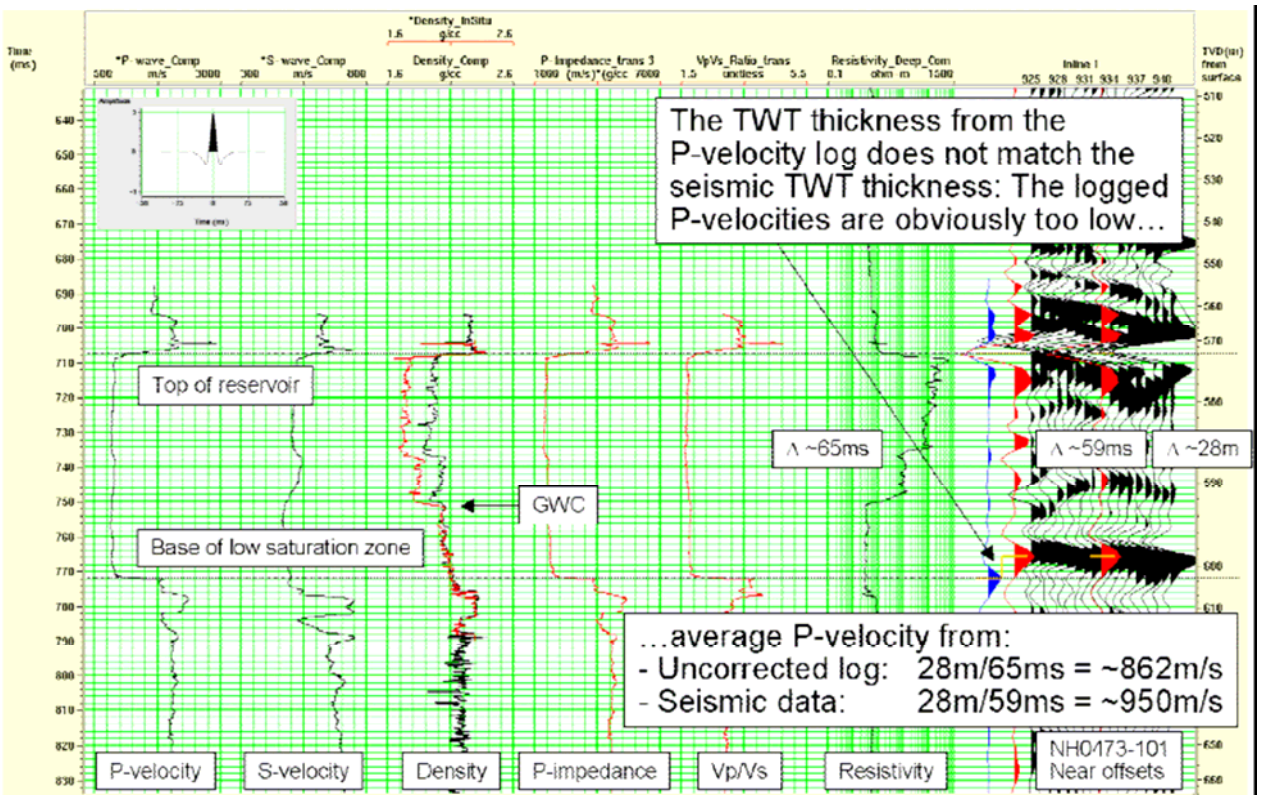


Figure 1-3. Initial NH0473-101 near offset seismic-to-well tie, after alignment of the top of the reservoir. Synthetic trace in blue, near offset seismic trace at the 35/2-1 well location in red. Zero phase peak polarity wavelet extracted from the data. Note the initial miss-tie for the reflection from the base of the Peon anomaly.

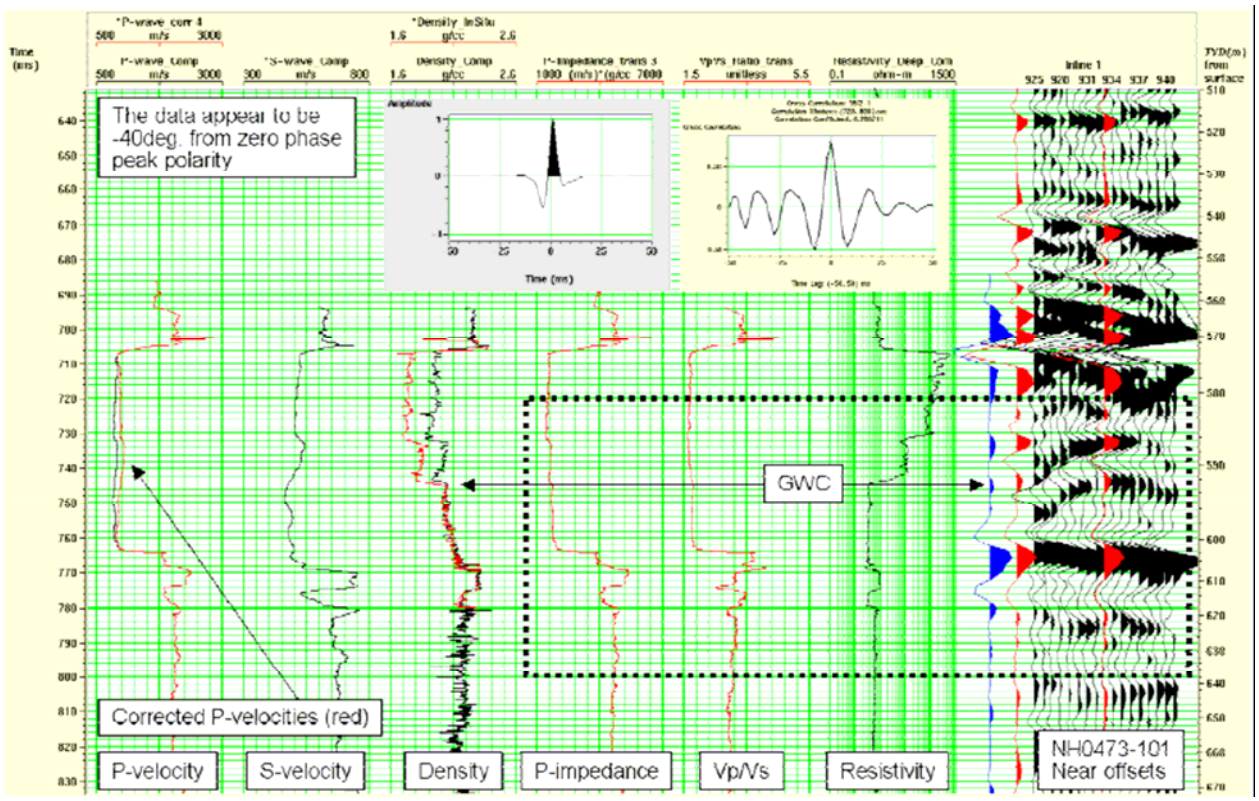


Figure 1-4. Final NH0473-101 near offset seismic-to-well tie. Updated P-velocity log in red. A wavelet phase rotation of -40deg. produces a symmetrical synthetic-to-real cross-correlation function for the time window 720-800ms. Note that a weak positive reflection is expected for the GWC.

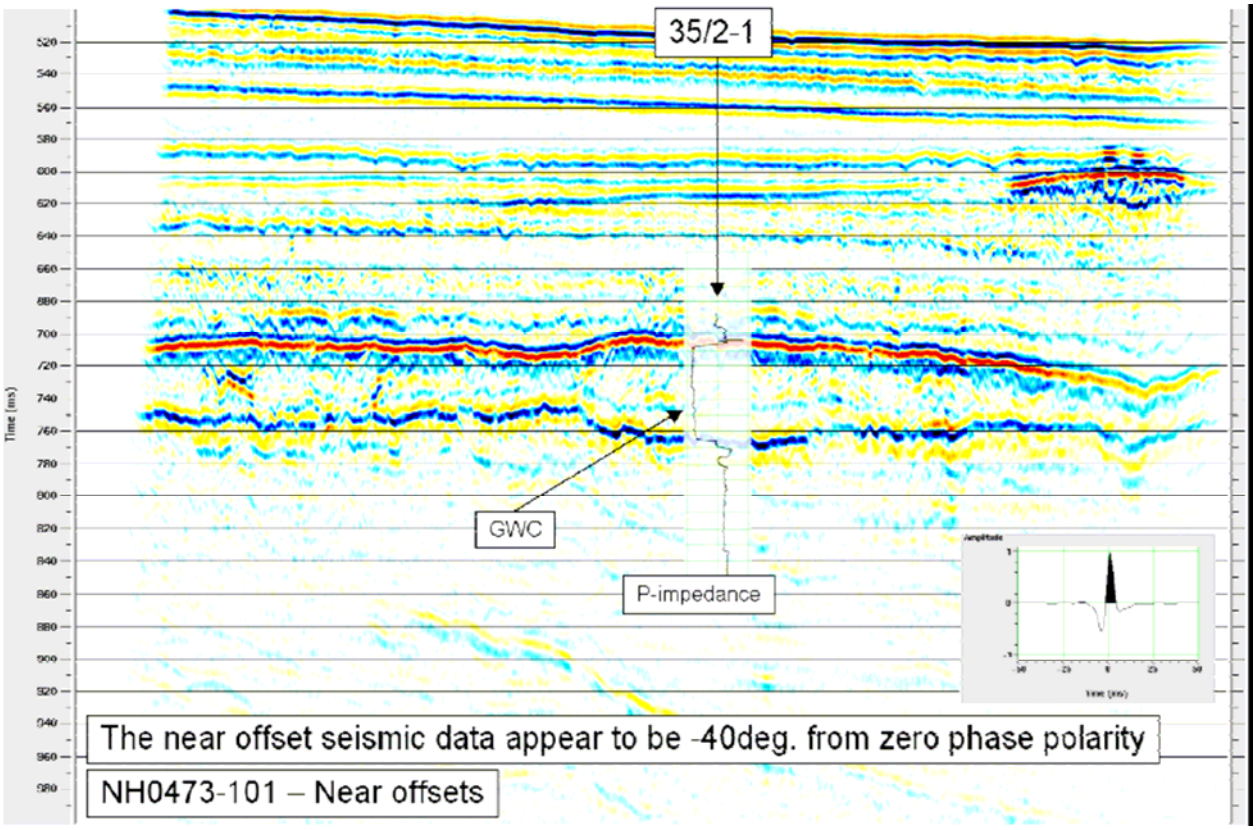


Figure 1-5. High-resolution survey NH0473-101 near offset seismic section. Red colours represent negative values. P-impedance log inserted at the 35/2-1 well location. A weak positive reflection coincides with the GWC at the well location. The soft reflection from the top of the reservoir does not appear to be completely symmetrical, matching the phase prediction from the seismic-to-well tie.

1.2 Geological evaluation

For a thorough description of the geological evaluation based on structural and geomorphological features, please refer to Peon Discovery Report (Rep. No. NH-01201242)

1.2.1 Lithostratigraphy

The lithostratigraphic breakdown for well 35/2-1 is shown in table 1-2 and figure 1-6.

GROUP	FORMATION	MEMBER	SERIES/SUB-SERIES	DEPTH (m MD RKB)
Nordland	Naust T		Holocene/Pleistocene	409
		Middle to Late Pleistocene sand		493
	Naust S			484
	Naust U			562
		Peon sand		574
		Middle to Early Pleistocene sand		613
	Naust N		Pliocene	618

The Naust A Fm is missing in the well.

Table 1-2. Lithostratigraphic breakdown of Well 35/2-1

1.3 Lithostratigraphic Summary

This summary is compiled predominantly from ditch cuttings and core descriptions.

Wire-line and MWD logs were used to aid lithological interpretation and the placement of formation boundaries.

The well was drilled with returns to seabed from the sea floor at 393,5 m MD to 479 m MD before setting the 20” casing at 476,2 m MD. For details on sampling descriptions see attached Completion log.

1.4 Naust Group (409 – 713 m MD)

Undifferentiated Naust (409 – 713 m MD)

409-543 m MD: Clays with occasional sands and boulders

Returns to seabed, interpretation based on MWD logs and drilling parameters.

Clay with boulders: 439-441m, sand: 471-472m and sand: 506-512m

543-569 m MD: Sandy silt grading to clay

Silt: medium dark grey to olive grey, sub blocky, soft, slily argillaceous grading to Clay, very sandy: very fine to fine, rarely micropyrittic, rarely micromicaceous, rare calcareous material.
Clay: medium dark grey to olive grey, very soft, plastic to sticky, soluble, non calcareous, commonly sandy, slightly silty.
Sand : clear to translucent quartz, rare lithic fragments, fine to coarse, predominantly medium to fine, angular to occasionally rounded. predominantly subangular, subspherical, poorly sorted, loose, trace shell fragments, rarely micaceous.

569-574 m MD: Sandy and silty clay

Clay: olive grey to light olive grey to medium light grey, very soft, sticky, soluble, amorphous and moderate to slily calcareous, silty and very sandy.
Sand: clear translucent Quartz, rare lithic Fragments, fine to medium, occasional coarse, predominantly fine to medium, angular to sub rounded, occasional polish, sub spherical, poor to moderate sorted, loose, Pyrite, rare Shale Fragments, rare Micaceous.
Limestone: very light grey, firm. moderate hard, friable, partly chalk, poor crypto to micro crystalline.

574-608 m MD: Sand

Sand: clear translucent to milky Quartz, rare rose Quartz, predominant fine, rare medium to coarse, sub angular to sub rounded, loose, well sorted, rare calcareous material, rare glauconitic, rare micaceous.

608-615 m MD: Clay

Clay: dark grey to olive grey, sub blocky, soft, amorphous, sticky, calcareous, silty to sandy.
615-619 m MD: Sand
Sand: clear translucent to milky Quartz, rare rose Quartz, predominant very fine to fine, predominantly fine, sub rounded, loose, well sorted, trace glauconitic, trace micaceous

619-713 m MD: Clay

Clay: dark grey to olive grey, sub blocky, soft, amorphous, sticky, calcareous, silty to sandy, rare micaceous, rare pyretic, rare shell fragments.

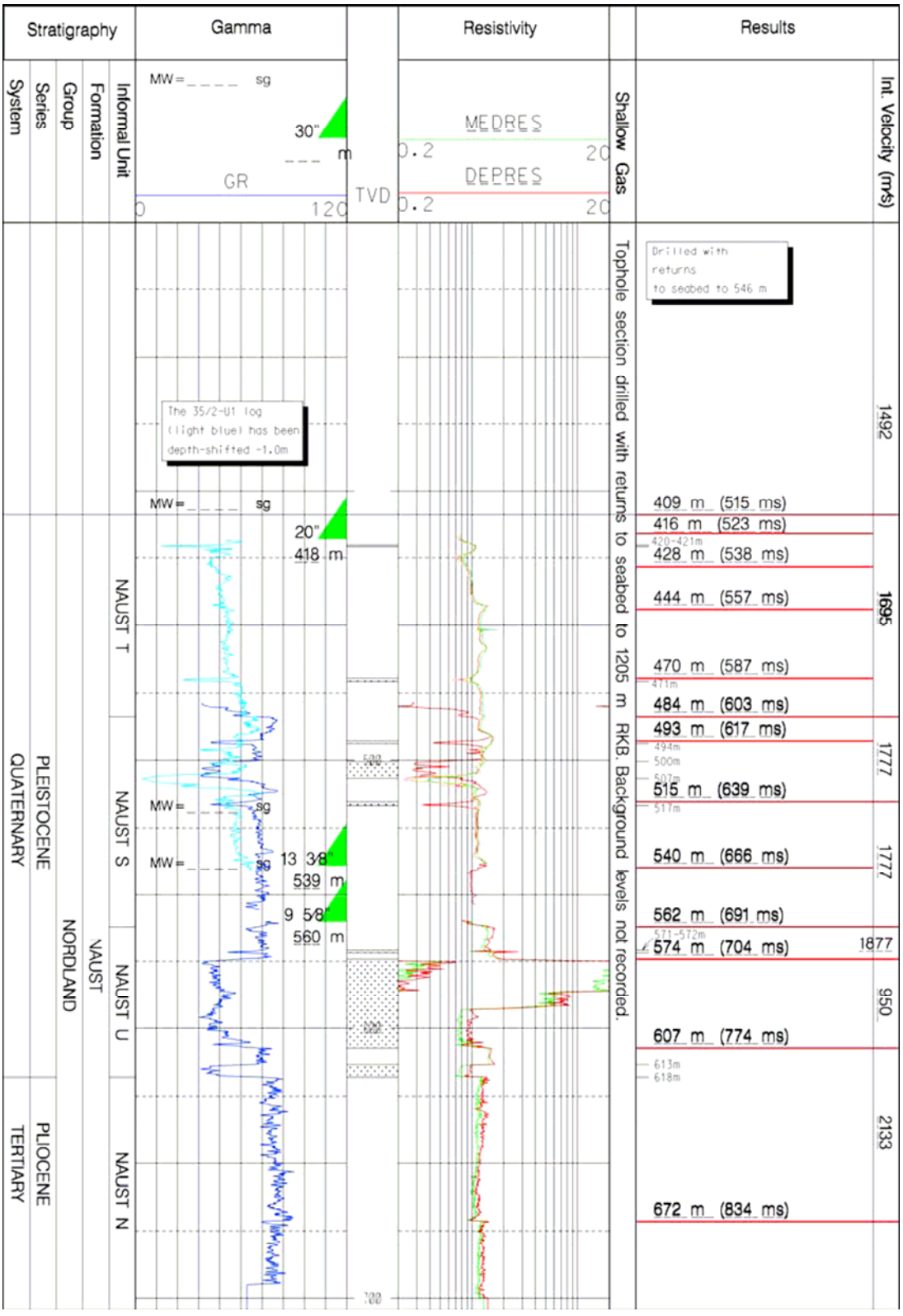


Figure 1-6. Lithostratigraphic breakdown of Well 35/2-1. All depths in m MD RKB

2 Biostratigraphy

2.1 Summary

A biostratigraphic study was initiated in order to estimate age, paleoenvironmental conditions and climate during deposition of sediments recorded in well 35/2-1, drilled to penetrate the Peon reservoir. Four sidewall cores and 57 ditch cuttings samples from the interval 546 -713 m MD RKB were prepared and analysed quantitatively for palynology and micropaleontology, and the results are presented in report 2005/69 from GEUS; “Biostratigraphy and paleoecology of well 35/2-1, Dinoflagellate cysts and foraminiferal faunas” (Poulsen and Juul Larsen, 2005).

Based on the results, an age ranging from middle Early to Middle Pleistocene could be suggested.

Throughout the Pleistocene series of glacials and interglacials have affected the Norwegian continental margin with ice-streams, channel systems and change of depositional areas. During the last 0.5 Ma the Norwegian Channel was location of a fast moving ice-stream during glacial periods (Sejrup et al., 2000).

The Peon prospect is a result of such processes. The reservoir sediments are deposited immediately above an angular unconformity reflecting the extensive erosion caused by fast ice movements. The Peon reservoir consists of sub-glacial sediments, transported below the ice and deposited at the ice margin.

The results are presented in figure 2.1.

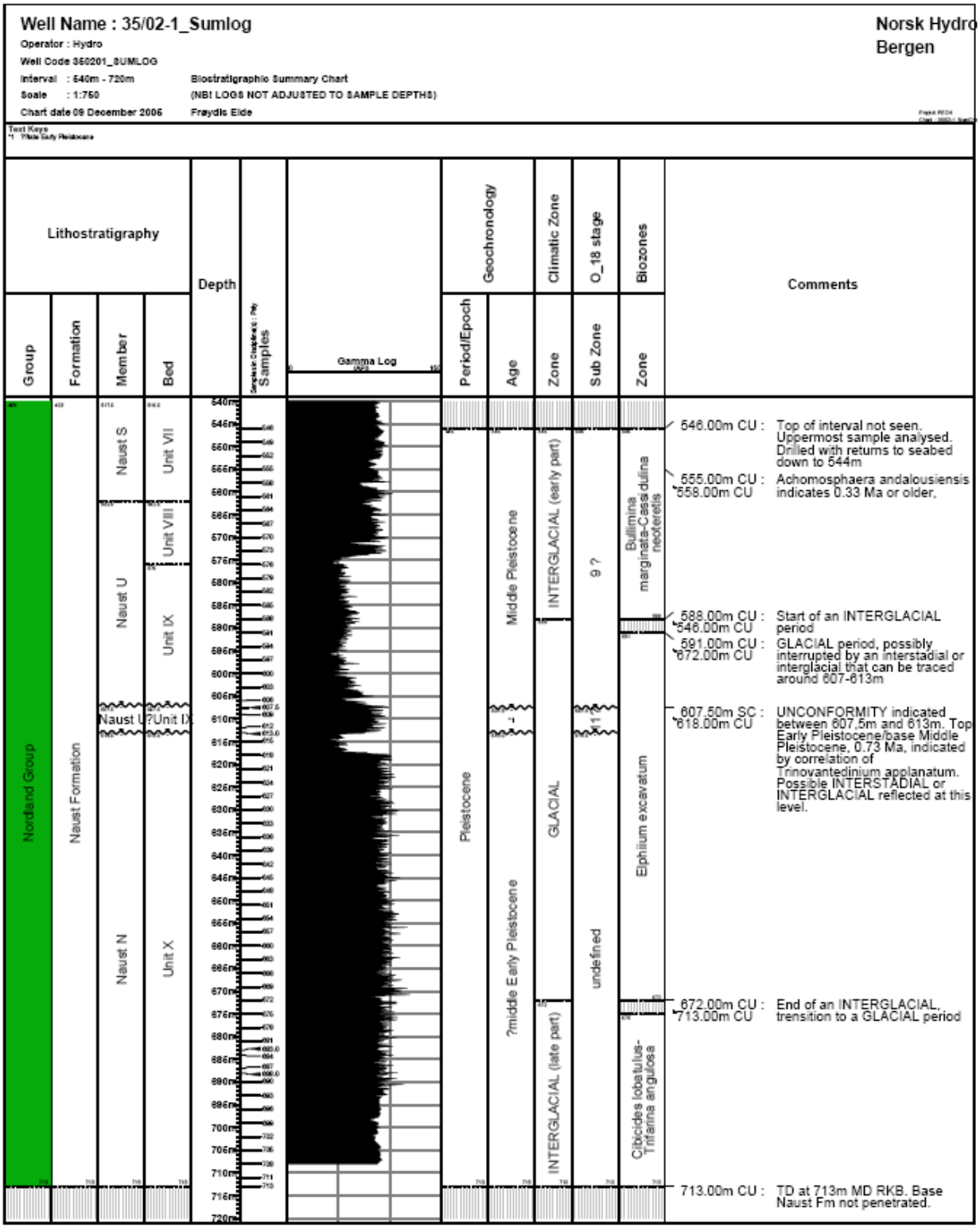


Figure 2.1 Biostratigraphic summary chart

3 Petrophysical evaluation

3.1 Log data acquisition and quality

3.1.1 LWD Logs

Baker Hughes INTEQ provided the MWD/LWD services for the well 35/2-1, according to Table 3-1. The data are of good quality

Run	Section	Sensors	Interval logged (MD RKB)	Comments
1	9 7/8	GR-RES-ECD*DIR	409.0 - 544.0 m	Pilot
2	36	GR-RES-ECD-DIR	409.0 - 463.0 m	Hole opener – broken drill string
3	36	GR-RES-ECD-DIR	409.0 - 483.0 m	Respud
4	17½	GR-RES-ECD-DIR	483.0 - 543.0 m	Section TD
5	12¼	GR-RES-ECD-DIR	543.0 - 561.0 m	Section TD
6	8½	GR-RES-ECD-DEN-NEU-TesTrak	561.0 - 586.0 m	LWD failure
7	8½	GR-RES-ECD-DEN-NEU-TesTrak	586.0 – 713.0 m	TD

Table 3-1. MWD/LWD services run in well 35/2-1.

3.1.2 Wire line Logs

The wire line logs are summarized in Table 3-2. Schlumberger provided the wire line services for Well 35/2-1. The data are of good quality, except from the sidewall cores, MRCT. The recoveries for the MRCT runs were poor. The few “recovered” samples were not fit for analysis.

Run #	Section	Tool String	Interval logged (MD RKB)	Comments
1A	8½	FMI-MSIP**	484.0 - 707.0 m	MSIP chosen (with success!) due to very slow FM
1A	8½	MDT	576.0 - 612.0 m	Pressure points and samples. Got stuck; skipped 3 deepest pressure points
1A	8½	SP-HRLA-PEX-ECS*	550.0 - 709.0 m	HRLA failed
1A	8½	VSI	430.0 – 612.0 m	Station every 10m
1A	8½	MRCT***	613.0 – 703.0 m	Tool failure. 8 cores, 3 "recovered"
1B	8½	SP-HRLA	560.0 – 709.0 m	HRLA rerun
1B	8½	MRCT	575.0 – 607.5 m	23 cores, 1 recovered
1C	8½	MRCT	571.0 – 574.0 m	3 cores, 0 recovered
1D	8½	MRCT	578.0 – 614.0 m	5 cores, 0 recovered

Table 3-2. Wire line services run in well 35/2-1.

3.1.3 Pressure measurements

16 MDT pressure tests were attempted during MDT run 1A, of which 13 are considered successful. 2 tests were dry and 1 was supercharged. Two of the good tests were gathered during sampling (one at 582m MD and one at 589m MD). In general, the pressure tests are of good quality.

3.1.4 Pressure Points

See Table 3-3 for listing of results from the MDT pressure test including Formation Pressure (Quartz Guage) in bar together with initial hydrostatic pressure (HYDB) and final hydrostatic pressure (HYBA) in bar. Figure 3-2 is a pressure interpretation plot.

DEPTH M MD RKB	DEPTH TVD MSL	FMP (QG)	HYDB	HYDA	MOBILITY [MD/CP]	COMMENT
574.9	549.9		66.031	66.031	-	Dry test
576.0	551.0	59.704	66.416	66.400	-	Supercharged
577.6	552.6		66.307	66.307	-	Dry test
580.0	555.0	59.665	66.858	66.858	487.4	O.K.
582.0	557.0	59.703	67.134	67.065	1029.0	O.K.
582.0	557.0	59.695	67.065	67.203	220.2	O.K.
583.0	558.0	59.673	67.203	67.203	960.1	O.K.
586.5	561.0	59.685	67.617	67.617	695.7	O.K.
589.0	564.0	59.738	67.892	67.892	380.0	O.K.
589.0	564.0	59.707	67.892	67.892	547.9	O.K.
591.0	566.0	59.716	68.375	68.375	1050.4	O.K.
593.0	568.0	59.746	68.099	68.099	509.2	O.K.
596.0	571.0	60.047	68.720	68.720	2700.9	O.K.
598.0	573.0	60.253	68.927	68.927	66.5	O.K.
602.0	577.0	60.646	69.409	69.409	200.5	O.K.
602.0	577.0	60.663	69.409	69.409	97.6	O.K.

Table 3-3. Listing of MDT pressure tests.

3.2 Petrophysical evaluation methodology and results

The petrophysical interpretation is based on the available logs, fluid tests and samples. No cores were cut from this well and the MRCT runs (sidewall cores) failed completely. The resulting CPI is presented in Figure 3.1.

3.2.1 Petrophysical Input Parameters

The petrophysical input parameters used for well 35/2-1are given in Table 3-4. Since there is no core data available in this well, the same set of parameters have been used throughout the reservoir.

Input parameters well 35/2-1				
Zones			**Peon / Naust**	**Cap rock**
Calculation	**Parameter**	**unit**	**Parameter value**	
V_{sh}	GR_{min} GR_{max}	GAPI GAPI	60 90	75 90
Net sand	**Vsh < 0.5 and Phie > 0.15, Sw < 0.65**			
Log porosity	ρ_{ma} $\rho_{mud\ filtrate}$ $\rho_{HC,\ app}$ ρ_{shale}	g/cc g/cc g/cc g/cc	2.65 1.15 -0.05 2.3	2.65 1.15 1.0 2.3
Archie	a m n R_t R_{xo} R_w @ 15.6 °C R_{mf} @ 20.6 °C Temp @ 582mMD	 ohm-m ohm-m ohm-m ohm-m °C	0.62 2.15 2.00 Deep laterolog (RT_HRLA) PEX/MCFL – RX08 0.0260 0.085 13	0.62 2.15 2.00 Deep laterolog (RT_HRLA) PEX/MCFL – RX08 0.0260 0.0850 13

Table 3-4. Petrophysical Input Parameters

3.2.2 Net Sand/Shale Volume

The net sand intervals were determined by applying a shale volume cut off of 0.50 and porosity cut off of 15 %.

The shale volume has been calculated from a non-linear relationship with the gamma ray. The reservoir interval is primarily a straightforward sand-shale sequence. The relative abundance of sand and shale is well defined from the gamma ray log, using GFCT factor of 0.5.

The Net Sand definition is insensitive to the porosity cut off, as the Peon reservoir is at much higher porosity than a most likely cut off value. (No cores available.)

3.2.3 Porosity and Permeability

The effective porosity has been calculated from the density log. A linear relationship has been developed. The effective porosity is corrected for shale volume. A HC correction has also been performed, using the Material Balance equation.

(The version called Material Balance method was introduced directly by Hydro, firstly for use in the Troll project. This option uses the form of the density prorosity equation given in this formula: $Sh*(Dens_{w,a}-Dens_{h,a})$. This gives a more efficient iteration between Porosity (Ø) and Water Saturation (Sw).)

There is some uncertainty in the porosity computation due to the gas correction of the

density log. This uncertainty is propagated to the water saturation. However, the uncertainty is not regarded as large, but would have been reduced if core data had been available.

The Peon reservoir properties are very good with an average porosity of 33.2%. In the gas zone the average porosity is 36.0%. Mobilities up to 2700 mD/cP (Table 3-3) have been obtained. The other MDT Pressure pre-tests show mobility values varying from 66.5 to 1029.0 mD/cP. The fluid viscosity will be a mixture of gas and mud filtrate, which makes permeability from the pre-tests difficult to interpret.

3.2.4 Water Saturation

The Indonesia equation was used to calculate the water saturation from the logs. The formation water resistivity is estimated based on the MDT water gradient=1.019 g/cc. Schlumberger charts “Resistivity of NaCl Solutions” and “Densities of NaCl Solutions” (Ref. 4.3) have been used as input, obtaining an Rw value of 0.260 ohmm @ 15.6 degC.

Due to the soft formation of Peon, Humbles formula has been used, resulting in the following input parameters: a,m,n= 0.62, 2.15, 2.00.

The formation temperature was collected from the MDT samples. This gave a temperature of 12.8 degC @ 591 meters MD.

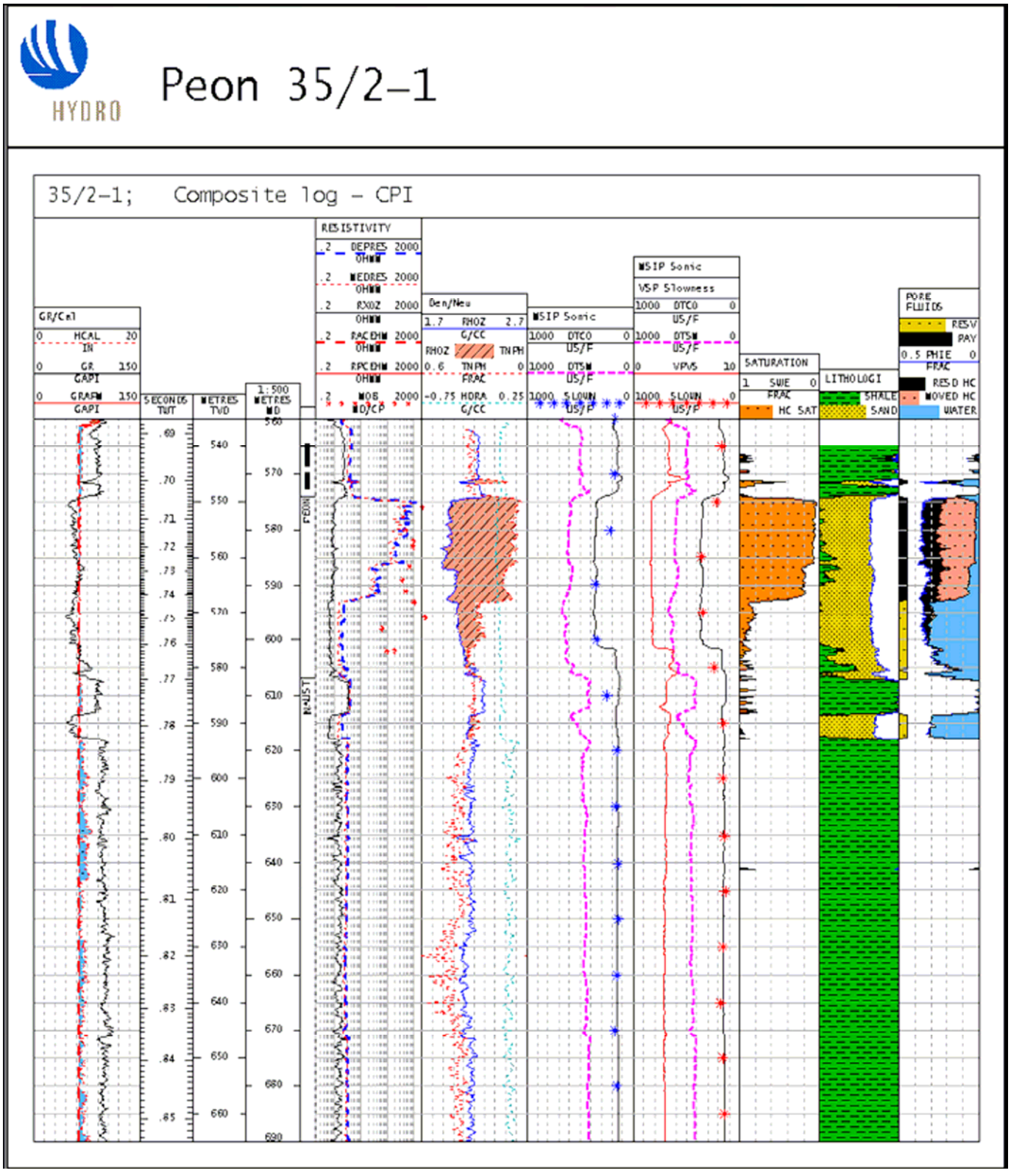


Figure 3-1. Raw logs and CPI.

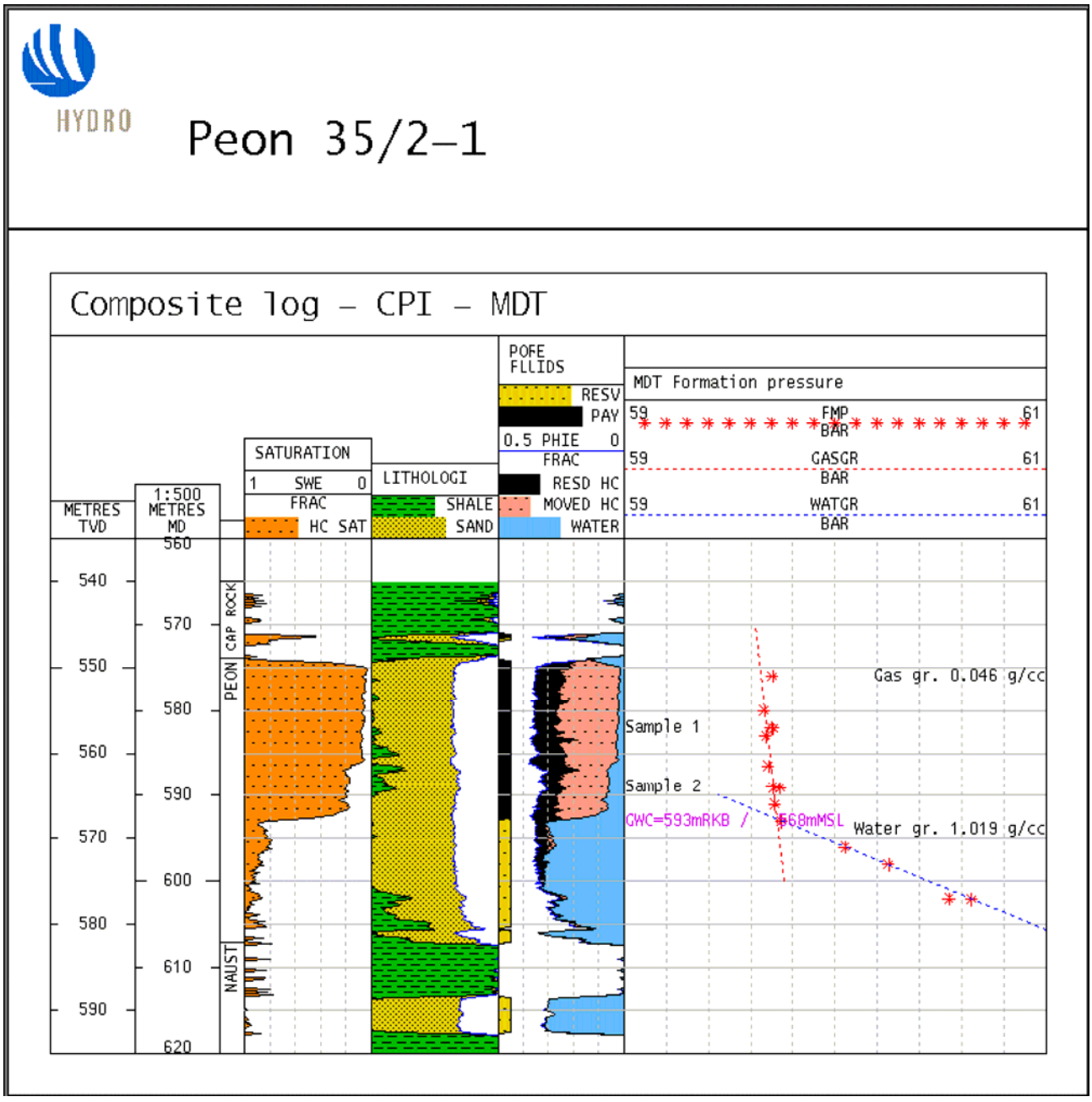


Figure 3-2. Peon Pressure Interpretation

4 Geochemical results

Hydro's Research Centre in Bergen has performed a geochemical reservoir-study. Nine Canned DC samples were sent to SINTEF for C1-C9 analysis. Seven gasbags samples were sent to IFE, Kjeller for isotope analysis. Cuttings samples were sent to Fluid Inclusion Technologies, Tulsa USA for fluid inclusion analysis. Well 35/2-1 contains only dry gaseous hydrocarbons in the zone ranging from 540 to 708 m RKB MD. Gas compositions of MDT samples in the gas column, at 574-593 m RKB MD contain more than 99% methane. No liquid hydrocarbons were detected.

Headspace and occluded gas in canned DC samples Analysed by SINTEF		Mud Gas from gas bags Analysed by APT as		MDT Analysed by APT as	
(m RKB MD)	Sample ID	(m RKB MD)	Sample ID	(m RKB MD)	Sample ID
543-550	1A	551	2A	587.2	3A
560-570	1B	560	2B	593	3B
570-580	1C	570	2C		
580-590	1D	582	2D		
590-600	1E	596	2E		
610-620	1G				
640-650	1H				
670-680	1I				
700-710	1J				

Table 4-1. Overview of the fluid samples and analysis.

4.1 Hydrocarbon migration/diffusion

The dry gas accumulation in Peon is mainly of biogenic origin. This is a result of bacterial gas that occurs in a depositional setting with high sedimentation rate and low geothermal gradient. The high sedimentation rate has in this region a twofold effect namely the preservation of organic matter throughout the sedimentary section and prevention of escape of shallow gas.

5 Post Site Survey for Well 35/2-1

5.1 WELL DATA

1 Distance from rig floor to sea level: 25 m

2 Water depth (MSL): 384 m

3a Setting depth for conductor (m RKB): 482,8 m

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

4a Setting depth (m RKB TVD) for casing on which BOP mounted: 539 m

4b Formation Integrity Test (g/cc): N/A

5 Depth (m RKB TVD & Two Way Time) to formation/section/layer tops:

Top Naust S (R50) 484m (603ms)
Top Naust U (R80) 562m (691ms) (Uncertain depth due to casing)
Top Peon Member (R90) 574m (704m)
Top Naust N / Base Quaternary: 618m (-ms) (reflection obscured by gas-effect)

Note:
No chrono stratigraphic information was obtained from the well. Consequently, the interpretation of the different formations in this area is based on the LWD logs, seismic character and previous work, and biostratigraphy (between 540m and 713m RKB)

Mud logging commence at 539 m RKB TVD.

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

Quaternary:

420-421m Between R10 and R20
470-471m At R40
493-494m At R55
500-507m Between R55 and R60
515-517m R60
571-572m R80
574-607m Peon Member (gas-filled between 574m and 594m)
613-618m Between R100 and Base Pleistocene

7 By what means is the presence of gas proven:

The well was drilled with returns to seabed from sea floor to 543 m before setting 13 3/8" casing at 539 m RKB TVD. Hence, no data exists on background gas levels from this interval. Still, no gas-related incidents were reported. Below 543 m RKB MD gas analyses were accomplished using

flame ionisation detectors (FID) with gas measured as percentage methane (C1) equivalent in air, and chromatographic analyses expressed in parts per million.

8 Composition and origin of gas:

Well 35/2-1 is dominated by dry gaseous hydrocarbons (measurements performed between 540 m to 708 m RKB TVD). MDT samples from the reservoir interval (574-593 m RKB TVD) contain more than 99% methane (C2 and larger components make up less than 0.05 volume-%). No liquid hydrocarbons were detected.

9 Describe all measurements taken in gas bearing layers:

Peon Member:

C1-C9 analysis: Canned drill cuttings samples
Isotope analyses: Gasbag samples
Fluid inclusion analysis: Drill cuttings samples

5.2 SEISMIC DATA

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

Reflection seismic anomalies indicative of shallow gas were mapped at two levels, however none occur closer than 900m from the 35/2-1 Well Location.

No shallow gas warning was issued for the well.

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

N/A

12 How does the interpretation of the site survey correspond to the well data with respect to?

12a Shallow Gas:

No shallow gas was observed in the well.

12b Shallow Water Flow:

N/A

12c Sand Bodies:

The upper section (i.e. above c. 485m RKB TVD) is based on LWD logs from the pilot hole. The remaining is based on LWD logs from the main well.

The R40 sand layer at 470 m RKB TVD was not predicted. The sands between R50 and R60, and at R80 were anticipated.

The Peon Member was confirmed, however the sand was four metres thinner than expected. The sand between R100 and the regional angular unconformity was not anticipated.

12d Boulders:

No boulder problems were reported during drilling of the neighbouring wells. However, scattered boulders were expected throughout the Pleistocene succession (416±1m-613±6m RKB TVD).

No boulders were encountered.

12e Unconformities (depths in metres RKB (TVD)):

Horizon	Prognosis (P)	Observation (O)	O-P
Top Naust S (R50)	485 ± 5m	484	-1 m (shallower)
Top Naust U (R80)	567 ± 6m	562	-5 m (shallower)
Top Peon Member (R90)	576 ± 6m	574	-2 m (shallower)
Top Naust N / Base Quaternary	613 ± 6m	618	+5 m (deeper)

The differences between anticipated and observed depths are within the uncertainty limits.

12f Correlation to Nearby Wells:

No direct correlation is possible as no shallow gas well occurs in the area.

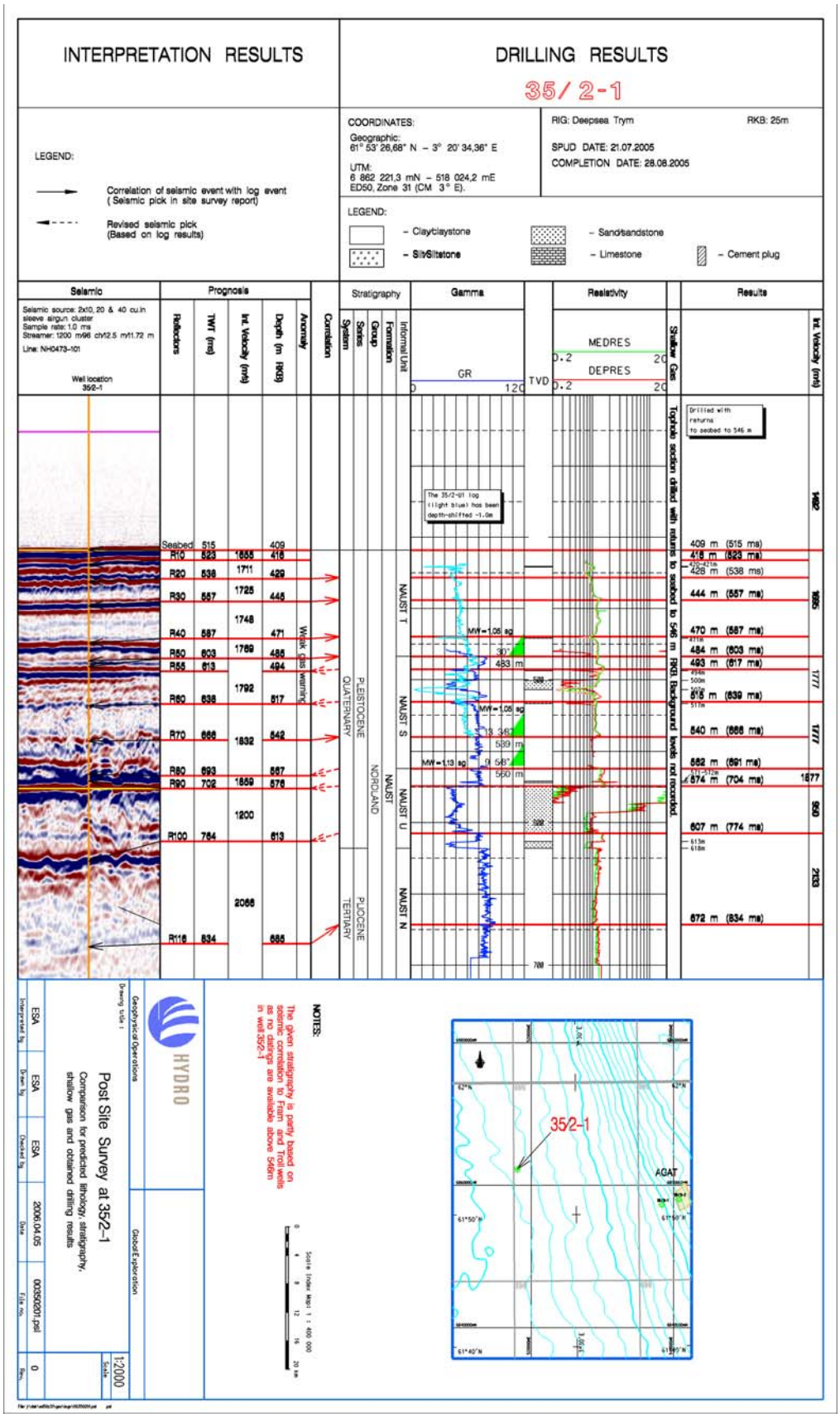


Figure 5-1 Post Site Survey Panel

CONFIDENTIAL

REPORT
Hydro Oil & Energy
Operations
Exploration Well 35/2-1 Peon
Deepsea Trym Rig group

Title:	**Final Well Report - Exploration Well 35/2-1 Peon**	No.	: NH/OD-B-4528/06
		Rev.	: 0
		Page	: B-1 of 104
		Date	: 2005/11/01

Prepared by	:	Bjørn Thore Leidland / Drilling Engineer	Sign.	:
Verified by	:	Oskar Berge / Senior Drilling Engineer	Sign.	:
Approved by	:	Svein Dybdahl / Drilling Superintendent	Sign.	:

CONTENTS

1 General Data

1.1 Well objectives:

To drill a well into the Peon reservoir to prove to prove presents of hydrocarbons in the Peon reservoir and log the well according to the data acquisition program. The will be permanently plugged and abandoned and will not be tested.

1.2 HSE expectations/goals

Main focus: Good planning of all activities, both during design and operation.

The project was satisfactory carried out both during design and operation.
HSE meetings were arranged on weekly basis internally on rig and rig/land organisation.

Goals:
Implementing of Best Practise "Trygt Boredekk":
Best practise implemented for the following areas; Barriers and Sealing of areas, Radio communication, Colour marking of pipes.

Focus on verification and follow up of working environment for service companies:
Verifications were started after the completion of the Peon project.

0 Emissions to the environment: 0 unplanned emissions were fulfilled on the project

0 Unscheduled incidents: 0 serious (red) accidents were fulfilled on the project

Reporting:
RUH
The RUH reporting during the project has been satisfying.

- Number of RUH reported: 228
- Number of yellow cases in Synergi: 6
- Number of lost time accidents: 0
- Number of first aid injuries: 3
- Number of medical treatments: 1

1.3 Location history

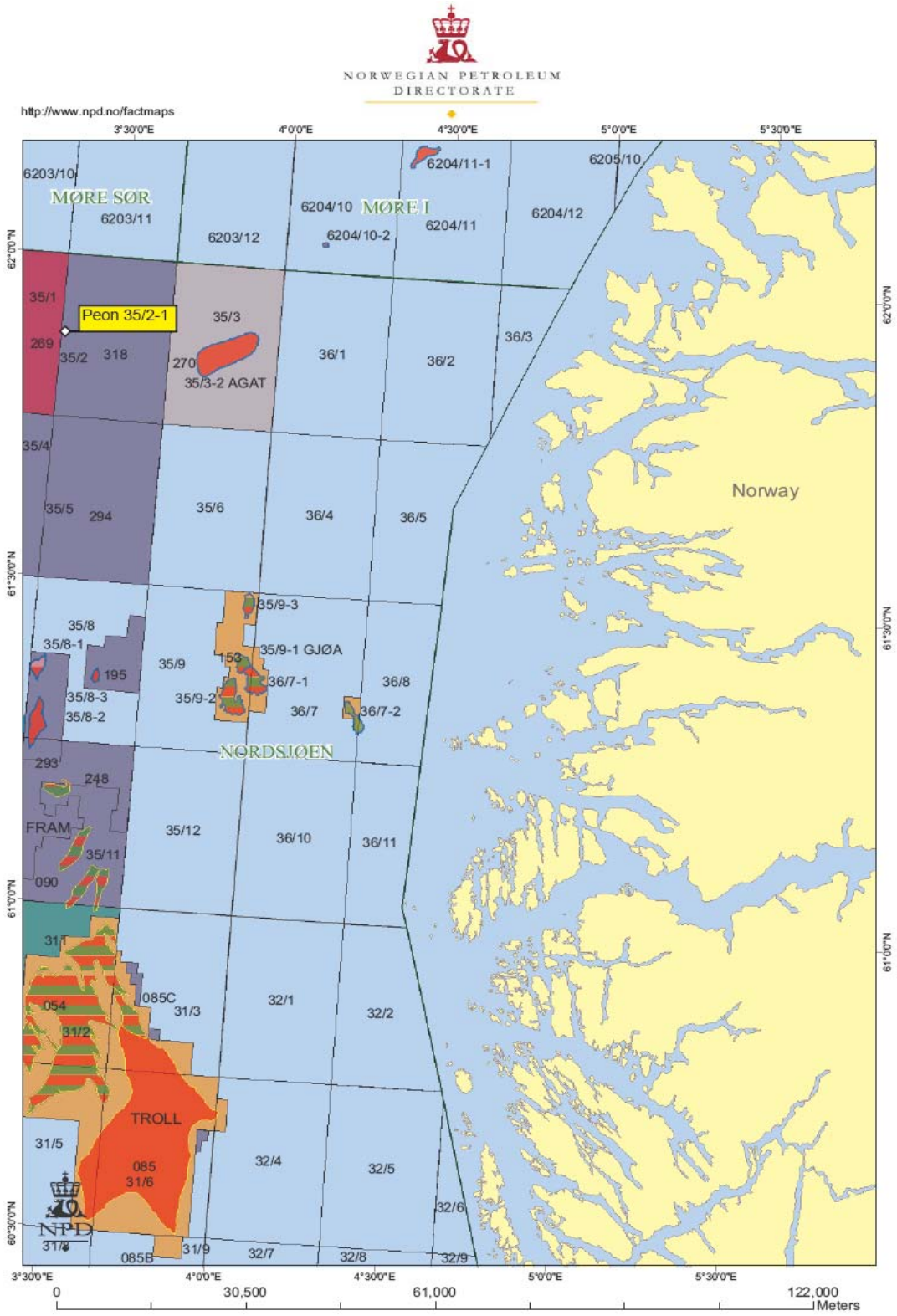
The rig location was placed to the south of a clear shallow gas section above the shallow Peon.
The well was first spudded to the North of the final position and a 9 7/8" Pilot hole was drilled to 544m. During drilling of the 36" hole opening the BHA parted in a drill collar connection. The BHA was left in the hole. The rig was moved 20m to the south and re-spudded.

1.4 Well Summary

WELL DATA			
Horizontal Datum:	ED 50	Coordinate ref.: Zone 31, Central Meridian 3º E	
Area:	Norwegian North Sea	Field: Peon	
Wellhead location:	6 862 221.28 mN 518 024,19 mE	61° 53' 26,679" N 03° 20' 34,364" E	
Well identification:	35/2-1		
Targets:	See chapter 8		
Target tolerances:	40 m radius		
Well classification:	Exploration		
Well design basis:	Permanent abandonment		
H_2S level of preparedness:	Level 2 – Exploration		
Prognosed tot depth	710m MD/TVD approximately +/- 97m below base of the Peon reservoir (613m) interval.		
SAP-network:	Drilling: 901019	Testing: N/A	
DRILLING UNIT			
Name:	Deepsea Trym	Rig heading:	179,8 deg. TN
Type:	Semi Submersible	Num. anchors:	8
RKB-MSL:	25 m	Anchor tension:	Min. 200t
SEABED			
Water depth:	384 m ± 1 m MSL (409 m ± 1m RKB)		Seabed slope: app < 0.2 deg
Water Depth Variations:	381 m – 386m m +/- 1m MSL within 2 km radius of the proposed well location.		
Seabed conditions:	Very soft, to soft silty CLAY (Kleppe Senior Formation)		
Seabed hazards:	Scattered (minor) depressions interpreted as pockmarks occur. No pockmark is located in the vicinity of Location. No other obstructions are identified		
Anchor conditions:	Less than 4-10m of soft, silty CLAY) above firm to hard CLAY (till).		
Shallow Gas:	No reflection seismic amplitude anomalies occur at Location. No shallow gas warning at the Planned Location. However, shallow gas preparedness will apply and 9 7/8" hole will be drilled since Block 35/2 is regarded as a new area.		
Shallow Water Flow:	No shallow water flow is expected at Location.		
Boulders:	Scattered boulders expected at 416±3m – 445±3m and 471±4m – 576±6m TVD RKB		

RELIEF WELL LOCATIONS			
o	205m SW:	Northing 6 862 094 mN, Easting 517 882 mE	Lat. 61° 53' 22.58" N, Long. 03° 20' 24.57" E
o	1500m SW:	Northing 6 860 825 mN, Easting 517 537 mE	Lat. 61° 52' 41.64" N, Long. 03° 20' 00.51" E

1.5 Area Location Map



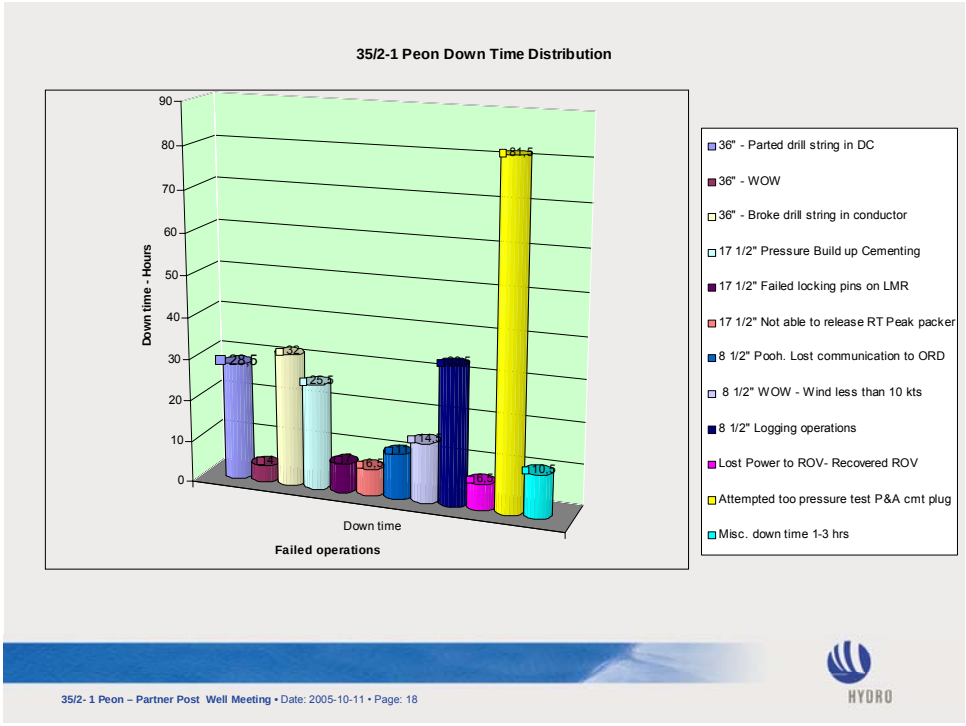
1.6 Drilling Time

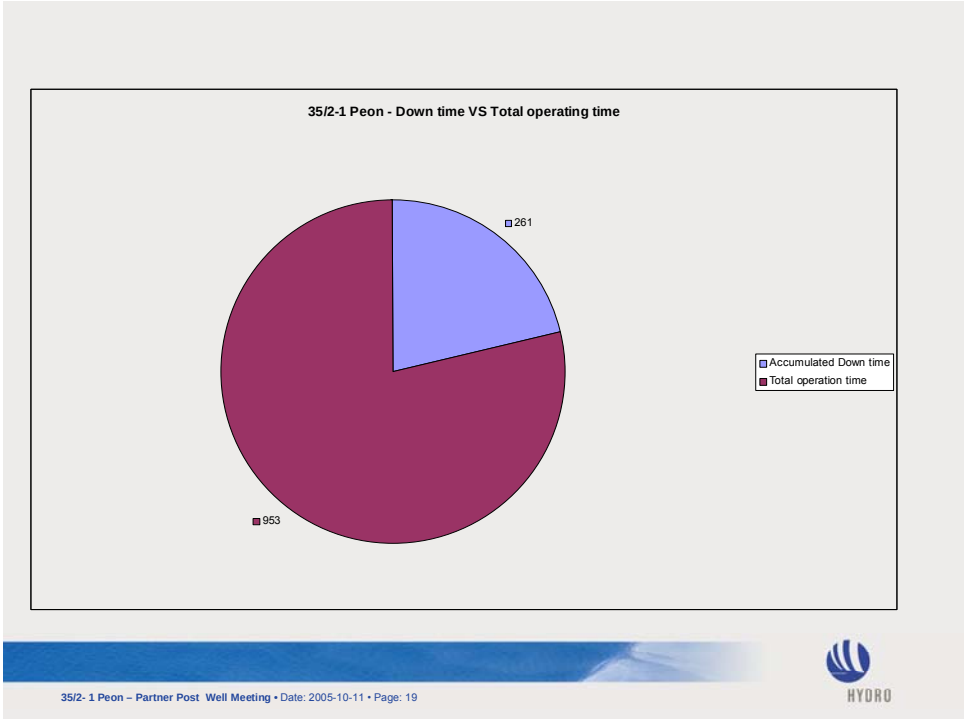
HYDRO	Work Platform 35/2-1 PEON Drilling Time Estimate		28-aug				UPDATE: 11-nov-05 fr		
Main-activity	Sec.	Activity	BL PLAN hrs.	Budget hrs.	Act. hrs.	NPT	Start Date: Date	20-jul-05 on Finished Time	Budget Hours 0,0
Start:	0	Start tow from Troll					on-20-jul	01:00	0,0
AFE 78,0	1	Transit to the Peon site.	14,0	30,0	19,5		onsdag-20-jul	20:30	-10,5
Bud 78,0	2	Anchor handling and deballasting rig.	24,0	48,0	16,5		torsdag-21-jul	13:00	-42,0
Drill 9 7/8" pilot	3	M/U 9 7/8" BHA	3,0	4,0	3,0		torsdag-21-jul	16:00	-43,0
	4	RIH w/ 9 7/8" BHA	1,0	1,0	1,5		torsdag-21-jul	17:30	-42,5
	5	Held tabletop meeting wrt. shallow gas handling	0,0	0,0	0,5		torsdag-21-jul	18:00	-42,0
	6	Cont. RIH w/ 9 7/8" BHA	1,0	1,0	4,0		torsdag-21-jul	22:00	-39,0
	7	Drill 9 7/8" pilot hole to from 409m - 544m MD. 13 m/hr	13,0	7,7	13,0		fredag-22-jul	11:00	-33,7
AFE 20,7	8	Circulate hole clean/ flow-check/ displace to 1,2 sg or 1,5 sg	1,0	2,0	0,5		fredag-22-jul	11:30	-35,2
Bud 20,7	9	POOH and rack BHA	4,0	4,0	3,5		fredag-22-jul	15:00	-35,7
Act 26,0	10	Inspect derrick and equipment for loose objects	1,0	1,0	0,0		fredag-22-jul	15:00	-36,7
Drill 36" hole	11	Make up 36" BHA	4,0	4,0	4,0		fredag-22-jul	19:00	-36,7
	12	RIH w/36 BHA	1,0	1,0	5,0		lørdag-23-jul	00:00	-32,7
	13	Drill 36" hole to SB 409m - 463m MD	10,0	8,0	14,0		lørdag-23-jul	14:00	-26,7
	14	POOH with twist off pipe, inspect, evaluate fishing possibilities	8,0	0,0	8,0	8,0	lørdag-23-jul	22:00	-18,7
	15	Make up new 36" BHA	4,0	0,0	4,0	4,0	søndag-24-jul	02:00	-14,7
	16	RIH with new 36" BHA	6,0	0,0	8,0	8,0	søndag-24-jul	10:00	-6,7
	17	Drill 36" hole to SB 409m - 463m MD (5 m/hr)	8,5	0,0	8,5	8,5	søndag-24-jul	18:30	1,8
	18	Drill 36" hole to SB 463m - 483m MD (5 m/hr)	4,5	3,0	5,5		mandag-25-jul	00:00	4,3
	18	Circulate clean & displace to 1,50 sg mud.	2,0	3,0	3,0		mandag-25-jul	03:00	4,3
	19	Perform wipertrip	1,0	1,0	1,0		mandag-25-jul	04:00	4,3
AFE 27,2	20	If wipertrip, circ clean & displace to 1,50 sg	2,0	2,0	0,5		mandag-25-jul	04:30	2,8
Bud 27,2	21	POOH and rack BHA	4,0	3,2	2,0		mandag-25-jul	06:30	1,6
Act 64,0	22	Inspect derrick and equipment for loose objects	1,0	1,0	0,5		mandag-25-jul	07:00	1,1
30" Cond	23	Rig up equipment and prepare for running 30" conductor	1,5	2,3	2,5		mandag-25-jul	09:30	1,3
	24	Run 30" conductor w/PGB	10,0	10,0	10,0		mandag-25-jul	19:30	1,3
	25	Waited for improved visibility to sting in	0,0	0,0	4,0	4,0	mandag-25-jul	23:30	5,3
	26	Cement 30" conductor	2,0	2,0	3,0		tirsdag-26-jul	02:30	6,3
	27	WOC	4,5	4,5	4,5		tirsdag-26-jul	07:00	6,3
AFE 26,8	28	Grouting	2,0	5,8	2,0		tirsdag-26-jul	09:00	2,5
Bud 26,8	29	POOH R/T. L/D R/T inner string	3,0	3,5	4,5		tirsdag-26-jul	13:30	3,5
Act 30,5	30	Inspect derrick and equipment for loose objects	1,0	1,0	0,0		tirsdag-26-jul	13:30	2,5
Drill cementshoe	31	M/U 26" BHA	2,0	0,0	3,0		tirsdag-26-jul	16:30	5,5
	27	RIH with 26" BHA to 478m	2,0	0,0	2,0		tirsdag-26-jul	18:30	7,5
	28	Fishing for lost BHA in 30" Conductor	0,0	0,0	27,5	27,5	onsdag-27-jul	22:00	35,0
	29	Re-make up of BHA	0,0	0,0	3,0	3,0	torsdag-28-jul	01:00	38,0
	30	RIH with new 26" BHA	0,0	0,0	4,5	4,5	torsdag-28-jul	05:30	42,5
AFE 0,0	30	Drill shoe and 26" hole to 486m	3,0	0,0	4,5		torsdag-28-jul	10:00	47,0
Bud 0,0	31	POOH and lay down 26" BHA	3,0	0,0	4,0		torsdag-28-jul	14:00	51,0
Act 49,5	32	Inspect derrick and equipment for loose objects	1,0	0,0	1,0		torsdag-28-jul	15:00	52,0

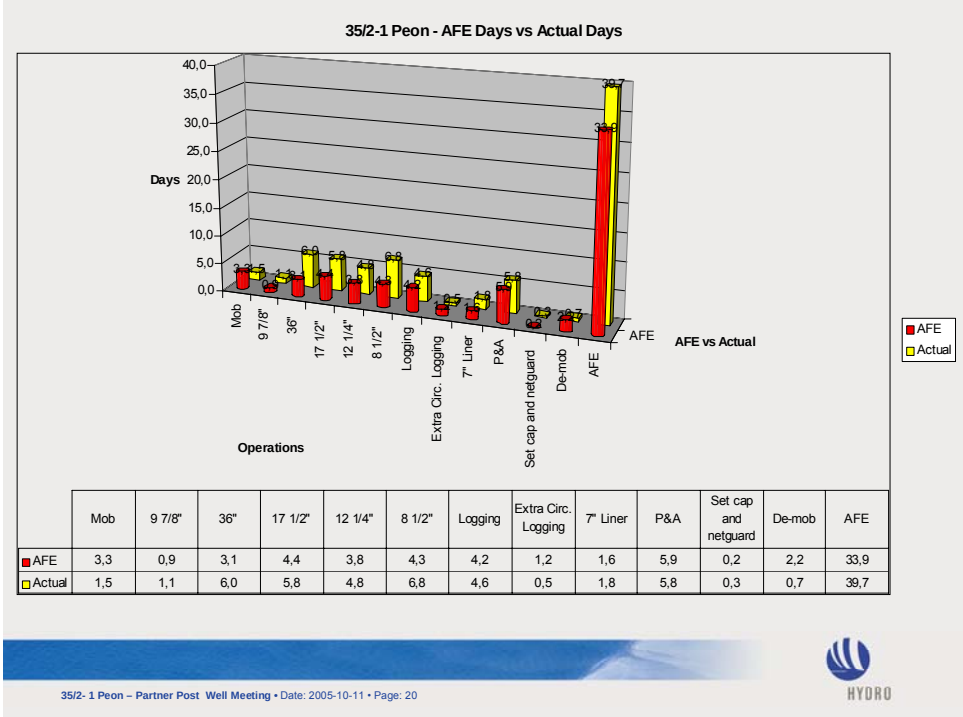
Drill 17 1/2" hole	31	M/U 17 1/2" BHA	2,0	3,0	4,0		torsdag-28-jul	19:00	53,0
	32	RIH with 17 1/2" BHA to 486m	1,5	3,0	3,0		torsdag-28-jul	22:00	53,0
	33	Drill 17 1/2" hole from 486m to 543m MD. **Maks drilling dept 544m**.	9,5	9,3	11,0		fredag-29-jul	09:00	54,7
AFE 23,8	34	Circulate clean, wiper trip and displace to 1,50 sg.	2,0	3,0	4,0		fredag-29-jul	13:00	55,7
Bud 23,8	35	POOH and rack BHA	4,0	4,5	4,0		fredag-29-jul	17:00	55,2
Act 27,0	36	Inspect derrick and equipment for loose objects	1,0	1,0	1,0		fredag-29-jul	18:00	55,2
20" x 13 3/8" Cs	37	Rig up equipment and prepare for running 20" X 13 3/8" Casing	3,5	6,0	1,5		fredag-29-jul	19:30	50,7
	38	Run 20"X 13 3/8" casing from RT to 539m	7,0	12,0	8,5		lørdag-30-jul	04:00	47,2
	39	Trouble shooting plugged circulation prior to cementing 13 3/8" casing	0,0	0,0	6,5	6,5	lørdag-30-jul	10:30	53,7
	40	Lay down casing tong. Checked the DDM	1,0	0,0	1,0		lørdag-30-jul	11:30	54,7
	41	Rig up, RIH and drill cement plugs	0,0	0,0	14,0	14,0	søndag-31-jul	01:30	68,7
	42	POOH and rack back 12 1/4" BHA	0,0	0,0	2,0	2,0	søndag-31-jul	03:30	70,7
	43	RIH with 18 5/8" running tool and cement innerstring	0,0	0,0	3,0	3,0	søndag-31-jul	06:30	73,7
	44	Cement 20"x 13 3/8" casing.	6,0	8,0	2,5		søndag-31-jul	09:00	68,2
	45	POOH. Disconnect guide line and move rig to safe sone. Rig down.	3,0	4,0	5,5		søndag-31-jul	14:30	69,7
	46	Downtime due to loose bolts DDM. ROV failure	0,0	0,0	2,0	2,0	søndag-31-jul	16:30	71,7
	47	Maintenance of rig equipment	0,0	0,0	3,0		søndag-31-jul	19:30	74,7
	48	Change VX ring on LMRP. Run and land BOP.	28,0	34,5	31,5		tirsdag-02-aug	03:00	71,7
	49	Test BOP connector and 20" casing to 102 bar	0,5	6,5	1,5		tirsdag-02-aug	04:30	66,7
	50	Disconnect and re-connect LMRP	4,0	4,0	5,0		tirsdag-02-aug	09:30	67,7
	51	Work on Locking pins for LMRP stab plate	0,0	0,0	7,0	7,0	tirsdag-02-aug	16:30	74,7
	52	Prejob meeting and start to RIH w/ Peak packer	1,0	1,0	1,5		tirsdag-02-aug	18:00	75,2
	53	Planned maintenance on Dolly.	0,0	0,0	5,0		tirsdag-02-aug	23:00	80,2
	54	RIH and set Peak packer @ 481 m MD.	1,0	1,0	2,0		onsdag-03-aug	01:00	81,2
	55	Attempted to release RT from Peak packer. POOH for inspection. RIH.	0,0	0,0	6,5	6,5	onsdag-03-aug	07:30	87,7
AFE 81,0	56	Connect running tool to packer. Pressure test riser connector and Peak packer to 102 bar.	0,5	1,0	1,5		onsdag-03-aug	09:00	88,2
Bud 81,0	57	POOH with Peak Packer.	2,0	2,0	2,0		onsdag-03-aug	11:00	88,2
Act 113,0	58	Inspect derrick and equipment for loose objects	0,0	1,0	0,0		onsdag-03-aug	11:00	87,2
Drill 12 1/4" hol	59	Make up 12 1/4" BHA.	3,0	4,0	3,5		onsdag-03-aug	14:30	86,7
	60	RIH w/ 12 1/4" BHA from RT to 539m (400 m/hrs)	1,5	2,0	1,5		onsdag-03-aug	16:00	86,2
	61	Test FIT equipment and procedures, perf SCR, prep to drl cmt	20,0	5,0	27,5		torsdag-04-aug	19:30	108,7
	61	Clean out shoetrack & drill rathole+ 1m new formation	11,5	8,0	13,5		fredag-05-aug	09:00	114,2
	62	Perform FIT to min 1,25 sg and maks 1,30 sg	6,0	8,0	2,0		fredag-05-aug	11:00	108,2
	63	Drill 12 1/4" hole from 543m - 561m MD.	8,0	12,6	8,0		fredag-05-aug	19:00	103,6
AFE 41,6	64	Circulate hole clean	4,0	4,0	5,0		lørdag-06-aug	00:00	104,6
Bud 47,6	65	POOH and rack BHA from 570m - RT	3,0	3,0	5,5		lørdag-06-aug	05:30	107,1
Act 67,0	66	Inspect derrick and equipment for loose objects	1,0	1,0	0,5		lørdag-06-aug	06:00	106,6
Run 9 5/8" Line	67	Scraper run to setting depth for 9 5/8" liner packer	5,0	5,0	8,0		lørdag-06-aug	14:00	109,6
	68	Rig up equipment and prepare for running 9 5/8" liner	2,0	3,0	2,5		lørdag-06-aug	16:30	109,1
	69	Run 9 5/8" liner to 560m .	5,5	6,4	7,5		søndag-07-aug	00:00	110,2
	70	Run liner to TD on drill pipe	2,0	2,0	1,0		søndag-07-aug	01:00	109,2
	71	M/U cement head	2,0	3,0	0,5		søndag-07-aug	01:30	106,7
	72	Set liner hanger	2,0	3,0	1,0		søndag-07-aug	02:30	104,7
	73	Circulate and Cement 9 5/8" liner	4,0	6,0	2,5		søndag-07-aug	05:00	101,2
	74	Set & P/T Liner Top Packer	1,5	2,5	0,5		søndag-07-aug	05:30	99,2
	75	Reverse out excess cement	2,0	2,0	2,0		søndag-07-aug	07:30	99,2
	76	Pull the running string from 489m to RT	2,0	2,0	2,5		søndag-07-aug	10:00	99,7
	77	Lay down casing tong. Washed the top drive	2,0	1,5	1,0		søndag-07-aug	11:00	99,2
	70	Pressure test BOP	6,0	6,0	10,0		søndag-07-aug	21:00	103,2
	71	Installed fan housing on top drive	0,0	0,0	2,0	2,0	søndag-07-aug	23:00	105,2
AFE 48,4	72	Pressure test surf equip,inst fan housing, changed bailes & clamp on tool joint breaker	3,0	4,0	4,5		mandag-08-aug	03:30	105,7
Bud 48,4	73	P/U 12 1/4" BHA from derrick, L/D same	2,5	2,0	2,5		mandag-08-aug	06:00	106,2
Act 48,5	74	Inspect derrick and equipment for loose objects	1,0	1,0	0,0		mandag-08-aug	06:00	105,2

Drill 8 1/2" hole	75	Make up 8 1/2" BHA	3,0	3,5	4,5		mandag-08-aug	10:30	106,2
	76	RIH with 8 1/2" BHA, pick up 5" DP	5,0	3,0	7,5		mandag-08-aug	18:00	110,7
	77	Test FIT equip, clean out shoetrack & drill rathole+ 1m new formation	13,0	4,0	15,0		tirsdag-09-aug	09:00	121,7
	78	Perform LOT/FIT	3,0	5,0	2,5		tirsdag-09-aug	11:30	119,2
	79	Increase mud weight to 1,15 sg, cond mud after add LC-Lube, SCR, prejob meeting	3,0	0,0	6,5		tirsdag-09-aug	18:00	125,7
	80	Trouble shooting MWD decoding problems	0,0	0,0	1,0	1,0	tirsdag-09-aug	19:00	126,7
	81	Drill 8 1/2" hole in the reservoar to from 561m to 586,5	12,0	5,0	16,5		onsdag-10-aug	11:30	138,2
	82	Circulate and test trip.	7,0	5,0	7,0		onsdag-10-aug	18:30	140,2
	83	Trip out to pick up new BHA	14,0	10,0	11,5		torsdag-11-aug	06:00	141,7
	84	MWD problems, changed out CCN	12,0	0,0	11,0	11,0	torsdag-11-aug	17:00	152,7
	85	Drilled 8 1/2" hole from 586,5 m to 632m	16,0	15,0	17,0		fredag-12-aug	10:00	154,7
	86	Circulate, check trip, presspoints.	6,0	8,0	9,5		fredag-12-aug	19:30	156,2
	87	Drilled from 632 to 645	5,0	3,0	5,5		lørdag-13-aug	01:00	158,7
	88	Stop drl due to wind force below 10 kts.	8,0	0,0	8,0	8,0	lørdag-13-aug	09:00	166,7
	89	Function tested BOP.	0,5	0,5	0,5		lørdag-13-aug	09:30	166,7
	90	Stop drl due to wind force below 10 kts.	4,5	0,0	6,5	6,5	lørdag-13-aug	16:00	173,2
	91	Drill 8 1/2" hole from 645m to 683 m.	12,0	10,0	13,0		søndag-14-aug	05:00	176,2
	92	Drill 8 1/2" hole to TD 713m MD. 10 m/hr and circ.	20,0	26,0	9,0		søndag-14-aug	14:00	159,2
AFE 107,5	93	Circulate hole clean	6,0	4,0	5,0		søndag-14-aug	19:00	160,2
Bud 107,5	94	POOH, dumped MWD and rack BHA	5,0	4,5	6,0		mandag-15-aug	01:00	161,7
Act 163,5	95	Inspect derrick and equipment for loose objects	1,0	1,0	0,5		mandag-15-aug	01:30	161,2
Wireline Loggin	96	Pick up logging equipment	3,5	4,0	4,0		mandag-15-aug	05:30	161,2
	97	FMI	6,0	8,0	8,5		mandag-15-aug	14:00	161,7
	98	Made up and RIH with the MDT logging string to 500 m.	3,0	4,0	3,0		mandag-15-aug	17:00	160,7
	99	Pulled out and changed cable head. Rih to 500 m.	0,0	0,0	4,0	4,0	mandag-15-aug	21:00	164,7
	100	Performed MDT and pulled to surface.	11,0	13,0	11,5		tirsdag-16-aug	08:30	163,2
	101	Unble to unscrew connections on the MDT tool. Made sja.	0,0	0,0	8,5	8,5	tirsdag-16-aug	17:00	171,7
	102	Recovered the powerless ROV	0,0	0,0	6,5	6,5	tirsdag-16-aug	23:30	178,2
	103	Released trapped gas from the MDT tool.	0,0	0,0	2,0	2,0	onsdag-17-aug	01:30	180,2
	104	Laid down the MDT tool.	1,0	1,0	1,0		onsdag-17-aug	02:30	180,2
	105	Clean up run	15,0	28,0	12,5		onsdag-17-aug	15:00	164,7
	106	Rig up schlumb. Made up PEX.	2,0	2,0	2,0		onsdag-17-aug	17:00	164,7
	107	Changed none-functional EDCT tool	0,0	0,0	1,0	1,0	onsdag-17-aug	18:00	165,7
	108	PEX	6,0	8,0	5,0		onsdag-17-aug	23:00	162,7
	109	VSP	5,0	8,0	5,0		torsdag-18-aug	04:00	159,7
	110	MSCT	5,5	5,0	5,5		torsdag-18-aug	09:30	160,2
	111	Failure MSCT,	6,5	0,0	6,5	6,5	torsdag-18-aug	16:00	166,7
AFE 95,0	112	Waited on HRLA (res log) tool from shore.	5,0	0,0	6,0	6,0	torsdag-18-aug	22:00	172,7
Bud 95,0	113	M/U and perf. SP-HRLA log . Made up new MSCT logging tool	8,0	0,0	5,5	5,5	fredag-19-aug	03:30	178,2
Act 110,0	114	MSCT	10,5	10,0	10,0		fredag-19-aug	13:30	178,2
	115	Rig down logging equipment	2,0	4,0	2,0		fredag-19-aug	15:30	176,2
P&A	116	Ran in the hole to shoe with bit and scraper.Filled the pipe	4,0	4,0	4,0		fredag-19-aug	19:30	176,2
	117	Unable to start mudpump 2 and 3.	0,0	0,0	2,0	2,0	fredag-19-aug	21:30	178,2
	118	Wiper trip to TD	10,5	12,0	10,5		lørdag-20-aug	08:00	176,7
	119	BOP test	8,0	8,0	8,5		lørdag-20-aug	16:30	177,2
	120	Run and cement liner	24,0	23,0	27,5		søndag-21-aug	20:00	181,7
	121	Wash BOP	4,0	3,0	2,5		søndag-21-aug	22:30	181,2
	122	Laid down casing tong and cement head.	2,0	2,0	1,0		søndag-21-aug	23:30	180,2
	123	P/U mule shoe and run 7 std of 3 1/2" DP + 5" DP to 486 m	2,0	3,0	3,0		mandag-22-aug	02:30	180,2
	124	Wash to 670 m.	1,0	4,0	1,0		mandag-22-aug	03:30	177,2
	125	Circ. and cond. mud.	2,0	4,0	0,5		mandag-22-aug	04:00	173,7
	126	Install cement stand and pressure test surface lines to 150 bar	2,0	4,0	0,0		mandag-22-aug	04:00	169,7
	127	Pump cement plug # 1 from TD to 496 m.	2,0	5,0	1,0		mandag-22-aug	05:00	165,7
	128	POOH to 496 m w/cement singer and circulate.	3,0	6,0	2,0		mandag-22-aug	07:00	161,7
	129	POOH to 475 cement plug #2 from 475 m to 416 m.:	3,0	8,0	1,0		mandag-22-aug	08:00	154,7
	130	POOC and circulate, displace riser to sea water.POOH	3,0	5,0	3,0		mandag-22-aug	11:00	152,7
	131	Wash BOP	3,0	2,0	2,5		mandag-22-aug	13:30	153,2
	132	Lay down equipment from derrick andclear drillfloor.	4,0	2,0	1,5		mandag-22-aug	15:00	152,7
	133	Pull wearbushing	3,0	3,0	2,5		mandag-22-aug	17:30	152,2
	134	Set wear bushing. RIH and tag/pressure test the cement plug.POOH	14,5	3,0	15,0		tirsdag-23-aug	08:30	164,2
	135	M/U clean out assembly and RIH to 421m. Displace to 1.10 sg mud	4,0	0,0	4,0		tirsdag-23-aug	12:30	168,2

1.7 Down Time Distribution







	Mob	9 7/8"	36"	17 1/2"	12 1/4"	8 1/2"	Logging	Extra Circ. Logging	7" Liner	P&A	Set cap and netguard	De-mob	AFE
AFE	3,3	0,9	3,1	4,4	3,8	4,3	4,2	1,2	1,6	5,9	0,2	2,2	33,9
Actual	1,5	1,1	6,0	5,8	4,8	6,8	4,6	0,5	1,8	5,8	0,3	0,7	39,7

For more details regarding the down time can be found in the BORE data section.

1.8 AFE VS Actual Costs

JVP3 - Boring brønn 35/2-1

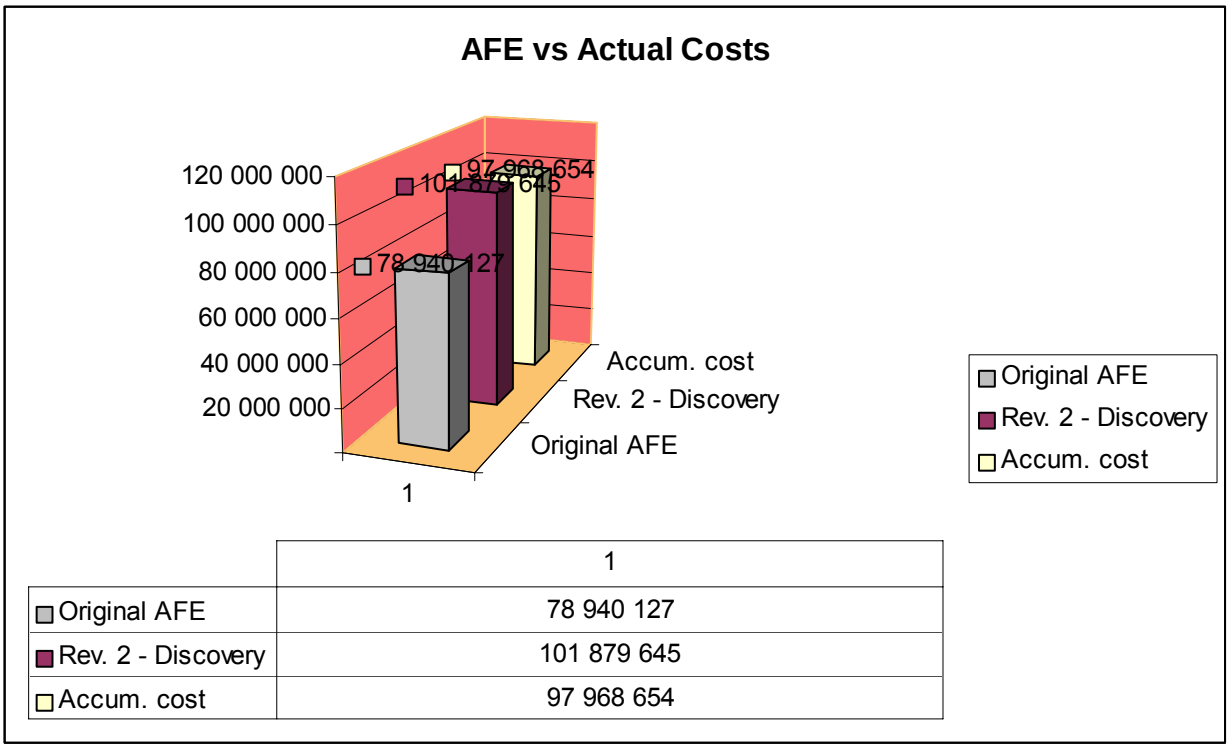
AFE report period: / 12

Norsk Hydro a.s.

Date.....: 07.01.2006

	Original AFE	Rev. 1	Rev. 2	Accum. cost
Employee relat. costs	8 981 977	9 607 777	10 217 932	9 893 933
Employee relat. costs	**8 981 977**	**9 607 777**	**10 217 932**	**9 893 933**
Rig costs	**28 876 631**	**33 778 630**	**38 558 079**	**38 718 403**
Rig support costs	**1 504 867**	**1 759 534**	**2 007 834**	**3 091 635**
Consumable costs	**7 688 484**	**9 017 435**	**10 375 668**	**5 752 857**
Transportation costs	**12 836 000**	**13 420 000**	**13 989 400**	**13 970 898**
Service contracts	**15 796 742**	**20 956 119**	**23 190 906**	**18 213 568**
Survey costs	**2 319 426**	**2 319 426**	**2 319 426**	**6 914 848**
Warehouse costs	**936 000**	**1 080 000**	**1 220 400**	**1 300 020**
Total	**78 940 127**	**91 938 921**	**101 879 645**	**97 968 654**

* Seems to be an accrual of 5,3 MNOK that are credited agains Misc.rental & op.costs
** Lost in hole
**** Rigpool under Misc. Rental…



	1
Original AFE	78 940 127
Rev. 2 - Discovery	101 879 645
Accum. cost	97 968 654

JVP3 - Boring brønn 35/2-1

AFE report period: / 12

Norsk Hydro a.s.

Date.....: 07.01.2006

	Original AFE	Rev. 1	Rev. 2	Accum. cost	
Employee relat. costs	8 981 977	9 607 777	10 217 932	9 893 933	
Employee relat. costs	**8 981 977**	**9 607 777**	**10 217 932**	**9 893 933**	
Rig costs	28 876 631	33 778 630	38 558 079	38 718 403	
Rig costs	**28 876 631**	**33 778 630**	**38 558 079**	**38 718 403**	
Rig support costs	1 504 867	1 759 534	2 007 834	3 091 635	
Rig support costs	**1 504 867**	**1 759 534**	**2 007 834**	**3 091 635**	
Fuel/luboil	2 112 996	2 364 996	2 610 696	1 843 149	
Bits	78 361	78 361	78 361	546 671	
Casing/casing equipment	1 348 935	2 425 886	3 531 436	1 231 776	
Wellhead	803 100	803 100	810 083	951 542	
Cement/cement addit.	224 394	224 394	224 394	216 778	
Mud/mud chemicals	3 120 698	3 120 698	3 120 698	962 941	
Consumable costs	**7 688 484**	**9 017 435**	**10 375 668**	**5 752 857**	
Other transport	300 000	340 000	379 000	643 582	
Standby vessel	780 000	900 000	1 017 000	557 255	
Helicopter transport	936 000	1 080 000	1 220 400	1 891 037	
Supplyboat	10 820 000	11 100 000	11 373 000	10 879 023	
Transportation costs	**12 836 000**	**13 420 000**	**13 989 400**	**13 970 898**	
Coring		1 333 000	1 333 000	72 132	
Directional drilling	1 484 541	1 484 541	1 901 177	4 996 769	**
Cutting of casing	378 308	378 308	378 308	24 057	
Completion costs	151 024	151 024	301 992	824 511	
MWD-services	3 894 369	3 894 369	3 894 369	3 082 326	
Casing operations	198 409	198 409	421 124	563 567	
Mud logging	900 489	954 289	1 006 744	1 404 590	
Cementing/press.test	1 701 364	1 782 816	1 862 232	1 873 633	
El.logging	2 770 321	3 970 321	4 895 321	3 799 801	
Rig pool	1 040 000	1 200 000	1 356 000		***
Rov/diving	645 936	823 061	993 818	1 990 031	
Misc.rental & op.costs	2 631 981	4 785 981	4 846 821	-417 850	*
Service contracts	**15 796 742**	**20 956 119**	**23 190 906**	**18 213 568**	
Site survey	1 354 279	1 354 279	1 354 279	6 415 145	*
Rig positioning	965 147	965 147	965 147	612 195	
Survey costs	**2 319 426**	**2 319 426**	**2 319 426**	**6 914 848**	
Warehouse costs	936 000	1 080 000	1 220 400	1 300 020	
Warehouse costs	**936 000**	**1 080 000**	**1 220 400**	**1 300 020**	
Total	**78 940 127**	**91 938 921**	**101 879 645**	**97 968 654**	

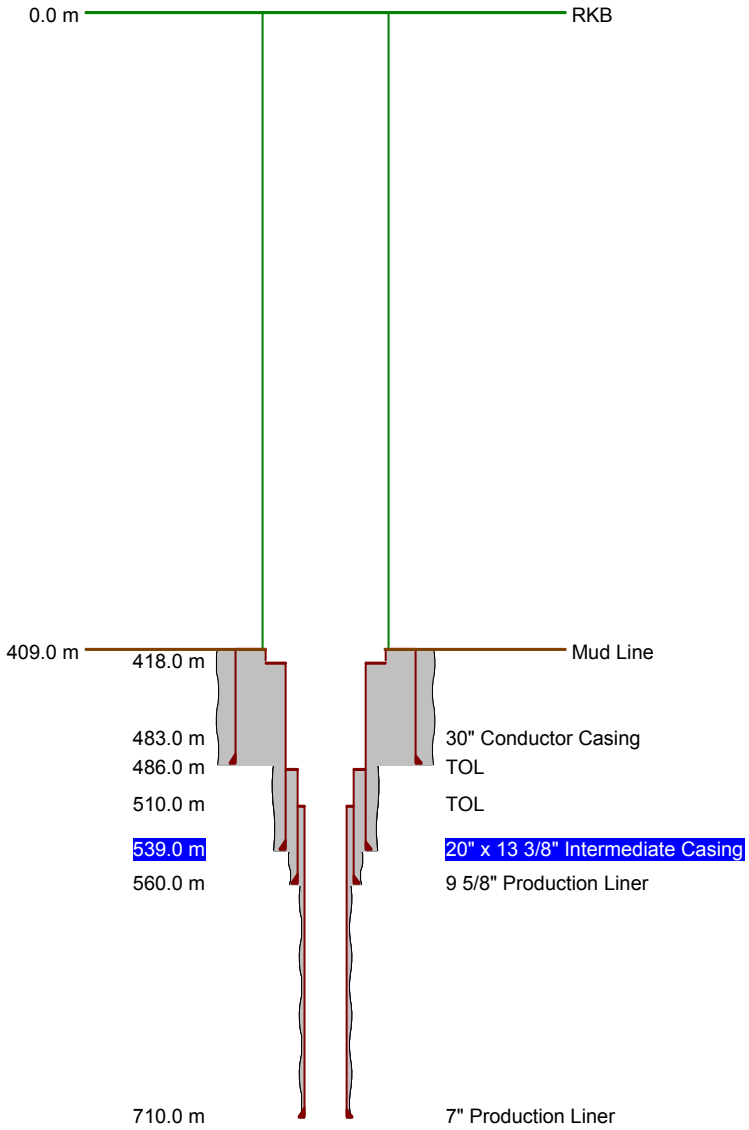
* Seems to be an accrual of 5,3 MNOK that are credited agains Misc.rental & op.costs
** Lost in hole
**** Rigpool under Misc. Rental…

1.9 Geological data acquisition

1.10 Logging table. MWD / LWD / Wireline.

Run	Hole diam	Log type	Interval logged	Comments
		MWD / LWD		
1|	9 7/8	GR-RES-ECD-DIR	409,0 - 544,0 m	Pilot
2	36	GR-RES-ECD-DIR	409,0 - 463,0 m	Hole opener – broken drill string
3	36	GR-RES-ECD-DIR	409,0 - 483,0 m	Respud
4	17½	GR-RES-ECD-DIR	483,0 - 543,0 m	Section TD
5	12¼	GR-RES-ECD-DIR	543,0 - 561,0 m	Section TD
6	8½	GR-RES-ECD-DEN-NEU-TesTrak	561,0 - 586,0 m	LWD failure
7	8½	GR-RES-ECD-DEN-NEU-TesTrak	586,0 – 713,0 m	TD
		Wireline Logging		
		TD logging		
1A	8½	FMI-MSIP	484,0 - 707,0 m	
1A	8½	MDT	576,0 - 612,0 m	Pressure points and samples. Got stuck; skipped 3 deepest pressure points
1A	8½	SP-HRLA-PEX-ECS	550,0 - 709,0 m	HRLA failed
1A	8½	VSI	430,0 – 612,0 m	Station every 10m
1A	8½	MSCT	613,0 – 703,0 m	Tool failure. 8 cores, 3 “recovered”
1B	8½	SP-HRLA	560,0 – 709,0 m	HRLA rerun
1B	8½	MRCT	575,0 – 607,5 m	23 cores, 1 recovered
1C	8½	MRCT	571,0 – 574,0 m	3 cores, 0 recovered
1D	8½	MRCT	578,0 – 614,0 m	5 cores, 0 recovered

1.11 Casing Data



Size (inch)	Weight (lbs/ft)	Grade	Connection	Casing shoe depth (m BRT)
30”		X52		269m
20”	133	X-56	Welded to 13 3/8”	418m
13 3/8"	72	P-110	Buttress	539m
9 5/8"	53.5	P-110	Vam Top	560m
7”	32	P-110	NSCC / Vam Top	711m

1.12 LOT/FIT summary report

Casing m MD	Shoe m TVD	Track	Hole m M	Hole m TVD	Test Type	Test Result sg
539	539		544	544	FIT	1,3
560	560		561	561	FIT	1,29

1.13 Cementation

1.13.1 Cementing operation Summary Overview

30" casing run in 36" hole, drilled to total depth 483m MD/TVD, and cemented in place with 29.5m3 1.56 SG Class G extended lead slurry and 16.7m3 1.95 SG Class G accelerated tail slurry. The section was subsequently grouted with 15m3 1.95 SG Class G accelerated tail slurry as planned. TOC tagged by ROV ½m below seafloor proved cement job success.

20" x 13 3/8" casing run in 17 ½" hole, drilled to total depth 543m MD/TVD, and cemented in place with 55m3 1.60 SG Class C Anti-Gas Migration slurry. Although the sub sea cement head malfunctioned, a 1.30 SG Equivalent FIT proved cement job success.

9 5/8" liner run in 12 ¼" hole, drilled to total depth 561m MD/TVD, and cemented in place with 7.7m3 1.25 SG Lite Set 10 slurry. A 1.30 SG Equivalent FIT proved cement job success.

7" liner run in 8 ½" hole, drilled to total depth 713m MD/TVD, and cemented in place with 4m3 1.25 SG Lite Set 10 slurry. No FIT necessary.

7" liner TP&A with 3.5m3 of 1.25 SG Lite Set 10 slurry balanced from 670m to 496m. No pressure test available.

13 3/8" casing TP&A with 4.5m3 of 1.95 SG Class G accelerated tail slurry balanced from 475m to 416m. WOC 12 hours, pressure test failure. WOC additional 9 hours tag successful with 10 tons, pressure test failure.

1**3 3/8" casing TP&A** with 3.2m3 of 1.95 SG Class G accelerated tail slurry balanced from 450m to 413m. WOC 18 hours, pressure test failure.

A 13 3/8" Peak retrievable packer, was set and tested as contingency since the pressure test of the P&A cement plugs failed.

1.13.2 Sequence of events Cementing Operations

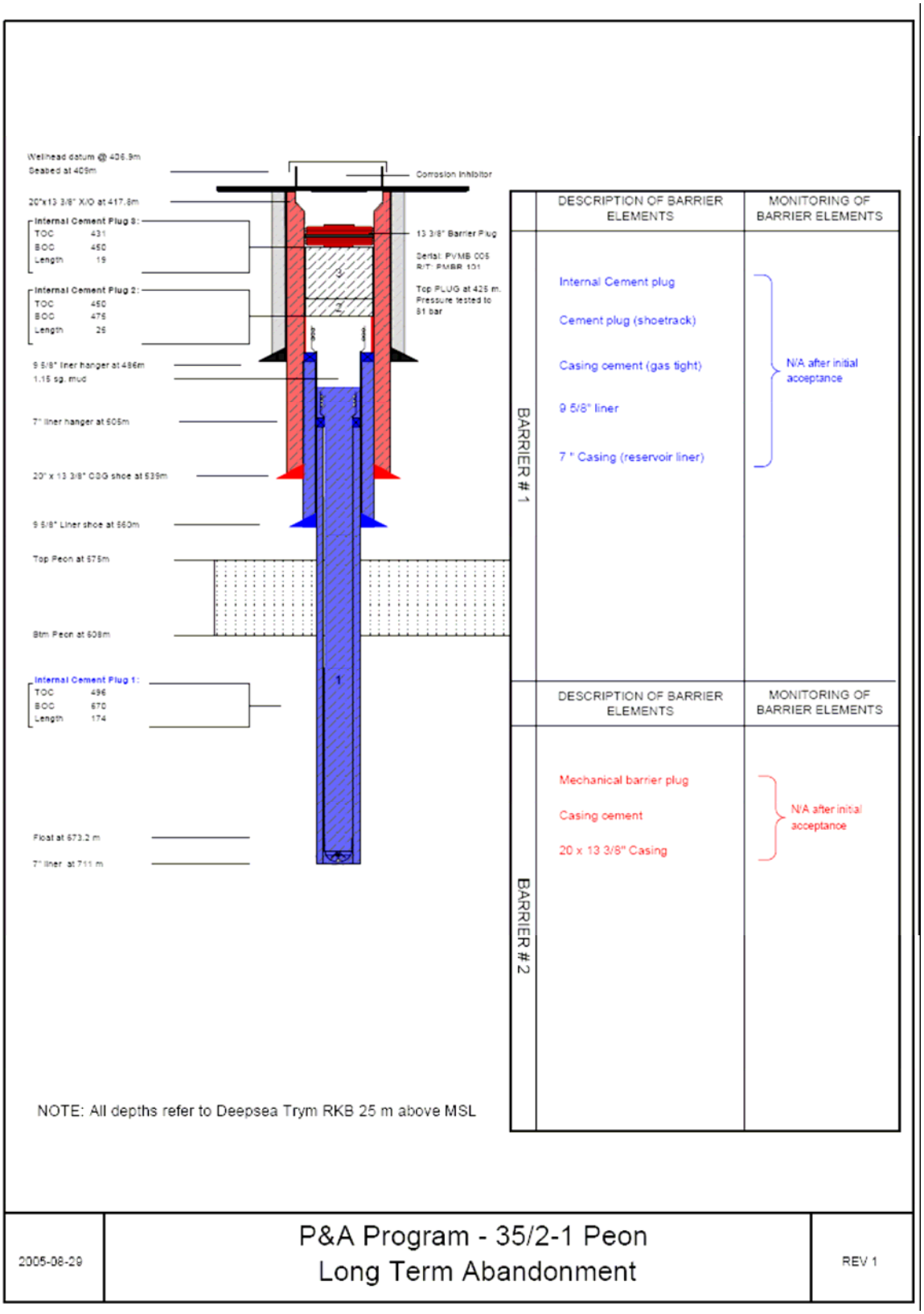
Sequence of Events Overview

Date	Event	Notes
22-Jul-05	Spud Well	
23-Jul-05	Lose BHA	
24-Jul-05	Re Spud Well	
24-Jul-05	Reach 36" TD	
26-Jul-05	Cement 30" Casing	
27-Jul-05	PU 17 1/2" BHA	
28-Jul-05	ROV Tag TOC	
29-Jul-05	Reach 17 1/2" TD	
31-Jul-05	Cement 20" x 13 3/8" Casing	
4-Aug-05	PU 12 1/4" BHA	
5-Aug-05	FIT	
6-Aug-05	Reach 12 1/4" TD	
7-Aug-05	Cement 9 5/8" Casing	
8-Aug-05	PU 8 1/2" BHA	
9-Aug-05	FIT	
14-Aug-05	Reach 8 1/2" TD	
21-Aug-05	Cement 7" Liner	
22-Aug-05	Balance TP&A 1	
22-Aug-05	Balance TP&A 2	
22-Aug-05	Tag & Pressure Test TP&A 2	
23-Aug-05	Balance TP&A 3	
24-Aug-05	Tag & Pressure Test TP&A 3	
26-Aug-05	Set and Test Packer	
26-Aug-05	Pull BOP & Riser	
28-Aug-05	EOW	

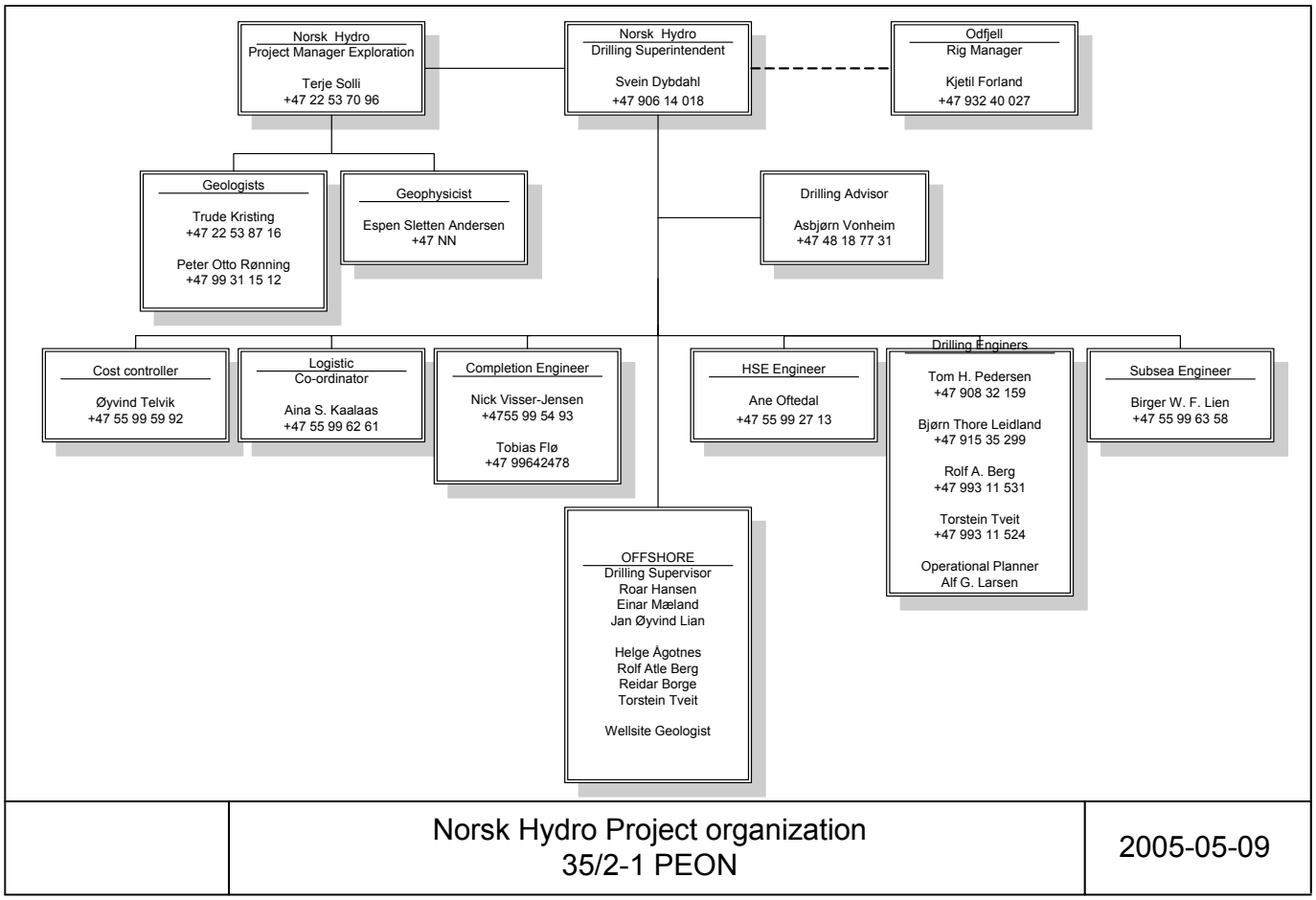
1.14 Mud summary

Interval	36	17 ½"	12 ¼"	8 ½"
Mud Type	Spud Mud	Spud Mud	Aqua-Drill	Aqua-Drill
Start Depth (m) (BORE)	409	483	543	561
End Depth (m) (BORE)	483	543	561	713
Drilled (m)	74	60	18	152
Days (inc. comp)	6	5	4	20
Casing Size / Liner Size (in)	30	13 3/8" - 20"	9 5/8	N/A
Casing Depth (m)	483	539	560	N/A
Mud Wt. (sg)	SW	SW	Aquadrill/ CaCO3	Aquadrill/ CaCO3
Pump Liner Size (in)	6	6	6	6
Flow Rate (l/min)	3500	3500	1700	1450
SPP (bar)	80	90	77	75
Hole Angle Range (°)	0.5 - 0.9	0.4	0.4	0.4
Dilution Rates (m3/m)	N/A	N/A	N/A	N/A
Downhole Losses m3	0	0	0	0
Riserless Losses m3	223	198	0	0

1.15 Long term Temporary Plug and Abondon



1.16 Project Organisation



Norsk Hydro Project organization
35/2-1 PEON

2005-05-09

1.17 Contractor Data

Service	Company
Mud logging	Baker Hughes INTEQ
Directional Drilling	Baker Hughes INTEQ
LWD / MWD	Baker Hughes INTEQ
Mud / Mud Engineering	Baker Hughes Fluids
Well-head	Dril-Quip
Cementing	BJ services
Casing	Mitsui
Casing running	Odfjell Well Services
Liner Services	Weatherford
Electric Wire line Logging	Schlumberger
Drilling / Rig Contractor	Odfjell Drilling
Fishing, Milling, Hole opening	Smith Red Baron
Plug and Abandonment	BJ/Red Baron/Dril-Quip

2 Operations and experiences

All depths are referenced to RKB, 25 m above MSL. Seabed was at 384 m below MSL.

The semi submersible rig Deepsea Trym drilled the exploration well 35/2-1 Peon. The well is located north of the Fram field and west of the Agat field. Deepsea Trym arrived location 20th of July 2005 and the well was spudded 21th of July.

The original plan was to permanently abandon the well. However, decision was made after the well was drilled to TD, to test the well 35/2-1 during summer 2006. A 7" liner was run and cemented to TD to prepare the well to . The well was plugged as a long-term temporary abandonment well. The rig left the location at 28th of August 2005.

The well was drilled in a **total of ~39,7 days (953hours) which was 5,8 days behind the AFE (33.9 days)**. The down time was mainly caused by operational and equipment failures including problems to get a pressure test on the P&A top cement plug. The downtime was not related to any Peon geological or prospect related problems.

3 Transit and positioning

The total time used for mobilization from Troll and anchoring of Deepsea Trym on the 35/2-1 Peon location was 36 hours / 1,5 days. This includes rig move, positioning, testing of the anchor lines, anchoring and installation of transponders.

The gyro on Deepsea Trym was out with 20 degrees and new gyro was ordered as back up. Experienced problems with heating of the roller bearings in winch #3 and the winch was out of service during the anchor handling operations. The anchor handling boats and the Deepsea Trym performed an efficient anchor handling operations. This feedback was communicated to the respective captains on the boats and the OIM on Deepsea Trym.

Based on the problems with twist in the anchor chains Odfjell Drilling will consider installing swivel on the anchors.

After the installation of the anchors a Table Top exercises was held covering shallow gas preparedness and emergency anchor handling to move the rig away from the location.

Prior to move the rig too Peon a survey of the anchor winches were conducted. Due to the problems with anchor winch #3 it is recommended to review the report out if anything was missed during the inspection.

iSurvey AS was contracted to cover the navigational positioning of the rig move from the Troll Field up to 35/2-1 Peon location. A full report of the anchor handling is attached to this report. The final rig position is presented below:

Datum:	ED50SOUTH62
Geographic Position	Longitude: 003°20’34.364’’
	E Latitude: 61°53’26.679’’ N
UTM Position	Easting: 518 024.19 m
	Northing: 6 862 221.28m

UTM Zone and CM Zone 31, Central Meridian 3°E

4 9 7/8" Pilot hole 409 m – 544 m

9 7/8" Section (MD, TVD)	409 m	544 m
Total time consumption	953 Hrs	
Operational time (hrs, %)	26 Hrs	2.7 %
Downtime (hrs, %)	0 hrs	0 %

4.1 Drilling

The geological site survey did indicate any sign of shallow gas above the Peon reservoir. However, shallow gas preparedness was implemented. Prior to drill 9 7/8" pilot hole sufficient volume of 1.2 and 1.5 sg kill mud was prepared. Made up 9 7/8" BHA and ran in hole. Washed soft clay from 413m – 423m. Drilled 9 7/8" hole from 443,5m to 544m while pumping his-vis pills and circulated bottoms up at TD. No sign of gas on bottoms up. Flow checked for 10 min with the ROV at the wellhead prior to pull out of the hole. The MWD/LWD was downloaded at the surface.

The section was drilled with seawater and high vis sweeps.

Run	Bit no	Size in	Vendor	Type	Serial no	Jets(x1/32")	Depth in(m)	Dist (m)	Hrs	ROP (m/hr)	Circ Hrs	WOB (ton)	RPM (bit)	TQ (kNm)	Ppress (bars)	Flow rate (l/min)	TBR	IADC Grading
1	1	9 7/8"	HCC	MXB20DX	5044824	3x18	409	35	10.2	11.2	12.7	0-3	14-59	1-4	10-55	1000-1900	35035	1-1-WT-A-E-0.0-NO-TD

5 36” Hole section 409 m - 463 m

TD 17 ½” (MD, TVD)	463m	463m
TD 30" casing (MD, TVD)		
Total time consumption	953 hrs	953 hrs
Operational time (hrs, %)	144hrs	15,1%
Downtime (hrs, %)	64,5hrs	6,7 % of section time

5.1 Drilling

A 36” tandem hole opener comprising 36” x 26” hole openers and a 17 ½” pilot bit was made. Positioned the rig using the transponders at the sea bed. Drilled 36” hole from 418m – 443m. Boulders were drilled from 439m to 442m and reaming was required to maintain a vertical hole. Lost suddenly pressure and loss in up-weight. The ROV confirmed that the string was parted in the drill collars. Pulled out of the hole with 57,6m of the BHA lost in the hole. Performed survey with the ROV to investigate if any of the DC were sticking up. The BHA was most likely parted in two places. Decision was made to abandon the BHA and repositioned the rig to a new spud location.

The 36” x26” Hole opener including 17 ½” bit and the 8 ¼” MWD MPR tool was lost in hole.

Run	Bit no	Size in	Vendor	Type	Serial no	Jets(x1/32")	Depth in(m)	Dist (m)	Hrs	ROP (m/hr)	Circ Hrs	WOB (ton)	RPM (bit)	TQ (kNm)	Ppress (bars)	Flow rate (l/min)	TBR	IADC Grading
2	2	17.5" x 36"	HCC	MXT305HDX2	6018434	4x18	409	54	4.7	14.1	15.4					Lost in hole		

6 36” section - re-drill 409 m – 483 m

17 ½”/36”Section (MD, TVD)	482,7 m	482,7 m
TD 30" casing (MD, TVD)	482,7 m	482,7 m
Total time consumption	953 hrs	
Operational time (hrs, %)	144 hrs	15,1%
Downtime (hrs, %)	64,5 hrs	6,7%

The rig was moved approximately 20m south of the original spud location. The original pilot hole was still within the range to be valid for the new location and a new 9 7/8” pilot hole was not required.

6.1 Re-drilling 36” hole

Made up the back up BHA #3 comprising 36”x26” hole opener, 171/2” bit and 8 ¼” MWD tool. Washed from 409m to 413m and drilled from 413m 440m. Drilled on harder formation indicating boulders at 439m. The hole was reamed due to increase in inclination and the rig was moved 9m. Drilled from 440m to 463m. The inclination was held within set specifications. Circulated the hole clean staying 4m off bottom and pumped 15 m3 Hi-vis pills. As a consequence of possible boulders the well was displaced with 1.5sg mud, which is according to Hydro best practice. Performed wiper trip without any over pull to 418m and ran in hole and had 1m of fill at TD. The hole was displaced to 1.5 sg mud. Pulled out of the hole and topped up the well with 1.50 SG mud. The 36”x26” hole opener assembly was racked back in the derrick.

Run	Bit no	Size in	Vendor	Type	Serial no	Jets(x1/32")	Depth in(m)	Dist (m)	Hrs	ROP (m/hr)	Circ Hrs	WOB (ton)	RPM (bit)	TQ (kNm)	Ppress (bars)	Flow rate (l/min)	TBR	IADC Grading
3	3	17.5" x 36"	HCC	MXT305HDX2	ZJ93DK	4x14	409	74	10.8	6.8	18.3	0-6	58-62	3-6	78-85	3000-3500	38805	1-1-WT-A-E-0.0-NO-TD

6.2 30” Conductor running

Rigged up for 30” conductor running. The 30” conductor included float, conductor joints and 30” conductor-housing. The operation to sting in the 30” conductor in the 36” hole at seabed was delayed for 4 hours due to poor visibility at the sea bed.. The conductor was landed on bottom at 482,7 m and prior to cement, the conductor orientation, inclination and stick up was verified.

Displaced the hole with 20m3 seawater and cemented the 30” conductor according to the program. Waited on cement and prepared for the grouting operation in 36” annulus by using the pre-installed Dril-Quip Titus system. Pumped 15m3 1.95 cement with 650 lpm and 8 bar. Released 30” conductor running tool, flushed cement and drill pipe and POOH.

6.3 26” clean out assembly run #1

Made up a clean out assembly comprising a 26” bit and drill collars to clean out the 30” conductor. The assembly was run in hole and lost sudden weight. Investigation at the wellhead with the ROV confirmed that the BHA had parted while running in the hole. The BHA was tied with rope to the guide wires. The last top stabiliser hung up in the 30” wellhead while running in the hole. The drill collar connection broke off and two 8” drill collars were lost on the seabed. Top of the fish was located at 458,3m in the well. Made up fishing assembly and performed 2 fishing runs before the BHA was recovered and pulled out of the hole.

During plug and abandonment a total of 3 drill collars were recovered from the seabed.

Run	Bit no	Size in	Vendor	Type	Serial no	Jets(x1/32")	Depth in(m)	Dist (m)	Hrs	ROP (m/hr)	Circ Hrs	WOB (ton)	RPM (bit)	TQ (kNm)	Ppress (bars)	Flow rate (l/min)	TBR	IADC Grading
4	4	26"	HCC	GTX-CM03	6027697	4x14	483	0	0.2	0	0.6	Twist off					171	0-0-NO-A-E-1-BU-TW

A total of 32 hours was lost due to the twist off.

6.4 26” clean out assembly run #2

Made a new 26” BHA and RIH to top of cement at 477m. Drilled out cement in 30” shoe track from 477m to 482,7m and 4m of 26” new formation without any problems. Pulled out of the hole and laid down the BHA and prepared to pick up 17 1/2” assembly.

Run	Bit no	Size in	Vendor	Type	Serial no	Jets(x1/32")	Depth in(m)	Dist (m)	Hrs	ROP (m/hr)	Circ Hrs	WOB (ton)	RPM (bit)	TQ (kNm)	Ppress (bars)	Flow rate (l/min)	TBR	IADC Grading
5	4RR	26"	HCC	GTX-CM03	6027697	4x14	483	3	1.2	2.5	2.7	0-1	59-61	2-3	133	3025	10160	1-1-NO-A-E-I-NO-TD

6.5 30” hole section investigation reports

The two incidents in 36” holesection have been logged in Synergi and have case numbers:

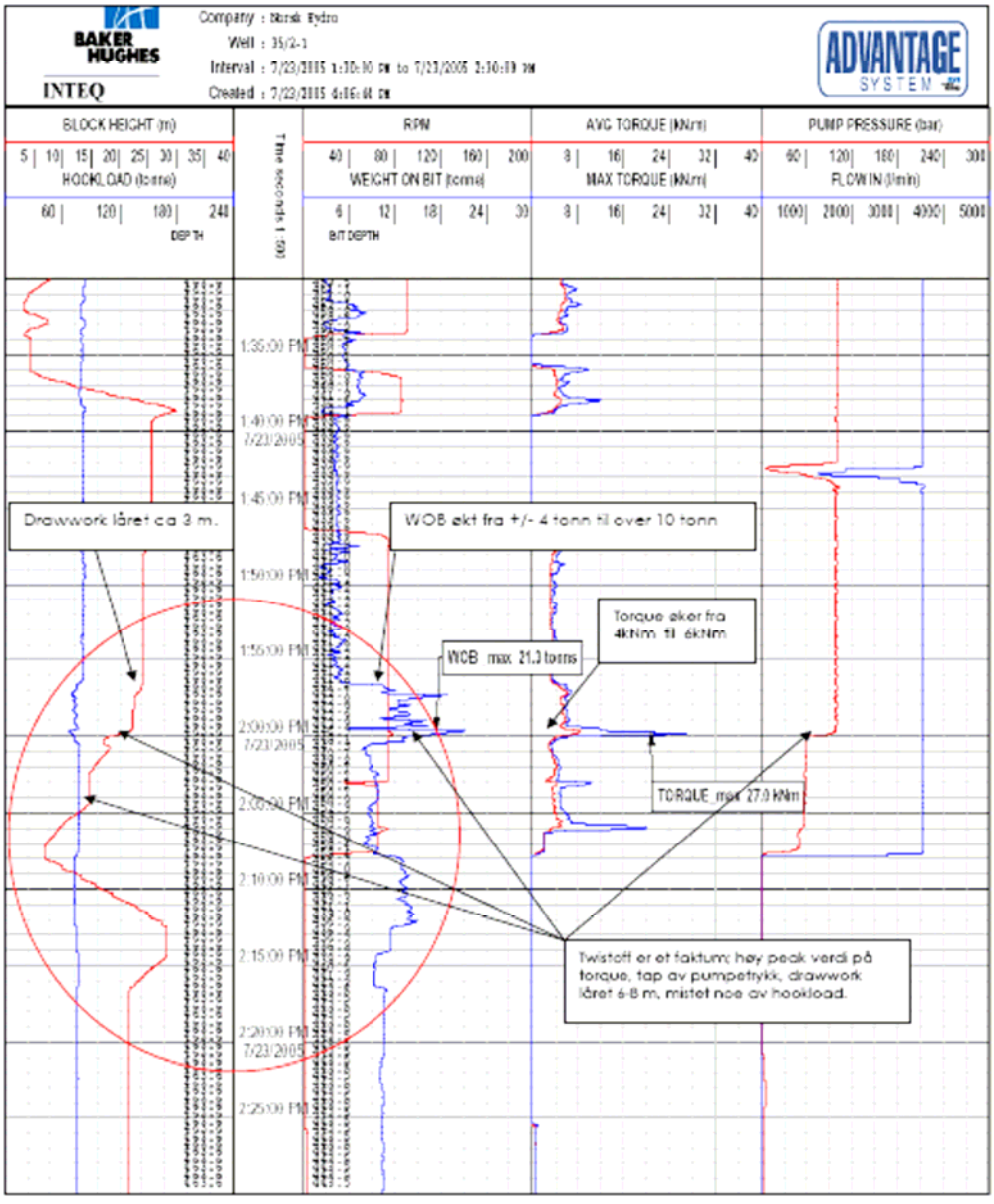
1. BHA broken during hole opening **- Synergi # 83013**
2. BHA broken while running in the hole with 26” BHA – **Synergi 83147**

Odfjell Drilling have prepared an incident investigation report, which covers details and conclusions from the above incidents.

6.5.1 Incident #1 – 36" Hole section

Gjennomgang av hendelse DST
23.07.05: BHA brakk under reaming, synergi # 83013
26.07.05: BHA brakk under innkjøring, synergi # 83147

8.3 BHI plot, hendelse # 1, (forklarende kommentarer er lagt til i ettertid)

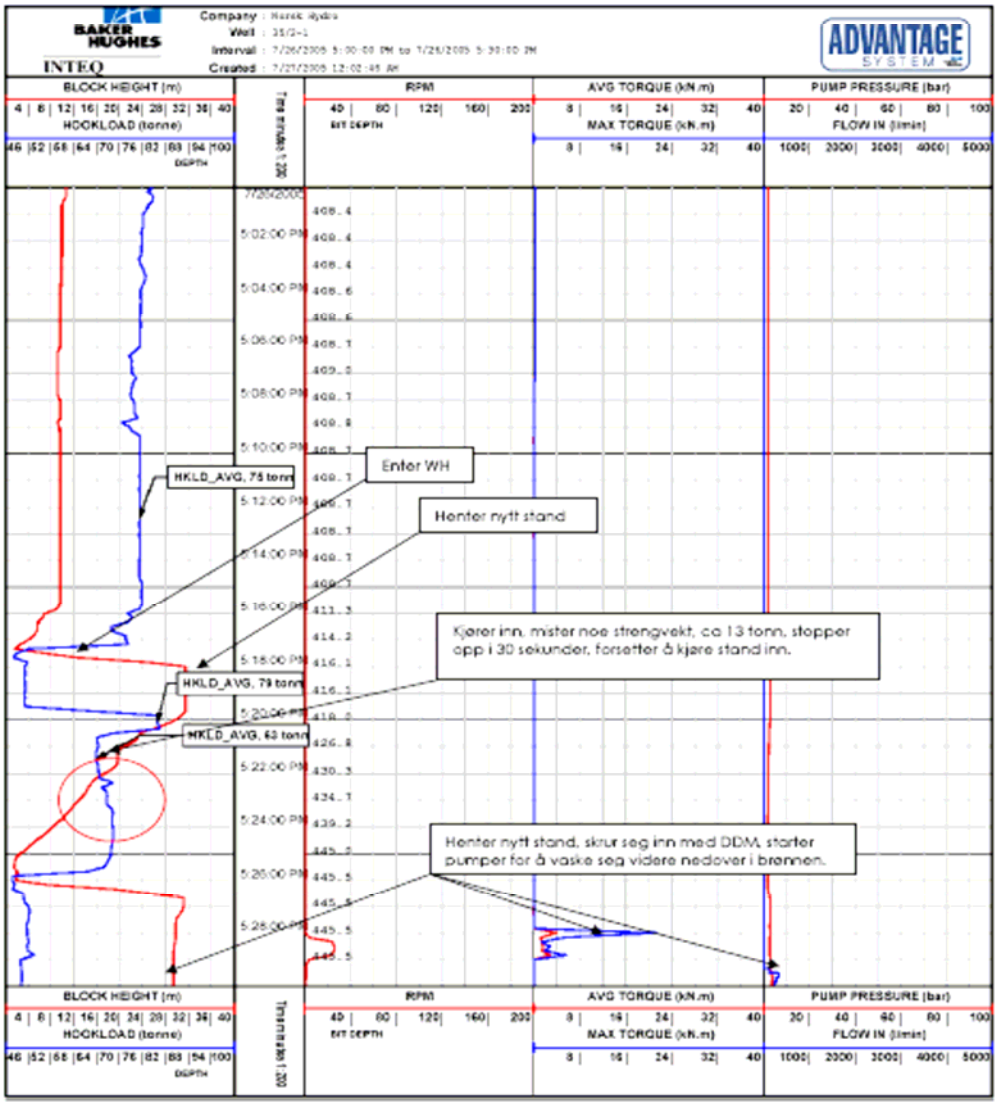


162187 11 av 12

6.5.2 Incident #2 - 36" Hole section

Gjennomgang av hendelse DST
23.07.05: BHA brakk under reaming, synergi # 83013
26.07.05: BHA brakk under innkjøring, synergi # 83147

8.4 **BHI plot, hendelse # 2,** (forklarende kommentarer er lagt til i ettertid)



7 17 ½" hole section 483 m – 543 m

17 ½" Section (MD, TVD)	543m MD RKB	543m TVD
13 3/8" Casing (MD, TVD)	539m	539m
Total time consumption	953hrs	
Operational time (hrs, %)	140 hrs	14.7%
Downtime (hrs, %)	41 hrs	4,3%

7.1 17 ½" Drilling and casing running

Picked up a new 17 ½" BHA, installed guide ropes and ran in the hole to 487m. Drilled and surveyed 17 ½" hole from 487 m to 543 m. Circulated the hole clean and displaced to 1.2 sg mud. Flow checked and performed a wiper trip to the BOP. Ran back to TD, displaced the hole to 1,50 sg mud and pulled out of the hole. When tripping out into the 30" casing, the casing volume was topped up with 3m3 mud. Made up 20"x13 3/8" casing according to the tally and picked up 18 5/8" wellhead housing. Ran the casing in the hole to TD and landed 18 5/8" wellhead and performed an over pull test to 25 tons.

Run	Bit no	Size in	Vendor	Type	Serial no	Jets(x1/32")	Depth in(m)	Dist (m)	Hrs	ROP (m/hr)	Circ Hrs	WOB (ton)	RPM (bit)	TQ (kNm)	Ppress (bars)	Flow rate (l/min)	TBR	IADC Grading
6	5	17 1/2"	HCC	MXST303DX	6021788	4x16	486	57	8.2	6,9	13.8	0-2	67-91	2-3	137-139	3410-3445	41714	0-1-WT-HE-0.0-CT-TD

7.2 Cementing 13 3/8" casing

While displacing the hole to seawater a sudden pressure increase was experienced. Stopped the pumps and started to trouble shoot. When the cement head was opened up the dart was released. Pulled out of the hole and laid down 18 ¾" running tool. Discovered at surface that the cement plug was left in the casing.

Made up a 12 1/4" bit and additional BHA elements and ran in the hole. Tagged the cement plugs at 419 m. Pushed the plugs to the float at 507 m and drilled out the plugs. The ROV confirmed rubber from the plugs over the wellhead. Pulled out of the hole when the plugs were drilled out.

Picked up 5" DP and made up a cement inner-string to the 18 3/4" running tool. Ran in the hole with the cement inner-string. Broke circulation and increased the pump rate in steps to 1000 lpm. Cemented the 13 3/8" casing in place according to the cement program. Disconnected the running tool from the 18 3/4" wellhead and pulled out of hole.

For more details regarding the cement job and the cement plug failure please refer to BJ services end of well report.

7.3 BOP running and BOP pressure testing

The rig was moved to the safe zone away for the template for BOP handling. Performed planned maintenance on the top drive and the iron roughneck. Picked up the riser running tool and the riser spider. Connected the BOP to the riser and disconnected lower marine riser package from the BOP. Inspected and greased all moving parts and changed the AX gasket. Re-connected LMRP to the BOP and ran in with the BOP prior to pick up and connect the slip joint and diverter.

Disconnected and re-landed Lower Marine Package on top of the BOP. Tested the kill and choke lines to 35 / 345 bar. Found one of the four locking dogs still to be in unlocked position. Continued to troubleshoot on the Lower Marine Package before continuing to lock in all four locking dogs. Managed finally to close the locking dogs after disconnecting the hose to the pre-charging hydraulic bottles connected to the LMR package. The pre-charge pressure of the LMR hydraulic bottles caused the problem. The bottles were not charged to sufficient pressure to compensate for the water depth. The locking mechanism could therefore not be operated according to the operating procedure.

Performed a final pressure test on kill and choke lines to 35 bar / 345 bar and stroked out the inner barrel of the slip joint and installed the diverter element.
Performed pre-job meeting and ran in the hole with the 13 3/8 Peak packer to 483 m. Circulated with 1000 lpm / 6 bar prior to set the plug. The Peak packer was sat at 481,5 m. Attempted to release the running tool without any success. Released the peak plug and pulled out of the hole.
Verified proper make up torque and function tested the peak plug at the surface. Ran in the hole and sat the peak packer at 483 m. Released and re-latched the running tool to the peak packer. Pressure tested the riser connector and the peak packer to 35 / 103 bar for 5 / 10 min.
Released the Peak plug and pulled out of the hole from 483 m.

8 12 ¼" Section 534 m – 539 m

12 ¼" Section (MD, TVD)	543 m MD RKB	534 m TVD
9 5/8" Liner (MD, TVD)	543 m	539 m
Total time consumption	953 hrs	
Operational time (hrs, %)	115 hrs	12.1%
Downtime (hrs, %)	2 hrs	1,7%

8.1 12 ¼" drilling

All personnel going to the rig attended a Peon specific well control seminar. The purpose of the seminar was to get the personnel exposed and trained to handle Peon specific well control challenges and risks. For more details regarding well control issues please refer to chapter 2. On each shift an extra Driller/Toolpusher was available on the rig floor at all the time. His main focus was to operate the BOP panel to minimise the time to shut the well in.

Installed the BJ Services triplex well control pump and BJ custom-made FIT pumping equipment. Made up 12 ¼" bottom hole assembly and ran in the hole. Spaced out and performed BOP function test. Broke circulation and function tested the diverter system and trip tank system. Connected BJ well control pumps and walked the lines with the crew.

Washed down and tagged the cement with 5 ton at 502 m. Performed kick and choke drill circulating with MP# 3 (kill pump) adjusted to operate at max 30 spm and 4 ½" liners installed. Tested all low-pressure range sensors with 2 decimal readings. Displaced the surface equipment, kill lines, choke lines and the well volume with 1,13 sg Aquadrill mud.

The FIT equipment was tested and several FIT tests were simulated inside 13 3/8" casing which also included slow circulation rates. The remote control system was tested to specifications.

Drilled hard cement from 502 m to 539 m and drilled out the shoe from 539 m. Cleaned out the rat hole in 1 m steps from 539 m to 543 m. Drilled 1 m new formation from 543 m to 544 m and circulated the hole clean prior to perform the FIT test. Installed pump in sub and performed FIT test with an equivalent mud weight of 1,30 sg. The actual FIT was higher than the fracture prognosis that was prepared for well 35/2-1 Peon. This gave higher kick margin and a wider drilling window with regard to the pore pressure and fracture curve.

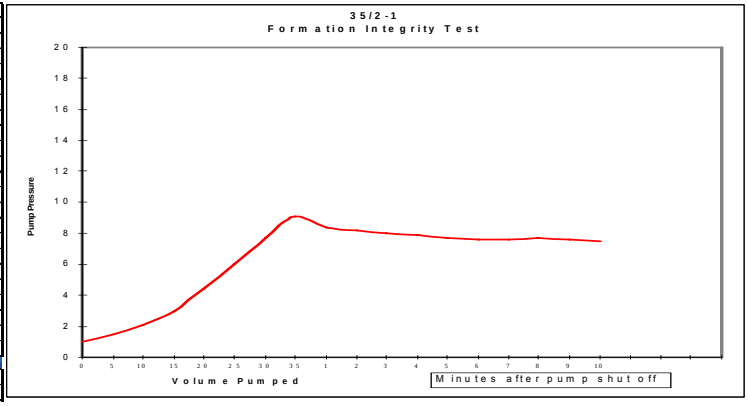
LEAK OFF TEST / FORMATION INTEGRITY TEST

Well:	Peon 35/2-1	Date	13.09.2005
Rig:	Deepsea Trym	Sign.	Einar Mæland

HYDRO

Hole Size Dia oh	:	12 1/4	Inch	CSG Size D csg	:	13 3/8"	Inch
Hole Depth MD oh	:	544	m	CSG Depth MD csg	:	539	m
Hole Depth TVD oh	:	544	m	CSG Depth TVD csg	:	539	m
Mud Weight in Use MW	:	1,13	s.g.	FITest, EMW fit	:	1,30	s.g.
Leak Off Pressure PI	:	9,1	bar	Pressure Test Lines	:	30	bar
Equivalent Mud Weight	:	MW + PI / TVD csg x 10,2 =			:	1,30	s.g.
Formation Integ. Press.	:	Pfit = (EMW fit - MW) x TVD csg / 10,2 =			:	9,09	bar

Volume ltr	Pressure bar
0	1
5	1,5
10	2,1
15	3,0
20	4,4
25	6,0
30	7,7
35	9,1
1	8,4
2	8,2
3	8,0
4	7,9
5	7,7
6	7,6
7	7,6
8	7,7
9	7,6
10	7,5
650	ltr bled back



All well control procedures and well barriers were reviewed prior to drill 12 1/4" hole from 544 m to 561 m. Performed check trip by pulling one single without pumping and ran to bottom. Circulated bottom up while recording maximum gas reading of 0,14 %. Performed one stand check but no gas was observed pumping bottom up and ran in hole. Circulated bottom up without out any sign of gas while recording maximum gas reading of 0,12 %. Lubricated out of the hole to avoid swabbing from 561 m to 500 m and flow checked. Continued to lubricate out of the hole from 480 m to 383 m to surface and racked the BHA back in the derrick.

Run	Bit no	Size in	Vendor	Type	Serial no	Jets(x1/32")	Depth in(m)	Dist (m)	Hrs	ROP (m/hr)	Circ Hrs	WOB (ton)	RPM (bit)	TQ (kNm)	Ppress (bars)	Flow rate (l/min)	TBR	IADC Grading
7	6	12 1/4"	HCC	MXCS09DX	5055069	3x18,1x16	543	Drilling out plug and float in 13 3/8" casing										

8.2 9 5/8” Liner operation

Pick up 13 3/8” scraper assembly and ran the assembly in the hole. Broke the circulation and cleaned 13 3/8” casing from 470 m to 495 m. Lubricated out of the hole with the 13 3/8” casing scraper assembly to avoid swabbing effect.

Prepared to run 9 5/8” liner and performed pre job meeting / HAZOP. Picked up 9 5/8” liner as per tally including the 9 5/8” liner hanger.

Ran in hole with 9 5/8" liner on a 5 1/2" landing string from 76 m to 555 m while filling each stand. Picked up Cement head from deck and took up/down weight at 561 m while circulating with 300 lpm at 4 bar. Sat down 10 tons and pulled back to 1 m above TD. Broke the circulation in steps from 100 lpm / 2 bar to 260 lpm / 9 bar. Circulated a total volume of 9 m3 mud.

Dropped and pumped down 2 1/8" aluminum ball and pressured up 9 5/8” liner to 110 bar and activated the liner hanger slips. Sat down 20 tons weight on the landing string weight.

Released the liner hanger running tool and sheared the ball seat at 240 bars.

8.3 9 5/8" Liner cementing

Due to the risk of getting losses due to high circulation pressure during cementing, the well was planned to use a Lite weight cement. For more details refer to BJ Services final report.

Performed pre-job meeting prior to cement the 9 5/8" liner. Circulated with 500 lpm with a pressure of 10 to 17 bars. Pressure tested the cement lines to 345 bars. Cemented the 9 5/8" liner and pumped a total of 7,7 m3 1,25 sg Lite weight cement and bumped the plug after displacing with 5 m3 1,13 sg mud.

The liner was pressure tested to 80 bar / 10 min and bled back while checking for backpressure. Laid out the cement head, set and verified the TSP Liner Top Packer. Lined up and reverse circulated out excess cement with 800 LPM and 30 bar. The excess cement volume was designed based on staying 20m below the BOP.

Lined up and circulated the long way with 2500 LPM / 30 bar meanwhile flushing the kill and choke lines. Pulled out of the hole with the running tool. Pressure tested the TSP Liner Top Packer against the shear ram to 80 bars. Pressure tested the BOP to 6 bar / 103 bar for 5 / 10 min.

There was only 2 hours of down time during 12 ¼" hole section, which was caused by installation of fan housing on the top drive.

9 8 ½" Section 539 m – 713 m

8 ½" Section (MD, TVD)	713m MD RKB	713m TVD
7" Liner (MD, TVD)	711m MD RKB	711m TVD
Total time consumption	953hrs	
Operational time (hrs, %)	234,5 hrs	24,6%
Downtime (hrs, %)	35 hrs	3,7%

9.1 8 ½" Drilling – BHA #6 529 m – 580 m

Made up 8 1/2" bottom hole assembly and tested the MWD tool prior to run in the hole to 480 m. Broke the circulation and washed through the liner lap and tagged the cement at 528,7 m. Prior to drill out the cement the BOP was closed and a choke drill was performed circulating with the modified kill pump - MP #3. During the choke drill the diverter was closed.

Drilled out the cement plugs from 528,7 to 529,3 m and circulated the hole clean. Rigged up the side entry sub and the BJ low flow FIT pump. The FIT equipment was tested prior to simulate two FIT tests inside the liner. Rigged down the side entry sub and prepared to drill the cement plugs.

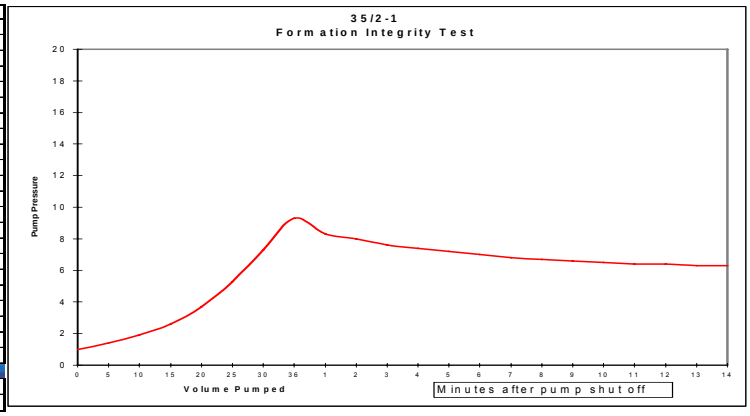
LEAK OFF TEST / FORMATION INTEGRITY TEST

Well: Peon 35/2-1 Date 13.09.2005
Rig: Deepsea Trym Sign. Audstein Dybvad

HYDRO

Hole Size Dia oh	:	8 1/2	Inch	CSG Size D csg	:	9 5/8	Inch
Hole Depth MD oh	:	562	m	CSG Depth MD csg	:	560	m
Hole Depth TVD oh	:	562	m	CSG Depth TVD csg	:	560	m
Mud Weight in Use MW	:	1,13	s.g.	FITest, EMW fit	:	1,30	s.g.
Leak Off Pressure Pl	:	9,3	bar	Pressure Test Lines	:	20	bar
Equivalent Mud Weight	:	MW + Pl / TVD csg x 10,2 =			:	1,30	s.g.
Formation Integ. Press.	:	Pfit = (EMW fit - MW) x TVD csg / 10,2 =			:	9,33	bar

Volume ltr	Pressure bar
0	1
5	1,4
10	1,9
15	2,6
20	3,7
25	5,3
30	7,3
36	9,3
1	8,3
2	8,0
3	7,6
4	7,4
5	7,2
6	7,0
7	6,8
8	6,7
9	6,6
10	6,5
11	6,4
12	6,4
13	6,3
14	6,3
28	ltr bled back



Continued to drill cement and plugs from 529,3 m to 529,7 m, drilled soft cement from 530 m to 558 m and circulated bottom at 558 m. Performed kick drill with the drill crew and recorded slow circulation rates with the modified kill pump MP #3 (4 ½" liner) and the BJ kill triplex low flow pump.

Conducted pre-job meeting which included 8 ½" well control procedures prior to drill out of the

9 5/8" shoe at 560 m. Drilled 1 m new formation from 561 m to 562 m and circulated the hole clean with equal mud weight in the hole. The plan was primarily to aim for a FIT without pressuring up to LOT and risking to break up the formation. The worst case was to get communication up to the seabed. Performed Formation Integrity Test (FIT) to 8,8 bar or 1.3 sg equivalent mud weight. Based on the good FIT of 1,3 sg decision was made to increase the mud weight to 1.15 sg to build in an additional safety margin when drilling in the reservoir. For more details regarding the FIT in 8 ½" section refer to
Chapter 3.

Continued to circulate and increased the mud weight from 1,13 sg to 1,15 sg while adding LC-Lube (LCM material). Circulated and conditioned the mud due to loss of LC-Lube over the shale shaker. Flushed the kill and choke lines with 1,15 sg mud and performed SCR with mud pump #3 up the riser and the choke line. Spaced out the drill string to be able drill to 572 m without making a connection. 572m were the shallowest possible depth, based on geological prognosis and uncertainty to top of the Peon reservoir.

Performed pre job meeting with involved personnel prior to drill 8 1/2" hole. The plan was to drill with singles and after each single it was drilled down and circulated bottoms up to monitor for gas.

Drilled 8 1/2" hole from 562 m to 578 m and prior to make connection the hole was circulated clean and monitored for gas when having bottoms up. This practice was according to the Peon well control procedures and guidelines. The reasoning behind this procedure was to have only one bottom up or potential only one influx in the hole at the time (HTHP procedures). For more details refer to the well control chapter.

Drilled from 578 m to 580 m where a drilling break was experienced. The well was shut in according to the Peon well control procedures. Observed the well over the choke manifold and opened the choke while flow checking over the trip tank. The well was found to be stable and flow checked for 15 minutes with the choke open and closed annular for 15 min. The annular preventer was opened and the well flow checked on the trip tank for another 15 min. The well was still found to be stable.

Broke the circulation in steps up to 1400 LPM / 72 bar and washed down to 580 m.
Continued to drill 8 1/2" hole from 580 m to 586,5 m. Circulated the hole clean. To check if the well was under balanced a 1 single check trip was performed which included circulating bottoms up to monitor for any gas. Performed 1 stand check trip including circulating bottoms up to monitor for gas. There was no sign of any gas on bottoms up.

Decision was made to POOH to pick up TestTrak to take pressure points. Lubricated out of the hole from 585 m to 385 m with 500 lpm and 15 bar. Pulled out of the hole from 385 m to the surface while pumping 275 lpm and 6 bar in the riser.

Run	Bit no	Size in	Vendor	Type	Serial no	Jets(x1/32")	Depth in(m)	Dist (m)	Hrs	ROP (m/hr)	Circ Hrs	WOB (ton)	RPM (bit)	TQ (kNm)	Ppress (bars)	Flow rate (l/min)	TBR	IADC Grading
8	6RR	12 1/4"	HCC	MXCS09DX	5055069	3x18,1x16	543	18	3.6	5	26.3	1-5	60-83	1-3	31-35	1617-1641	42531	1-2-WT-A-E-2-LT-TD

9.2 8 ½" drilling - BHA # 7 586,5 m – 713 m

A new INTEQ MWD BCPM, stop sub and TesTrak was made up and function tested prior to install the radioactive sources. Ran in the hole with 8 1/2" bottom hole assembly to 550 m and brought up the circulation in steps to 1400 lpm. Performed SCR with mud pump #3 and BJ kill pump while circulating up the riser and up through the choke line.

Circulated while troubleshooting on the MWD tool. Decision was made to lubricate out of the hole from 560 m to surface due to the MWD failure. Removed the radioactive sources and pulled the MWD tool out of the hole. The threads on the stop sub, which was made up above the neutron sub (CCN), was found to be damaged. Replaced the stop sub and the neutron sub (CCN). Installed radioactive sources and ran in the hole to 550 m. Broke circulation in steps up to 1400 lpm with 30 rpm while testing the MWD. Continued to ream down from 560 m to 586,5 m and circulated bottoms up.

Continued to drill 8 1/2" hole from 586,5 m – 632 m hole while circulating bottoms up after each single drilled. Circulated bottoms up after each connection and flow checked for 15 min at 632m prior to circulate bottoms up. Performed 1 stand check trip and circulated bottoms up. Lubricated out of the hole from 632 m to 556 m. Performed pre-job meeting prior to take pressure points with the TesTrak. A total of eight pressure points were taken and five failed due to no seal towards the formations. For more details regarding the TesTrak failure please refer to Baker Hughes INTEQ's end of well report.

Ran in the hole and continued to drill 8 1/2" hole from 632 m to 645 m. Circulated bottoms up. At 645 m decision was made to stop drilling due to the wind force was below 10 knots. Flow checked the well for 15 min waited on weather.

Performed check trip while circulating. Flow checked the well and lubricated out of the hole from 645 m into the 9 5/8" liner. Circulated with 600 LPM while monitoring the well. Performed general rig maintenance while WOW. Washed down from 548 m to 645 m and circulated the bottoms up. Continued to drill 8 1/2" hole from 645 m to 713m and circulated the hole clean.

Once the well was confirmed to be stable according to the well control procedures, lubricated out of the hole from 713 m to the surface. Removed the radioactive sources. Dumped the memory from the MWD tool and TesTrak. Racked the MWD tool in the derrick and cleaned the rig floor prior to rig up for logging.

Run	Bit no	Size in	Vendor	Type	Serial no	Jets(x1/32")	Depth in(m)	Dist (m)	Hrs	ROP (m/hr)	Circ Hrs	WOB (ton)	RPM (bit)	TQ (kNm)	Ppress (bars)	Flow rate (l/min)	TBR	IADC Grading
9	7	8 1/2"	HCC	HCR605	7003764	5 x 11	561	25.5	2.7	3.5	38.0	1-3	60-97	1-3	67-70	1410-1430	25000	0-1-CT-S-X-I-NO-BHA

9.3 8 ½" logging

8 ½" Logging (MD, TVD)	713m MD RKB	713m TVD
7" Liner (MD, TVD)	711m	711m
Total time consumption	953hrs	
Operational time (hrs, %)	95hrs	10%
Downtime (hrs, %)	33,5 hrs	%

A total of 7 wire line runs were performed but the service was not executed up to the standard as expected by Hydro. The poor service delivery was caused by tool failures, problems to supply back up equipment and not providing enough personnel to run the service. For more details regarding the logging refer to the geology summary.

10 P&A operation

8 ½" Section (MD, TVD)	713m MD RKB	713m TVD
7" Liner (MD, TVD)	711m MD RKB	711m TVD
Total time consumption	953hrs	
Operational time (hrs, %)	146,5hrs	15,4%
Downtime (hrs, %)	85 hrs	8,9%

10.1.1 8 ½" clean out run

Based on the logging results decision was made to test the well using the existing well 35/2-1. To meet the request to prepare the well for testing a 7" liner had to be run. A cleanout BHA including a 9 5/8" casing scraper was made up to clean the 7" liner hanging area prior to run 7" liner. Ran in hole with 8 1/2" bottom hole assembly to 560m and made up a 9 5/8" casing scraper 196m behind the bit. Washed from 460 m to 713m TD and scraped the liner 7" hanger area at 510m . Lubricated out of the hole with the 8 1/2" bottom hole assembly to the surface. Ran in the hole with the BOP test tool and tested the BOP.

10.1.2 P&A - 7" Liner running and cementing

Made up the 7" liner and the 9 5/8" x 7" liner-hanger including the running tool. Circulated the 7" liner volume prior to run in the hole on 5 1/2" HWDP. Picked up the cement head and broke circulation in steps 1m off bottom. Increased the pump rate in steps to 400 LPM and observed minor losses prior to establish loss free circulation rate at 300 LPM.

9 5/8"x7" liner hanger was activated with a shear pressure of 150 bar. The liner shoe was at 711 m and top of the PBR was at 505 m MD. Released the running tool and sheared out the ball seat with 240 bar.

Pumped a 3 m3 soap spacer ahead of 4 m3 1,25 sg Lite Weigth cement slurry. Displaced with 6,7 m3 1,15 sg mud. Pressure tested the liner to 80 bar. Attempted to set the 7" liner packer without any success. Pulled the stinger above the PBR and circulated the well clean prior to set the liner packer. Ran in the hole with 7" liner packer stinger and made an attempt to pressure test the liner packer without being able to get a test. Pulled the stinger out of the liner and pressure tested the packer/liner to 80 bar through the stinger. Pumped the wiper ball down the string and pulled out of the hole from 477m with the 7" liner hanger running tool. Ran in hole with a BOP clean out BHA comprising a jet sub on 5" DP to clean out and make sure no excess cement was left in the BOP area.

10.1.3 P&A - Cement plug #1

Ran in the hole with a 3 1/2" cement stinger on 5" drill pipe from surface to 670m. Pumped spacer and cement and sat a balanced cement plug from 670 m to 496 m. The following volumes were pumped:

- 3 m3 soap spacer
- 3,4 m 3 1,25 sg Lite Weight cement slurry
- 0.33 m3 water.
- Displaced the cement with 3,0 m3 1,15 sg mud.

Pulled out of the hole with the 3 1/2" cement stinger to 496 m and circulated out excess cement and spacer.

10.1.4 P&A Cement plug #2

Sat second balanced cement plug from 475 m to 416 m. The following volumes were pumped:

- 5 m3 sea water
- 4,5 m3 1,95 sg cement slurry
- 0.90 m3 sea water behind.
- Displaced the cement with 2,1 m3 1,15 sg mud

Pull out of the hole with 3 1/2" cement stinger to 416 m. Circulated out excess cement and displaced the well to sea water and pulled out of the hole. The BOP and well head area was cleaned with a circulation sub.

10.1.5 Pressure test #1 against annular

Attempted to test the cement to 85 bars but observed a leak of 3 bar in 5 minutes. Ran in hole with 12 ¼" drilling assembly after setting the wear bushing to 416m and washed and tagged top of cement at 423 m. Attempted to pressure test the cement plug for the second time to 85 bar down 5" drill pipe against the annular preventer. **The pressure dropped 4,5 bar in 10 minutes.**

10.1.6 Pressure test #2 against shear ram

Pulled out of the hole to 280m and attempted to pressure test against shear ram to 85 bar and the well was **leaking 4,5 bar in 10 minutes.**

10.1.7 12 ¼" BHA to drilling out cement

Made up a new 12 ¼" BHA on 5" DP, ran in hole to 423m and displaced the mud to 1.10 sg mud. Drilled cement from 423m to 450m and weight tested the cement to 10 tons. Circulated the hole clean and pulled out of the hole to 307m. Attempted to pressure test to 85 bars. **Observed a leak of 2 bar over 10 minutes.**

10.1.8 P&A Cement plug # 3

Ran in the hole with 3 ½" cement stinger to 435m and washed to bottom. Sat a balanced cement plug from 450 m to 413 m. Pumped the following volumes:

- 5m3 sea water ahead
- 3,2 m3 1,95 sg cement slurry
- 0.09 m3 sea water behind the cement
- Displaced the cement plug with 3,1 m3 1,10 sg mud.

Waited on cement for 12 hours prior to attempt to pressure test the well to 85 bar against the shear ram. The well was still not able to hold pressure. Ran in hole from 426m to 431m. Pulled out of the hole and mobilized 13 3/8" casing scraper and 13 3/8" Peak retrievable plug.

10.1.9 Run casing scraper and set 13 3/8" Peak plug

Made up a clean up assembly comprising 13 3/8" casing scraper and worked the casing scraper from 431 m to 420 m and placed 3m3 corrosion inhibitor. Ran in the hole with 13 3/8" Peak VMB plug to 414m and circulated 1 string volume. Continued to run in the hole and sat 13 3/8" Peak VMB plug at 429,5m.

Attempted to pressure test the plug to 81 bar but the Peak running tool was leaking. Released the running tool and pulled out of the hole above the BOP. Closed blind/shear ram and tested the 13 3/8" plug to 81bars. Prior to POOH a 10m3 anti corrosion pill was spotted on top of the 13 3/8" packer.

11 De-mob and anchor handling

Pulled the BOP and riser and retrieved the permanent guide base. Moved the net guard to the guide base trolley and ran in with the net guard to 395m.

Attempted to pump the corrosion inhibitor fluid into the abandonment cap with the cement unit. Observed the pressure build up to 20 bar. Continued to make several attempts to pump the corrosion inhibitor fluid into the corrosion cap. Disconnected the Net guard running tool and moved the rig 40 m off the location. Prepared to pull the anchors.

Anchor #4, off bottom at 04.10 hrs. On bolster 07:33 hrs. Handled by Tor Viking.

Anchor #8, off bottom at 04:14 hrs. On bolster at 07:33 hrs. Handled by Olympic Hercules.

Anchor #2, off bottom at 04:30 hrs. On bolster 08:07 hrs. Handled by Skandi Admiral.

Anchor #7, off bottom at 04:45 hrs. On bolster at 09:16 hrs. Handled by Mærsk Asserter.

Anchor #1, off bottom at 10:50 hrs. On the deck of Skandi Admiral 11:13 hrs.

Anchor #6, off bottom at 11:32 hrs. On bolster at 14.32 hrs. Handled by Mærsk Asserter.

Anchor #9, off bottom at 11:03 hrs. Disconnected the anchor and moved it to anchor chain #10. Kept 2000 m of anchor chain from winch #9 on the Olympic Hercules. Anchor #5, off bottom at 09:25 hrs. On bolster at 12:24 hrs. Handled by Tor Viking. A

12 After Action Review Log

Experience No	Description (Basis)	Suggestion (Experience / Opportunity)	Conclusion (Actual Result)	Date	Status	Accountable Person
DST50	BHA: When setting up the plan for BHA (from onshore) we don't have the possibility to make up connections for 9 1/2" DC i.e.. with the irn, roughneck.	Use 8" DC if possible on Trym. 6 5/8" Reg conn on the BHA is preferable.	Mail regarding issue sent to BHI	20-jul-05	Closed	Alf
DST51	We transferred 308m3 of cement contaminated mud for Troll S-21.This was a good idea, but we were initially unable to take it back to the rig, due to bad weather. Had to mix 150m3 new mud.	Therefore it is important to ensure backup chemicals available on the rig, to mix a start-up volume.		21-jul-05	Closed	Alf
DST52	During reaming drill string broke off. This was caused by…	Always turn off active compensator when reaming boulders. Never allow 0 point in BHA to move above seabed. ROV to observe drill string/BHA all times. Driller to log weight/rates while drilling/tripping. Use trip sheet in OH.	Added into programme. Also need to be implemented into new programmes.	28-jul-05	Closed	DST Planner
DST53	During the process of setting new location, it was discovered that the transponders were placed in the opposite direction of planned. This led to some confusion when we planned the rig move.	Ensure all involved personnel have the same understanding of rig position and placement of transponders. Action when needed.	Misunderstanding in ROV super visors handover.	21-jul-05	Closed	DST Planner
DST54	When position rig, the navigation position system was used with good success.			21-jul-05	Closed	DST Planner
DST55	Hard to organise the logistic side of the operation on this well. Lots of stuff onboard and we had to use the stand by boat as cargo storage area.	Don't send out B/U of 30" cond.		27-jul-05	Closed	Alf
DST56	During entering of the 30" housing the drill string broke off. This was maybe caused by a stabilizer landing on top of housing when RIH w/ BHA.	Add to programme: Never allow zero point to move above seabed/WHH. ROV to observe for buckling of pipe. Ensure good communication between driller/ROV. Space out to avoid connections when stab. in WHH area.	Ref. DST 52	28-jul-05	Closed	Alf

Experience No	Description (Basis)	Suggestion (Experience / Opportunity)	Conclusion (Actual Result)	Date	Status	Accountable Person
DST57	Difficult to make up cement stinger in the 30" as housing sitting very high at the rotary table.	Use 30" housing support plate to allow the stinger to be made up at a better height. Drill quip. Support plate	Dril Quip is able to supply support plate. Request when needed	28-jul-05	Closed	Alf
DST58	When running fishing tools, no guide ropes were used.	Always use guide ropes when running fishing tools into WHH.	To be added into TOP pros.	28-jul-05	Closed	DST Planner
DST59	Good communication between ROV and driller	None		28-jul-05	Closed	DST Planner
DST60	ROV assisted in entering BHA into the well. After entering, the ROV returned into cage.	Add to programme: Never leave BHA of sight when RIH. Keep focus on stabilizers and other "obstruction" parts. Driller to use ROV picture until the whole BHA is inside the WHH. Driller to give clear instructions.		28-jul-05	Closed	Alf
DST61	Lost time due to lack off fishing gir onboard.	Supply fishing gir acc. to contract.		28-jul-05	Closed	Odfjell Onshore
DST62	Iron rough neck is not up to date.	NH and Odfjell need to evaluate purchasing of a new.		28-jul-05	Closed	Odfjell Onshore
DST63	Problem on hydraulic locking pin on BOP LMRP.	Maintenance after pulling BOP.	This is taken care of in Maisy, ref FV 105548	5-aug-05	Closed	DST Planner
DST64	Problems with setting/releasing Peak plug	Discuss with Peak	Ref DST 45	5-aug-05	Closed	Hydro Onshore
DST65	Loose part on DDM	Action against Natoil	Has ongoing punch list on DDM. History logged in Maisy.	5-aug-05	Closed	Odfjell Onshore
DST66	Long hanger 20" x 13 3/8"	Reduce 13 3/8" pup, when use of longer 20" pup. Look at drawing offshore. Send onshore.	Make standard sketch of desired shape.	5-aug-05	Closed	Hydro Onshore
DST67	Disconnected LMRP with 20 ton over pull, in bad weather BOP had touched posts.	Increase over pull to 40 ton. Rev. TOP.		5-aug-05	Closed	DST Planner
DST68	Dart released from cmt. head unexpected	Wait on report from BJ.	Wrong operation	5-aug-05	Closed	Hydro Onshore
DST69	Used PDC bit drilling out the cement. Used 4 hrs to drill plugs. Rock bit that came out was not acceptable to run in hole.	Quality control onshore before shipping out. Use PDC or rock bit?	Bit information available on project place, ref S Dybdahl	8-aug-05	Closed	Hydro Onshore

Experience No	Description (Basis)	Suggestion (Experience / Opportunity)	Conclusion (Actual Result)	Date	Status	Accountable Person
DST70	IKM 0-100 bar gauges is not good enough. Damaged 3 gauges.	Look at new design. Have enough in spare.	Supplier has these gauges available, must be taken in to consideration if drilling any 'Peon* weels.	9-aug-05	Closed	Odfjell Onshore
DST71	Encountered trouble while logging, performed by Schlumberger. Seems like quality of procedures, shipping routines and ordering back up equipment could be improved.	Experiences logged in Synergi, along with actions.		11-aug-05	Closed	Hydro Onshore
DST72	High quality on procedures for well control. Thorough preparations of involved personnel in advance of going offshore.	Similar activities in case of another sensitive well. Post well meeting. Summarized well control experiences. Target: Achieve best practice.	There will be a gatheringthe 15th of September. Necessary sketches of well control equipment and pictures will be available.	11-aug-05	Closed	Alf
DST73	A while after last cement job, the wash pipe on DDM failed. It was ran 250 hrs before failure. Excepted cycle was 400 hrs. When examining the bursted wash pipe it was found residue cement inside.	Ned to specify in every cement programme that wash pipe has to be thoroughly greased both before and after every cement job.	Added in programmes, as well as TOP C-165	11-aug-05	Closed	Alf
DST74	Pip tag came out without proper shielding. No place to store it. Came with boat, no data sheet.	Need to have a permanent storage compartment. Actions as pr RUH.	Dedicated area is now st.b aft.	18-aug-05	Closed	DST Planner
DST75	All programs concerning P/A plugs from cement company must always contain specified hardening time prior to pressure test	Inform BJ	Sent e mail to M. Louvierre in BJ	18-aug-05	Closed	Alf
DST76	HiVis weight pill left out in between cement plugs while doing temporary long time abandonment.	Proceed within pre agreed programmes. If any deviations, need to make a stop and arrange a new prejob meeting if deviations from original programme is necessary. Evaluate to use Parabow or CST plug insted.	This has to be stated in every programme, and a part of pre job meeting.	25-aug-05	Closed	DST Planner
DST77	Enough time given to perform all operations in a safe manner.	Focus on the importance of not pushing time limits in order to recieve high quality performance.	All involved personnell have preformed a proffesional job.	25-aug-05	Closed	Hydro Onshore

Experience No	Description (Basis)	Suggestion (Experience / Opportunity)	Conclusion (Actual Result)	Date	Status	Accountable Person
DST78	The last cement plug were set form 450m and back to 416m. Plug was set on top of the previus cmt. plug to ensure good fundation. Plug were loadtested and hard. The pressuretesting gave negative result, this could be caused by the fact its a short cmt plug and to less volume pumped. (3,2m3) Acc. to Hydro pros. a minimum of 10m3 is recomended. This because contaminasion form spacer fluid and mud in both ends. Another problem might be that the plug were tested against app. 5m3 fluid volume. 3dl gave 1bar drop/10min. If plug were set deeper and a bigger volume above plug, this leak might never been observed.	Proposal to set parabow/CST below cementplugg or to set a brigde plug below.		26-aug-05	**Closed**	Hydro Onshore
DST79	Net guard: No succes pumping anti corrotion fluid into cap on net guard. Most likely plugged hose.	Proposals: 1: to use seperate hose from rig(mini reel) 2: Improve Odfjell procedures 3:Test the equipment on deck before launching.		29-aug-05	**Closed**	DST Planner
DST80	Pulling PGB. Job vent well, but a bumpersubb below the DC might have improved the operation.	Evaluate to use bumpersubb below DC if bad weather.	Rejected.	29-aug-05	**Closed**	DST Planner
DST81	The main observation during ROV operation was the constant sea current that provided to be difficult to organise rig operations involving ROV. During recovery of the guide base where the running tool was 35m away from the GB, prior to connection to the well head.	Evaluate to use a guide frame to position the guidelines closer to the tool.	Rejected.	29-aug-05	**Closed**	DST Planner
DST82	During the operation it were found that certain tasks where not undertaken in order. For example the urgency to move the rig in to position over the wellhead before all the guidelines where in position at depth.	With regards to the guide wire winches a mark for every location should be registered on each winch to the required depth. For example 20m off bottom. The mark should be recognised by all winch operators and logged in a relevant location.	A mark 20m above seabed. Update TOP pros. Update. B-163	1-sep-05	**Closed**	DST Planner

Experience No	Description (Basis)	Suggestion (Experience / Opportunity)	Conclusion (Actual Result)	Date	Status	Accountable Person
DST83	During the last recovery of the ROV we experienced some difficulties, due to the rig had commenced de-ballasting and raising out of the water. Due to the current and the launch and recovery position of the RO, the ROV comes very close to the Pontoon. -Possibility to hit the Pontoon with ROV Difficult and dangerous to get the ROV into hangar. (the ROV were swinging due to rig movement) Personnel could have been injured.	Give the ROV and crew time to complete the job before de-ballasting the rig. Note. Ref. DST 03	ROV to evaluate weather conditions. If conditions to bad, inform NH and Odfjell. Make SJA for the job.	1-sep-05	**Closed**	DST Planner
DST84	It is easier for the ROV to handle soft slings than slings.	Suggestion to supply ROV crew with a selection of 5 & 10 tonn soft slings to be used sub sea.	Has to be evaluated by ROV/operation. Slings used for this operation has to be inspected after use. Fingers on ROV can damage straps.	1-sep-05	**Closed**	DST Planner
DST85	During anchor handling miscommunication were involved in certain events. This led to misunderstandings.	Follow procedures, inform involved personnel, focus on meetings.	OIM has informed personnel and this will be a ongoing process.	1-sep-05	**Closed**	DST Planner
DST86	Spent long time cleaning the Riser generally and the seal area. This is essential to ensure success when running BOP/riser on the next location.	Always clean riser before pulling BOP. Especially after cement jobs. Ensure good flow and MW when cleaning out.(on this job it were used low mud weight, 1,11 sg and only two mud pumps available) This is in the Odfjell TOP. Evaluate to mob. extra personnel to do this.	It`s better to bring extra personell out and clean more after pulling BOP/riser, than spend time cleaning on rig time.	1-sep-05	**Closed**	DST Planner
DST87	Due to preventenance maintenance on the BOP extra time needed was flagged into the leadership. This gave the maintenance crew time to work effective in a safe manner.	Same issue has to be done for the next rig move/ or when pulling BOP. Has to be implemented into the time planner.	Evaluate needs in front of operation. Consider to drill other top hole if major BOP maintenance	1-sep-05	**Closed**	Odfjell Onshore
DST88	P/U 5 1/2" DP were done to ensure sufficient weather window and complete maintenance on BOP.	Order DP at a early stage to be able to do alternative work change the sequence of event)	DP will be ordered to be onboard 4-7 days before need.	1-sep-05	**Closed**	DST Planner

Experience No	Description (Basis)	Suggestion (Experience / Opportunity)	Conclusion (Actual Result)	Date	Status	Accountable Person
DST89	When using the Trym modified DO section as a part of the handover meeting with crew, a bigger understanding of the scope of work were comprehended by the crew.	Follow up and to be evaluated by all crews.	Has to also be evaluated by the oter planners.	1-sep-05	**Closed**	DST Planner
DST90	8" Jar came with 5" lift sub. Extra time spent changing elevator.	Info to supplier of equalent equipment. RUH sent to Baker.	RUH sent to Baker	1-sep-05	**Closed**	Hydro Onshore
DST91	Difficult for the Driller to see pictures from the ROV. Might lead to extra time spent and damaged equipment.	ROV/Baker to find solution to use logging screen when critical view from the ROV is essential.	Ongoing. Also look into replace screen w/ new type	1-sep-05	**Closed**	DST Planner

13 Well Control overview

The objective of this Chapter is to capture the well control preparations and well control lessons experienced during the 35/2-1 Peon drilling operation. For more details regarding reports and analysis carried out during the planning refer to Chapter 3.
The following subjects are summarised in the Peon well control challenges:

1. Preparations
2. Relief well positioning
3. Kick margin simulations
4. Well control Training
5. Well Control guidelines and Procedures
6. Operational considerations regarding FIT/LOT
7. Well control kill strategy
8. Well Control Finger Printing

13.1 Preparations

Prior to start up the operation several studies and analysis were conducted to obtain a clear understanding of the operational challenges with regards to well control. With reference to the document 35/2-1 Peon Design Review and Lessons learnt the following studies were initiated:

- Kick simulations – RF Rogalands Forskning
- Quantitative Risk assessment – RF Rogalands Forskning
- Peon Blow-out and kill simulations - Well Flow Dynamic AS
- Relief well feasibility – John Wright Company
- Gas plume study - Sintef
- Kick simulations and kick margin – Aberdeen Petroleum Training International
- Well control procedures and guidelines. - Aberdeen Petroleum Training International

13.2 Relief well planning

A relief well location and a directional drilling plan for a relief well is a requirement in a drilling program. The relief well planning was a challenge on 35/2-1 Peon due to the shallow TD at 713m.

To design a relief well trajectory the rig location has to be in such a distance from the original well location to pass the 13 3/8" casing within 10m. After a positive indication of intersection the well inclination is dropped to 0 degrees and drilled parallel to the original well. A relief well for a deeper exploration well the distance to original position have a distance in a range of 2000m – 2500m.

When planning a relief well on 35/2-1 Peon it was not possible to design a standard well relief well with a distance of 2000m – 2500m away from the location. The figure below is taken from the relief well feasibility study prepared by John Wright Company and it illustrates a relief well on the Peon location. The full report can be found in chapter 3 reference 21.

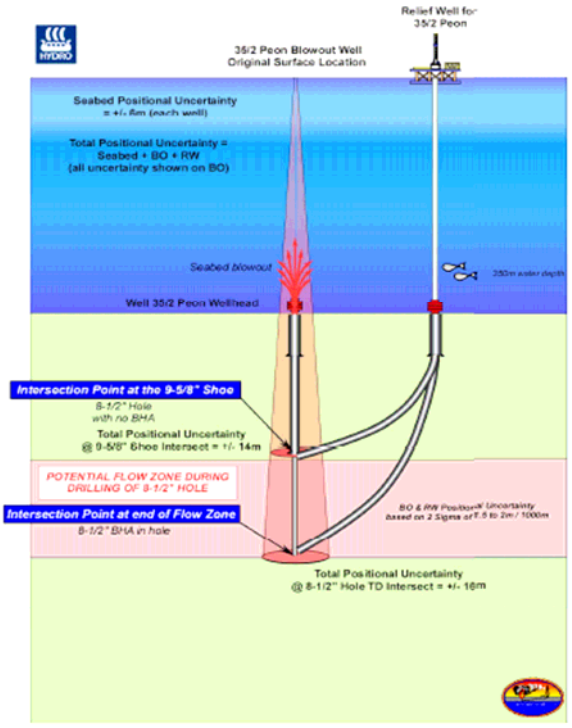


Figure 1.4.3: Relief Well Intersection Schematic with Positional Uncertainty Information

The hazards introduced to drill a relief well close to the original well head is that the rig will be exposed for gas in the water (buoyancy) and in the air (explosion).

John Wright Company's recommendation was to initiate a gas plume study to investigate how a gas plume would behave on Peon with a 386m water depth. The gas plume study, which was conducted by Sintef, concluded that the rig would still have sufficient buoyancy with gas bubbles and dissolved gas in the water. The gas plume had an extension of 100m. Meter. The model simulated gas in the air from 0,5m to 10m above sea level.

The study was followed up with a study to determine a safe well location to anchor up the rig a safe distance from the original well location without being exposed to explosive gas concentration. A report from Hydro research centre concluded that the rig could be place within a distance of 200m from the original hole. A Relief Well design basis was prepared and included a J-shape medium radius design.

A U-shape design was designed but the well was a much more complex well drilling below the Peon reservoir and up. One of the challenges with the U-Shape design was survey techniques drilling with more than 100 degrees. The U shape design could not meet relief well surveying requirements and ranging tools specifications.

For more details refer to (25) Relief well, (23) Relief well - Gas content in water and air Peon prospect – Sintef, (23A) Relief well - Gas content in water, gas plume and rig placement - Hydro Corporate Research centre

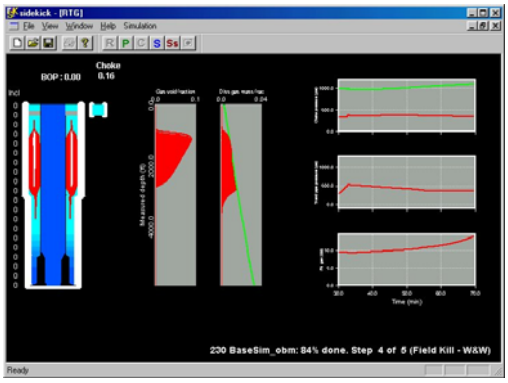
13.3 Kick Margin simulations

Kick simulations were carried out in 12 ¼", 6" and 8 ½" hole sections. The original plan was to drill a 6" hole through the reservoir to minimize the kick potential. However, based on the latest pore pressure prognosis of 1.12 sg done on 6" well control condition, proved that the kick margins was reduced and the 6" hole section was not as favourable as first simulated. It was restriction in the influx height, flow rate to circulate out the kick and ECD. Decision was made to drill 12 ¼" hole and set 9 5/8" Liner above the reservoir and drill 8 ½" hole through the reservoir.

Aberdeen Petroleum Training International prepared the kick simulations and used the **SideKick** well control simulator, which have been developed by Schlumberger. The simulations indicated that the formation would fracture with 1.15 mud and 1.2 sg frac gradient in 6" hole. Based on this decision was made to drill 8 ½" hole.

The results of the well control simulations can be found in Chapter 1.3.1 and 1.3.2.

13.3.1 SideKick well control simulator-



Overview
SideKick* gas-kick simulation software is an advanced kick simulator, suitable for simulating gas kick development, well-control events and well bore hydrodynamics. The application is intended to simulate the conditions leading up to a blowout. SideKick also can be used as a fully transient dynamic under- balanced drilling simulator.

13.3.2 Kick tolerance 8 ½" hole section:

Kick Tolerance Estimate

8.5" Hole Section - MD/TVD = 580 m
Pore Pressure = 63.7 bar
Fracture Gradient @ 9 5/8" Liner Shoe = 1.18 SG,
1.20 SG, 1.23 SG and 1.27 SG
Choke line ID = 3 "
Permeability = 5000md - Porosity = 20%
Safety Factor while Circulating the Gas = 3 bar
SCR = 120 l/min

Element	Length m	Bottom m	O.D. in	I.D. in
Drill pipe	540	540	5	4.76
Collars	40	580	6.5	2.75
Bit		580	8.5	

Element	Bottom m	O.D. in	I.D. in
Riser	409	21	19.5
Casing	416	20	18.75
Casing	436	13.375	12.347
Liner	555	9.625	8.68

RESULTS

Fracture Gradient = 1.18 SG

MW		KT /Pit Gain		KT/ K. Size
SG		Liters		Liters
1,12		786		701
1,13		X**		X
1,14		X		X
1,15		X		X

** ECD at the Circulating rate of 1500 l/min fractured the shoe even without influx inside the wellbore.
At a drilling rate of 900 l/min, the kick Tolerance was 783 litres (pit gain)
For a kick size of 707 litres.

Fracture Gradient = 1.20 SG

MW SG	KT /Pit Gain Liters	KT/ K. Size Liters
1,12	1246	1053
1,13	1412	1182
1,14	1419	1197
1,15	X**	X

** ECD at the Circulating rate of 1500 l/min fractured the shoe even without influx inside the wellbore.
At a drilling rate of 900 l/min, the formation has not been fractured

13.3.3 Kick Tolerance 6” hole section

Kick Tolerance Estimate

6" Hole Section - MD/TVD = 585 m
Pore Pressure = 65 bar
Fracture Gradient @ 9 5/8" Liner Shoe = 1.20 SG
Choke line ID = 3 "
Permeability = 1000md - Porosity = 20%
Safety Factor while Circulating the Gas = 3 bar
SCR = 300 l/min

Element	Length m	Bottom m	O.D. in	I.D. in
Drill pipe	485	485	3.5	2.764
Collars	100	585	4.75	2.5
Bit		585	6	

Element	Bottom m	O.D. in	I.D. in
Riser	409	21	19.5
Casing	539	13.375	12.347
Liner	570	9.625	8.68

Results

MW		KT /Pit Gain		KT/ K.Size	
SG		Liters		Liters	
1,1		1912		1584	
1,11		1580		1344	
1,12		1570		1346	
1.13**		1696**		1457**	
1,14		1351		1192	
1.15*		0		0	

Note *: At 300 l/min & MW = 1.15 the CLFL would be sufficient to fracture the liner shoe even if there is no influx in the wellbore

Note **: At MW = 1.13 SG and SCR = 300 l/min, the formation has reacted to pit gain as follows:

	Pit Gain		Kick Size		Formati
	liters		liters		
	0 - 1696		0 - 1457		OK
	]1696 - 1797[		]1457-1532[		Fracture
	[1797 -1866]		[1532-1585]		OK
	> 1866		> 1585		Fracture

13.4 Well control Training and work perspective

Aberdeen Petroleum Training International was contracted to prepare a Peon specific well control training program including Well control guidelines and procedures.

Scope of work of the engineering work:

Stage#1:
3 to 5 days engineering consultancy to review and analyse the well control parameters and challenges for the Peon well.
Prepare Kick tolerance calculations and review advanced practical computer modelling and simulation.

Stage #2: a) Preparations of specific well control Guidelines & Procedures for the Peon Well
b) Workshop in Bergen to present findings
Stage #3: Customise Well Control training courses.
Stage #4: Follow up during drilling and well control operations using computer modelling and computer simulations.

Objectives:

- Review the well control challenges when drilling the well
- Effects of gas migrations and gas expansion in the Peon well
- Effects of choke line on well controlling operations/gas expansion in choke line (CL)
- Limitations of conventional well control methods in handling kicks for the Peon well
- Special well control techniques for Peon well / Dynamic & Static volumetric versus bullheading.
- Gas handling in the riser / role of diverter and surface equipment
- Risk evaluation of hydrates formation
- Drilling and tripping practices
- Review the critical issues for well design and procedures
- Evaluations of various design parameters / using spread sheet, computer modelling and simulation
- Practical evaluation of well control parameters in well control incidents (gas in choke line, gas in the riser, gas in the MGS)
- Check points calculations for various scenarios of well control incidents for Peon well(Choke pressure versus SIDPP & CLFPL)
- Kick tolerances practical evaluation using computer modelling (SideKick)
- Modelling of well Control parameters during kill techniques, gas behaviour and gas migration (below shoe, BOP, in the choke line, in the riser, at surface), CLFPL effects and handling, fracture pressure development
- Practical Prediction of choke pressure (dispersed model) at various stages and other relevant parameters and issues in well control
- Rig site training, drills and assistance during well control incidents.

Aberdeen Petroleum Training International was contracted to prepare a Peon well control training course which was planned to be held over 2 ½” days.

13.4.1 Agenda Course # 1: - Peon Well control - Deepwater check points

1 day course
Toolpushers, drilling supervisors, drilling engineers, drilling advisors, drilling superintendent.
To cover:

- Standard Well Control Techniques
- Well Control Procedures / Deepwater Check points
- Volumetric method
- Static volumetric method
- Lubrication techniques

13.4.2 Agenda Course #2: - Well Control Course for Hydro (Peon Well)

Attendees: Drilling supervisors, drilling engineers, drilling advisors, Odfjell drill crew, sub sea engineers, mud engineers and mud loggers.

Day #1:

- Peon well design & operational challenges
- Kick detection & operational challenges

- Kick detection and prevention for the Peon well
- Effects of gas migration on W.C. Procedures for Peon

- Kick tolerances and Leak off test considerations / Small operating Margins
- Riser Margins & barriers
- Effects of Temperature
- Effects of temperature
- Effects of CLFL (Choke line friction)

- Well control procedures for Peon
- Bullheading
- Volumetrics
- Drills / Roles and Responsibility

- Well control Practices for Peon
    - Gas in riser
    - Hydrate prevention
    - Effects of WBM on well control operations

- Riser management and well control equipment / Line up.

Day 2: (1/2 day):

- Fingerprinting and Well control practices for Peon

- Example of calculation and checkpoints in well control for Peon

- Results of sidekick modelling

- Open session about the Peon well

13.4.3 Recommendations

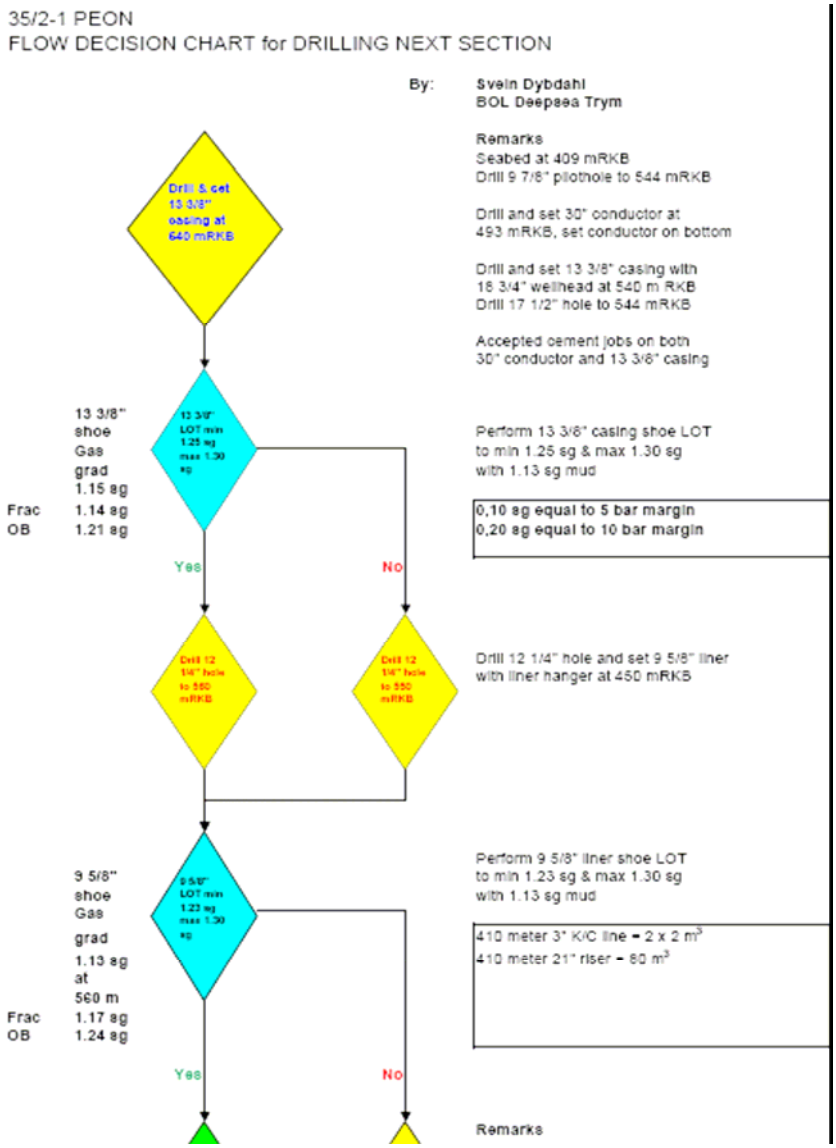
The feedback from the attendees was that they were very positive. The course gave the attendees a good understanding of the well control challenges. When the course was scheduled 2-3 days before departing to the rig, the crew members felt they were updated and prepared for the Peon drilling operation.

13.5 Well Control guidelines and procedures

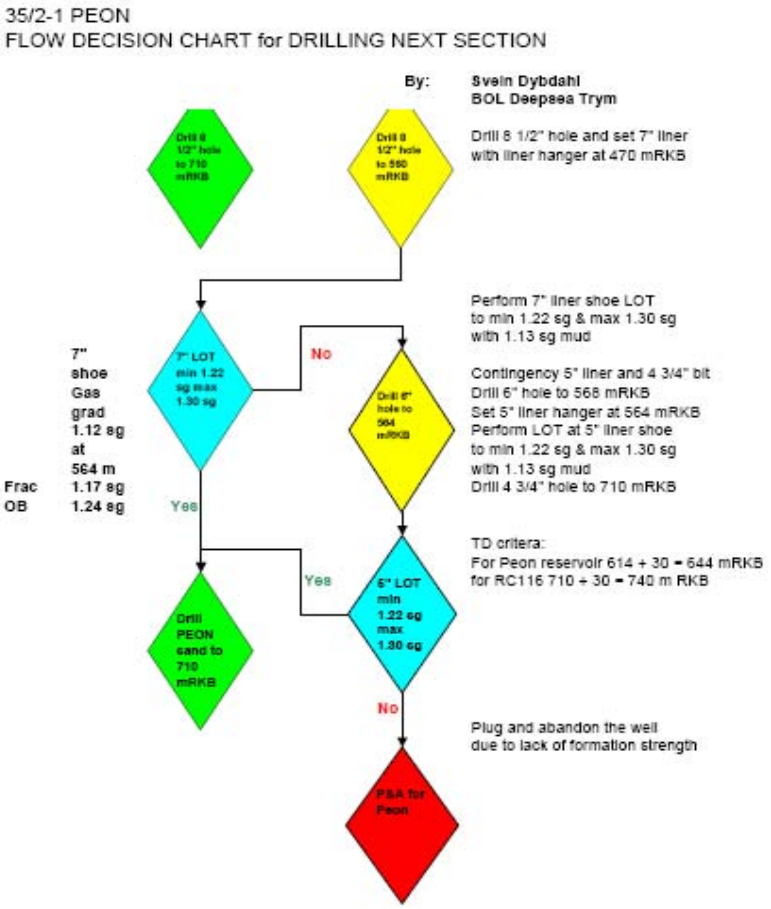
A complete document including specific well control guidelines for the Peon well was prepared. Participants on the well control course was given a copy or access to a copy stored on the www.Prosjektplassen.no . The rig crew used the manual on the rig and incorporated relevant guidelines into the operational procedures.

13.6 Decision tree casing options

The project decided a acceptance criteria for 13 3/8" FIT was to be min. 1.25 SG and max. 1.30 SG. The 9 5/8" acceptance criteria were min.1.23 SG and max.1.3 SG.



Decision tree continued:



13.7 Operational considerations regarding FIT/LOT

Due to the shallow depth of the overburden (167m) the project decision was made to perform a Formation Integrity Test and not perform a full Leak Off Test. The philosophy behind this was not to expose the formation to a higher pressure than necessary to drill the well and not risking initiating fractures that in the worst case could lead to an unstable shoe.

The objective of the Formation Integrity Test :

- **Obtain enough formation strength to be able to circulated out a gas kick**

13.7.1 12 ¼" section – Formation Integrity Test (FIT)

- 13 3/8" casing shoe at 539 m.
- Mud weight out of the shoe 1.13 sg.
- Min. leak off equal to 1.25 sg mud weight. (Acceptance criteria)
- Max. FIT needed 1.30 sg.

Objective 12 ¼" FIT:

- **6,4 bar pressure on surface needed to obtain a formation strength equal to 1,25 sg.**

13.7.2 8 ½" Hole section – Formation Integrity Test

Facts:

- 9 5/8" liner shoe at 560 m.
- Mud weight out of the shoe 1.15 sg.
- Min. leak off equal to 1.23 sg. Mud (Acceptance ciriteria)
- Max FIT needed 1.30 sg.

Objective 8 ½" FIT:

- **4,4 bar pressure on surface needed to obtain a formation strength equal to 1,23 sg.**

Challenges to obtain FIT:

- Low pump pressure on surface. Min. 4, 4 bar.
- Small volumes +- 15 litres to be pumped on surface to obtain a pressure of min. 4,4 bar.
- Instrumentation and calibration of pressure gauges.

The consequences of uncertainty in the FIT measurements:

- Could be end off the project if the rig could not physically measure the FIT.
- If the formation strength recorded was to low the rig would not be able to drill the well due to a too low leak off.
- Uncertainty in pore pressure and formation braking down after taking a kick

Equipment and instrumentation:
The conclusion was that the rig was not able to perform a FIT with current conventional rig equipment such as the cement pumps and rig gauges.

BJ services supplied a FIT pump that could deliver a low flow pump:

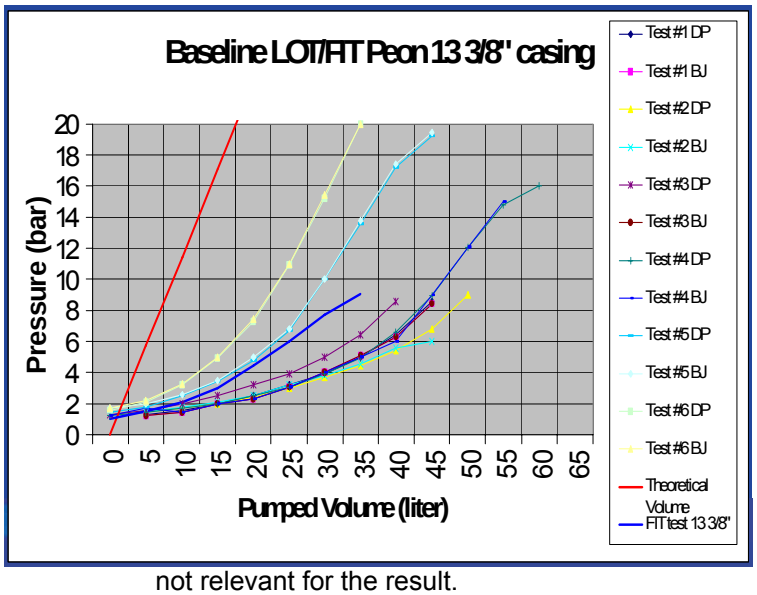
- Capable to pump small volumes
- Capable to handle low pressures
- Capable to pump down kill&choke lines and down drill pipe at the same time.
- Instrumentation, capable to read low values.

Since working with low pressures the rig had to be upgraded before taking the actual FIT. The BJ pump was tested several times inside the cemented 13 3/8" casing and 9 5/8" casing to:

- To obtain operational experience with the pump
- Train personnel
- Check sensors
- Indication of volume needed for different pressures
- Indication of start pressure for the test
- Indication of curve profile when pressuring up and bleeding down several times.

All relevant well control gauges were changed to small scales reflecting the small pressures on Peon. The gauges had 2 decimal places.

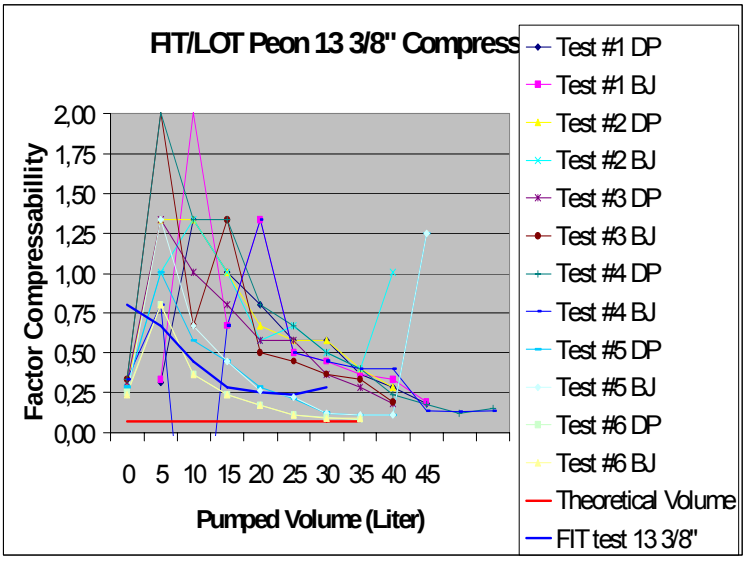
13.7.3 FIT/LOT and compressibility of the drilling fluid



The graphs describe the effect of the mud when pressuring up inside the casing when taking the actual FIT. The curves did not follow a theoretical compressibility curve fit.

The effect experienced was that the curve did not behave linear with pressures below +/-5 bars. The mud improved over time and the behaviour of the curves changed toward the left before the parameters were stable. Some of this effect was believed to be air in the mud.

In a normal well with high FIT/LOT test pressures is the low-pressure effect probably present but the pressures are much higher and the low-pressure effect is not relevant for the result.



This table indicates the volume plotted against the compressibility. What was important was to condition the mud and do several tests to understand how the behaviour of the mud and air in the mud.

Based on the above discussion it was important to do several tests to understand the low-pressure effects, air in mud and how the curve fit improved over time when conditioning the mud over time.

13.7.4 Operational best practise to take Formation Integrity Testing (FIT):

1. Start up pressure 1 bar.
2. Pumped down choke line and drill pipe through a pump in sub at the drill floor level.
3. Plot pressure against volume every 5 l.
4. Checked radio communication between all involved personnel.
5. Released hose with side entry sub to remove trapped air. Pumped with supercharge pump
6. Circulated down choke line with the BJ FIT low flow test pump to break the gel (1 m3) before starting the FIT.
7. Started to pump up to 1 bar.
8. Pumped up to 3 to 4 bar.
9. Bled off pressure to 1 bar (established start line)
10. Pressured up to calculate pressure equal FIT to 1,30 sg and plotted the pressure in steps of 5 litre.
11. Stopped pumping and monitored the pressure for 10 to 15 min.
12. Bled of pressure and recorded bled back volume.
13. Evaluate results

13.7.5 13 3/8" Formation Integrity Test

LEAK OFF TEST / FORMATION INTEGRITY TEST

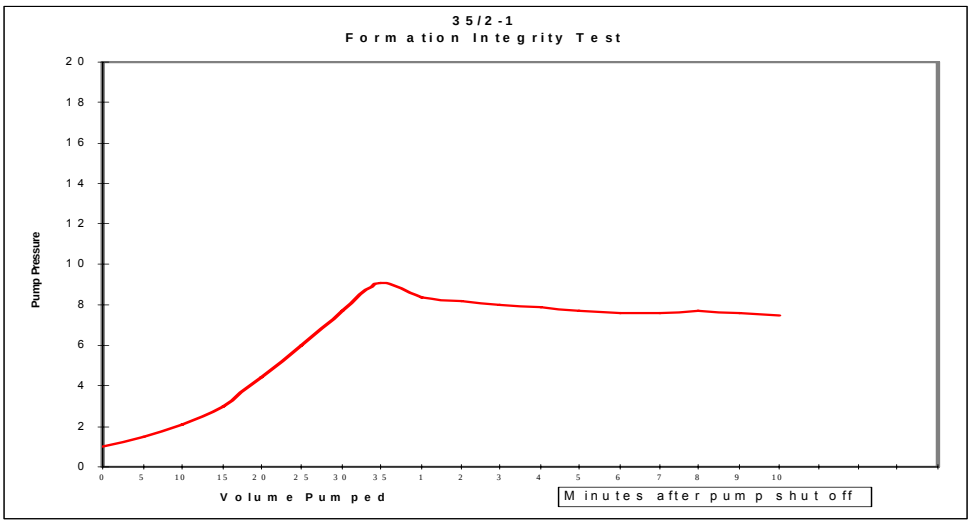
Well: Peon 35/2-1 Date 13.09.2005

Rig: Deepsea Trym Sign. Einar Mæland

HYDRO

Hole Size Dia oh	:	12 1/4	Inch	CSG Size D csg	:	13 3/8"	Inch
Hole Depth MD oh	:	544	m	CSG Depth MD csg	:	539	m
Hole Depth TVD oh	:	544	m	CSG Depth TVD csg	:	539	m
Mud Weight in Use MW	:	1,13	s.g.	FITest, EMW fit	:	1,30	s.g.
Leak Off Pressure Pl	:	9,1	bar	Pressure Test Lines	:	30	bar
Equivalent Mud Weight	:	MW + Pl / TVD csg x 10,2 =			:	1,30	s.g.
Formation Integ. Press.	:	Pfit = (EMW fit - MW) x TVD csg / 10,2 =			:	9,09	bar

Volume ltr	Pressure bar
0	1
5	1,5
10	2,1
15	3,0
20	4,4
25	6,0
30	7,7
35	9,1
1	8,4
2	8,2
3	8,0
4	7,9
5	7,7
6	7,6
7	7,6
8	7,7
9	7,6
10	7,5
650	ltr bled back



13.7.6 9 5/8" Formation Integrity Test

LEAK OFF TEST / FORMATION INTEGRITY TEST

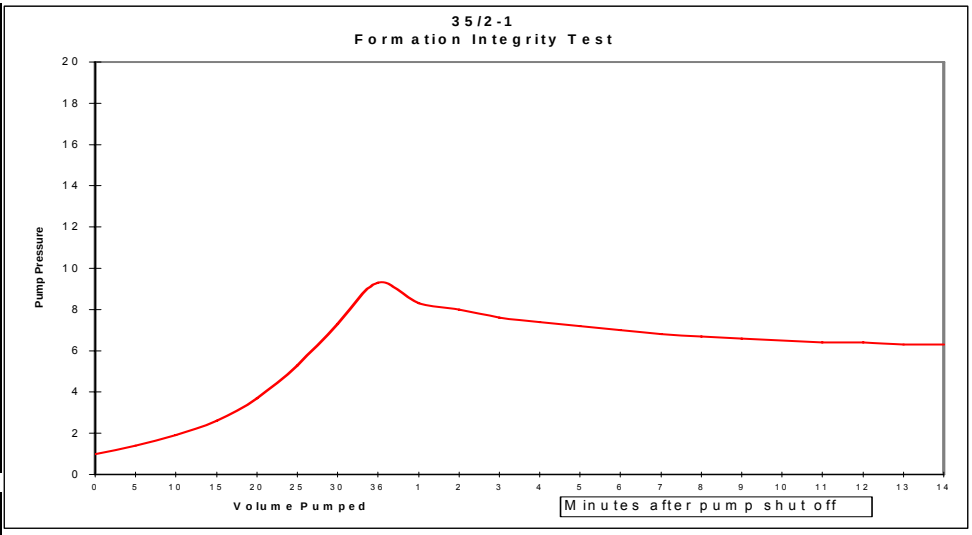
Well: Peon 35/2-1 Date 13.09.2005

Rig: Deepsea Trym Sign. Audstein Dybvad

HYDRO

Hole Size Dia oh	:	8 1/2	Inch	CSG Size D csg	:	9 5/8	Inch
Hole Depth MD oh	:	562	m	CSG Depth MD csg	:	560	m
Hole Depth TVD oh	:	562	m	CSG Depth TVD csg	:	560	m
Mud Weight in Use MW	:	1,13	s.g.	FITest, EMW fit	:	1,30	s.g.
Leak Off Pressure Pl	:	9,3	bar	Pressure Test Lines	:	20	bar
Equivalent Mud Weight	:	MW + Pl / TVD csg x 10,2 =			:	1,30	s.g.
Formation Integ. Press.	:	Pfit = (EMW fit - MW) x TVD csg / 10,2 =			:	9,33	bar

Volume ltr	Pressure bar
0	1
5	1,4
10	1,9
15	2,6
20	3,7
25	5,3
30	7,3
36	9,3
1	8,3
2	8,0
3	7,6
4	7,4
5	7,2
6	7,0
7	6,8
8	6,7
9	6,6
10	6,5
11	6,4
12	6,4
13	6,3
14	6,3
28	ltr bled back



13.8 Well control kill strategy

Below 13 3/8" casing shoe the well was drilled with singles. In case of connection gas any gas had to be circulated out before the next connection was made. The connections were carried out in a consistent manner, which gave a consistent procedure allowing accurate comparison between connections. The main objective when tripping and drilling was to avoid swabbing gas into the well.

Well control philosophy and strategy behind the guidelines and procedures established for the Peon well can be listed up in the following points:

1. Conduct required well control training for the rig crew
2. Kick prevention - Avoid to take a kick
3. Avoid to bring the gas to the surface if a kick is taken.
4. Avoid to swab gas into the well (Swab)
5. Shut in the well if you are in doubt
6. First line kill method - **Drillers method** and second kill method **Dynamic Volumetric.**

The most serious incident that could happen on a drilling vessel:

- Release of Methane – CH4
- Methane is the major component of gas in the Peon well
- Swabbing gas

The main objective of the Peon well control guidelines and procedures are:
Kick prevention (=Safety)

1. Kick prevention = Take no kick = Continue drilling
2. Minimize kick size = Take smallest kick
3. Regain Primary Well Control = Bottom Hole Pressure (BHP) Constant

Best practises:

- During the preparations it was focused on not to induce under balanced conditions and to calculate and control the trip margins to avoid getting gas in the well.
- During the drilling operation trip margin check trips were conducted.
- The well was drilled with singles and after each single circulated bottoms up as per HTHP well control procedures.
- The BHA was lubricated (pumped) out of the hole while tripping.

The well control manual that was prepared included Well Control Guidelines and procedures. These guidelines were incorporated into the operational procedures prepared on the rig.

During the drilling operation the Mud loggers where focused on monitoring changes of the mud volumes. Drilling was stopped if the rig used the crane to be able to monitor stable mud pits. All

transfers were done being 100% sure that it was communicated to all relevant parties. On each connection the mud loggers monitored the Flow off volume and monitored for changes. Feedback from the rig was that good volume control was maintained during the drilling operation.

To detect pore pressure increase the following method can be used.

- Gas response
- Focus on kick warning signs
- Pit gain

13.9 Geo-mechanic study

A Geo-mechanic study was carried out during the planning phase and followed up during the drilling phase. Bernt Sigve Aadnøy with Well Experts AS conducted the study. A full report is available.

13.10 Well control post well meeting

A Peon well control post meeting was conducted and included personnel from Hydro, Odfjell Drilling and the service companies.

The objective of the meeting was to present and captures lessons learnt during the 35/2-2 Peon drilling operations.

Attached to this document is the presentations and other material relevant material.

13.11 Appendix 12 ¼" Operation Procedure

13.11.1 Program details

13.11.2 Shut in Procedure

Innstegningsprosedyre Peon. Cato		
Ved indikasjon på flow eller pit gain utover det normale skal brønnen stenges inn.		
1.	Borer stopper mud pumper.	Ekstra borer/boresjef gjør seg klar for å stenge middel pipe ram. (MPR)
2.	IBOP stenges etter ca 1-2 sekunder* (venter til pumpene har fått redusert rpm for å unngå at pop off ryker)	Det skal maksimalt være to single dp over RKB ved innstenging.
3.	Borer gir beskjed til ekstra borer/boresjef om at MPR kan stenges.	Failsafe ventiler lavere enn MPR skal være åpne under bore operasjonen.
4.	Diverter insert packer stenges.	Over bord linen på le side skal stå åpen under boreoperasjonen.

* Basert på test utført på rigg.

Boreprosedyre Peon.		
Etter at BOP er satt skal det bores med dobbel dp. Dette gjøres på følgende måte.		
1.	Når stand er boret ned skal det sjekkes for flow før connection.	Bor med redusert ROP 5-10 m/hr.
2.	Topp single legges ut etter hvert stand som er boret dette gjøres på følgende måte.	Det skal alltid sirkuleres når stand blir trukket opp.
3.	Når stand er boret ned, sett slips og brekk connection mellom drilling pup og dp, make den så opp til 10 -15 klbft trek ut en singel.	Sirkuler mens singel bli trukket opp.
4.	Sett slips og skru løs drilling pup fra dp.	
5.	Sett på pick up elevator og heis den opp under tool joint. Sett på manipulator arm.	
6.	Brekk med iron roughneck.	Bruk mud bucket
7.	Løft singel opp og styr den ut på catwalk-vognen med manipulator arm.	
8.	Hent nytt stand og forsett boring.	Pumpe oppstart gjøres forsiktig.

13.11.3 Tripping Procedure

Trippeprosedyre Peon.		
Gjennomfør pump off test før enhver tripp ut av hullet.		
1.	Stopp pumpene i 5 min.	
2.	Start pumpene og sirkuler bunn opp gjennom riser.	Pumpe oppstart gjøres forsiktig.
3.	Flow check.	
4.	Lubricate ut av hullet til bit er over BOP.	

13.11.4 Top Hole Drilling

Før oppstart:
- 2 mann på dekk dedikert kjøring, navn formidles til kontrollrom.

- **Kontrollrom sjekker vind og strøm og avgjør med Pl.sjef / Stab. hvilke vinsjer det skal trekkes på, og hvilke som skal slakkes ved forhaling.**
- **Kontrollrom informerer dekk om hvilke vinsjer som skal være innkoblet.**
- **Ved forandring av vind / strøm skal forhalingsplan vurderes sammen med Pl.sjef / Stab og eventuelt korrigeres.**

Gass!

Dersom gass oppdages:

ROV informerer boredekk **(tlf 5870)** og kontrollrom **(tlf:112)**

Driller:

Starter / fortsetter pumping.
Kontakter pumperom, ber om kill mud.
Fortsetter pumping av kill mud, vanlig mud, sjøvann inntil ny ordre.

Pumperom:

Liner opp på kill mud ”on the fly”.
Mixer mer kill mud.
Pumper det som er tilgjengelig av mud, deretter liner opp på sjøvann.

Kontrollrom:

Kontakter PL.SJEF / Stab.
Sende riggere til ankerspill. Går på UHF **CH # 7** sammen med dedikert ankerpersonell.
Avventer ordre fra Pl.sjef / Stab.
Varsler boreleder/boresjef.
Påser at vi har sjøvann tilgjengelig for pumping.

TELEFON 112 ER **KUN** NØDNUMMER.

13.11.5 Table Top

Uke 29 Dato: 21.07.2005

Deltakere: Dag:		**Deltagere natt:**
Plattformsjef		Plattformsjef
NH Boreleder		**NH Boreleder**
Boresjef		**Boresjef**
Safety		**Safety**
Deck crew		**Deck crew**
Stab		**Stab**
Driller + ass. Driller.		**Driller + ass. Driller.**
Op. planlegger		
Møte start	**Kl 18:00 for dag skift**	
	Kl 20:00 for natt skift	

Distribusjon:

NH, Deltakere, Plattformsjef, Teknisksjef, Stabilitetsjef, Medic, Verneombud, Safety, KHMS Gertie Nygaard, Kjetil Forland, Morten Haukebø, Geir Dombestein, Espen Hole, Runar M. Haugen, DST, messa og kafferom.

Sak		Aksjon ved	
TOP	**TOP for grunn gass må revideres.(B-155)**	**Boresjef / Plattformsjef**	
Forhåndsreg.	**Forhåndsregler som er gjort/gjøre ble gjennomgått med de involverte:** **Safety møte.** **Grunn gass drill.** **Observasjoner med ROV.** **Shut down nivå 1.** **Kontroll av gass alarmer.** **Ballast systemet.** **Stans i alt varmt arbeid.** **Værmelding.** **St. by boat.** **Lengder på kjettinger i kasser.** **At alle blir informer om deres oppgaver.** **Kontroll av nødutløsning av kjetting.** **To dedikerte ankervinsj førere, avklares på forhånd, meldes til kontrollrom.** **Kontinuerlig bemannet kontrollrom.**	**Info**	

Sak		Aksjon ved	

Dersom gass oppdages:	**Det er laget en forenklet plan for handling ved eventuell gass. Denne er distribuert til involvert personell. Planen ser slik ut:** **BORING TOPPHULL PEON.** **Før oppstart:** **- 2 mann på dekk dedikert kjøring, navn formidles til kontrollrom.** - **Kontrollrom sjekker vind og strøm og avgjør med Pl.sjef / Stab. hvilke vinsjer det skal trekkes på, og hvilke som skal slakkes ved forhaling.** - **Kontrollrom informerer dekk om hvilke vinsjer som skal være innkoblet.** - **Ved forandring av vind / strøm skal forhalingsplan vurderes sammen med Pl.sjef / Stab og eventuelt korrigeres.** **Gass!** Dersom gass oppdages: ROV informerer boredekk **(tlf 5870)** og kontrollrom **(tlf:112)** **Driller:** Starter / fortsetter pumping. Kontakter pumperom, ber om kill mud. Fortsetter pumping av kill mud, vanlig mud, sjøvann inntil ny ordre. **Pumperom:** Liner opp på kill mud ”on the fly”. Mixer mer kill mud. Pumper det som er tilgjengelig av mud, deretter liner opp på sjøvann. **Kontrollrom:** Kontakter PL.SJEF / Stab. Sende riggere til ankerspill. Går på UHF **CH # 7** sammen med dedikert ankerpersonell. Avventer ordre fra Pl.sjef / Stab. Varsler boreleder/boresjef. Påser at vi har sjøvann tilgjengelig for pumping. TELEFON 112 ER **KUN** NØDNUMMER.	**Planlegger**	

Table TOP øvelse	**Plattformsjef simulerte gass fra havbunnen, retning for vind og gass ble definert.** **De involverte gjennomgikk deretter handlingsforløpet for øvelsen. Dette ble gjort for dag og nattskift.**		

13.11.6 Operational Procedure 12 ¼"

Well status:

- **Seabed at 409m**
- **Top BOP at 393 m**
- **Wellhead datum at 406,7 m**
- **13 3/8" float collar at 507 m, shoe at 539,22m**
- **17 ½" rat hole to 543 m**
- **BOP pressure tested to 345 bar date 31.07.05**
- **20" x 13 3/8" x-over at 417,8m.**

Responsible	Main operation		Respon sible	Offline activity / Details
Driller/ PEAK	**1. Preparations** Make up PEAK plug and rack in derrick. Drawing in rig office. Verify internal threads in box end. Verify checklist is completed.		TP	BOP pressure tested and ready for operation. PEAK plug to be used in case of disconnect of riser. (No riser margin).
	2. Drill: Run in hole with the PEAK packer to 483 m. RIH with PEAK packer on 5 ½" HWDP to 483m. Use compensator when going trough the BOP/ wellhead and 20 x 13 3/8 x-over with the plug. Run in using compensator. Leave space above plug to be able to retrieve plug with BOP closed.		TP/ Driller/ PEAK Driller Driller	Perform drill running and installing PEAK. No drift run. SLOW-SLOW. OBS. XO 20"/13 3/8" @417,7
	3. Setting sequence of the plug at 483 meter. Circulate one string volume. Max rate 1100 lpm. Reciprocate plug 3-4 meter above and below setting depth. Record up and down weight.			

Responsible	Main operation		Responsible	Offline activity / Details
	Set plug according to PEAK representative. Release running tool, reconnect to packer and test riser connector against annular to 103 bar.		Driller	UP:_____, down:_____
	4. Retrieve plug Retrieve plug according to PEAK representative. See separate program. Compensate trough well head and BOP. POOH and rack plug in derrick.			
Driller	**5. Make up 12 ¼" BHA** Perform safety meeting prior to picking up BHA M/U 12 ¼" assembly acc. attached plan from dir. Driller. Must be verified against program. Use Dog Collar/drill collar elevator until sufficient weight.		Driller Driller Driller	**Procedure: B-121 M/U 12 ¼" BHA.** Ensure only 1 man in charge of lifting operation Verify float. Installed with no orifice.
Driller Driller /TP	**6. RIH 12 ¼" BHA** Run in hole with 12 ¼" assembly to last stand before expected cement. Break circulation. Wash down and tag cement. Flush trough and test diverter system. Test diverter both sides. Displace hole and kill/choke lines to 1,13 sg. Watch displacement volumes closely. Exercise: Simulate FIT to 6,2 bar and 8,98 bar. Practise: Shut inn and well killing procedures. Refer to separate program for Peon Well control.		AD Driller Driller Driller/BJ	**Procedure: C-110 Tripping** Calculate space outs before RIH. Drill 1m new formation low on last sgl. Compensate through BOP Fill pipe before tag of cement Take SCR w/mudpump #3 + BJ kill pump.
Driller	**7. Drill cement** Bring up to normal circulation rate while reciprocating pipe.			Check hole behind us when cleaning out shoe, make sure pipe is free.

Responsible	Main operation		Responsible	Offline activity / Details
	Drill out the cement plug. **Note:** Carefully clean out the rat hole and shoe in stages. Drill 1m new formation. Check for boulders. Consider to do separate fish run for boulders.			Double check tally! Prepare to treat mud from cement contamination. Adjust Rucker tension for 1.13sg mud. Avoid circulating in tanks if possible. Use as few shakers as possible to avoid foam.
Driller	**8. Perform FIT** Perform FIT to min 1,25 – max 130.			*13.11.6.1.1.1.1.1* *rocedure: B-116 Leak off test.* Circulate to equal mud weigh in DP.
Driller	**9. Drilling 12 ¼" hole.** Verify the weather forecast prior to start drilling. Wind force not to be less than 10 knts. TD to be advised after fit. Max TD 560m. Shut in well if any sign of flow without flow checking. (Pump off test if any indication of gas.) Displace to 1,13 sg Aqua dril mud before drilling new formation. WOB As required Steady drilling parameter, reduce ROP. Start slow rotation (30 rpm) before engaging pumps in order to break gel strength in mud. Refer to established procedures for pump start-up. Drilling parameters (to be recommended by Inteq): Take survey as required by DD. Establish base line for ECD w/ Inteq. Watch trend line. Limit casing rat hole to a minimum.		Driller Mudeng. Driller Geolog/ Inteq TP2	**Procedure: B-124 Drill 12 ¼" section** Maintain KCl and Aqua-Col-D concentration out of hole above 160 kg/m3 and 3-4% respectively at all times Take SCR before start and when mud is in proper shape. Take up / down weight. Take cuttings samples every 10 m Set up a system to monitor and report cuttings on shakers in respect to volume shape and size Drilling parameters

Responsible	Main operation		Respon sible	Offline activity / Details
				needs to be revived according DD and best practices drilling a vertical well
Driller	**10. Circulate clean** At section TD, circulate to clean the hole while reciprocating and rotating max rpm (130-150 rpm). Pump at least 2 times bottoms up and flow check 10 min. If any sign of flow, shut well in.		AD AD/DD	Count stands left in derrick Prepare plan to rack assembly in derrick. If anything needs to be laid out, consider laying out MWD for down loading
Driller\ Weatherford	11. **Take torque readings** @ 10 & 20 rpm and up\down weights at td and liner hanger setting depth			Ref Weatherford procedures Hanger setting depth: 475-480m pbr depth.
Driller	**12. POOH** Perform trip check prior to POOH. Check trip: Wipe one sgl without pumping. Go back to btm. Circulate bottom up. Wipe one stand without pumping. Go back to btm. Circulate bottoms up. Lubricate out of hole with 12 ¼" assembly with 400-600 lpm. Lubricate until min above BOP. Line up small circ. Pump and pump down kill line. Note down and wipe if any over pulls above 10 ton. Pull max 25 ton Pull wet all the way out. **No slugging allowed**. Check rig equipment for potential loose objects. Pull out and rack assembly in derrick Clean drill floor and check drilling equipment.		Driller Driller AD Driller	Space out to avoid connections while in wellhead/BOP area and compensate through Avoid over pulls when pulling BHA through the extended wear bushing. Prepare lay down of BHA Leave 3 stands 8" DC in derrick for setting 9 5/8" liner packer Next operation is run 9 5/8" liner.

13.12 Appendix 8 ½" Well program

Programme details

13.12.1 Well status

- Wellhead datum at 406,7 m
- XO 20" x 13 3/8" at 417,8m
- TOP PBR at 485,94m
- 9 5/8" shoe at 560 m
- 12 1/4 " rat hole to 561 m
- BOP pressure tested to 103 bar with 1,13 sg mud.

Responsible	Main operation		Responsible	Offline activity / Details
Driller/ PEAK	**13. Preparations** 13 3/8" PEAK plug racked in derrick. Drawing in rig office. Verify checklist is completed.		TP	BOP pressure tested and ready for operation. PEAK plug to be used in case of disconnect of riser. (No riser margin).
Driller	14. M/U 8 1/2" bottom hole assembly Perform safety meeting prior to picking up BHA Use Dog Collar/drill collar elevator until sufficient weight.		Driller/MWD	Procedure: B-131 M/U 8 1/2" BHA
Driller	**15. RIH w/ 8 ½" BHA** P/U enough pipe for 8 1/2"hole while RIH. Use 5" DP on 8 1/2"section. Verify 5" DP across BOP. Displace K/C line to 1,13 sg mud RIH to one single above PBR. Activate compensator. Slowly establish circulation and rotation. Perform kick drill with crew prior to drill out the shoe. Test FIT pump and backup kill pump. Reduce active volume to a minimum. Minimise all activities that will influence on active mud system. E.g		Driller Driller Driller/AD Driller	**Procedure: C-110 Tripping** Rack one stand 5"dp in derrick. Compensate trough BOP/xo 20" x 13 3/8". Space out for closing rams available at drill floor.

Responsible	Main operation		Responsible	Offline activity / Details
	:crane activities, mud transfer etc. Go carefully into PBR cause of cement.		AD Driller/BJ	TOP PBR@ 485,94m Calculate space outs before RIH. Drill 1m new formation low on last sgl. Take SCR w/mudpump #3 + BJ kill pump.
Driller	**16. Drill cement.** Bring up to normal circulation rate while reciprocating pipe. Drill out the cement . Use 5"dp stand in derrick. Normal cmt drilling. Flow 1500 LPM, 60-80 RPM. **Note:** Reduce the flow to 1400 l/min prior to drill out the shoe. Carefully clean out the rat hole. Drill 1m new formation to 562m. Circulate bttm up. (Clean).		Driller Mudeng Driller/Drk.man Driller Driller	Check hole behind us when cleaning out shoe, make sure pipe is free. Double check tally! Prepare to treat mud from cement contamination. Avoid circulating in tanks if possible. Use as few shakers as possible to avoid foam. Monitor for kick warning signs and gas trend changes:
Driller	**17. Perform FIT** Install pump in sub w/Kelly cock above and space out 2,5m above RKB. Pull into liner and close BOP. Perform FIT to min 1,25 sg, max 1,30 sg. If FIT is acceptable to 1,25 sg - increase mud weight to 1,15 sg and add Lclub to the active system. Displace kill/choke line to 1,15sg. Test choke line friction down kill and up choke. Perform slow pump rate.		 Driller Driller	Procedure: B-116 Leak off test. Circulate to equal mud weigh in DP. Adjust Rucker tension for 1.15sg mud. 10 strokes with MP#3.
Driller	18. **Drill 8 1/2" hole.** Verify the weather forecast prior to start drilling. Wind force not to be less than 10 knts.		 Driller	Take SCR before start and when mud

Responsible	Main operation		Responsible	Offline activity / Details
				is in proper shape.
	At any sign of well flowing, shut in well immediately.		Driller	
	Always bring pumps up according to Peon well control manual.		Driller	Take SCR with both MP3 and BJ kill pump.
Driller	Use singles while drilling. Be ware of connection gas and bttm up gas.		BHI	Drilling parameter sheet to be filled in on each connection
	- Drilling parameters: Flow 1000-1600 l/min RPM 100-140. Max WOB___ ton.		Driller	Verify drilling parameters.
	Drill to +/- 567m (5m). Circulate bttm up and monitor gas readings. If indication of underbalance, evaluate.		Drilling super	The drill crew to have completed well control preparedness training and drills according to the Peon well control manual.
	If no indication of underbalance: Drill to max 572 (5m).			
	Circulate bttm up and monitor gas readings. If indication of underbalance, evaluate setting 7" liner. Evaluate R 80. Time out.		Driller	If MWD fails consider to trip and replace.
	If no indication of underbalance: Drill to 576 (4m).			Monitor for kick warning signs and gas trend changes:
	Circulate bttm up and monitor gas readings.			
	Perform check trip: Pull one single without pumping and circ. bttm up.			
	If indication of underbalance, evaluate.			
	If no indication of underbalance: Drill +/- 5m into reservoir.		Driller	
	Circulate bttm up and monitor gas readings.			
	Perform check trip: Pull one single without pumping and circ. bttm up.			Sensor offsets from the bit: Gamma: 3,03 Receptivity: 4,26
	If indication of underbalance, evaluate.			
	If no indication of underbalance:			
	Drill to +/- 614m to identify base Peon reservoir with the			

Responsible	Main operation		Responsible	Offline activity / Details
	MWD log. Circulate bttm up and monitor gas readings. Perform check trip: Pull one single without pumping and circ. bttm up.		Driller	Evaluate conn. depth.
	19. Lubricate out of hole. Perform trip check prior to POOH. Check trip: Wipe one sgl without pumping. Go back to btm. Circulate bottom up. Wipe one stand without pumping. Go back to btm. Circulate bottoms up. Lubricate out of hole with 8 ½" assembly with 400-600 lpm. Lubricate until min above BOP. Pump down kill line while pump out of hole. Pull wet all the way out. **No slugging allowed**.		Driller	Up weight:_____ Down weight:_____
	20. RIH. Pick up test track,ORD,CCN,APX from deck. RIH with BHA to bottom. Circulate bottom up. Watch ECD closely. Establish base line for ECD with Inteq. Keep all drilling parameters as steady as possible. Avoid pulling up unless pumps are running. If a drilling break is recorded. Stop drilling and shut in well. Check for pressure. If no pressure is observed, flow check as per guidelines. Circulate bottoms up at a selected slow circulating rate through the choke manifold with fully open choke. Record formation pressure with the Test Trak tool as specified by geologist. Use MWD ECD to monitor gas kicks.			

Responsible	Main operation		Responsible	Offline activity / Details
	Use LWD neutron density to detect gas in annulus. If well is closed also close diverter element If survey required, take this before connection.			
Driller	**21. At TD of section.** Circulate bottoms up. Monitor for kick warning signs and gas trend changes: - Increase of mud flow - Mud weight reduction and/or signs of HC at surface - Gas trend changes during circulation - Decrease in pump pressure/increase of pump strokes. As soon as any sign of the above is observed, shut in and circulation shall continue over choke manifold. If in doubt shut in immediately and observe pressures.			
Driller	**22. Lubricate out of hole with 8 1/2" assembly.** Perform trip check prior to POOH. Check trip: Wipe one sgl without pumping. Go back to btm. Circulate bottom up. Wipe one stand without pumping. Go back to btm. Circulate bottoms up. Lubricate out of hole with 8 ½" assembly with 400-600 lpm. Lubricate until min above BOP. Pump down kill line while pump out of hole. Note down and wipe if any over pulls above 10 ton. Pull max 25 ton Pull wet all the way out. **No slugging allowed**. Check rig equipment for potential loose objects. Pull out and rack assembly in derrick Clean drill floor and check drilling equipment.		Driller Driller AD	Procedure C-110 Tripping Space out to avoid connections while in wellhead/BOP area and compensate through. Avoid over pulls when pulling BHA through the extended wear bushing. Prepare lay down of BHA

14 Background

14.1 35/2-1 Peon Presentation

No shallow gas warning was given in the site survey report for the proposed well 35/2-1 location. Within a 400 m radius of the well location no amplitude anomalies have been mapped above the top of the Peon structure. However, the well was drilled with caution and shallow gas preparedness was apply when drilling through the top Naust T and S formations.

No shallow water flow warning was given for the proposed location and depth. Shallow water flow has been observed deeper in the area. General preparedness was applied and shallow water experience from the Fram area was planned as contingency.

The seabed is at 409m ± 1 m MD/TVD RKB (384 ± 1 m MSL).

A 9 7/8" pilot hole was drilled from seabed to the planned setting depth of the 13 3/8" casing at 544m which was within a safe distance above the Peon reservoir. The 9 7/8" pilot hole was opened up to 36" hole prior to install 30" conductor at 483m TVD. The remaining of the 9 7/8" hole was opened up 17 ½" hole to 544m MD/TVD and a 20"X13 3/8" casing was installed. The 13 3/8 surface casing was cemented in place with return to the seabed. 18 5/8" BOP and marine riser was run.

Prior to drill the 12 1/4" hole section risk assessment was conducted with the rig crews. This included well control drills and final acceptance of the well control preparedness to assure the rig and its organisation was prepared to drill the 12 ¼" hole section. The 12 ¼" hole section was drilled to 560m and 9 5/8" liner was based on geological correlations and enough distance to set a 7" contingency liner above the Peon reservoir.

Prior to drill out of the 9 5/8" liner and into the Peon reservoir liner a risk assessment exercise was held with the rig crew. Well control drills and acceptance of the well control preparedness for the 8 ½" section was carried out to ensure that the rig and its organisation was well prepared drill the 8 ½" reservoir section.

The original drilling strategy was to drill a 6" pilot hole into the Peon reservoir in order to minimize the gas kick risk potential. If hydrocarbons were present in the reservoir the 6" pilot hole section was planned to be opened up to 8 ½" hole. Formation evaluation logging included LWD logging program and wire line logging depending of the hole condition.

Based on a higher FIT of 1.3 SG, which was higher than expected below the 13 3/8" shoe, decision was made to drill 8 ½" hole and increase the mud weight in the 8 ½" hole section to 1.15. Well control simulations indicated that drilling a 6" hole showed increased ECD and less kick tolerance.

14.2 Identified risks and challenges

The following challenges had been identified prior to spud the well:

- BOP support
- Integrity below 9 5/8" (7") casing shoe

- Fracture 9 5/8" (7") shoe during gas kick
- Kick margin less than 4m3
- Potential shallow gas while drilling pilot hole
- Boulders in the 36" hole section
- Not able to drill with riser margin
- Unable to obtain 200 m surface plug in P&A
- Unable to obtain 200m cement barrier above 7" liner/casing
- To achieve good cement jobs with small cement volumes
- Well integrity and well control in a shallow reservoir

14.3 Well design strategy

- The main purpose of the 30" conductor was to give sufficient support and foundation for the BOP. The 30" conductor was designed to take up loads from the BOP and riser.
- A 9 7/8" pilot hole was planned to be drilled and opened up to 36" and 17 ½" holes.
- 20" x 13 3/8" surface casing to be run and cemented back to the seabed to minimise open hole exposure and increase well integrity if gas with reservoir pressure migrates above the reservoir.
- 12 ¼" hole will be drilled to safe distance to the top of the reservoir prior to run and cement 9 5/8" liner. The liner will be hung off 50m inside the 13 3/8" casing
- To minimise the potential kick rate when drilling into the reservoir, was to drill 6" pilot hole when entering the reservoir for the first time. The hole will be logged with MWD/LWD.
- If discovery the 8 ½" to be and logged.
- The P&A strategy was to cement the hole well back to 25m below seabed by setting 2 cement plugs. Both plugs to be load and pressure tested.

14.4 CONTINGENCY:

Depending on the hole condition in the 12 ¼" hole section and if 9 5/8" have to be set high, the design flexibility and contingency is to drill 8 ½" hole and set 7" liner on top of the reservoir. The 7" Liner will be cemented back with a minimum of 50 m liner lap inside 9 5/8" casing. 6" hole will be drilled in the reservoir.

Both 9 5/8" and 7" liner well integrity should be strong enough to drill 6" Pilot/8 ½" hole to TD of the reservoir section at 710m.

During the drilling operation the casing design, casing points, pore pressure, fracture gradients mud weights etc will be continuously updated and reviewed. The operational plans will be updated accordingly if the design criteria's are changed.

14.5 Additional work and documents

In addition to the drilling program operational procedures including operational HAZID analysis were prepared for each operation. A well control manual will be prepared and will cover relevant well control topics for well 35/2-1 Peon. The manual will include relevant equipment, well control procedures, organisation and training requirements.

15 Risk reducing measures using ALARP principals

The Management regulations Section 1: Risk reduction and the Frame work regulations - Section 9: Principles relating to risk reduction describes ways and methods to identify and reduce risks in a project.

During the planning and in the operational phase the identified risks have been handled according to these principals.

When risks have been identified these risks have been followed up by analysis and studies. All these studies have been sorted in a structured way in order to have all studies traceable.

The method used to keep the risks As Low As Reasonable practical possible – ALARP can be described with the following two figures. Figure 1 describes an overview of all the studies and emergency preparedness initiatives conducted on 35/2-1 Peon. These studies are described more in Chapter 4.1. The purpose of these analysis and studies has been to reduce the overall risk picture of the project and to keep a systematic tracking and status of each individual study.

Figure 3.1 gives and overall over view

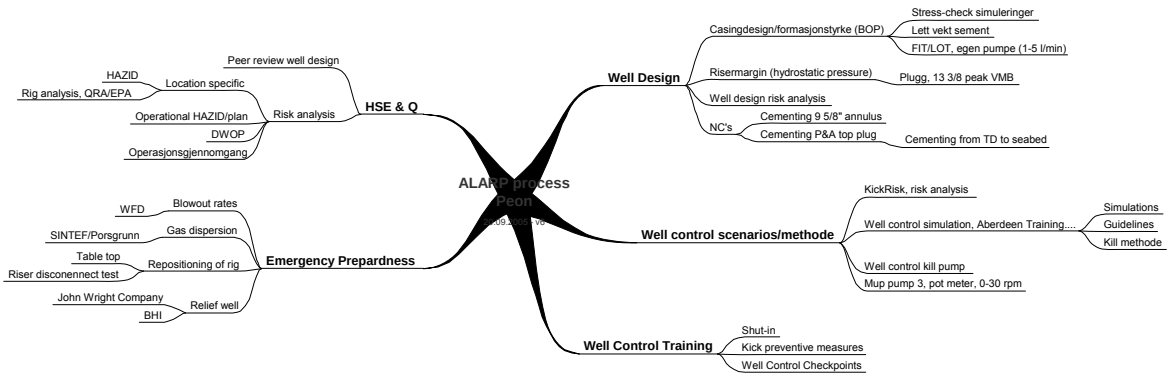
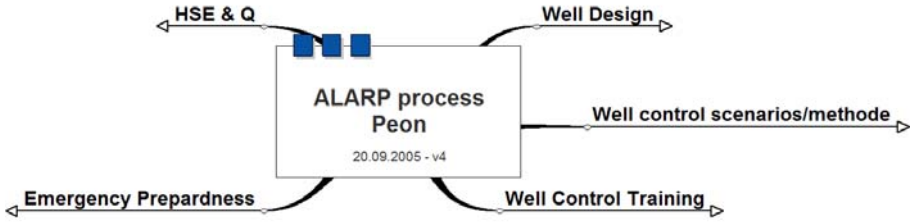


Figure 3.2 gives a more high level overview of the risk picture.



16 Studies and Documentation used in the planning

References and studies were clearly documented and listed in the drilling program. Chapter 3.1 describes an overview of these documents and studies, which was prepared throughout the well design and planning process.

16.1 Reference documents and studies used for 35/2-1 Peon well design and planning

1. APOS – Arbeids Prosess Orientert Styring – Intern Hydro
2. Synergi HSE management system – Internal Hydro
3. Feasability study, Vurderinger rundt grunn gass prospektet Peon" – Internt Hydro
4. Drilling Engineering Pre–Study – DPT (Drilling Production Technology)
5. Shallow Well Conductor Assessment – DPT/ATKINS
6. Peon Riser Analyse - Odfjell
7. Geological site survey – Fugro / Internal Hydro
8. Well design Risk Assessment 35/2-1 Peon – Internal Hydro
9. 35/2-1 Peon Well design basis – Internal Hydro
10. Lokasjonsspesifikk HAZOP 35/2-1 Peon – Internt Hydro
11. Extended Geological site survey including additional depth correlation – Fugro / Internal Hydro
12. Pore pressure-,fracture- and overburden gradients – Internal Report Hydro
13. Deviation from §76 Aktivitetsforskriften – Stigerørsmargin – Application in Internal Synergi report
14. Extended reservoir stability study for 35/2-1 Peon – Hydro forskningssenter / Sintef
15. Cementing program and engineering – Internal Hydro / BJ services
16. Casing Design engineering with engineering software StressCheck – Internal Hydro
17. Peer Review / assist of the 35/2-1 Peon well design, identification of additional risks and feed back on Design Basis – Internal Hydro
18. Well head and Titus recommendation – Dril-Quip
19. Subsea Wellhead System – Dril-Quip service manual – Deep Sea Trym
20. Peon Blow-out & Kill Simulations - Well Flow Dynamics AS
21. Relief Well feasibility investigation for the Peon Prospect – John Wright Company and Well Flow Dynamics AS
22. Relief Well feasibility study U – shape solution - Baker Hughes INTEQ
23. Relief Well: Gas content in water and air- Peon prospect – Sintef/Well Flow Dynamics
24. Well Control risk evaluation for the Peon Exploration Well - RF- Rogalandsforskning
25. Well control kick simulations using RF kick simulator – RF-Rogalandsforskning
26. Peon – Sand collapse risk evaluation in a vertical well – Hydro forskningssenter
27. Hole stability study – Extended simulation of sand production with moving gas - Sintef
28. Feedback report shallow water flow well 35/9-4SX - Hydro
29. Experience report Agat well drilled by RWE - RWE final well report
30. Snorre gas kick - experience report
31. Peon weather study and operational limitations. – Hydro forsknings senter
32. Additional mud logging service – BH INTEQ
33. Risiko og beredskapsvurdering av Deepsea Trym for boring av brønn 35/2-1 Peon – Intern Hydro
34. Geomekanisk studie for letebrønn 35/2-1 Peon – Well Experts AS
35. 35/2-1 Peon Well control Guidelines and procedures – Aberdeen Petroleum Training Int.

16.1.1 APOS

APOS describe work processes including Hydro requirements and guidelines.

16.1.2 Syngergi HSE management system

The program is a database to track and manage HSE related issues.

16.1.3 Internal Hydro 35/2-1 Peon feasibility study

An internal Hydro feasibility study was conducted and presented in a memo by Ove Andre Solheim and Emil Skotlien 15 February 2005. The objective of this study was to determine feasibility of drilling an exploration well on the Peon prospect.

The work was based on existing steering documentation used in B&O to identify areas not in compliance with rules and regulation. The report included preliminary proposed drilling plan, time estimates, budget time and budget.

The report described drilling challenges and non-conformances too rules and regulations.. Identified area of concern:

- Pore pressure
- Riser margin and calculations
- Cement barriers
- P&A barriers
- BOP foundation

Included are also preliminary:

- Initial Casing design
- Time estimate
- Cost estimate to drill Peon.

The objectives of the study was to determine the feasibility of drilling an exploration well on the Peon prospect

16.1.4 Drilling Production Technology – Drilling Pre-study

The objective of the pre-study was to determine feasibility of drilling an exploration well on the Peon prospect. The drilling pre-study concluded that it was technical feasible to drill an exploration well on the Peon prospect.

The following issues were covered with respect to drilling technology:

- Identify operational challenges
- Propose casing setting depths
- Drilling mud design
- Conductor design
- Casing design
- Cement design
- Formation evaluation considerations
- P&A proposal and design
- Well control
- Non-conformances with Hydro and regulatory requirements and guidelines
- Recommended drilling guidelines
- Rig requirements
- Vessel study
- Identification of required HES work to be performed
- Propose technical solutions

16.1.5 Hydro shallow well assessment - Aitkins Process

Drilling Production Technology (DPT) requested Atkins Process (Atkins) to undertake an assessment of the conductor, both axially and under cyclic riser loads. The main concern was the ability of the 30" conductor to support the weight with very little contribution from internal casings. The conductor was also assessed for limiting tensions-angle limits while drilling.

This document details the results of this assessment.

The study objectives were:
1. To determine the axial capacity of the proposed conductor, calculate safety factors for the anticipated load conditions and, if capacity was insufficient, advise minimum number of conductor joints required;
2. To determine conductor design limits for latched riser loading.

16.1.6 Deepsea Trym Riser Analysis – Odfjell Drilling.

The riser analysis for 35/2-1 Peon was based on the 35/11-13 Astero exploration well, which had a water depth of 363m. The water depth at Peon was 384m, which is only 21m deeper. Based on the results of the analysis performed on Astero, Odfjell did not see any problems use the Deepsea Trym Astero riser analysis on Peon.

Maximum load in the riser was 315 Mpa. The steel quality in the area was X-80 steel with max load of 369 Mpa. The rig verified minimum tension load. Collapse loads with full gas evacuation was calculated.

16.1.7 Geological site survey at location 35/2_1 PL 318 – Fugro/Hydro

Summary:
The purpose of this report was to evaluate possible drilling hazards, describe the sea floor condition and shallow geology at the Planned 35/2-1 Well Location in PL 318.
The water depth at the Planned 35/2-1 Well Location was 384m ± 1m below MSL, and the water depth vary over the site from a minimum of 379m ± 1 m MSL to a maximum of 388m ± 1m MSL. Minor pockmarks dissect the survey area; still the seafloor is flat at Location.
Reflection seismic anomalies are present within the Quaternary succession as well as in the Pliocene strata below, but no gas-related anomalies occur at Location. No shallow gas warning Was issued.

Shallow water flow were registered in wells 35/3-6 (Oligocene sands) and 35/8-5 S (Pleistocene sand layers), however no shallow water flow was expected at the Planned 35/2-1 Well Location as no sands occur in the corresponding levels.
No boulder problems were reported during drilling of the neighboring wells. However, scattered boulders may occur in the Pleistocene tills and glaciomarine clays; 391m ±1m – 588m ±6m MSL.

For more details refer to the geological summary.

16.1.8 Well design Risk Assessment 35/2-1 Peon

The well design risk assessment for 35/2-1 Peon covers identified risks affecting the well design. In addition HAZOPS was prepared for each hole sections and main operations.

16.1.9 35_2_1 Well design basis – Hydro

The Well Design Basis of the 35/2-1 Peon, which was sent to Ptil 28/4-2005, was the basis to prepare the drilling program. After the well design and drilling program was sent to Ptil in May, it was presented to Ptil in the beginning of June 2005. The goal of the meeting was to present the design and have an open dialog with regards to the planned drilling operation.

The purpose of this Well Design Basis document was as input to the drilling program. The Peon well design was slightly changed compared to the original design when the drilling program was sent 9 weeks before spud of the well.

The design basis was the main input document to prepare SFT discharge application of Deep Sea Trym as well as important input to the consent to drill application.

The document outlines the design basis for the exploration well 35/2-1 Peon, which was located north east of the Visund field and west of the Agat field.

The prime objective of the well was to prove commercial hydrocarbon volume in Quaternary (Late Pleistocene) sandstones in the Peon reservoir.

The document has discussed the vertical well to a total depth of approximately 710 mMD RKB. The well was not planned for production testing and was planned as permanent plug and abandonment. During the logging phase decision was made to prepare the well for testing.

16.1.10 Location specific HAZOP 35/2-1 Peon

A location specific HAZOP was conducted 16/2-2005 and 24/2-2005. The objective of the analysis was to identify location specific risks and evaluate emergency preparedness. The analysis was based on the NPD regulations, Hydro internal requirements and Odfjell Drilling internal regulations.

The operational phases covered:

- Transit
- Anchoring
- Arrival on location
- Spud and top hole section
- Intermediate and reservoir drilling
- Plug and abandonment

All actions are attached in appendix B and followed up in Synergi.

16.1.11 Extended Geological site survey including additional depth correlation

Additional processing of the site survey data was performed by Fugro to improve depth correlation. The data was incorporated in the geological summary of the drilling program. For more details refer to the geological summary.

16.1.12 Pore pressure- , fracture- and overburden gradients

During the planning of the reservoir section two sets of data were used.

Pore pressure prognosis 1.10:
Pore pressure max 1.10 sg was based on a gas gradient of 0,15. This gradient was included in the drilling program snet to Ptil.

Updated pore pressure prognosis 1.12:
The pore pressure was updated too max 1.12 sg, which was based on a gas gradient of 0,0463 and 82m gas column. The gradient was based 0% water saturation

Based on the changes in pore pressure to 1.12 simulations, reports and analysis had to be updated and included in revision 1 of the drilling program.

16.1.13 Deviation from §76 Aktivitetsforskriften – Stigerørsmargin

The drilling operation on well 35/2-1 Peon could not be carried out with riser margin. To include riser margin in the 12 ¼" and 8 ½" hole section a mud weight of 1.46 had to be applied. According to the local fracture gradient this mud weight would be higher than the fracture gradient.

The riser margin non-conformance according to Activity regulation § 76, with reference to Norsok D-010 paragraph 5.4.1 " Additional well barrier elements (WBE) acceptance criteria", was processed in Synergi HSE management system had case number **521857** and included the Ptil application, riser margin calculations, compensative measures and PDF print of Synergi **521857.**

16.1.14 Extended reservoir stability study Hydro forskningssenter / Sintef

Hydro Forskningssenter prepared a reservoir stability and sand production study which recommended to be follow up with a analysis of Sintef sand production model.

A study using 2 SINTEF sand production models has already been conducted by Norsk Hydro to evaluate the sanding risk in the case of a shallow gas field. However, the models used are based on laboratory hollow cylinder experiments performed with liquid oil, giving rise to a number of empirical correlations between simple rock mechanical properties and cavity stress for onset of sand; moreover, the models also calculate a sand mass rate for stress above the onset value and for given flow rates.

16.1.15 Cementing program and engineering – Hydro/BJ Services

During the planning of the well loss during cementing was identified as a risk using standard G-cement. BJ services where actively pursuing an opportunity to engineer a tailor made lightweight cement slurry. This was an ongoing process throughout the planning process.

During the testing of the mixing capability at BJ services yard it was experienced problems in mixing/pumping the light weight material with the Ventury pump. On the rig this was solved by mixing the light weight material directly into a batch mixer and transferred from there to the cement unit.

For more details regarding execution of the cementing operation refer to the cementing summary in the operational final well summary.

16.1.16 Casing design engineering using engineering software StressCheck – Internal Hydro

The casing design was check for drilling loads according Hydro internal casing requirements and guide lines. The design had high safety factor and the only limitation factor was the 20” x13 3/8” crossover if high test pressure was applied.

Attached is the Landmark StressCheck file including all calculations done on each section.

16.1.17 Peer review / assist of the 35/2-1 Peon Well design

Prior to finalize the well design a Peer review/assist full day meeting was held with internal Hydro and external attendees to review and comment on the proposed well design. The participants contributed a lot and came with suggestions to further optimize the well design.

A minutes of meeting with including actions were prepared after the meeting. The actions were followed up and logged in **Synergi case no 521441.**

16.1.18 Well head and Titus recommendation

Analysis from Aitkins Process and recommendations from Dril-Quip concluded that the upper 7-10m of the 30” conductor was the most critical part of the conductor with regards of having sufficient cement up in the conductor. All the loads form the BOP and riser are taken up in the 30” conductor from 7-10m. A good cement bond in the surface was therefore critical.

Dril-Quip recommended advised not to have cement in the wellhead area or in the BOP. If cement was pumped into the wellhead it could cause the risk of cementing the running tool, failure to set annulus seal, failure to run wear bushing and need to clean BOP and wellhead due to cement.
By installing a simplified casing design with a 20”X13 3/8” casing that could be cemented with returns to the seabed. The cross over from 20” to 13 3/8” was welded on and was therefore gas tight. The 20” extention was rated to 278bar (20”x0.812” WT X-56). If needed the extension could be delivered with 1” Wall Thickness (330bar).

The 9 5/8” was run as a liner and was hung of inside 13 3/8” casing. Excess cement was calculated based on the height from top of the liner to the BOP.

The TITUS cement top-up system is an alternative to traditional grouting systems and it is simple and efficient way of doing a cement top up job in the 30” annulus.

16.1.19 SS-13 Subsea Wellhead System – Dril-quip service manual – Deepsea Trym.

The SS-15 sub sea wellhead service manual included the specifications of wellheads, running tools, hang off tool and wear bushings.

16.1.20 Peon Blow-out & Kill Simulations – Well flow dynamics

Summary and Conclusions:

The prognosis of the permeability indicated permeability of 1 Darcy +, and together with a net pay of 50 m, the productivity from the Peon formation was high.
A gas with a GOR of 100 000 Sm3/Sm3 was used.

Blowout Scenarios:
A total of 4 scenarios were run from the Peon target, see. Figure 3.1.

- Blowout through drill pipe to surface
- Blowout through annulus to seabed
- Blowout through open hole to seabed
- Blowout through annulus between 9 ⅝" casing and 30" conductor to seabed

Sensitivities on the productivity were run for all scenarios, additionally, sensitivity was run on the length of the BHA to investigate the importance of this in a short well.
All simulations were performed using Olga-Well-Kill powered by Olga2000.

Summary and Conclusions:
A study was performed to evaluate potential blowout rates and kill methods for the Peon shallow gas project, to be drilled by Hydro. The conclusions from the project were as follows:

- Blowout rates are high, 7 million Sm3/d of gas for the open hole scenario
- A relief well cannot be drilled, the blowout well is too shallow to enable intersection
- Dynamic kill through drillpipe in the existing well was possible, the killrate was 17 bpm
- Rock mechanics data should be evaluated to compare with drawdown for potential
- collapse

- A BHA of 120 m has significant influence on restricting the flow rate
- Extending the BHA another 50 meters will have little impact neither on flow nor kill rate

16.1.21 Relief Well feasibility investigation for the Peon Prospect- John Wright Company and well Flow Dynamics

Dr. Ole Rygg, Managing Director of Well Flow Dynamics, requested the John Wright Company to assist with the investigation and development of a relief well feasibility study for the 35/2 Peon
Prospect located in the North Sea, offshore western Norway.
In particular to this specific blowout contingency planning investigation, the John Wright Company was requested to specifically consider:

- Relief well intersection techniques available and their limitations
- Evaluate the possibility to intersect a very shallow blowout well and the limitations on spud location. Evaluate spud distance vs. intersection depth.
- Minimum intersection depth
- Evaluate ranging techniques in combination with available MWD and Gyro technology

The primary focus of this report is the feasibility of a relief well intervention project while the primary purpose is to identify circumstances and conditions where blowout control may be unusually difficult to achieve for several shallow blowout scenarios.
Examples of the types of conditions present in the Norsk Hydro operations and/or conditions necessary during a relief well intervention project include:

- offshore conditions
- deepwater drilling environment
- unknown geologic zones
- potential underground crossflow zones
- permeable recipient formations
- water column blowout plume considerations
- blowout effluent pollution
- unknown pore pressure regimes
- very limited deepwater drilling and support vessels
- harsh meteorological environment
- severe oceanic wave environment
- environmentally sensitive area

This report should provide the Norsk Hydro Peon Prospect drilling team with enough information
to determine if the risk and consequence(s) of a blowout justifies additional expenditures to further investigate the use of a relief well for primary or secondary source control.
Jim Woodruff, an expert in relief well engineering with the John Wright Company, undertook the task to identify critical elements for developing and implementing an effective relief well intervention project particular to the Norsk Hydro Peon Prospect
Norsk Hydro Peon Prospect Blowout Contingency Planning
©December 2004 Well Flow Dynamics & John Wright Company Page 3
Due to the nature of presenting a hypothetical situation, this document should be considered as a first iteration, based on very limited data, for ultimately controlling the Peon Prospect well when
using a relief well. Many assumptions and estimations were necessary during this investigation and would require resolution before proceeding with an actual relief well program.

For more details please refer to the complete report.

16.1.22 22 Relief Well feasibility study U-shape solution - Baker Hughes INTEQ

Directional drilling plan to drill a relief well on the Peon field 200m from the original location – J-shape well. Includes a U-shape well to be drilled below the Peon reservoir and up again.

16.1.23 Relief well - Gas content in water and air Peon prospect – Sintef

The present study has been conducted to delimitate potential hazardous regions related to gas surfacing from an underwater blowout. The possible hazards of main concern are loss of buoyancy due to high gas void fractions in surface waters, and gas explosions due to high gas concentrations in the air. The results show that the maximum gas void fractions in the surface water will produce an insignificant loss of buoyancy, and that the vertical extent of the hazardous zone will be limited to about 10 meters from the sea surface at any distance from the release point. At the sea surface, however, the hazardous zone may extend up to 500 meters downwind of the release point. In this study, the hazardous zone is presumed to be limited to regions with gas concentrations in air exceeding 1 percent by volume. This corresponds to 25 % of the lower explosion limit (LEL) of the gas mixture of concern.

It should be noted that these results to a large extent is related to the relatively large water depth in the case considered here (384 m). Subsea releases of gas at such depths will imply a quite extensive radial extent of the boiling zone, while gas releases of the same magnitude at more shallow depths would surface within a smaller area, and thus cause more extended hazardous zones at the same wind conditions.

This report summarizes the main results from a study that has been conducted on behalf of Well Flow Dynamics on dispersion of gas from a possible blowout during exploration drilling at the Peon field. The blowout is presumed to take place at 384 m depth, and will mainly comprise releases of a methane rich gas, in addition to minor amounts of condensate. The discharge conditions are presumed to be as follows:

- Discharge rate: 7×10^6 Sm^3/day gas
- Gas density: 0.743 kg/Sm^3
- Gas-to-oil ratio (GOR): 100 000:1
- Reservoir temperature: 25°C
- Outlet diameter: 8 ½"

SINTEF has recently conducted plume calculations with the DeepBlow model for the same case (Johansen 2005). In the present study, the following results from these simulations have been used to calculate the gas void fraction in surface waters and atmospheric dispersion of gas:

- Plume centreline velocity: 3.2 m/s
- Characteristic radius of plume: 26.2 m
- Radius of the boiling zone (95% contour): 70.8 m

The plume parameters given above refer to the stage when the plume approaches the sea surface. However, as the plume comes closer to the surface, the plume will be deflected into a radial flow in the surface waters. The radial flow stage will be considered in the following chapter.

16.1.23.1 23A - Some considerations concerning the placement of a relief well on the Peon field

Introduction:
In case of a blowout on the Peon field some work considering gas dispersion and plume effects was conducted by Sintef /1/. The main objective of the memo was to suggest a possible placement of a relief well based on the findings in /1/.

Conclusions:
The localization of a relief well in case of sub sea blowout from the Peon field must be placed minimum 200 m west of the blowout location.
It is not advisable to be placed in the boiling zone of the plume due to fire hazard.

Objectives:
The main objective for this memo was to suggest placement of a relief well for the Peon field. Based on Sintef work /1/ on the sub sea gas blowout and environmental data /2/ the placement of a relief well could be suggested. There are two major contributions to the displacement of the plume; effects of current and effect from wind. The figures and models used in /1/ are assumed to be correct. These numbers are not checked in detail, however the numbers from /1/ which are used is checked and found good.

16.1.24 Well Control risk evaluation for the Peon Exploration well RF-Rogalandsforskning

Executive summary:

The analysis undertaken in this project is based on a combination of probabilistic risk analysis and hydraulic simulations. It should be noted that the results presented here to a large degree are a function of the uncertainty related to geological and operational parameters. The purpose of this study has been to quantify the probability of kick and fracturing and to recommend risk reducing measures and robust operational parameters. The study covers the activities drilling ahead, static conditions, tripping operations and running liner. Focus has been on the 6" reservoir section.
The main findings of the analysis are:

- The optimal mud weight given the information we have as of today is 1.15 s.g. This recommendation is based on that the pore pressure can be in the interval 1.03-1.12 s.g., that the fracturing pressure can be in the interval 1.17-1.36 s.g and that operational variation will occur.
- By using a mud weight of 1.15 s.g. the kick and fracturing probability are 0.1% and 1.7%, respectively. These results are based on that the pore pressure can be in the interval 1.03-1.12 s.g., that the fracturing pressure can be in the interval 1.17-1.36 s.g and that operational variation will occur.
- The swab and surge pressures are relatively small in this well, even if heave effects are included. This presupposes that HPHT procedures are implemented.
- The most critical factor with respect to kick is gas that may reside in the well during unplanned static conditions. Examples of unplanned static conditions are the situation following brake failure, draw- work failure or power failure. In order to reduce the possibility of having gas in the well, circulating bottoms up should be performed at every connection.
- The most critical factor with respect to fracturing is a too hard pump startup at circulation start. Risk reducing measures with respect to circulation start are i) drillstring rotation before pump startup in order to break eventual gelling and ii) a very slow pump startup scheme.
- The worst case pressure margin, defined by a pore pressure of 1.12 s.g and a fracturing pressure of 1.17 s.g., gives a kick probability of 11% and a fracturing probability of 48%. The optimal mudweight in this case is 1.14 s.g.
- The predicted kick volume is in the range 0.5-2.25 m^3. This is a relatively low kick volume, however, due to the small well volume, this well is not very tolerant for kick volumes, and there should be a strong focus on kick detection modes in order to minimize the kick volume given that a kick occur.
- The philosophy of shutting in the well if a kick is suspected, without running a flow check, reduces the kick volume with approximately 0.8 m^3. This is a very effective risk reducing measure.
- The fracturing probability during Driller's method is very high if the fracturing pressure is smaller than 1.20 s.g. Focus should be on proper choke handling and on keeping low circulation rates during Driller's method.
- The potential for underground blowout during Bullheading is very low, since this can be regarded a shallow gas setting.
- The probability of unintentionally hitting the reservoir in the 12 ¼" section is considered very low since the location of top Peon has been established using seismic, nearby wells

and general experience from Norskerenna. The consequence of unintentionally hitting the reservoir in the 12 ¼" section is most likely a kick, and such a kick situation will be complex due to the combined mud loss/influx situation that may occur.

- It should be established decision gates with respect to mudweight and the preferred kill approach as drilling proceeds. In particular, the result from the FIT at the 9 5/8" casing shoe should support the decision on whether Driller's method should be the preferred kill method in case of a kick.

(Note: Bull heading was never considered as an option during the planning or the operational phase).

16.1.25 25 Well control risk evaluation for the Peon exploration well RF-Rogalandsforskning

RF prepared two separate well control simulations with two well designs. For more detail refer to the complete reports. The reports mentioned Bull heading but its should be very clear that bull heading have never considered as an option during the planning phase. The strategy was not to fracture the formation and not even go as high as LOT.

16.1.25.1 Well design #1: 20"x9 5/8" and 7" Liner on top of the reservoir

In this study, the risk for kick and fracturing on the Peon prospect has been analysed. In addition, dynamic simulations of surge/swab effects have been performed. The purpose of the study was to quantify the risks related to kick and fracturing and to determine optimal operational parameters when taking geological and operational uncertainty into account. Focus has been on the 6" reservoir section.

Executive Summary

The analysis undertaken in this project is based on a combination of probabilistic risk analysis and hydraulic simulations. It should be noted that the results presented here to a large degree are a function of the uncertainty related to geological and operational parameters. The purpose of this study has been to quantify the probability of kick and fracturing and to recommend risk reducing measures and robust operational parameters. The study covers the activities drilling ahead, static conditions, tripping operations and running liner. Focus has been on the 6" reservoir section.

The main findings of the analysis are:

- The optimal mud weight given the information we have as of today is 1.15 s.g. This recommendation is based on that the pore pressure can be in the interval 1.03-1.12 s.g., that the fracturing pressure can be in the interval 1.17-1.36 s.g and that operational variation will occur.
- By using a mud weight of 1.15 s.g. the kick and fracturing probability are 0.1% and 1.7%, respectively. These results are based on that the pore pressure can be in the interval 1.03-1.12 s.g., that the fracturing pressure can be in the interval 1.17-1.36 s.g and that operational variation will occur.
- The swab and surge pressures are relatively small in this well, even if heave effects are included. This presupposes that HPHT procedures are implemented.
- The most critical factor with respect to kick is gas that may reside in the well during unplanned static conditions. Examples of unplanned static conditions are the situation following brake failure, draw work failure or power failure. In order to reduce the possibility of having gas in the well, circulating bottoms up should be performed at every connection.

- The most critical factor with respect to fracturing is a too hard pump start-up at circulation start. Risk reducing measures with respect to circulation start are i) drill string rotation before pump start-up in order to break eventual gelling and ii) a very slow pump start-up scheme.
- The worst case pressure margin, defined by a pore pressure of 1.12 s.g and a fracturing pressure of 1.17 s.g., gives a kick probability of 11% and a fracturing probability of 48%. The optimal mud weight in this case is 1.14 s.g.
- The predicted kick volume is in the range 0.5-2.25 m^3. This is a relatively low kick volume, however, due to the small well volume, this well is not very tolerant for kick volumes, and there should be a strong focus on kick detection modes in order to minimize the kick volume given that a kick occur.
- The philosophy of shutting in the well if a kick is suspected, without running a flow check, reduces the kick volume with approximately 0.8 m^3. This is a very effective risk reducing measure.
- The fracturing probability during Driller's method is very high if the fracturing pressure is smaller than 1.20 s.g. Focus should be on proper choke handling and on keeping low circulation rates during Driller's method.
- The potential for underground blow-out during Bull heading is very low, since this can be regarded a shallow gas setting.
- The probability of unintentionally hitting the reservoir in the 12 ¼" section is considered very low since the location of top Peon has been established using seismic, nearby wells and general experience from Norskerenna. The consequence of unintentionally hitting the reservoir in the 12 ¼" section is most likely a kick, and such a kick situation will be complex due to the combined mud loss/influx situation that may occur.
- It should be established decision gates with respect to mud weight and the preferred kill approach as drilling proceeds. In particular, the result from the FIT at the 9 5/8" casing shoe should support the decision on whether Driller's method or Bull heading should be the preferred kill method in case of a kick.

16.1.25.2 Well design #2: 20”x13 3/8” and 9 5/8” Liner on top of the reservoir

Executive summary:
The “worst case” margin in the Peon exploration well was very small. The consequences of meeting a fracture gradient of 1.14 sg at the 13 3/8” shoe (539 m) and 1.17 sg at the planned 9 5/8” liner shoe (570 m) have been evaluated, along with the worst case assumption of a pore pressure of 1.12 s.g. at top Peon (576 m TVD RKB). One has to be aware that 0.01 sg at these depths only correspond to 0.5 bar. It seems difficult to omit fracturing if a kick was taken. If Driller’s method is to be used, it is unlikely that the choke operator is able to adjust the choke perfectly enough to stay within margins. Choke line friction effects will also complicate the picture. Focus must be on reducing the probability of taking a kick. The FIT/LOT’s taken during the operation will be very important design and decision criteria. A “what-if” strategy should be clear before the operation starts.

16.1.26 Peon - Sand collapse risk evaluation in a vertical well - Hydro research center

Summary:
Peon is an exploration well, so there will be a degree of uncertainty regarding rock mechanical parameters used in this evaluation. The sand collapse risk evaluation is based on two different models, Sand Predictor and Cavity Failure models.

For case 1, the results show no signs of significant sanding as a consequence of pressure conditions in the well during blow-out assuming initial reservoir pressure of 60 bar, 20 bar depletion, a draw down of 50 bar, and a formation strength (Uniaxial Compressice Strength, UCS) of 1 MPa. Some sand is however registered for case 2 (increased stresses compared to case 1).

Note that only pressure conditions and no gas flow are taken into considerations in the calculations. Large gas rates may erode sand from the borehole wall and into the well (see separate SINTEF study for calculation of drag forces experienced by the grains at the cavity).

Based on the work reported in this memo there should be no reason to believe in a massive inflow of sand, that will kill the well naturally.

Sand risk evaluation
The risk assessment is based on Sand Predictor and Cavity Failure, and the sanding risk will be governed by: formation strength, well orientation and inclination, perforation orientation/phasing pattern, perforation interval, original reservoir pressure, current state of depletion, and production draw down.

The following formation properties and rock mechanical input data are assumed:

	Case 1	Case 2
UCS	1 MPa	1 MPa
Poisson's ratio	0.20	0.20
Vertical stress	8.24 MPa	12 MPa
Horizontal stress	8.12 MPa	10 MPa
Porosity	0.23	0.23
Permeability	2000 mD	2000 mD

16.1.27 Hole stability study - Extended simulation of sand production with moving gas – Sintef

Introduction:
A study using 2 SINTEF sand production models has already been conducted by Norsk Hydro to evaluate the sanding risk in the case of a shallow gas field. However, the models used are based on laboratory hollow cylinder experiments performed with liquid oil, giving rise to a number of empirical correlations between simple rock mechanical properties and cavity stress for onset of sand; moreover, the models also calculate a sand mass rate for stress above the onset value and for given flow rates.

The accepted view is that for competent rocks, regardless of the nature of the pore fluid, mechanical failure induced by stress concentration at the borehole is the dominating mechanism, required for any solids production to occur. Once the rock is ruptured, fluid flow is necessary to wash into the borehole the solids (breakouts, cavings or single particles) constituting the near-well bore failure zone. In other words, fluid flow alone is insufficient to trigger sand production, unless the formation is very weak or almost unconsolidated, such that the fluid drag force is in itself large enough to create tensile conditions near the borehole above the strength of the rock and overcome the solid friction between the grains.

In the models used in the Hydro study, the draw down and depletion conditions are combined to evaluate the cavity stress and the pore pressure gradient. Threshold values for both indicate onset of sand production. There is however a great uncertainty on the value for the pressure gradient threshold, and moreover, the calculation is based on the Darcy linear flow equation. For high gas rates, this equation is no longer valid and has to be substituted with a non-linear relation.

Looking specifically at the gas flow, one can instead try to derive the drag force expected for a given draw down, by using a suitable non-linear extension of the Darcy equation and a suitable drag force formulation for dense granular media. This calculated drag force can then be compared to values calculated for laboratory sand production tests on similar sandstones, where sand production occurred.

Onset of sand production can also be estimated, looking at draw down induced tensile failure of the borehole, if the mechanical parameters (strength, friction angle etc.) of the reservoir rock are known and specifically taking into account the non-linear gas flow.

Conclusion:
We have performed flow calculations taking into account the non-linear aspect of high rate gas flow in order to estimate the magnitude of the fluid drag force on the formation grains. The values determined are dependent on the fluid model used, the input parameters such as porosity, permeability, grain size, fluid viscosity etc., but nonetheless the resulting forces are 3 orders of magnitude higher than the forces computed for an outcrop tested at SINTEF, which had similar strength and produced sand. It is therefore concluded that significant sand production may be expected in the present field case, although previous studies using SandPredictor (based on Darcy flow) show that nearly no sand should be expected.

A sand prediction analysis was then conducted along the lines of the article by S. Ong *et al.*, giving lower onset of sand drawdo wns than the planned 5 MPa drawdown. This clearly indicates a major sanding risk, solely based on tensile failure due to high rate gas velocity. In addition, the input parameters were deliberately more optimistic (i.e. larger rock strength than estimated) compared to those used in the SandPredictor software, as our experience is that existing sand prediction models outside of SINTEF's volumetric model tend to be quite conservative.

In short, the conclusion of this study is that when taking into account non-linear gas flow, major sand production is to be expected, even though no volumetric model is at present available.

16.1.28 Feedback report shallow water flow well 35_9_4SX – Hydro

The purpose of this report is to present the findings of a study of shallow water flow problems experienced in the 35/9-4SX well. Shallow water flow was experienced at two levels in the shallow tophole section and resulted in the loss of the well without any of the objectives being achieved.

Special attention has been given to:

- seismic character and geological significance of the shallow water flow intervals,
- likely causes of shallow water flow,
- methods of controlling shallow water flow,
- criteria which can be used to identify levels of potential shallow water flow in known problem areas or to establish the risk in new areas,
- recommendations for future site investigations.

The report is divided into eight sections. The main conclusions from the study and recommendations for future site investigations are presented in section 2. Section 3 gives a diary of events from the spudding of the well to the final abandonment, and highlights the main conclusions from the operations review. Sections 4 and 5 provides some background information on shallow water flow processes and control methods based on a review of recent literature. Section 6 re-examines all the available data for the Gjøa area to see if the potential for shallow water flow could have been predicted.

16.1.29 Experience report Agat well 35/3-6 drilled by RWE - RWE final report

Well 35/3-6 is drilled in the neighbouring block to 3366 m MD.

16.1.30 Snorre gas kick experience report

The report was available and used as information and guide.

16.1.31 35/-1 Peon well control guidelines and procedures - Aberdeen Petroleum Training International

A total of 5 well control courses were held prior to crew change. Deep Water Well control Guidelines and procedures were prepared.

16.1.32 Peer Review 35/2-1 Peon Well Design

Actions and follow up after the Peer Review of the 35/2-1 Peon well design and identification of additional risks. Actions are followed up in Synergi xxxxx.

16.1.33 Risk and Emergency Preparedness the Deepsea Trym operating on 35/2-1Peon

The report describes the assumptions of the Deepsea Trym's Risk and Preparedness analysis to evaluate these against the location specific conditions on Peon as described in Hydro's procedure - Risks and preparedness analysis in rig projects.

With reference to the risk reducing measures as described in the Deepsea Trym Risk and the Emergency preparedness analysis not found anything that should prove any conditions to disqualify the Deepsea Trym not suited for the planned operation on the well 35/2-1 Peon to be conducted in a safe manner.

GENERAL INFORMATION

Well : 31/3-Q-21 AY1H **PO** : 1

Field : TROLL **Country** : NORWAY **Wellbore Type :** WELLBORE
Licence : TROLL UNIT **Installation** : WEST VENTURE
UTM zone : 31 **Central Median** : 3' E **Horiz. Datum:** ED50

Location coordinates:		Surface	Target
UTM	**North [m]:**	6744446,6	
UTM	**East [m]:**	538959,602	
Geographical	**North :**	60 49'55.18"	
Geographical	**East :**	03 42'59.48"	

Water Depth: 338,7 **m** **Reference Point Height:** 35,5 **m**
Formation at TD: No formation data found.

Operator:	NORSK HYDRO PRODUKSJON AS	**Share:** 9.78 **%**
Partners:	PETORO AS	**Share:** 56,00 **%**
	STATOIL ASA	20,80 **%**
	A/S NORSKE SHELL	8,10 **%**
	TOTAL E&P NORGE AS	3,69 **%**
	NORSKE CONOCOPHILLIPS AS	1,62 **%**

Total depth (RKB) : 5532,0 **m MD** 1580,3 **m TVD**

TIME SUMMARY

Start Time : 2004-03-21 08:30:00
Spudding date : 2004-03-24
Abandonment date : 2004-05-14

Main operation	Hours	Days	%
MOBILIZATION	18,5	0,8	3,0
DRILLING	501,0	20,9	82,1
COMPLETION	35,5	1,5	5,8
DOWNTIME DRILLING	53,5	2,2	8,8
DOWNTIME COMPLETION	1,5	0,1	0,2
Sum:	**610,0**	**25,4**	

Hole and casing record

Hole	Track	Depth [m MD]	Casing/Tubing	Track	Depth [m MD
12 1/4"		2100,0	10 3/4"		1349
8 1/2"		5532,0	9 5/8"		2100

Well status: Completed

CONTRACTORS:

Cement Contractor : SCHLUMBERGER DOWELL
Coring Contractor : SECURITY DBS
Fishing Tool Supplier : SMITH RED BARON
Liner Hanger Equipment Supplier : BAKER OIL TOOLS
Mud Contractor : MI NORGE
Other Supplier : AGR
Other Supplier : AKER KVÆRNER SUBSEA
Other Supplier : KVÆRNER OILFIELD PRODUCTS
Rig Contractor : SEADRILL OFFSHORE AS
Rig Contractor : SMEDVIG OFFSHORE A/S
Rov Contractor : STOLT OFFSHORE
Well Service Contractor : SMEDVIG TECHNOLOGY A/S
Wireline Logg Contractor : SCHLUMBERGER OFFSHORE SERVICES LTD

DAILY REPORT

Well: 35/2-1 **PO:** 1

Daily report no : 1 **Date:** 2005-07-20

Midnight depth : m MD **Estimated PP:** sg **Mud weight:** 0,00 sg

Stop time	Description
01:00	No activity on 35/2-1. Anchor handling on 31/3- S-21
20:30	Transit to Peon
23:59	Anchor handling on Peon

Daily report no : 2 **Date:** 2005-07-21

Midnight depth : 444 m MD **Estimated PP:** sg **Mud weight:** 1,05 sg

Stop time	Description
13:00	Installed anchors, ballasted rig and tested anchorlines
16:00	Picked up 8 joints of 8" drill collar and jar and racked back in derrick.
17:30	Ran in hole with 9 7/8" BHA to 110 m MD.
18:00	Table top meeting concerning shallow gas awareness and handling procedures.
22:00	Continued to ran in hole with 9 7/8" BHA to seabed. Adjusted rig position to spud within target limits.
23:59	Washed down from 413 m to 423 m. Took up to 2 ton WOB. Drilled 9 7/8" pilot hole from 423 m to 443,64 m

Daily report no : 3 **Date:** 2005-07-22

Midnight depth : 409 m MD **Estimated PP:** sg **Mud weight:** 1,05 sg

Stop time	Description
11:00	Drilled 9 7/8" pilot hole from 443,64 m to 544 m
11:30	Pumped 3 m3 HiVis and circulated bottoms up two times. Flow checked w/ROV for 10 min. Displaced the hole to 1,20 sg mud.
13:00	Pulled out while pumping 400 lpm from 544m to 409 m.
15:00	Tripped from seabed. Racked back BHA. Downloaded MWD.
18:00	Made up 36" BHA and ran in hole to 297 m.
19:00	Made up and racked back cement stand and drifted one stand HWDP.
22:30	Tripped to seabed with 36" BHA.
23:59	Adjusted rig position to spud within target area

Daily report no : 4 **Date:** 2005-07-23

Midnight depth : 409 m MD **Estimated PP:** sg **Mud weight:** 1,05 sg

Stop time	Description
01:00	Tagged seabed at 409,3 m. Continued to run in from 409,3 m to 412,5 m. Washed down from 412,5 m to 414,5. Drilled from 414,5 m to 418 m.
01:30	Adjusted rig position to have zero offset between rotary and well center
04:30	Drilled 36" hole from 418 m to 432. Adjusted rig position and reamed hole several times to obtain hole inclination requirements
09:00	Drilled 36" hole from 432 m to 443 m. Boulders from 439 m to 442 m.
10:00	Reamed several times to obtain required hole inc.
11:00	Drilled from 443 m to 463 m
12:00	Took survey and reamed the stand several times.
14:00	Repositioned rig and reamed several times.
17:00	Observed pressure loss and loss in up-weight. Observed that string was parted at a DC tool joint. ROV checked hole for flow. Negative.
18:30	POOH. Observed 57,6 m of BHA left in hole. DC parted in tool joint in the middle of a stand.
22:00	Performed ROV survey to verify if top of fish could be located above seabed as expected based on the pipe tally. No stick up was found, indicating that the drill string probably had parted at two places. Meanwhile prepared and modified fishing equipment
23:00	Prepared new BHA. Repositioned rig to new spud location.
23:59	Made up BHA for re-spud.

DAILY REPORT

Well: 35/2-1 **PO:** 1

Daily report no : 5 **Date:** 2005-07-24

Midnight depth : 483 m MD **Estimated PP:** 1,03 sg **Mud weight:** 1,50 sg

Stop time	Description
05:30	Made up new 36" BHA.Painted white meter marks from 5 to 10 m. Tested the MWD tool. Made up 8" drill collar from 22 m to 113 m.
06:30	Tripped in with BHA to a few meters above seabed.
08:30	Repositioned rig to be able to spud within target area.
09:00	Washed down from 409,3 m to 413 m and tag hard formation with 5 ton.
11:30	Drilled from 413 m to 440. Tag boulders at 439 m. Hole inclination at 440 m exceeded limits. Reamed several times.
12:30	Moved rig 9 m and reamed one single several times. Obtained acceptable hole inclination.
18:30	Drilled and surveyed from 440 m to 463 m. Hole inclination within limits.
23:59	Drilled and surveyed from 463 m to 483 m. Hole inclination at 468 m exceeded limits. Reamed one single several times and obtained acceptable values.

Daily report no : 6 **Date:** 2005-07-25

Midnight depth : 483 m MD **Estimated PP:** 1,03 sg **Mud weight:** 1,50 sg

Stop time	Description
02:00	Circulated hole clean 4 m off bottom. Pumped 2 times 15 m3 HiVis pills.
03:00	Flowchecked hole in 10 min. Displaced hole with 56 m3 1,50sg mud.
04:00	Made a wiper trip to 418 m. No overpull. Got indication of 1 m fill at TD.
04:30	Displaced hole to 1, 50 sg mud.
05:30	Tripped out from TD to 254 m. Topped up hole with 10 m3 1,50 sg mud at seabed level.
06:00	Checked topdrive, IRA, and URA for loose items.
07:00	Racked back HWDP and BHA in derrick.
09:30	Prepared cement stand and rigged up for running 30" conductor. Cleaned and cleared drill floor.
10:00	Held pre-job meeting with involved personnel
14:00	Picked up conductor shoe end conductor joints from deck and ran in hole.
14:30	Picked up conductor housing running tool and connected to housing.
17:30	Installed conductor housing in PGB and ran in hole .
21:30	Stinging in conductor in 36" hole was delayed by poor visibility on seabed.
23:30	Ran in hole with conductor to TD at 482,7 m. Verified orientation, inclination and stick up.
23:59	Pumped 20 m3 with seawater to displace 1,50 sg mud prior to cementing.

Daily report no : 7 **Date:** 2005-07-26

Midnight depth : 483 m MD **Estimated PP:** 1,03 sg **Mud weight:** 1,28 sg

Stop time	Description
02:30	Cemented the 30" conductor.
03:30	Waited for cement to set up. Meanwhile prepared for grouting operation throug Dril-Quip Titus system.
07:00	Waiting for cement to set up.
08:30	Checked Titus grouting system and pumped 15 m3 1.95 sg cement slurry with 650 lpm, 8 bar. Displaced lines with 75 l seaawater
10:30	Released 30" conductor running tool. Flushed cement and DP. Tripped out with landing string and running tool.
13:30	Laid down 30" running tool. Racked back 5" stinger. Laid down cement stand and 17 1/2" and 36 " bit and hole opener assembly.
16:30	Picked up 26" clean out assembly and check bit make up torque. Ran in hole to 240 m.
17:30	Changed to 5 1/2" DP equipment and continue to run in hole from 240 m to 400 m. Filled pipe & stung in hole at 17.17 hrs. on compensator.
19:30	RIH from 409. Expected to tag top of cement at 477 m. No cement top was found. Stopped drilling. Asked ROV to check drillstring/PGB alignment. Found drillstring stung into seabed. Part of drillstring was broken off and was laying from PGB out on seabed. Minimum 2 joints of drill collar.
22:30	Pulled out with remaining drillstring. Laid down jar and 5 joints of 8" DC.
23:59	Prefabricated skirt on overshot. Meanwhile performed general rig maintenance.

Daily report no : 8 **Date:** 2005-07-27

Midnight depth : 483 m MD **Estimated PP:** 1,03 sg **Mud weight:** 1,09 sg

Stop time	Description
03:30	Made up fishing toolstring. Tripped to seabed with modified 11 3/4" overshot and 8" basket grapple.
05:30	Ran in hole to 458,3 m and tagged top of fish. Carried out several attempts to latch on to top of fish. No success.

DAILY REPORT

Well: 35/2-1 **PO:** 1

Daily report no : 8 **Date:** 2005-07-27

Midnight depth : 483 m MD **Estimated PP:** 1,03 sg **Mud weight:** 1,09 sg

Stop time	Description
07:00	Pulled out of hole from 458 m. Broke out overshot and XO.
11:30	Made up 11 3/4" overshot w/ 22" guide. Dressed with 8 " mill control and grapple. RIH to top of fish.
12:00	Made several attempts to latch on to the fish.
12:30	POOH with fishing equipment and laid down same.
13:30	Built cement stand for 13 3/8" casing and racked back same in derrick.
15:30	Cut/slip 104 ft drilling
17:00	Made up 11 1/4" overshot with 21" guide dressed with extension sub and 9 1/2" spiral grapple.
19:00	RIH with fishing assembly to 458 m. Tagged fish with 200 lpm, 5 RPM, 3 ton. Pulled fish with 20 ton overpull. Verified 5 ton weight increase.
20:30	Pulled out with fish from 458 m.
22:00	Broke out fishing equipment and the elements in the retrieved BHA. Cleaned bit for cement and inspected.
23:59	Ran in hole with 26" BHA. Picked up new drill collar from deck

Daily report no : 9 **Date:** 2005-07-28

Midnight depth : 502 m MD **Estimated PP:** 1,03 sg **Mud weight:** 1,05 sg

Stop time	Description
02:30	Continued to make up BHA. Picked up drill collar and new jar from deck.
03:00	Repaired broken hydraulic hose on upper racking arm
04:30	Tripped to seabed and entered 30" conductor at 04.17 hrs.
05:30	Ran in hole to top of cement at 477 m.
10:00	Drilled cement in 30" conductor shoetrack from 477 m to 486,7 m and 4 m of new formation.
11:00	Flowchecked well for 15 min by ROV. Pulled out of hole from 487 m to 238 m
11:30	Held kickdrill with crew. Checked topdrive for loose items prior to pulling BHA to surface.
12:00	Pulled out with 5 1/2" HWDP from 238 m to 100 m.
14:30	Pulled out BHA and racked back 8" DC. Laid down remaining BHA.
15:00	Clear and cleaned drillfloor.
16:00	Held prejob meeting prior to picking up 17 1/2" BHA. Picked up BHA according to dir. drillers instructions.
17:00	MWD/LWD verification. Meanwhile painted 10 m mark on BHA.
19:00	Made up rest of BHA and installed guiding ropes to the guide wires.
19:30	Tripped in with new BHA to 244 m.
20:00	Picked up and installed 13 3/8" casing tong on drillfloor
22:00	Continued to tripped to seabed. Entered 30" conductor housing and ran in hole to 487 m.
23:59	Drilled and surveyed from 487 m to 502m.

Daily report no : 10 **Date:** 2005-07-29

Midnight depth : 543 m MD **Estimated PP:** 1,03 sg **Mud weight:** 1,50 sg

Stop time	Description
09:00	Drilled and surveyed from 502 m to 543 m
10:00	Pumped 20 m3, 1,30 sg HiVis. Circulated hole clean.
11:00	Flowchecked well 15 min. Ok. Displaced hole to 1,20 sg mud.
12:00	Performed wiper trip from 543 m to shoe. Ran in hole to TD.
13:00	Ran in hole to TD. 0,5 m fill. Displaced hole to 1,50 sg mud. Wiped fill before displacing to 1,50 sg.
13:30	Pulled out of hole from 543 m to 415 m. Topped up 30" csg. with 3 m3 mud.
15:00	Tripped out with 17 1/2" BHA.
17:00	Racked back 8" drillcollar and jar in derrick. Laid down MWD /LWD.
18:00	Clear and cleaned rig floor. Held Hazop for running 13 3/8" casing and cementing.
19:30	Rigged up handling equipment for casing running.
23:00	Ran casing according to casing tally to 116 m.
23:59	Rigged down BX -elevator. Changed to 5 1/2" elevator. Picked up 18 5/8" wellhead.

DAILY REPORT

Well: 35/2-1 **PO:** 1

Daily report no : 11 **Date:** 2005-07-30

Midnight depth : 543 m MD **Estimated PP:** 1,03 sg **Mud weight:** 1,51 sg

Stop time	Description
00:30	Rigged down casing equipment.
03:30	Ran in hole with casing to TD and landed wellhead in conductor housing. Performed 25 ton overpull test.
04:00	Started to circulate and displacing hole to seawater.
06:30	Experienced sudden pressure increase while circulating. Stopped pumping and started problem solving.
07:00	Released landing string with 15 ton overpull. Pumped thru string. Got no pressure increase, indicating pipe plugged in cement stinger/plugs.
09:00	Opened cement stand and found dart released. Laid down cement stand.
10:30	Pulled out with landing string. Laid down 18 3/4" wellhead running tool. Broke out 5" stinger.
11:00	Laid down OWS casing tong, panels and computer. Cleared and cleaned rig floor.
11:30	Checked topdrive prior to picking up 12 1/4" BHA.
12:00	Held prejob meeting prior to start on next BHA.
15:00	Picked up 12 1/4" bit and additional BHA elements and RIH to 114 m.
17:00	Ran in hole to 500 m. Tagged plugs at 419 m. Pushed plugs towards float with slow rotation and 4-5 ton WOB.
19:00	Pushed cement plugs to float at 507 m. Set down 10 ton without rotation. Decreased WOB and started to drill plugs with maximum torque sat to 10 kft/lbs.
23:59	Drilled cement plugs at 507 m. ROV confirmed rubber from both upper plug (black) and lower plug (red) on wellhead.

Daily report no : 12 **Date:** 2005-07-31

Midnight depth : 543 m MD **Estimated PP:** 1,03 sg **Mud weight:** 1,10 sg

Stop time	Description
00:30	Drilled cement plugs and top of float. ROV confirmed cuttings from float (aluminum).
01:00	Pumped 10 m3 HiVis. ROV cleaned wellhead.
03:30	Flowchecked for 10 min. Pulled out of hole. Racked back BHA in derrick.
04:30	Picked up 5" DP and made up cement innerstring to 18 5/8" running tool.
06:30	Tripped to seabed with cement innerstring. Stabbed into wellhead. Ran in hole and landed wellhead housing running tool in wellhead. Rotated 5 turns to left and took 5 ton overpull.
07:00	Broke circulation and increased pump rate in steps to 1000 lpm.Verified return at seabed by ROV.
09:00	Cemented the 13 3/8" casing. Pumped 55 m3 1,60 sg tail slurry. Displaced with 4,4 m3 seawater. Checked for backflow.
14:30	Disconnected running tool from 18 3/4" wellhead. Pulled out of hole with cement stinger. Flushed landingstring, innerstring and topdrive.Continued to pull out of hole. Laid down 18 3/4" running tool. Racked back innestring. Disconnected guide wires and pulled to surface. Moved rig to safe zone for BOP handling, 40 m to starboard.
17:30	Performed planned maintenance on topdrive and iron rough neck.
19:00	Held prejob meeting prior to rigging up of BOP equipment. Removed iron rough neck chain rails. Picked up riser running tool and riser spider.
23:59	Picked up 3 riser joints and moved BOP to center of moonpool. Connected riser to BOP. Disconnected lower marine riser package from BOP. Lifted up, inspected and greased moving parts. Changed AX gasket.

Daily report no : 13 **Date:** 2005-08-01

Midnight depth : 543 m MD **Estimated PP:** 1,03 sg **Mud weight:** 1,13 sg

Stop time	Description
07:00	Re-connected LMRP to BOP. Ran the BOP to 135 m with the rig 40 m offset from well.
09:00	Performed pre job meeting. Continued to run the BOP from 135 m to 197 m.
10:00	Made up loose bolts on the dolly arms.
18:00	Continued to run the BOP from 197 m to 387 m. Performed safety meeting with the crew prior to pick up the slip joint.
23:59	Picked up the slip joint from deck and continued to run thr BOP from 387 to 401 m. Performed pre job meeting prior to work in the moon pool with thr slip joint. Connected the support ring, hooked up the double yoke and installed the pod sadles.

Daily report no : 14 **Date:** 2005-08-02

Midnight depth : 543 m MD **Estimated PP:** 1,03 sg **Mud weight:** 1,13 sg

Stop time	Description
00:30	Installed the pod sadles.
01:30	Waited on the ROV due to failure.
02:00	Moved the rig to the location.
03:00	Installed and tensioned the guide wires. Checked the bull's eyes. Washed the wellhead and landed the BOP in the wellhead. Performed overpull test to 25 ton.

DAILY REPORT

Well: 35/2-1 **PO:** 1

Daily report no : 14 **Date:** 2005-08-02

Midnight depth : 543 m MD **Estimated PP:** 1,03 sg **Mud weight:** 1,13 sg

Stop time	Description
04:30	Stroke out the inner barrel and tested the wellhead connector to 103 bar / 10 min.
05:00	Disconnected the lower marine riser package (LMPR).
07:00	Collapsed the inner barrel and landed the LMRP. Performed overpull test. Pressure tested Kill and Choke lines to 35 / 345 bar.
09:30	Disconnected and landed LMRP again. Re-tested kill and choke lines to 35 / 345 bar. Found one of four locking dogs still in open position.
12:00	Disconnected and troubleshooted on the LMRP.
14:00	Connected LMRP and attempted to lock in all four locking dogs.
15:00	Performed a final pressure test on the kill and choke lines to 35 / 345 bar. Stroked out the inner barrel. Meanwhile ROV checked the locking dogs. Installed the diverter element.
16:30	Laid down riser handling equipment on the deck. Cleaned the drill floor.
18:00	Performed prejob meeting and ran in the hole with peak packer on 5 1/2" heavy weight drillpipe to 223 m.
23:00	Adjusted the topdrive / dolly allignment and changed out bolts on the top drive dolly support.
23:59	Continued to run in the hole with the peak plug to 483 m. Circulated with 1000 lpm / 6 bar prior to set the plug.

Daily report no : 15 **Date:** 2005-08-03

Midnight depth : 543 m MD **Estimated PP:** 1,03 sg **Mud weight:** 1,13 sg

Stop time	Description
01:00	Sat the peak plug at 481,5 m. Attempted to release the running tool.
01:30	Made several attempts to release the running tool.
03:00	Released the peak plug and pulled out of the hole.
07:30	Verified proper make up torque and function tested the peak plug at the surface. Ran in the hole and sat the peak packer at 483 m.
08:00	Released and relatched the running tool to the peak packer.
08:30	Pressure tested the riser connector and the peak packer to 35 / 103 bar for 5 / 10 min.
11:00	Released the peak plug, pulled out of the hole from 483 m and racked the peak plug in the derrick..
14:30	Performed pre job meeting and made up the 12 1/4" bottom hole assembly. Tested the MWD.
15:00	Ran in the hole with 12 1/4" bottom hole assembly on 5 1/2" drillpipe to 383 m.
15:30	Installed BJ pumping equipment at the set back.
16:00	Continued to run in the hole with 12 1/4" bottom hole assembly from 383 m to 494 m.
17:00	Spaced out and performed BOP function test.
17:30	Filled the pipe and broke circulation.
18:00	Tested out the diverter closing system. Connected pipeline to BJ unit.
19:00	Tested out trip tank sensors.
22:00	Continued to hook up the BJ pumping equipment at the set back. Walked the lines with the crew. Picked up one single, washed down and tagged the cement with 5 ton at 502 m.
23:00	Performed kick and choke drill. Tested mudpump # 3, routing and gauges.
23:59	Performed pre job meeting prior to displace the well from seawater to 1,13 sg aquadrill. Performed excercise with new crew on diverter and kill system.

Daily report no : 16 **Date:** 2005-08-04

Midnight depth : 543 m MD **Estimated PP:** 1,03 sg **Mud weight:** 1,13 sg

Stop time	Description
02:00	Displaced surface equipment, kill and choke lines and the well to 1,13 sg aquadrill mud.
13:00	Tested the FIT equipment and procedures. Simulated several FIT tests.
17:00	Rotated and circulated to brake the gel strength. Performed slow circulation rates. Tested shut down on the BJ kill pump. Hooked up and tested remote control.
19:00	Performed pre job meeting. Break out pump inside entrysub and kelly cock. Laid down two singles and rigged up the chicksan to the standpipe.Tested the super charge feeding to the BJ pump.Picked up one stand and spaced out to drill cement and one meter of new formation.
19:30	Prepared to start drilling cement with 12 1/4" bottom hole assembly.
23:59	Drilled hard cement from 502 m to 520 m. Performed kick drill.

DAILY REPORT

Well: 35/2-1 **PO:** 1

Daily report no : 17 **Date:** 2005-08-05

Midnight depth : 561 m MD **Estimated PP:** 1,03 sg **Mud weight:** 1,13 sg

Stop time	Description
04:30	Continued to drill hard cement from 520 m to 539 m.
05:30	Drilled out shoe at 539 m and cleaned out rathole in 1 m steps from 539 to 543 m.
06:00	Drilled 1 m new formation from 543 m to 544 m.
09:00	Pumped 5 m3 HiVis pill and circulated the hole clean prior to perform FIT test.
11:00	Installed pump in sub and performed FIT test to equivalent 1,30 sg.
13:00	Performed pre job meeting and reviewed well barriers with the crew. Broke circulation and prepared to continue to drill 12 1/4" hole.
19:00	Drilled 12 1/4" hole from 544 m to 561 m.
20:30	Circulated two times bottom up from 561 m. Performed flowcheck.
22:00	Performed torque readings at TD. Performed chech trip by pulling one single without pumping and ran in to bottom again. Circulated bottom up, no gas peak at bottom up, maximum gas reading 0,14 %.
23:59	Performed chech trip by pulling one stand without pumping and ran in to bottom again. Circulated bottom up, no gas peak at bottom up, maximum gas reading 0,12 %.

Daily report no : 18 **Date:** 2005-08-06

Midnight depth : 561 m MD **Estimated PP:** 1,03 sg **Mud weight:** 1,13 sg

Stop time	Description
00:30	Lubricated out of the hole from 561 m to 539 m.
03:00	Continued to lubricate out of the hole from 539 m to 500 m. Flowchecked. Performed torque readings at 480 m. Continued to lubricate out of the hole from 480 m to 383 m.
04:00	Continued to pull out of the hole from 383 m to 60 m while circulating on the riser with mud pump #3. Removed the diverter insert.
04:30	Checked the intermediate and upper racking arm, crown block and top drive for loose objects prior to pull out with the 12 1/4" bottom hole assembly.
05:30	Pulled out and racked the bottom hole assembly in the derrick.
06:00	Performed pre job meeting prior to pick up the scraper assembly.
06:30	Verified MWD tool.
09:00	Ran in the hole with scraper assembly.
10:30	Broke circulation in steps to 500 LPM - 18 bar.Scraped the area from 470 m to 495 m.
12:00	Dropped drift in the string. Circulated bottom up. Pulled out of the hole with the scraper assembly, lubricated out to above the BOP. Laid down the scraper assembly.
13:00	Cleared the rig floor and picked up the casing tong, cement head and pup joint.
13:30	Changed and pressure tested the wash pipe to200 bar while rotating.
19:00	Performed pre job meeting / HAZOP prior to run liner with involved personell. Rigged up to run the liner. Picked up the liner hanger.
20:00	Performed hazop / pre job meeting prior to running 9 5/8" liner. Picked up and made up 1 std HWDP. Ran in the hole with 9 5/8" liner to 76 m, circulated one liner volume with 300 lpm and 3 bar while installing diverter insert. Up/down weight 43 ton.
23:30	Ran in hole with the 9 5/8" liner on 5 1/2" landing string from 76 m to 539 m, filled each stand. Recorded up/down weight: 73/73 ton, broke circulation and circulated for 15 min.
23:59	Continued to run in hole with 9 5/8" liner from 539 m to 555 m. Picked up pup joint and cement head from deck. Made up same. Took up/down weight at 555 m.

Daily report no : 19 **Date:** 2005-08-07

Midnight depth : 561 m MD **Estimated PP:** 1,03 sg **Mud weight:** 1,13 sg

Stop time	Description
01:00	Ran in hole with 9 5/8" liner on 5 1/2" landing string from 555 m to 561m, circulating with 300 lpm at 4 bar. Sat down with 10 ton and pulled back to 1 m above TD. Broke circulation in steps from 100 lpm / 2 bar to 260 lpm / 9 bar. Circulated total 9 m3 mud.
01:30	Dropped and pumped down the 2 1/8" aluminium ball and pressured up to 110 bar to set hanger slips. Sat off 20 ton of landing string weight.
02:00	Released the hanger running tool and sheared ball seat at 240 bar. Performed pre job meeting prior to cement the 9 5/8" liner. Meanwhile circulated with 500 lpm / 10 to 17 bar.
02:30	Pressure tested the cement lines to 345 bar / 10 min.
05:00	Prepared for and cemented the 9 5/8" liner. Pumped 7,7 m3 1,25 sg cement and bumped the plug after displacing with 5 m3 1,13 sg mud. Pressure tested the liner to 80 bar / 10 min. Bled back and checked for backpressure.
05:30	Laid out the cement head, set and verified the TSP Liner Top Packer. Lined up and started to reverse circulate.
06:00	Reverse circulated out cement excess, 800 LPM - 30 bar.
07:30	Lined up and circulated down the long way, 2500 LPM - 30 bar. Meanwhile flushed the kill and choke lines.

DAILY REPORT

Well: 35/2-1 **PO:** 1

Daily report no : 19 **Date:** 2005-08-07

Midnight depth : 561 m MD **Estimated PP:** 1,03 sg **Mud weight:** 1,13 sg

Stop time	Description
10:00	Pulled out of the hole with the running tool. Took out the diverter element and laid down the running tool. Meanwhile pressure testet the TSP Liner Top Packer against the shear ram to 80 bar.
10:30	Laid down the casing tong to deck. Empty the trip tank due to repair the Baker sensor.
11:00	Washed the top drive after the cement job.
13:30	Picked up jet sub, one stand 5" drill pipe and BOP test tool. Ran in the hole with the test tool on 5 1/2" drill pipe to 396 m.
14:30	Washed through the BOP with 2500 LPM - 82 bar. Laid down one single and picked up one pup.
15:00	Ran in compensated through the BOP and landed the test tool in the wellhead. Released the elevator from the string.
18:30	Pressure tested the BOP to 6 bar / 103 bar for 5 / 10 min.
21:00	Released the BOP test tool with 25 ton overpull and pulled out of the hole to surface. Meanwhile pressure tested the lower shear ram to 20 / 80 bar for 5 / 10 min. Operated the shear ram accustic. Cleared the drill floor.
23:00	Installed the fan housing on the top drive.
23:30	Changed to 5" saver sub on the top drive. Meanwhile continued to pressure test choke manifold to 20 / 103 bar for 5 / 10 min.
23:59	Changed clamp on the tool joint breaker on the top drive. Meanwhile continued to pressure test choke manifold to 20 / 103 bar for 5 / 10 min.

Daily report no : 20 **Date:** 2005-08-08

Midnight depth : 561 m MD **Estimated PP:** 1,03 sg **Mud weight:** 1,13 sg

Stop time	Description
01:00	Continued to change clamp on tool joint breaker on the top drive. Meanwhile continued to pressure test the choke manifold to 20 / 103 bar for 5 / 10 min.
01:30	Changed to short bails on the top drive. Meanwhile pressure tested standpipe manifold to 20 / 345 bar for 5 / 10 min.
04:00	Made up pup joint, pump in sub and cement hose to the top drive. Pressure tested manual kelly cock, auto kelly cock and kelly hose to 20 / 345 bar for 5 / 10 min. Rigged down the test equipment.
06:00	Rigged down the 12 1/4" bottom hole assembly from the derrick.
10:30	Installed diverter and changed to 5 " drillpipe handling equipment. Picked and made up 8 1/2" bottom hole assembly. Tested the MWD tool. Ran in the hole to 79 m.
15:00	Ran in the hole from 79 m to 420 m. Made up two stands and racked in the derrick. Meanwhile flushed the kill and choke lines. Continued to run in the hole from 420 m to 480 m.
17:30	Filled the string and broke circulation. Washed through the liner lap and tagged the cement at 528,7 m.
18:00	Performed choke drill with mudpump #3 and diverter close-in test.
20:00	Drilled on cement plugs from 528,7 to 529,3 m.
21:00	Rigged up side entry sub and BJ pump.
22:00	Tested the FIT equipment and procedures. Simulated two FIT tests.
23:59	Rigged down the side entry sub. Continued to drilll on cement plugs from 529,3 m to 529,7 m.

Daily report no : 21 **Date:** 2005-08-09

Midnight depth : 572 m MD **Estimated PP:** 1,03 sg **Mud weight:** 1,15 sg

Stop time	Description
01:30	Continue to drill on cement plugs to 530 m.
02:00	Drilled soft cement from 530 m to 558 m.
04:30	Circulated bottom up from 558 m. Performed kick drill and took slow circulation rates with mud pump #3 and BJ kill pump.
05:30	Performed pre job meeting prior to drill out of the shoe. Drilled out the shoe at 560 m and rathole. Cleaned the rathole.
06:00	Drilled 1 m new formation from 561 m to 562 m.
09:00	Circulated to clean the hole prior to FIT test.
11:00	Performed FIT test to 1,30 sg equivalent mud weight.
17:00	Circulated bottom up. Increased the mud weight from 1,13 sg to 1,15 sg while adding LC-Lube. Circulated and conditioned the mud due to loss of LC-Lube over the shale shaker. Flushed the kill and choke lines with 1,15 sg mud. Performed SCR with mud pump #3 up riser and chokeline. Spaced out the drill string due to drill to 572 m without connection.
18:00	Performed pre job meeting with involved personnel prior to drill 8 1/2" hole.
19:00	Troubleshooted on the MWD due to decoding problems.
20:00	Performed pre job meeting with involved personnel prior to drill 8 1/2" hole.
21:00	Drilled 8 1/2" hole from 562 m to 567 m.
22:00	Circulated bottom up.
22:30	Drilled 8 1/2" hole from 567 m to 572 m.
23:30	Circulated bottom up.
23:59	Racked one stand in the derrick. Picked and made up one single from deck. Picked and made up one stand from the derrick. Started to circulated bottom up.

DAILY REPORT

Well: 35/2-1 **PO:** 1

Daily report no : 22 **Date:** 2005-08-10

Midnight depth : 587 m MD **Estimated PP:** 1,12 sg **Mud weight:** 1,15 sg

Stop time	Description
01:00	Circulated bottom up.
01:30	Drilled 8 1/2" hole from 572 m to 578 m.
02:30	Circulated the well.
03:00	Flowchecked for 15 min.
04:30	Circulated the well after flowcheck.
05:00	Drilled from 578 m to 580 m. Shut the well in due to drilling break.
06:30	Observed well on the choke. Opened the well on the choke and flowchecked on the trip tank. Well stable. Lined up to circulate the well through the choke.
08:00	Circulated the well through the choke.
08:30	Flowchecked with open choke and closed annular for 15 min. Opened the annular and flowchecked the well on the trip tank for 15 min. Well stable.
10:30	Broke circulation in steps to 1400 LPM - 72 bar and washed down to 580 m.
11:30	Drilled 8 1/2" hole from 580 m to 586,5 m.
12:30	Circulated the well.
13:00	Flowchecked on the trip tank.
14:30	Broke circulation in steps to 1400 LPM and circulated the well.
18:00	Performed check trip with 1 singel. Circulated the well. Performed check trip with 1 stand. Circulated the well.
18:30	Performed survey and lubricated out of the hole from 585 m to 560 m.
22:30	Lubricated out of the hole from 560 m to 385 m, 500 lpm - 15 bar. Pulled out of the hole from 385 m to surface while pumping 275 lpm - 6 bar on riser.
23:00	Checked finger boards, intermediate and upper racking arms, crown block and top drive for loose items. Performed pre job meeting prior to make up new bottom hole assembly.
23:59	Made up BCPM, stop sub and TesTrak.

Daily report no : 23 **Date:** 2005-08-11

Midnight depth : 608 m MD **Estimated PP:** 1,12 sg **Mud weight:** 1,15 sg

Stop time	Description
01:30	Tested MWD tool and TesTrak. Installed radioactive sources.
04:00	Ran in the hole with 8 1/2" bottom hole assembly from 30 m to 550 m.
06:00	Filled the drill pipe. Circulated in steps up to 1400 lpm, 30 rpm. Circulated the well. Performed SCR with mudpump #3 and BJ kill pump up riser and chokeline.
08:30	Installed drilling pup, circulated while troubleshooting on the MWD tool.
09:30	Lubricated out of the hole from 560 m to 376 m due to MWD failure.
11:00	Laid out the drilling pup. Pulled out of the hole from 376 m to 30 m.
14:00	Removed the radioactive sources. Pulled the MWD tool to surface. Found damaged threads on the stop sub above the CCN. Changed out stop sub and CCN.
15:00	Performed electric test on the MWD assembly. Installed radioactive sources.
17:00	Ran in the hole to 550 m. Circulated in steps up to 1400 lpm, 30 rpm. Tested the MWD.
19:30	Reamed down from 560 m to 586,5 m. Circulated the well.
20:00	Drilled 8 1/2" hole from 586,5 m to 596,7 m.
21:00	Circulated the well.
22:30	Drilled 8 1/2" hole from 596,7 m to 608 m.
23:59	Circulated the well. Performed connection.

Daily report no : 24 **Date:** 2005-08-12

Midnight depth : 645 m MD **Estimated PP:** 1,12 sg **Mud weight:** 1,15 sg

Stop time	Description
01:00	Circulated the well.
02:00	Drilled 8 1/2" hole from 608 m to 615 m.
03:30	Circulated the well. Performed connection.
04:30	Circulated the well.
07:00	Drilled 8 1/2" hole from 615 m to 626 m.
08:00	Circulated the well.
09:00	Performed survey and connection. Circulated the well.
10:00	Drilled 8 1/2" hole from 626 m to 632 m.
11:00	Circulated the well.
11:30	Flowchecked for 15 min.

DAILY REPORT

Well: 35/2-1 **PO:** 1

Daily report no : 24 **Date:** 2005-08-12

Midnight depth : 645 m MD **Estimated PP:** 1,12 sg **Mud weight:** 1,15 sg

Stop time	Description
12:30	Circulated the well.
14:00	Performed check trip with 1 stand. Circulated the well. Lubricated out of the well from 632 m to 556 m.
18:00	Performed pre jobb meeting prior to take pressure points with TesTrak. Took eight pressure points, five failed due to seal failure.
19:00	Ran in the hole from 614 m to 632 m and circulated the well.
19:30	Drilled 8 1/2" hole from 632 m to 636 m.
20:30	Circulated the well. Performed connection.
21:30	Circulated the well.
22:30	Drilled 8 1/2" hole from 636 m to 645 m.
23:59	Circulated the well. Performed connection.

Daily report no : 25 **Date:** 2005-08-13

Midnight depth : 674 m MD **Estimated PP:** 1,12 sg **Mud weight:** 1,15 sg

Stop time	Description
01:00	Circulated the well.
01:30	Decided to not continue the drilling due to to wind force below 10 kts. Flowchecked the well for 15 min.
02:30	Waiting on weather.
04:00	Performed check trip. Circulated the well. Flowchecked the well.
09:00	Lubricated out of the hole from 645 m into the 9 5/8" liner. Circulating with 600 LPM, monitoring the well. Performed general rig maintenance.
09:30	Function tested the BOP on the yellow pod from the toolpushers panel.
14:00	Performed general rig maintenance.
16:00	Washed down from 548 m to 645 m. Circulated the well.
17:00	Drilled 8 1/2" hole from 645 m to 656 m.
18:00	Circulated the well. Performed connection.
19:00	Circulated the well.
20:00	Drilled 8 1/2" hole from 656 m to 667 m.
21:00	Circulated the well. Performed connection.
22:30	Circulated the well.
23:30	Drilled 8 1/2" hole from 667 m to 674 m.
23:59	Circulated the well.

Daily report no : 26 **Date:** 2005-08-14

Midnight depth : 713 m MD **Estimated PP:** 1,12 sg **Mud weight:** 1,15 sg

Stop time	Description
00:30	Circulated the well. Performed connection.
02:00	Circulated the well.
03:00	Drilled 8 1/2" hole from 674 m to 683 m.
04:00	Circulated the well. Performed connection.
05:00	Circulated the well.
06:30	Drilled 8 1/2" hole from 683 m to 693 m.
08:00	Circulated the well. Performed connection.
09:00	Circulated the well.
10:00	Drilled 8 1/2" hole from 693 m to 704 m.
11:30	Circulated the well. Performed connection.
12:00	Circulated the well. Conditioned the mud.
13:00	Checked the ECD sensors. Meanwhile circulated and conditioned the mud.
14:00	Drilled 8 1/2" hole from 704 m to TD of the well at 713 m.
15:00	Circulated the well.
16:00	Performed flowcheck for 15 min. Performed survey and circulated the well.
17:30	Performed check trip with one single of drillpipe. Circulated the well.
19:00	Performed check trip with one stand of drillpipe. Circulated the well.
20:30	Lubricated out of the hole from 713 m to 560 m.
23:30	Lubricated out of the hole from 560 m to 376 m. Laid out the drilling pup and continued to pull out of the hole to 89 m.
23:59	Cleaned the drillfloor and checked the top drive, intermediate and upper racking arm for loose items.

DAILY REPORT

Well: 35/2-1 **PO:** 1

Daily report no : 27 **Date:** 2005-08-15

Midnight depth : 713 m MD **Estimated PP:** 1,12 sg **Mud weight:** 1,15 sg

Stop time	Description
01:00	Continued to pull out of the hole with the 8 1/2" bottom hole assembly.
01:30	Removed radioactive sources. Verified and dumped memory on the MWD tool and TesTrak. Racked the MWD tool in the derrick.
02:00	Rigged up for wireline logging.
03:00	Prepared and tested the logging tools on deck.
03:30	Prepared safety meeting and pre job meeting prior to pick up and run in hole with FMI-MSIP logging tools.
05:30	Picked up and prepared to run in the hole with wireline logging tool.
12:30	Ran in the hole and performed logging run #1, FMI-MSIP. Pulled out of the hole.
14:00	Laid down the logging tool string #1, FMI-MSIP.
16:00	Made up the logging tool string #2, MDT.
17:00	Ran in the hole with the MDT logging string to 500 m. Unable to communicate with the tool string.
18:30	Pulled out of the hole with the MDT logging string.
20:30	Changed wire line cable head. Found short in cable #2.
21:00	Ran in the hole with the MDT logging string to 500 m.
23:59	Performed logging run #2, MDT.

Daily report no : 28 **Date:** 2005-08-16

Midnight depth : 713 m MD **Estimated PP:** 1,12 sg **Mud weight:** 1,15 sg

Stop time	Description
06:30	Performed logging run #2, MDT.
07:30	Pulled out of the hole with the MDT logging tool
08:30	Prepared to lay down the MDT logging tool.
17:00	Unable to unscrew the connections above and below the LFA tool, this indicating trapped gas inside the MDT tool string. Evaluated the situation and performed SJA with involved personnel.
23:30	Performed recovery of the ROV, assisted by the ROV onboard the vessel Far Saga.
23:59	Prepared to bleed off trapped gas in the MDT logging tool bleed off line.

Daily report no : 29 **Date:** 2005-08-17

Midnight depth : 713 m MD **Estimated PP:** 1,06 sg **Mud weight:** 1,15 sg

Stop time	Description
01:30	Connected the MAPO-MRPC-TCC tool to the MDT tool string. Pulled out and closed the in/out port for the lower pump. Bled off trapped gas in the MDT logging tool bleed-off line. Tightened the loose connections above and below the LFA tool. Secured all sample chambers with the secondary barriere.
02:30	Laid down the MDT logging string. Rigged down the wire line logging equipment.
04:30	Ran in the hole with the 8 1/2" the bottom hole assembly to 79 m..
05:30	Ran in the hole with the 8 1/2" bottom hole assembly on 5" drill pipe from 79 m to 550 m.
07:00	Filled the pipe and circulated at 550 m. Performed SCR.
11:30	Washed down from 550 m to TD at 713 m and circulated bottom up. Flow checked 15 minutes. Well static.
13:30	Lubricated out of the hole from 713 m to 376 m.
14:00	Pulled out of the hole with the 8 1/2" bottom hole assembly on 5" drill pipe from 376 m to 79 m.
15:00	Pulled out of the hole with the 8 1/2" bottom hole assembly from 79 m to surface.
17:00	Rigged up the wireline logging equipment. Made up the logging tool string #3, PEX.
18:00	Unable to retrieve data from the EDTC tool. Changed out the tool.
18:30	Continued to make up the logging tool string #3, PEX.
19:30	Ran in the hole with the PEX logging string to 713 m.
20:30	Performed logging run #3, PEX.
22:30	Pulled out of the hole with the PEX logging string.
23:00	Laid down the PEX tool string.
23:30	Made up the logging tool string #4, VSP.
23:59	Ran in the hole with the VSP logging string to 400 m.

DAILY REPORT

Well: 35/2-1 **PO:** 1

Daily report no : 30 **Date:** 2005-08-18

Midnight depth : 713 m MD **Estimated PP:** 1,06 sg **Mud weight:** 1,15 sg

Stop time	Description
03:00	Performed logging run #4, VSP.
03:30	Pulled out of the hole with the VSP logging string.
04:00	Laid down the VSP logging string.
06:30	Made up the logging tool string #5, MSCT.
07:00	Ran in the hole with the MSCT logging string to TD at 713 m.
09:30	Performed logging run #5, MSCT,
10:00	Pulled out of the hole with the MSCT logging string.
11:30	Laid down the MSCT logging string on deck.
16:00	Repaired and function tested the MSCT tool on deck.
19:00	Attempt to repair and function test the HRLA tool with no success.
22:00	Waited for spare parts for the HRLA tool.
22:30	Made up the logging tool string #6, SP-HRLA.
23:00	Ran in the hole with the SP-HRLA logging string to 560 m.
23:59	Performed logging run #6, SP-HRLA.

Daily report no : 31 **Date:** 2005-08-19

Midnight depth : 713 m MD **Estimated PP:** 1,06 sg **Mud weight:** 1,15 sg

Stop time	Description
00:30	Pulled out of the hole with the SP-HRLA logging string.
01:00	Laid down the SP-HRLA logging string.
03:00	Made up the logging tool string #7, MRCT
03:30	Ran in the hole with the MRCT logging string to 607 m.
06:00	Performed logging run #7, MRCT.
07:00	Pulled out of the hole with the MRCT logging string.
09:30	Retrieved core sample. Installed new core barrel and prepared the MRCT tool string for run #8..
10:00	Ran in the hole with the MRCT logging string to 574 m.
10:30	Performed logging run #8, MRCT
11:00	Pulled out of the hole with the MRCT logging string.
12:00	Changed core barrel and prepared the MRCT tool string for run #9.
12:30	Ran in the hole with the MRCT logging string to 614 m.
13:00	Performed logging run #9, MRCT
13:30	Pulled out of the hole with the MRCT logging string.
15:30	Laid down the the MRCT tool on deck and rig down the wire line equipment.
18:00	Ran in the hole with the 8 1/2" bottom hole assembly to 179 m.
19:00	Ran in the hole with the 8 1/2" bottom hole assembly on 5" drill pipe from 179 m to 560 m. Installed 9 5/8" scraper at 196 m above the Bit.
19:30	Filled the pipe in the shoe.
21:30	Circulated the well with mud pump number 3 while attempted to start mud pump number 1 and 2.
23:00	Circulated bottom up in the 9 5/8" shoe.
23:59	Washed from 460 m to 584 m.

Daily report no : 32 **Date:** 2005-08-20

Midnight depth : 713 m MD **Estimated PP:** 1,06 sg **Mud weight:** 1,15 sg

Stop time	Description
02:30	Washed from 584 m to TD at 713 m.
04:00	Circulated bottm up. Scraped the liner hanger area at 510 m.
06:00	Lubricated out of the hole with the 8 1/2" bottom hole assembly on 5 1/2" drill pipe from 713 m to 378 m.
07:30	Pulled out of the hole with the 8 1/2" bottom hole assembly on 5" drillpipe from 378 m to 115 m.
08:00	Pulled out of the hole with the 8 1/2" bottom hole assembly from 115 m to surface.
08:30	Cleaned the rig floor. Inspected the top drive and pipe racking system for any potential falling objects.
11:30	Made up BOP test tool with jet sub one stand below. Ran in the hole with the BOP test tool. Washed the well head area and landed the BOP test tool in the well head.
15:00	Pressure tested the BOP to 5/105 bar with the blue pod from the drillers panel. Function tested the BOP with the yellow pod from the auxiliary panel.
16:30	Pulled out of the hole with the BOP test tool and the jet sub to surface.
20:30	Made up pup joint on the cement head. Installed the casing tong and the 7 " liner handling equipment.

DAILY REPORT

Well: 35/2-1 **PO:** 1

Daily report no : 32 **Date:** 2005-08-20

Midnight depth : 713 m MD **Estimated PP:** 1,06 sg **Mud weight:** 1,15 sg

Stop time	Description
23:59	Made up and baker locked the shoe, intermediate and float joint. Ran in the hole with the 7" liner to 196 m.

Daily report no : 33 **Date:** 2005-08-21

Midnight depth : 713 m MD **Estimated PP:** 1,06 sg **Mud weight:** 1,15 sg

Stop time	Description
01:30	Made up the 7" liner hanger and running tool. Installed cement wiper plugs.
02:00	Circulated the liner volume.
04:30	Ran in the hole with the 7" liner on 5 1/2" HWDP from 206 m to 543 m.
06:00	Broke circulation in steps and circulated the 7" liner at 540 m.
07:00	Ran in the hole with the 7" liner on 5 1/2" HWDP from 543 m to 706 m.
08:00	Picked up the cement head and broke the circulation slowly.
09:30	Tagged bottom at 713 m while circulating 190 LPM. Picked up 1 m including the up weight of the string. Increased the pump rate in steps to 400 LPM. Observed minor loss. Established loss free rate of 300 LPM. Circulated bottoms up.
10:30	Dropped the ball and sat the hanger at 711 m with 150 bar pressure. Top PBR 505 m. Released the running tool and sheared out the ball seat with 240 bar.
13:00	Pumped 3 m3 soap spacer ahead of 4 m3 1,25 sg sement slurry. Displaced with 6,7 m3 1,15 sg mud. Pressure tested the liner to 80 bar.
15:00	Attempted to set the 7" liner packer with no success. Pulled the stinger above the PBR and circulated the well clean. Ran in and sat the liner packer.
16:00	Ran in with the 7" liner packer stinger and attempted to pressure test the liner packer with no success. Pulled the stinger out of the liner and pressure tested the packer/liner to 80 bar through the string and the annulus.
17:00	Laid down the cement head. Pumped the wiper ball down the string.
18:00	Cleaned the top drive with the high pressure jet nozzle. Flushed through hoses and valves with sea water.
20:00	Pulled out of the hole with the 7" liner hanger running tool from 477 m to surface. Laid down the running tool on deck.
21:00	Ran in the hole with the jet sub on the 5" drill pipe to the well head at 406 m
21:30	Cleaned the BOP
22:30	Pulled out of the hole with the jet sub on 5" drill pipe from 406 m to surface.
23:30	Laid down the casing tong. Broke off the pup joint on the cement head.
23:59	Changed the equipment and prepared to run the 3 1/2" drill pipe.

Daily report no : 34 **Date:** 2005-08-22

Midnight depth : 713 m MD **Estimated PP:** 1,06 sg **Mud weight:** 1,15 sg

Stop time	Description
02:30	Ran in the hole with the 3 1/2" cement stinger on 5" drill pipe from surface to 486 m.
04:00	Washed from 486 m to 670 m
05:00	Sat a balanced cement plug from 670 m to 496 m. Pumped 3 m3 soap spacer followed by 3,4 m3 1,25 sg cement slurry and 0.33 m3 water behind. Displaced with 3,0 m3 1,15 sg mud.
05:30	Pulled out of the hole with the 3 1/2" cement stinger on 5" drill pipe from 670 m to 496 m.
07:00	Circulated out excess cement and spacer at 496 m.
08:00	Pulled out to 475 m and sat a balanced cement plug from 475 m to 416 m. Pumped 5 m3 sea water followed by 4,5 m3 1,95 sg cement slurry and 0.90 m3 sea water behind. Displaced with 2,1 m3 1,15 sg mud.
08:30	Pulled out of the hole with the 3 1/2" cement stinger on 5" drill pipe from 475 m to 416 m.
09:00	Circulated out excess cement and displaced the well to sea water.
10:30	Pulled out of the hole with the 3 1/2" cement stinger on 5" drill pipe to surface.
12:00	Made up the jet sub and ran in the hole with the 5" drill pipe to 407 m.
13:00	Washed the BOP and well head area.
14:00	Pulled out of the hole with the jet sub on 5" drill pipe from 407 m to surface.
15:00	Laid down the jar, MWD and Peak plug on deck.
17:30	Retrieved the wear bushing
18:30	Ran in the hole with the 12 1/4" bit on the 5 1/2" HWDP to 280 m
20:00	Waited on cement.
21:00	Attempted to pressure test the cement plug to 85 bar. Observed a leak of 3 bar in 5 minutes.
23:00	Ran in the hole with the 12 1/4" bit from 280 m to 416 m. Washed down from 416 to 420 m with 200 LPM. Observed no indications of cement. Circulated bottoms up twice.
23:59	Pulled out of the hole with the 12 1/4" bit on the 5 1/2" HWDP from 420 m to surface.

DAILY REPORT

Well: 35/2-1 **PO:** 1

Daily report no : 35 **Date:** 2005-08-23

Midnight depth : 713 m MD **Estimated PP:** 1,06 sg **Mud weight:** 1,10 sg

Stop time	Description
02:30	Sat wear bushing
04:00	Waited on cement
05:00	Ran in the hole with the 12 1/4" bit on 5 1/2" HWDP to 416 m.
06:00	Tagged the cement plug at 423 m with 10 ton. Circulated with 200 LPM. Lined up to pressure test the cement plug. Pressure tested surface lines to 85 bar.
07:00	Attempted to pressure test the cement plug to 85 bar down the drill string and the choke line against the upper annular preventer. Leaked 4,5 bar in 10 min.
08:00	Pulled out to 280 m and attempted to presseure test the cement plug to 85 bar down the choke line against the shear ram. Leaked 4,5 bar in 10 min.
09:30	Pulled out of the hole with the 12 1/4" bottom hole assembly to surface.
11:00	Made up new 12 1/4" bottom hole assembly.
12:00	Ran in the hole with the 12 1/4" bottom hole assembly on 5" drill pipe to 417 m.
13:30	Ran in and tagged the cement plug at 423 m. Displaced the hole to 1,10 sg mud.
15:00	Drilled cement from 423 m to 450 m. Weight tested the cement plug to 10 ton at 450 m.
15:30	Circulated the hole clean.
16:00	Pulled out of the hole with the 12 1/4" bottom hole assembly on 5" drill pipe from 450 m to 307 m.
17:00	Attempted to presseure test the cement plug to 85 bar down the choke line against the shear ram. Leaked 2 bar in 10 min.
17:30	Ran in the hole with the 12 1/4" bottom hole assembly on 5" drill pipe to 450 m and tagged the cement plug with 10 ton.
18:00	Pulled out of the hole with the 12 1/4" bottom hole assembly on 5" drill pipe from 450 m to 50 m.
18:30	Pulled out of the hole with the 12 1/4" bottom hole assembly from 50 m to surface.
20:30	Ran in the hole with the 3 1/2" cement stinger on 5" drill pipe to 435 m. Washed down and tagged the top of the cement at 450 m.
21:30	Circulated and conditioned the mud.
22:30	Sat a balanced cement plug from 450 m to 413 m. Pumped 5 m3 sea water ahead of 3,2 m3 1,95 sg sement slurry with 0.09 m3 sea water behind. Displaced the cement plug with 3,1 m3 1,10 sg mud.
23:00	Pulled out of the hole with the 3 1/2" cement stinger on 5" drill pipe from 450 m to 416 m.
23:30	Circulated out excess cement at 416 m.
23:59	Pulled out to 359 m and cleaned the top drive with a high pressure jet nozzle. Flushed through hoses and valves with sea water.

Daily report no : 36 **Date:** 2005-08-24

Midnight depth : 713 m MD **Estimated PP:** 1,06 sg **Mud weight:** 1,10 sg

Stop time	Description
01:00	Pulled out of the hole with the 3 1/2" cement stinger.
02:00	Ran in the hole with the jet sub on 5 1/2" HWDP to 409 m.
02:30	Washed the BOP and wear bushing.
04:00	Pulled out of the hole with the jet sub on 5 1/2" HWDP.
16:00	Waited on cement.
16:30	Lined up and pressure tested the choke line and surface equipment to 85 bar.
17:00	Attempted to pressure test the cement plug to 85 bar against the blind/shear ram.
18:30	Pressure tested the cement unit, surface lines, choke line and fail safes valves, one system at the time, to 85 bar.
19:00	Attempted to pressure test the cement plug to 85 bar against the blind/shear ram.
23:59	Changed from the blind/shear ram to the shear ram and attempted to pressure test the cement plug to 85 bar.

Daily report no : 37 **Date:** 2005-08-25

Midnight depth : 713 m MD **Estimated PP:** 1,06 sg **Mud weight:** 1,10 sg

Stop time	Description
03:00	Ran in the hole with the BOP test tool and and pressure tested the BOP to 85 bar against the upper annular preventer. Pulled out of the hole with the BOP test tool.
06:00	Ran in the hole with the 12 1/4" bottom hole assembly and tagged the cement at 416 m.
08:30	Drilled hard cement from 416 m to 426 m.
10:00	Circulated while evaluated further action
11:00	Drilled hard cement from 426 m to 431 m.
12:30	Circulated the well clean
16:00	Pulled out of the hole with the 12 1/4" bottom hole assembly from 431 m to surface.
18:00	Waited on the 13 3/8" casing scraper and the Peak plug to arrive with the vessel, Olympic Hercules.
19:00	Made up the 12 1/4" bottom hole assembly with the 13 3/8" casing scraper.

DAILY REPORT

Well: 35/2-1 **PO:** 1

Daily report no : 37 **Date:** 2005-08-25

Midnight depth : 713 m MD **Estimated PP:** 1,06 sg **Mud weight:** 1,10 sg

Stop time	Description
21:00	Ran in the hole with the 12 1/4" bottom hole assembly to 431 m.
23:00	Worked the 13 3/8" casing scraper from 431m to 420 m and circulated the hole clean. Placed a 3 m3 corrosion inhibitor pill at TD.
23:59	Pulled out of the hole with the 12 1/4" bottom hole assembly from 431 m to 56 m.

Daily report no : 38 **Date:** 2005-08-26

Midnight depth : 713 m MD **Estimated PP:** 1,06 sg **Mud weight:** 1,10 sg

Stop time	Description
01:30	Pulled out of the hole with the 12 1/4" bottom hole assembly.
02:30	Ran in the hole with the 13 3/8" Peak VMB plug assembly on 5 1/2" HWDP to 414 m.
03:30	Pumped 1 x string volume. Ran in the hole from 414 m and sat the Peak VBM plug at 429,5 m.
05:00	Attempted to pressure test, between the Peak plug and the cement plug at 431 m, to 81 bar.
05:30	Attempted to pressure test the Peak plug from above to 81 bar. Observed leak in the Peak plug running tool.
07:00	Released the Peak plug running tool and pulled out to above the BOP. Closed the blind/shear ram and pressure tested the Peak packer to 81 bar. Opened the blind/shear ram and spotted a 10 m3 anti-corrosion pill above the Peak packer.
08:30	Displaced the riser and kill/choke line to sea water.
09:30	Pulled out of the hole with the Peak packer running tool.
12:30	Retrieved the wear bushing
15:30	Prepared to pull the BOP
16:00	Dismanteled the top drive torque wrench for overhaul.
16:30	Atempted to install the diverter running tool. Pulled out the running tool and repaired the anti-rotating dogs.
19:00	Pulled out and laid down the diverter. Installed the slip joint landing pipe and collapsed the slip joint. Disconnected the BOP AT 18:55 hrs.
23:00	Disconnected the guide lines and moved the rig 40 m port of the well head. Disconnected the pod hose saddles and kill/choke line yoke. Hung off the support ring and landed the slip joint in the spider. Racked the slip joint in the derrick.
23:59	Pulled the BOP and riser from 375 m to 360 m.

Daily report no : 39 **Date:** 2005-08-27

Midnight depth : 713 m MD **Estimated PP:** 1,06 sg **Mud weight:** 1,10 sg

Stop time	Description
07:00	Pulled the bop and riser from 360 m to surface. Pulled out guide wires and landed the BOP on the BOP carrier.
11:30	Secured the BOP on the carrier and skidded to parked position. Laid down 2 x 50' and 1 x 20' riser. Rigged down the riser handling equipment.
12:00	Made up the permanent guide base retrieval tool on 2 stands of 8" drill collar.
17:30	Ran in and retrieved the permanent guide base. Pulled out and landed the guide base on the guide base trolley.
19:00	Secured the guide base on the gude base trolley. Disconnected the running tool and laid it down on deck.
21:30	Moved the net guard, with temporary abandonment cap incorporated, to the guide base trolley and transported it underneath the rotary. Made up the net guard running tool and prepared the hotstab with hose and valves for filling the corrosion cap with corrosion inhibitor fluid.
23:00	Ran in with the net guard to 395 m. Moved the rig to well centre and installed the net guard on the well head.
23:59	Opened the low torque valve with the ROV, and attempted to pump the corrosion inhibitor fluid into the abandonment cap with the cement unit. Observed the pressure build up to 20 bar.

Daily report no : 40 **Date:** 2005-08-28

Midnight depth : 713 m MD **Estimated PP:** 1,06 sg **Mud weight:** 1,10 sg

Stop time	Description
02:00	Made several attempts to pump the corrosion inhibitor fluid into the corrosion cap. Attempted to disconnect the hot stab with the ROV with no success. Disconnected the Net guard running tool and moved the rig 40 m off the location.
09:30	Anchor handling. Anchor #4, off bottom at 04.10 hrs. On bolster 07:33 hrs. Handled by Tor Viking. Anchor #8, off bottom at 04:14 hrs. On bolster at 07:33 hrs. Handled by Olympic Hercules. Anchor #2, off bottom at 04:30 hrs. On bolster 08:07 hrs. Handled by Skandi Admiral. Anchor #7, off bottom at 04:45 hrs. On bolster at 09:16 hrs. Handled by Mærsk Asserter.

Norsk Hydro

2006-12-28

DAILY REPORT

Well: 35/2-1 **PO:** 1

Daily report no : 40 **Date:** 2005-08-28

Midnight depth : 713 m MD **Estimated PP:** 1,06 sg **Mud weight:** 1,10 sg

Stop time	Description
18:00	Anchor #5, off bottom at 09:25 hrs. On bolster at 12:24 hrs. Handled by Tor Viking. Anchor #1, off bottom at 10:50 hrs. On the deck of Skandi Admiral 11:13 hrs. Anchor #6, off bottom at 11:32 hrs. On bolster at 14.32 hrs. Handled by Mærsk Asserter. Anchor #9, off bottom at 11:03 hrs. Disconnected the anchor and moved it to anchor chain #10. Kept 2000 m of anchor chain from winch #9 on the Olympic Hercules.Anchor #5, off bottom at 09:25 hrs. On bolster at 12:24 hrs. Handled by Tor Viking. A
23:59	No activity on this well. The activity is reported on the well 31/3-S-21H.

TIME DISTRIBUTION

Well: 35/2-1 **PO:** 1 **Rig:** DEEPSEA TRYM **Depth:** 714,2 **m MD**

All sections

Operations	Hours	%	Hours	%	Acc. total
MOBILIZATION					
MOVING	19,5	2,05			
MOORING; RUNNING ANCHORS	16,5	1,73			
MOORING; PULLING ANCHORS	16,0	1,68			
Sum.			52,0	5,46	52,0
DRILLING					
BHA HANDLING/TESTING	37,5	3,93			
MWD HANDLING/TESTING/SURVEYING	3,5	0,37			
TRIPPING IN CASED HOLE	26,5	2,78			
TRIPPING IN OPEN HOLE	24,0	2,52			
DRILLING	70,0	7,35			
OTHER	45,0	4,72			
REAMING	4,0	0,42			
CIRC. AND COND. MUD/HOLE	90,0	9,44			
WIPER TRIP	28,5	2,99			
CASING HANDLING/TESTING	44,5	4,67			
RUNNING CASING IN CASED HOLE	9,0	0,94			
RUNNING CASING IN OPEN HOLE	6,0	0,63			
DRILLING OUT OF CASING	4,5	0,47			
PRIMARY CEMENTING	19,0	1,99			
TRIPPING FOR CEMENT JOB	7,5	0,79			
DRILLING OUT CEMENT PLUG	12,5	1,31			
FORMATION STRENGTH TESTING	7,0	0,73			
BOP HANDLING	13,5	1,42			
BOP RUNNING/RETRIEVING	24,5	2,57			
BOP TESTING	20,0	2,10			
SET/RELEASE MECHANICAL PLUG	6,5	0,68			
RIG MAINTENANCE	11,5	1,21			
SLIP AND CUT DRILLING LINE	2,0	0,21			
Sum.			517,0	54,25	569,0
FORMATION EVALUATION LOGGING					
LOGGING	27,0	2,83			
LOGGING EQUIPMENT HANDLING/TESTING	20,5	2,15			
FORMATION TESTER	4,0	0,42			
SIDEWALL CORING	9,5	1,00			
VERTICAL SEISMIC	0,5	0,05			
Sum.			61,5	6,45	630,5
PLUG AND ABANDONMENT					
BHA HANDLING/TESTING	1,0	0,10			
TRIPPING IN CASED HOLE	4,5	0,47			
WELLHEAD EQUIPMENT INSTALLATION	12,5	1,31			
CIRC. AND COND. MUD/HOLE	2,5	0,26			
TRIPPING FOR CEMENT JOB	5,5	0,58			
BOP HANDLING	10,0	1,05			
BOP RUNNING/RETRIEVING	12,0	1,26			
WELLHEAD EQUIPMENT HANDLING	4,5	0,47			
SET CEMENT PLUG	7,0	0,73			
SET/RELEASE MECHANICAL PLUG	1,5	0,16			
RIG MAINTENANCE	0,5	0,05			
Sum.			61,5	6,45	692,0

TIME DISTRIBUTION

Well: 35/2-1 **PO:** 1 **Rig:** DEEPSEA TRYM **Depth:** 714,2 **m MD**

All sections

Operations	Hours	%	Hours	%	Acc. total
DOWNTIME DRILLING					
EQUIPMENT FAILURE AND REPAIR	38,0	3,99			
WAITING	18,5	1,94			
CEMENTING	25,5	2,68			
STICKING/GOING STUCK WITH EQUIPMENT	60,5	6,35			
Sum.			142,5	14,95	834,5
DOWNTIME FORM. EVAL. LOGGING					
EQUIPMENT FAILURE AND REPAIR	30,5	3,20			
Sum.			30,5	3,20	865,0
DOWNTIME FORM. EVAL. CORING					
EQUIPMENT FAILURE AND REPAIR	3,0	0,31			
Sum.			3,0	0,31	868,0
DOWNTIME PLUG AND ABANDONMENT					
EQUIPMENT FAILURE AND REPAIR	3,5	0,37			
CEMENTING	81,5	8,55			
Sum.			85,0	8,92	953,0
Reported time (100,0 % of well total 953,0 hours) :					953,0

Norsk Hydro

2006-12-28

HOLE DEVIATION

Well: 35/2-1 **PO:** 1 **Reference point:** RKB ; 25,0 **m** ABOVE MSL

Waterdepth: 384,0 **m** **Vertical to:** 408,9 **m** **Total Depth:** 713,0 **m MD**

Utm zone: 31 **Central Median:** 3' E **Horizontal datum:** ED50

Template Centre Coordinates, UTM: **North :** **m,** **East :** **m**

Wellhead Coordinates, UTM: **North :** 6862221,28 **m,** **East :** 518024,19 **m**

Official Surveys: Y **Track :**

Coordinates are measured from the wellhead centre.

Depth MD [m]	Incli-nation [Deg]	Direc-tion [Deg]	Tool Type	#	Depth TVD [m]	Coordinates North [m]	Coordinates East [m]	Vert. Sect [m]	Dogleg [D/30m]	Build [D/30m]	Turn [D/30m]
409,00	0,00	0,00	MWD	1	409,00	0,00	0,00	0,00	0,00	0,00	0,00
428,90	0,98	110,72	MWD	1	428,90	-0,06	0,16	0,17	1,48	1,48	166,91
438,50	0,74	71,55	MWD	1	438,50	-0,07	0,29	0,30	1,94	-0,75	-122,41
450,40	0,44	53,71	MWD	1	450,40	-0,02	0,40	0,40	0,88	-0,76	-44,97
458,70	0,88	73,25	MWD	1	458,70	0,02	0,49	0,49	1,76	1,59	70,63
466,60	0,98	100,19	MWD	1	466,60	0,02	0,62	0,62	1,69	0,38	102,30
471,80	1,20	110,38	MWD	1	471,79	-0,00	0,71	0,71	1,69	1,27	58,79
486,60	0,51	114,60	MWD	1	486,59	-0,08	0,92	0,92	1,40	-1,40	8,55
497,20	0,36	103,13	MWD	1	497,19	-0,11	0,99	1,00	0,49	-0,42	-32,46
514,00	0,39	94,81	MWD	1	513,99	-0,13	1,10	1,11	0,11	0,05	-14,86
526,20	0,38	88,19	MWD	1	526,19	-0,13	1,18	1,19	0,11	-0,02	-16,28
548,10	0,17	133,05	MWD	1	548,09	-0,15	1,28	1,29	0,39	-0,29	61,45
590,00	0,23	89,27	MWD	1	589,99	-0,19	1,41	1,42	0,11	0,04	-31,35
619,50	0,30	107,17	MWD	1	619,49	-0,21	1,54	1,55	0,11	0,07	18,20
686,70	0,12	13,51	MWD	1	686,69	-0,20	1,72	1,74	0,15	-0,08	-41,81
706,00	0,09	41,23	MWD	1	705,99	-0,17	1,74	1,75	0,09	-0,05	43,09

Norsk Hydro

2006-12-28

MAIN CONSUMPTION OF CASING/TUBING

Well: 35/2-1 **PO:** 1

Size	Casing string	Grade	Weight [kg/m]	Weight [lb/ft]	Threads type	Length [m]	No. of joints
30"	CONDUCTOR	X-52	460,86	309,70	SL-60	74,9	6
13 3/8"	SURFACE	P-110	107,14	72,00	NEW VAM	132,1	12
9 5/8"	INTERMEDIATE LINER	P-110	79,61	53,50	VAM TOP	74,0	6
7"	PRODUCTION LINER	P-110	47,62	32,00	NS-CC	206,0	20

Norsk Hydro

2006-12-28

B I T R E C O R D

Well: 35/2-1 **PO:** 1

Bit No		RR	Type	Size (in)	Manu-fact-urer	Trade name	Serial no.	IADC code	Nozzles diameter (../32in)	Flow area (in2)	BHA no.	Depth out (m MD)	Bit meter (m)	Rot. hours (hrs)	ROP (m/hr)	Rotation min/max) (rpm)	Total bit revol.	Weight min/max (kN)	Flow min/max (l/min)	Pump min/max (bar)	Cutting Structure I - O -DC- L - B	Gauge 1/16 (in)	Other Remarks	Pull Cause
1			ISRT	9,88	HTC	MXB20DX	5044824		18,18,18	0,746	1	544	135	10,20	13,2	0/61	35035	0/68	0/1966	0/55,8	1 - 1 - WT - A - E	I	NO	TD
2			ISRT	17,50	HTC	MXT305HDX2	6018434	415	18,18,18,18	0,994	2	463	54		0,0									TW
3			ISRT	17,50	HTC	MXT305HDX2	ZJ93DK	415	14,14,14,14	0,601	3	483	74	10,80	6,9	1/70	38805	-3/81	338/3526	3,5/99	1 - 1 - WT - A - E	I	NO	TD
4			ISRT	26,00	HTC	GTXC3M03D	6027697	415	14,14,14,14	0,601	4	483	0		0,0		171				0 - 0 - NO - A - 0	1	BU	TW
4		1	ISRT	26,00	HTC	GTXC3M03D	6027697	415	14,14,14,14	0,601	5	486	3	1,20	2,5	59/61	10160	0/1	3025/3025	133/133	1 - 1 - NO - A - E	I	NO	TD
5			ISRT	17,50	HTC	MXST303DX	6021788	415	16,16,16,16	0,785	6	543	57	8,20	7,0	67/91	41714	0/2	3410/3445	137/139	0 - 1 - WT - H - 0	I	CT	TD
6			BIT	12,25	HTC	MXCSO9DX	5055069		16,18,18,18	0,942	7	543	0		0,0									DP
6		1	BIT	12,25	HTC	MXCSO9DX	5055069		16,18,18,18	0,942	8	561	18	3,60	5,0	0/92	42531	0/6	0/3444	0/140,2	1 - 2 - WT - A - E	2	LT	TD
7			BIT	8,50	BHCR	HCR605	7003764	M323	11,11,11,11,11	0,464	9	586	25	2,70	9,3	0/97	25000	0/3	0/1431	0/70,7	0 - 1 - CT - S - X	I	NO	BHA
7		1	PDC	8,50	HTC	HCR605	7003764	M323	11,11,11,11,11	0,464	10	586	0		0,0		0				0 - 1 - CT - S - X	I	NO	DTF
7		2	PDC	8,50	HTC	HCR605	7003764	M323	11,11,11,11,11	0,464	11	713	127	12,90	9,8	0/117	80718	0/8	0/1416	0/84	0 - 1 - CT - S - X	I	NO	TD
7		3	PDC	8,50	HTC	HCR605	7003764	M323	11,11,11,11,11	0,464	12	713	0		0,0	0/0	0	0/0	0/0	0/0				TD
7		4	PDC	8,50	HTC	HCR605	7003764	M323	11,11,11,11,11	0,464	13	713	0		0,0		0							TD
8			MITO	12,25	HTC	MX3	6036226	117	18,18,18,18	0,994	14	420	4		0,0	0/0	0	0/0	0/0	0/0				DP
8		1	MITO	12,25	HTC	MX3	6036226	117	18,18,18,18	0,994	15	450	27		0,0	100/100	0	0/4	2500/2500	78/78				DP
8		2	MITO	12,25	HTC	MX3	6036226	117	18,18,18,18	0,994	16	431	15		0,0	60/100	0	3/5	3100/3100	55/55				DP
8		3	MITO	12,25	HTC	MX3	6036226	117	18,18,18,18	0,994	17	431	0		0,0		0							DP

Norsk Hydro 2006-12-28

BOTTOM HOLE ASSEMBLIES

Well: 35/2-1 **PO: 1**

BHA no. 1: No. / Element / Body OD(in) / Length(m) Depth In: 409 m MD Out: 544 m MD

1	MXB20DX	9,87	0,25	6	DRILL COLLAR STEEL	8,0	54,10
2	BIT SUB	8,0	0,96	7	JAR	8,0	9,61
3	BI-DIRECTIONAL COMMUNICATIOI	8,25	5,42	8	DRILL COLLAR STEEL	8,0	27,03
4	MEASUREMENT WHILE DRILLING	8,25	11,22	9	X-OVER	8,0	0,54
5	SAVER SUB	8,25	0,95	10	HWDP	5,5	140,54

Reason pulled: TOTAL DEPTH/CASING DEPTH Total Length: 250,62 m

BHA no. 2: No. / Element / Body OD(in) / Length(m) Depth In: 409 m MD Out: 463 m MD

1	MXT305HDX2	17,5	0,42	11	DRILL COLLAR STEEL	8,0	71,90
2	STANDARDHO	36,0	3,95	12	JAR	8,0	9,61
3	FLOAT SUB	9,5	0,99	13	DRILL COLLAR STEEL	8,0	53,63
4	SAVER SUB	9,5	0,63	14	X-OVER	7,78	0,54
5	MEASUREMENT WHILE DRILLING	8,25	11,15	15	HWDP	5,5	140,54
6	SAVER SUB	8,25	0,68	16	X-OVER	9,5	0,60
7	NON MAG. STAB	23,75	2,22	17	X-OVER	9,5	0,81

Reason pulled: TWIST-OFF Total Length: 297,67 m

BHA no. 3: No. / Element / Body OD(in) / Length(m) Depth In: 409 m MD Out: 483 m MD

1	MXT305HDX2	17,5	0,42	9	X-OVER	9,5	0,42
2	HOLE OPENER	36,0	3,88	10	X-OVER	9,5	1,18
3	FLOAT SUB	9,5	0,88	11	DRILL COLLAR STEEL	8,0	54,08
4	SAVER SUB	9,5	0,80	12	JAR	8,0	9,61
5	MEASUREMENT WHILE DRILLING	8,25	11,01	13	DRILL COLLAR STEEL	8,0	26,60
6	SAVER SUB	8,25	0,97	14	X-OVER	7,78	0,54
7	X-OVER	9,5	0,94	15	HWDP	5,5	140,54
8	DRILL COLLAR STEEL	9,5	2,30				

Reason pulled: TOTAL DEPTH/CASING DEPTH Total Length: 254,17 m

BHA no. 4: No. / Element / Body OD(in) / Length(m) Depth In: 483 m MD Out: 483 m MD

1	GTXC3M03D	26,0	0,54	8	X-OVER	9,5	0,42
2	BIT SUB	9,5	0,96	9	X-OVER	9,5	1,18
3	STEEL STAB	24,75	2,39	10	DRILL COLLAR STEEL	8,0	45,06
4	X-OVER	9,5	1,11	11	JAR	8,0	9,61
5	DRILL COLLAR STEEL	8,0	9,02	12	DRILL COLLAR STEEL	8,0	26,60
6	X-OVER	9,5	0,94	13	X-OVER	7,78	0,54
7	STEEL STAB	24,75	2,30	14	HWDP	5,5	139,34

Reason pulled: TWIST-OFF Total Length: 240,01 m

BHA no. 5: No. / Element / Body OD(in) / Length(m) Depth In: 483 m MD Out: 486 m MD

1	GTXC3M03D	26,0	0,54	8	X-OVER	9,5	0,98
2	BIT SUB	9,5	0,96	9	DRILL COLLAR STEEL	8,0	45,87
3	STEEL STAB	24,75	2,39	10	JAR	8,0	9,70
4	X-OVER	9,5	1,11	11	DRILL COLLAR STEEL	8,0	25,69
5	DRILL COLLAR STEEL	8,0	8,89	12	X-OVER	7,78	0,89
6	X-OVER	9,5	0,94	13	HWDP	5,5	138,67
7	STEEL STAB	24,75	2,30				

Reason pulled: TOTAL DEPTH/CASING DEPTH Total Length: 238,93 m

Norsk Hydro 2006-12-28

BOTTOM HOLE ASSEMBLIES

Well: 35/2-1 **PO: 1**

BHA no. 6: No. / Element / Body OD(in) / Length(m) Depth In: 486 m MD Out: 543 m MD

1	MXST303DX	17,5	0,43	7	STEEL STAB	17,0	2,50
2	NEAR BIT STAB	17,37	2,46	8	DRILL COLLAR STEEL	8,0	45,87
3	PIN SUB	8,25	0,79	9	JAR	8,0	9,70
4	MEASUREMENT WHILE DRILLING	8,25	5,07	10	DRILL COLLAR STEEL	8,0	25,92
5	MEASUREMENT WHILE DRILLING	8,25	11,01	11	X-OVER	7,75	0,89
6	SAVER SUB	9,5	0,97	12	HWDP	5,5	138,67

Reason pulled: TOTAL DEPTH/CASING DEPTH Total Length: 244,28 m

BHA no. 7: No. / Element / Body OD(in) / Length(m) Depth In: 543 m MD Out: 543 m MD

1	MXCSO9DX	17,5	0,43	7	STEEL STAB	17,0	2,50
2	NEAR BIT STAB	17,375	2,46	8	DRILL COLLAR STEEL	8,0	45,87
3	PIN-PIN SUB	8,25	0,79	9	JAR	8,0	9,70
4	MEASUREMENT WHILE DRILLING	8,25	5,07	10	DRILL COLLAR STEEL	8,0	25,92
5	MEASUREMENT WHILE DRILLING	8,25	11,01	11	X-OVER	7,75	0,89
6	SAVER SUB	8,25	0,97	12	HWDP	5,5	138,67

Reason pulled: DRILL PLUG Total Length: 244,28 m

BHA no. 8: No. / Element / Body OD(in) / Length(m) Depth In: 543 m MD Out: 561 m MD

1	MXCSO9DX	12,25	0,35	9	NON MAG. STAB	8,0	1,52
2	NEAR BIT STAB	8,0	2,38	10	FLOAT SUB	8,12	0,94
3	STOP SUB	8,25	0,46	11	DRILL COLLAR STEEL	8,0	9,06
4	MEASUREMENT WHILE DRILLING	8,25	4,96	12	JAR	8,0	9,70
5	LOGGING WHILE DRILLING TOOL	8,25	1,56	13	DRILL COLLAR STEEL	8,0	18,23
6	STOP SUB	8,25	0,55	14	X-OVER	7,75	0,89
7	MEASUREMENT WHILE DRILLING	8,25	9,11	15	HWDP	5,5	27,90
8	SAVER SUB	8,25	0,95				

Reason pulled: TOTAL DEPTH/CASING DEPTH Total Length: 88,56 m

BHA no. 9: No. / Element / Body OD(in) / Length(m) Depth In: 561 m MD Out: 586 m MD

1	HCR605	8,5	0,29	8	FLOAT SUB	6,5	0,76
2	NEAR BIT STAB	6,31	1,66	9	DRILL COLLAR STEEL	6,5	9,08
3	STEEL STAB	6,94	0,49	10	JAR	6,5	9,84
4	MEASUREMENT WHILE DRILLING	6,75	5,10	11	DRILL COLLAR STEEL	6,5	18,59
5	MEASUREMENT WHILE DRILLING	6,75	3,17	12	HWDP	5,0	28,14
6	X-OVER	6,94	0,45	13	DRILL PIPE	5,0	649,00
7	STEEL STAB	6,5	1,53				

Reason pulled: CHANGE BOTTOMHOLE ASSEMBLY Total Length: 728,10 m

BHA no. 10: No. / Element / Body OD(in) / Length(m) Depth In: 586 m MD Out: 586 m MD

1	HCR605	8,5	0,29	8	STEEL STAB	6,5	1,53
2	NEAR BIT STAB	6,31	1,66	9	FLOAT SUB	6,5	0,76
3	STOP SUB	6,94	0,49	10	DRILL COLLAR STEEL	6,5	9,08
4	ONTRAK, RESISTIVITY, GAMMA R/	6,75	5,10	11	JAR	6,5	9,84
5	BI-DIRECTIONAL COMMUNICATIOI	6,75	8,99	12	DRILL COLLAR STEEL	6,5	18,59
6	STOP SUB	6,75	0,57	13	HWDP	5,0	28,14
7	TEST TRAK - FORMATION PRESSU	6,87	13,42	14	DRILL PIPE	5,0	649,00

Reason pulled: DOWNHOLE TOOL FAILURE Total Length: 747,46 m

Norsk Hydro 2006-12-28

BOTTOM HOLE ASSEMBLIES

Well: 35/2-1 **PO: 1**

BHA no. 11: No. / Element / Body OD(in) / Length(m) Depth In: 587 m MD Out: 713 m MD

1	HCR605	8,5	0,29	8	STEEL STAB	6,5	1,53
2	NEAR BIT STAB	6,31	1,66	9	FLOAT SUB	6,5	0,76
3	STOP SUB	6,94	0,49	10	DRILL COLLAR STEEL	6,5	9,08
4	ONTRAK, RESISTIVITY, GAMMA R/	6,75	5,10	11	JAR	6,5	9,84
5	BI-DIRECTIONAL COMMUNICATIOI	6,75	8,99	12	DRILL COLLAR STEEL	6,5	18,59
6	STOP SUB	6,75	0,57	13	HWDP	5,0	28,14
7	TEST TRAK - FORMATION PRESSU	6,87	13,42	14	DRILL PIPE	5,0	649,00

Reason pulled: TOTAL DEPTH/CASING DEPTH Total Length: 747,46 m

BHA no. 12: No. / Element / Body OD(in) / Length(m) Depth In: 713 m MD Out: 713 m MD

1	HCR605	8,5	0,29	10	JAR	6,5	9,84
2	NEAR BIT STAB	6,31	1,66	11	DRILL COLLAR STEEL	6,5	18,59
3	STOP SUB	6,94	0,49	12	HWDP	5,0	28,14
4	ONTRAK, RESISTIVITY, GAMMA R/	6,75	5,10	13	DRILL PIPE	5,0	114,99
5	BI-DIRECTIONAL COMMUNICATIOI	6,75	3,10	14	X-OVER	6,5	1,00
6	STOP SUB	6,75	0,43	15	CASING SCRAPER	9,12	0,82
7	STEEL STAB	6,5	1,53	16	X-OVER	6,5	0,85
8	FLOAT SUB	6,5	0,76	17	DRILL PIPE	5,0	517,00
9	DRILL COLLAR STEEL	6,5	9,08				

Reason pulled: TOTAL DEPTH/CASING DEPTH Total Length: 713,67 m

BHA no. 13: No. / Element / Body OD(in) / Length(m) Depth In: 713 m MD Out: 713 m MD

1	HCR605	8,5	0,29	10	JAR	6,5	9,84
2	NEAR BIT STAB	6,31	1,66	11	DRILL COLLAR STEEL	6,5	18,59
3	STOP SUB	6,94	0,49	12	HWDP	5,0	28,14
4	ONTRAK, RESISTIVITY, GAMMA R/	6,75	5,10	13	DRILL PIPE	5,0	114,99
5	BI-DIRECTIONAL COMMUNICATIOI	6,75	3,10	14	X-OVER	6,5	1,00
6	STOP SUB	6,75	0,43	15	CASING SCRAPER	9,12	0,82
7	STEEL STAB	6,5	1,53	16	X-OVER	6,5	0,85
8	FLOAT SUB	6,5	0,76	17	DRILL PIPE	5,0	517,00
9	DRILL COLLAR STEEL	6,5	9,08				

Reason pulled: TOTAL DEPTH/CASING DEPTH Total Length: 713,67 m

BHA no. 14: No. / Element / Body OD(in) / Length(m) Depth In: 416 m MD Out: 420 m MD

1	MX3	12,25	0,34	3	DRILL COLLAR STEEL	6,5	54,88
2	BIT SUB	6,0	0,82	4	HWDP	5,5	357,66

Reason pulled: DRILL PLUG Total Length: 413,70 m

BHA no. 15: No. / Element / Body OD(in) / Length(m) Depth In: 423 m MD Out: 450 m MD

1	MX3	12,25	0,34	3	DRILL COLLAR STEEL	6,5	54,88
2	BIT SUB	6,0	0,82	4	HWDP	5,5	357,66

Reason pulled: DRILL PLUG Total Length: 413,70 m

BHA no. 16: No. / Element / Body OD(in) / Length(m) Depth In: 416 m MD Out: 431 m MD

1	MX3	12,25	0,34	4	DRILL COLLAR STEEL	6,5	54,88
3	BIT SUB	6,0	0,82	5	HWDP	5,5	357,66

Reason pulled: DRILL PLUG Total Length: 413,70 m

BHA no. 17: No. / Element / Body OD(in) / Length(m) Depth In: 431 m MD Out: 431 m MD

1	MX3	12,25	0,34	4	DRILL COLLAR STEEL	6,5	54,88
2	BRUSH TOOL	13,375	2,23	5	HWDP	5,5	357,66
3	CATCH ASSEMBLY	6,0	0,82				

Reason pulled: DRILL PLUG Total Length: 415,93 m

Norsk Hydro

2006-12-28

CEMENT SLURRY REPORT

Well: 35/2-1 **PO:** 1

Date	CsgSize	Jobtype	Slurry Type	Pumped Volume [m3]	Density [sg]	BHCT [DegC]	Yield [l/100 kg]	Additive	Unit	Additives [../100 kg Cement]	Additives [../m3 Slurry]
2005-07-26	30"	CASING CEMENTING	LEAD	29,50	1,56	8,00	129,51	A-3L	l	3,50	
								FP16LG	l	0,20	
			TAIL SLURRY	16,70	1,95	8,00	74,68	A-7L	l	3,50	
								FP16LG	l	0,20	
			DISPLACEMENT	6,00	1,03	8,00					
			DISPLACEMENT			8,00					
		GROUT	TAIL SLURRY	15,00	1,95	8,00	74,68	A-7L	l	3,50	
								FP16LG	l	0,20	
			DISPLACEMENT	0,75	1,03	8,00					
			DISPLACEMENT			8,00					
2005-07-31	13 3/8"	CASING CEMENTING	TAIL SLURRY	55,00	1,60	9,00	133,26	A-7L	l	6,00	
								BA-58L	l	20,00	
								CD-34L	l	2,00	
								FL-67L	l	4,50	
								FP16LG	l	0,20	
			DISPLACEMENT	4,40	1,03	9,00					
			DISPLACEMENT			9,00					
2005-08-07	9 5/8"	LINER CEMENTING	TAIL SLURRY	7,70	1,25	10,00	260,15	A-7L	l	2,00	
								BA-58L	l	40,00	
								CD-34L	l	1,00	
								FL-67L	l	8,00	
								FP16LG	l	0,20	
								W-6	kg	410,00	
			MUD SPACER	5,00	1,13	10,00					
			DISPLACEMENT			10,00					
2005-08-21	7"	LINER CEMENTING	SPACER	3,00	1,00	15,00		FP16LG	l		10,00
								MCS-J	l		52,00
			TAIL SLURRY	4,00	1,25	15,00	263,07	BA-58L	l	40,00	
								CD-34L	l	1,00	
								FL-67L	l	8,00	
								FP16LG	l	0,20	
								W-6	kg	410,00	

Norsk Hydro

2006-12-28

CEMENT SLURRY REPORT

Well: 35/2-1 **PO:** 1

Date	CsgSize	Jobtype	Slurry Type	Pumped Volume [m3]	Density [sg]	BHCT [DegC]	Yield [l/100 kg]	Additive	Unit	Additives [../100 kg Cement]	Additives [../m3 Slurry]
2005-08-21	7"	LINER CEMENTING	DISPLACEMENT	6,70	1,15	15,00					
			DISPLACEMENT			15,00					
2005-08-22	7"	PLUG IN CASED HOLE	SPACER	3,00	1,00	15,00		FP16LG	l		10,00
								MCS-J	l		52,00
			TAIL SLURRY	3,40	1,25	15,00	263,07	BA-58L	l	40,00	
								CD-34L	l	1,00	
								FL-67L	l	8,00	
								FP16LG	l	0,20	
								W-6	kg	50,00	
			SPACER	0,33	1,03	15,00					
			DISPLACEMENT	3,00	1,15	15,00					
2005-08-22	7"	PLUG IN CASED HOLE	SPACER	5,00	1,03	15,00					
			TAIL SLURRY	4,50	1,95	15,00		A-7L	l	3,50	
								FP16LG	l	0,20	
			SPACER	0,90	1,03	15,00					
			DISPLACEMENT	3,10	1,15	15,00					
2005-08-23	13 3/8"	PLUG IN CASED HOLE	PREFLUSH	5,00	1,00	8,00					
			TAIL SLURRY	3,20	1,95	8,00	74,68	A-7L	l	3,50	
								FP16LG	l	0,20	
			DISPLACEMENT	3,20	1,15	8,00					
2006-07-10	9 5/8"	PLUG IN CASED HOLE	SPACER	3,00	1,00	9,00		GW-22	kg		2,50
			TAIL SLURRY	3,50	1,95	9,00	77,14	BA-58L	l	8,00	
								CD-34L	l	0,80	
								FL-67L	l	2,75	
								FP16LG	l	0,20	
			DISPLACEMENT	0,25	1,00	9,00					
			DISPLACEMENT			9,00					

CEMENT CONSUMPTION PER JOB

Well: 35/2-1 **PO:** 1

Date	CsgSize	Job Type	Cement/ Additive	Description	Unit	Actual Amount Used
2005-07-26	30"	CASING CEMENTING	A-3L	EXTENDER: LIQUID LODENSE	l	850
			G	API CLASS G	MT	47
			A-7L	ACCELERATOR: LIQUID CACL2	l	860
			FP16LG	SPECIAL ADDITIVE: DEFOAMER FP-16LG	l	108
	30"	GROUT	FP16LG	SPECIAL ADDITIVE: DEFOAMER FP-16LG	l	40
			A-7L	ACCELERATOR: LIQUID CACL2	l	790
			G	API CLASS G	MT	20
2005-07-31	13 3/8"	CASING CEMENTING	FL-67L	FL-67LE	l	2100
			CD-34L	DISPERSANT: CD-34L LIQUID	l	930
			C	API CLASS C	MT	44
			BA-58L	BA-58L ANTI-GAS	l	9270
			A-7L	ACCELERATOR: LIQUID CACL2	l	2700
			FP16LG	SPECIAL ADDITIVE: DEFOAMER FP-16LG	l	170
2005-08-07	9 5/8"	LINER CEMENTING	A-7L	ACCELERATOR: LIQUID CACL2	l	85
			BA-58L	BA-58L ANTI-GAS	l	1700
			C	API CLASS C	MT	2
			CD-34L	DISPERSANT: CD-34L LIQUID	l	45
			FL-67L	FL-67LE	l	340
			FP16LG	SPECIAL ADDITIVE: DEFOAMER FP-16LG	l	20
			W-6	EXTENDER	kg	2700
2005-08-21	7"	LINER CEMENTING	BA-58L	BA-58L ANTI-GAS	l	783
			C	API CLASS C	MT	2
			W-6	EXTENDER	kg	2550
			MCS-J	MCS-J	l	123
			FP16LG	SPECIAL ADDITIVE: DEFOAMER FP-16LG	l	24
			FL-67L	FL-67LE	l	157
			CD-34L	DISPERSANT: CD-34L LIQUID	l	20
2005-08-22	7"	PLUG IN CASED HOLE	BA-58L	BA-58L ANTI-GAS	l	783
			C	API CLASS C	MT	2
			CD-34L	DISPERSANT: CD-34L LIQUID	l	20
			FL-67L	FL-67LE	l	157
			FP16LG	SPECIAL ADDITIVE: DEFOAMER FP-16LG	l	24
			MCS-J	MCS-J	l	123
			W-6	EXTENDER	kg	1000
2005-08-23	13 3/8"	PLUG IN CASED HOLE	A-7L	ACCELERATOR: LIQUID CACL2	l	240
			G	API CLASS G	MT	4000
			FP16LG	SPECIAL ADDITIVE: DEFOAMER FP-16LG	l	10
2006-07-10	9 5/8"	PLUG IN CASED HOLE	G	API CLASS G	MT	4
			FP16LG	SPECIAL ADDITIVE: DEFOAMER FP-16LG	l	10
			FL-67L	FL-67LE	l	130
			BA-58L	BA-58L ANTI-GAS	l	372
			CD-34L	DISPERSANT: CD-34L LIQUID	l	45
			GW-22	GW-22 VISCOSIFIER	kg	25

TOTAL CONSUMPTION OF CEMENT ADDITIVES

Well: 35/2-1 **PO:** 1

Section	Cement/Additive	Unit	Total Amount Used
36"	EXTENDER: LIQUID LODENSE	l	850,00
	ACCELERATOR: LIQUID CACL2	l	1650,00
	SPECIAL ADDITIVE: DEFOAMER FP-16LG	l	148,00
	API CLASS G	MT	67,00

Section	Cement/Additive	Unit	Total Amount Used
17 1/2"	ACCELERATOR: LIQUID CACL2	l	2700,00
	BA-58L ANTI-GAS	l	9270,00
	API CLASS C	MT	44,00
	DISPERSANT: CD-34L LIQUID	l	930,00
	FL-67LE	l	2100,00
	SPECIAL ADDITIVE: DEFOAMER FP-16LG	l	170,00

Section	Cement/Additive	Unit	Total Amount Used
12 1/4"	ACCELERATOR: LIQUID CACL2	l	85,00
	BA-58L ANTI-GAS	l	1700,00
	API CLASS C	MT	2,00
	DISPERSANT: CD-34L LIQUID	l	45,00
	FL-67LE	l	340,00
	SPECIAL ADDITIVE: DEFOAMER FP-16LG	l	20,00
	EXTENDER	kg	2700,00

Section	Cement/Additive	Unit	Total Amount Used
9 1/2"	BA-58L ANTI-GAS	l	372,00
	DISPERSANT: CD-34L LIQUID	l	45,00
	FL-67LE	l	130,00
	SPECIAL ADDITIVE: DEFOAMER FP-16LG	l	10,00
	API CLASS G	MT	4,00
	GW-22 VISCOSIFIER	kg	25,00

Section	Cement/Additive	Unit	Total Amount Used
8 1/2"	BA-58L ANTI-GAS	l	783,00
	API CLASS C	MT	1,50
	DISPERSANT: CD-34L LIQUID	l	20,00
	FL-67LE	l	157,00
	SPECIAL ADDITIVE: DEFOAMER FP-16LG	l	24,00
	MCS-J	l	123,00
	EXTENDER	kg	2550,00

Section	Cement/Additive	Unit	Total Amount Used
P&A	ACCELERATOR: LIQUID CACL2	l	240,00
	BA-58L ANTI-GAS	l	783,00
	API CLASS C	MT	2,00
	DISPERSANT: CD-34L LIQUID	l	20,00
	FL-67LE	l	157,00
	SPECIAL ADDITIVE: DEFOAMER FP-16LG	l	34,00
	API CLASS G	MT	4000,00
	MCS-J	l	123,00
	EXTENDER	kg	1000,00

Norsk Hydro

2006-12-28

DAILY MUD PROPERTIES:RHEOLOGY PARAMETERS

Well: 35/2-1 **PO:** 1

Hole section : 9 7/8" **WATER BASED SYSTEM**

Date	Depth [m]		Mud Type	Funnel Visc	Dens	Mudtmp Out	Fann Readings								Rheo Test	PV	YP	Gel0	Gel10
	MD	TVD		[sec]	[sg]	[DegC]	600	300	200	100	60	30	6	3	[DegC]	[mPas]	[Pa]	[Pa]	[Pa]
2005-07-21	409	409	SPUD MUD	100,0	1,05	0,0	0	0	0	0	0	0	0	0	0,0	0,0	0,0	0,0	0,0
2005-07-22	409	409	SPUD MUD	100,0	1,05	0,0	0	0	0	0	0	0	0	0	0,0	0,0	0,0	0,0	0,0

Hole section : 36" **WATER BASED SYSTEM**

Date	Depth [m]		Mud Type	Funnel Visc	Dens	Mudtmp Out	Fann Readings								Rheo Test	PV	YP	Gel0	Gel10
	MD	TVD		[sec]	[sg]	[DegC]	600	300	200	100	60	30	6	3	[DegC]	[mPas]	[Pa]	[Pa]	[Pa]
2005-07-24	482	482	SPUD MUD	80,0	1,50	0,0	0	0	0	0	0	0	0	0	0,0	0,0	0,0	0,0	0,0
2005-07-25	483	483	SPUD MUD	50,0	1,50	0,0	0	0	0	0	0	0	0	0	0,0	0,0	0,0	0,0	0,0
2005-07-26	483	483	SPUD MUD	80,0	1,28	0,0	0	0	0	0	0	0	0	0	0,0	0,0	0,0	0,0	0,0
2005-07-27	483	483	SPUD MUD	0,0	1,09	0,0	69	48	38	27	0	0	7	5	50,0	21,0	13,0	2,0	3,0
2005-07-28	501	501	SPUD MUD	100,0	1,05	0,0	0	0	0	0	0	0	0	0	0,0	0,0	0,0	0,0	0,0

Hole section : 17 1/2" **WATER BASED SYSTEM**

Date	Depth [m]		Mud Type	Funnel Visc	Dens	Mudtmp Out	Fann Readings								Rheo Test	PV	YP	Gel0	Gel10
	MD	TVD		[sec]	[sg]	[DegC]	600	300	200	100	60	30	6	3	[DegC]	[mPas]	[Pa]	[Pa]	[Pa]
2005-07-29	543	543	SPUD MUD	90,0	1,50	0,0	0	0	0	0	0	0	0	0	0,0	0,0	0,0	0,0	0,0
2005-07-30	543	543	SPUD MUD	95,0	1,51	0,0	0	0	0	0	0	0	0	0	0,0	0,0	0,0	0,0	0,0
2005-07-31	543	543	SPUD MUD	0,0	1,10	0,0	47	32	26	18	0	0	7	5	50,0	15,0	8,0	4,0	5,0
2005-08-01	543	543	SEA WATER	0,0	1,13	0,0	74	51	41	28	0	0	9	7	20,0	23,0	13,0	6,0	8,0
2005-08-02	543	543	SEA WATER	0,0	1,13	0,0	78	54	43	30	0	0	9	7	20,0	24,0	14,0	8,0	9,0
2005-08-03	543	543	AQUA-DRILL	0,0	1,13	0,0	78	54	43	30	0	0	9	7	20,0	24,0	14,0	8,0	9,0

Hole section : 12 1/4" **WATER BASED SYSTEM**

Date	Depth [m]		Mud Type	Funnel Visc	Dens	Mudtmp Out	Fann Readings								Rheo Test	PV	YP	Gel0	Gel10
	MD	TVD		[sec]	[sg]	[DegC]	600	300	200	100	60	30	6	3	[DegC]	[mPas]	[Pa]	[Pa]	[Pa]
2005-08-04	519	519	AQUA-DRILL	160,0	1,13	12,0	75	50	39	31	0	0	8	6	20,0	25,0	12,0	7,0	9,0
2005-08-05	561	561	AQUA-DRILL	0,0	1,13	16,0	82	57	45	32	0	0	8	6	20,0	25,0	15,0	7,0	9,0
2005-08-06	561	561	AQUA-DRILL	0,0	1,13	0,0	84	58	46	32	0	0	8	6	20,0	26,0	15,0	7,0	8,0
2005-08-07	561	561	AQUA-DRILL	0,0	1,13	0,0	73	50	36	23	0	0	8	6	20,0	23,0	13,0	6,0	7,0
2005-08-08	561	561	AQUA-DRILL	82,0	1,13	0,0	83	55	47	32	0	0	9	7	20,0	28,0	13,0	4,0	5,0

DAILY MUD PROPERTIES:RHEOLOGY PARAMETERS

Well: 35/2-1 **PO:** 1

Hole section : 8 1/2" **WATER BASED SYSTEM**

Date	Depth [m]		Mud Type	Funnel Visc	Dens	Mudtmp Out	Fann Readings								Rheo Test	PV	YP	Gel0	Gel10
	MD	TVD		[sec]	[sg]	[DegC]	600	300	200	100	60	30	6	3	[DegC]	[mPas]	[Pa]	[Pa]	[Pa]
2005-08-09	572	572	AQUA-DRILL	79,0	1,15	14,0	85	57	47	31	0	0	7	5	20,0	28,0	14,0	4,0	5,0
2005-08-10	587	586	AQUA-DRILL	81,0	1,15	0,0	85	57	46	32	0	0	8	6	20,0	28,0	14,0	4,0	5,0
2005-08-11	599	599	AQUA-DRILL	89,0	1,15	13,0	83	56	44	30	0	0	7	5	20,0	27,0	14,0	4,0	5,0
2005-08-12	644	644	AQUA-DRILL	79,0	1,15	12,0	81	55	44	30	0	0	7	5	20,0	26,0	14,0	4,0	5,0
2005-08-13	673	673	AQUA-DRILL	87,0	1,15	13,0	83	56	45	30	0	0	7	5	20,0	27,0	14,0	4,0	5,0
2005-08-14	713	713	AQUA-DRILL	78,0	1,15	12,0	81	55	45	31	0	0	7	5	20,0	26,0	14,0	4,0	5,0
2005-08-15	713	713	AQUA-DRILL	78,0	1,15	0,0	81	55	45	31	0	0	7	5	20,0	26,0	14,0	4,0	5,0
2005-08-16	713	713	AQUA-DRILL	77,0	1,15	0,0	81	55	45	31	0	0	7	5	20,0	26,0	14,0	4,0	5,0
2005-08-17	713	713	AQUA-DRILL	72,0	1,15	0,0	81	55	44	30	0	0	7	5	20,0	26,0	14,0	4,0	5,0
2005-08-18	713	713	AQUA-DRILL	76,0	1,15	0,0	81	55	44	31	0	0	7	5	20,0	26,0	14,0	4,0	5,0
2005-08-19	713	713	AQUA-DRILL	82,0	1,15	0,0	82	55	45	32	0	0	7	5	0,0	27,0	13,0	4,0	5,0
2005-08-20	713	713	AQUA-DRILL	75,0	1,15	0,0	0	0	0	0	0	0	0	0	20,0	0,0	0,0	4,0	5,0
2005-08-21	713	713	AQUA-DRILL	76,0	1,15	0,0	82	55	45	32	0	0	7	5	20,0	27,0	13,0	4,0	5,0

Hole section : P&A **WATER BASED SYSTEM**

Date	Depth [m]		Mud Type	Funnel Visc	Dens	Mudtmp Out	Fann Readings								Rheo Test	PV	YP	Gel0	Gel10
	MD	TVD		[sec]	[sg]	[DegC]	600	300	200	100	60	30	6	3	[DegC]	[mPas]	[Pa]	[Pa]	[Pa]
2005-08-22	416	416	AQUA-DRILL	0,0	0,00	0,0	0	0	0	0	0	0	0	0	0,0	0,0	0,0	0,0	0,0
2005-08-23	416	416	AQUA-DRILL	42,0	1,10	0,0	36	28	19	14	0	0	5	4	20,0	8,0	10,0	2,0	2,0
2005-08-24	416	416	AQUA-DRILL	42,0	1,10	0,0	0	0	0	0	0	0	0	0	0,0	0,0	0,0	0,0	0,0
2005-08-25	431	431	AQUA-DRILL	48,0	1,10	0,0	40	30	26	20	0	0	9	8	0,0	10,0	10,0	0,0	0,0
2005-08-26	431	431	AQUA-DRILL	0,0	0,00	0,0	0	0	0	0	0	0	0	0	0,0	0,0	0,0	0,0	0,0
2005-08-27	431	431	AQUA-DRILL	0,0	0,00	0,0	0	0	0	0	0	0	0	0	0,0	0,0	0,0	0,0	0,0
2005-08-28	431	431	AQUA-DRILL	0,0	0,00	0,0	0	0	0	0	0	0	0	0	0,0	0,0	0,0	0,0	0,0

DAILY MUD PROPERTIES : OTHER PARAMETERS

Well: 35/2-1 **PO:** 1

Hole section : 9 7/8" **WATER BASED SYSTEM**

Date	Depth [m] MD	Depth [m] TVD	Mud Type	Dens [sg]	Filtrate API [ml]	Filtrate HPHT [ml]	Filtcake API [mm]	Filtcake HPHT [mm]	HPHT Press/Temp [bar/DegC]	pH	Alcalinity Pm [ml]	Alcalinity Pf [ml]	Alcalinity Mf [ml]	Inhib Chem [Kg/m3]	K+ [mg/l]	CL- [mg/l]	Ca++ [mg/l]	Mg++ [mg/l]	Tot hard [mg/l]	Percentage Solid [%]	Percentage Oil [%]	Percentage Sand [%]	CEC [Kg/m3]	ASG [sg]	LGS [Kg/m3]	Glycol [%]
2005-07-21	409	409	SPUD MUD	1,05	0,0	0,0	0	0	0 / 0	8,5	0,0	0,0	0,0	0	0	0	0	0	0	0,0	0,0	0,0	0	0,0	0	
2005-07-22	409	409	SPUD MUD	1,05	0,0	0,0	0	0	0 / 0	0,0	0,0	0,0	0,0	0	0	0	0	0	0	0,0	0,0	0,0	0	0,0	0	

Hole section : 36" **WATER BASED SYSTEM**

Date	Depth [m] MD	Depth [m] TVD	Mud Type	Dens [sg]	Filtrate API [ml]	Filtrate HPHT [ml]	Filtcake API [mm]	Filtcake HPHT [mm]	HPHT Press/Temp [bar/DegC]	pH	Alcalinity Pm [ml]	Alcalinity Pf [ml]	Alcalinity Mf [ml]	Inhib Chem [Kg/m3]	K+ [mg/l]	CL- [mg/l]	Ca++ [mg/l]	Mg++ [mg/l]	Tot hard [mg/l]	Percentage Solid [%]	Percentage Oil [%]	Percentage Sand [%]	CEC [Kg/m3]	ASG [sg]	LGS [Kg/m3]	Glycol [%]
2005-07-24	482	482	SPUD MUD	1,50	0,0	0,0	0	0	0 / 0	10,8	9,2	0,0	0,0	0	0	0	0	0	0	0,0	0,0	0,0	0	0,0	0	
2005-07-25	483	483	SPUD MUD	1,50	0,0	0,0	0	0	0 / 0	10,8	9,2	0,0	0,0	0	0	0	0	0	0	0,0	0,0	0,0	0	0,0	0	
2005-07-26	483	483	SPUD MUD	1,28	0,0	0,0	0	0	0 / 0	10,8	2,0	0,0	0,0	0	0	0	0	0	0	0,0	0,0	0,0	0	0,0	0	
2005-07-27	483	483	SPUD MUD	1,09	4,0	0,0	1	0	0 / 0	8,0	0,0	0,0	0,0	19760	300000	500000	0	0	0	0,0	0,0	0,0	0	0,0	0	
2005-07-28	501	501	SPUD MUD	1,05	0,0	0,0	0	0	0 / 0	9,0	0,0	0,0	0,0	0	0	0	0	0	0	0,0	0,0	0,0	0	0,0	0	

Hole section : 17 1/2" **WATER BASED SYSTEM**

Date	Depth [m] MD	Depth [m] TVD	Mud Type	Dens [sg]	Filtrate API [ml]	Filtrate HPHT [ml]	Filtcake API [mm]	Filtcake HPHT [mm]	HPHT Press/Temp [bar/DegC]	pH	Alcalinity Pm [ml]	Alcalinity Pf [ml]	Alcalinity Mf [ml]	Inhib Chem [Kg/m3]	K+ [mg/l]	CL- [mg/l]	Ca++ [mg/l]	Mg++ [mg/l]	Tot hard [mg/l]	Percentage Solid [%]	Percentage Oil [%]	Percentage Sand [%]	CEC [Kg/m3]	ASG [sg]	LGS [Kg/m3]	Glycol [%]
2005-07-29	543	543	SPUD MUD	1,50	0,0	0,0	0	0	0 / 0	10,6	8,0	0,0	0,0	0	0	0	0	0	0	0,0	0,0	0,0	0	0,0	0	
2005-07-30	543	543	SPUD MUD	1,51	0,0	0,0	0	0	0 / 0	10,3	8,0	0,0	0,0	0	0	0	0	0	0	0,0	0,0	0,0	0	0,0	0	
2005-07-31	543	543	SPUD MUD	1,10	4,0	0,0	1	0	0 / 0	8,5	0,0	0,0	0,0	20141	300000	000000	0	0	0	0,0	0,0	0,0	0	0,0	0	
2005-08-01	543	543	SEA WATER	1,13	3,8	0,0	1	0	0 / 0	8,2	0,0	0,7	0,0	120	63000	65000	0	0	0	3,4	0,0	0,0	5	2,7	3	
2005-08-02	543	543	SEA WATER	1,13	3,6	0,0	1	0	0 / 0	7,4	0,0	0,0	0,7	120	63000	60000	0	0	440	3,7	0,0	0,0	5	2,7	3	
2005-08-03	543	543	AQUA-DRILL	1,13	3,6	0,0	1	0	0 / 0	7,5	0,0	0,0	0,7	126	66000	54000	0	0	440	3,5	0,0	0,0	1	3,0	3	

Hole section : 12 1/4" **WATER BASED SYSTEM**

Date	Depth [m] MD	Depth [m] TVD	Mud Type	Dens [sg]	Filtrate API [ml]	Filtrate HPHT [ml]	Filtcake API [mm]	Filtcake HPHT [mm]	HPHT Press/Temp [bar/DegC]	pH	Alcalinity Pm [ml]	Alcalinity Pf [ml]	Alcalinity Mf [ml]	Inhib Chem [Kg/m3]	K+ [mg/l]	CL- [mg/l]	Ca++ [mg/l]	Mg++ [mg/l]	Tot hard [mg/l]	Percentage Solid [%]	Percentage Oil [%]	Percentage Sand [%]	CEC [Kg/m3]	ASG [sg]	LGS [Kg/m3]	Glycol [%]
2005-08-04	519	519	AQUA-DRILL	1,13	3,8	0,0	1	0	0 / 0	8,5	0,0	0,0	0,8	124	65000	56000	0	0	500	3,4	0,0	0,0	1	3,0	3	
2005-08-05	561	561	AQUA-DRILL	1,13	3,8	0,0	1	0	0 / 0	8,5	0,2	0,0	1,6	128	67000	55000	0	0	480	4,0	0,0	0,0	5	2,7	4	
2005-08-06	561	561	AQUA-DRILL	1,13	3,6	0,0	1	0	0 / 0	8,5	0,1	0,0	1,3	126	66000	54000	0	0	480	3,5	0,0	0,0	21	3,0	3	
2005-08-07	561	561	AQUA-DRILL	1,13	3,5	0,0	1	0	0 / 0	8,0	0,0	0,0	1,1	128	67000	55000	0	0	400	4,0	0,0	0,0	15	2,7	4	
2005-08-08	561	561	AQUA-DRILL	1,13	3,4	0,0	1	0	0 / 0	8,8	0,0	0,0	1,3	128	67000	54000	0	0	480	3,5	0,0	0,0	15	3,0	3	

DAILY MUD PROPERTIES : OTHER PARAMETERS

Well: 35/2-1 **PO:** 1

Hole section : 8 1/2" **WATER BASED SYSTEM**

Date	Depth [m]		Mud Type	Dens	Filtrate		Filtcake		HPHT	pH	Alcalinity			Inhib	K+	CL-	Ca++	Mg++	Tot	Percentage			CEC	ASG	LGS	Glycol
					API	HPHT	API	HPHT	Press/Temp		Pm	Pf	Mf	Chem					hard	Solid	Oil	Sand				
	MD	TVD		[sg]	[ml]	[ml]	[mm]	[mm]	[bar/DegC]		[ml]	[ml]	[ml]	[Kg/m3]	[mg/l]	[mg/l]	[mg/l]	[mg/l]	[mg/l]	[%]	[%]	[%]	[Kg/m3]	[sg]	[Kg/m3]	[%]
2005-08-09	572	572	AQUA-DRILL	1,15	3,5	0,0	1	0	0 / 0	8,4	0,0	0,0	1,2	130	68000	54000	0	0	720	4,0	0,0	0,0	15	3,3	2	
2005-08-10	587	586	AQUA-DRILL	1,15	3,5	0,0	1	0	0 / 0	8,5	0,0	0,0	1,2	130	68000	54000	0	0	680	4,0	0,0	0,3	15	3,3	2	
2005-08-11	599	599	AQUA-DRILL	1,15	3,5	0,0	1	0	0 / 0	8,5	0,0	0,0	1,4	132	69000	54000	0	0	640	4,0	0,0	0,3	15	3,3	2	
2005-08-12	644	644	AQUA-DRILL	1,15	3,4	0,0	1	0	0 / 0	8,5	0,0	0,0	1,4	130	68000	53000	0	0	600	4,1	0,0	0,3	21	3,3	2	
2005-08-13	673	673	AQUA-DRILL	1,15	3,5	0,0	1	0	0 / 0	8,5	0,0	0,0	1,3	133	70000	54000	0	0	600	4,0	0,0	0,3	21	3,3	2	
2005-08-14	713	713	AQUA-DRILL	1,15	3,4	0,0	1	0	0 / 0	8,5	0,0	0,0	1,4	133	70000	54000	0	0	0	4,0	0,0	0,3	21	3,3	2	
2005-08-15	713	713	AQUA-DRILL	1,15	3,4	0,0	1	0	0 / 0	8,5	0,0	0,0	1,4	133	70000	54000	0	0	600	4,0	0,0	0,3	21	3,3	2	
2005-08-16	713	713	AQUA-DRILL	1,15	3,4	0,0	1	0	0 / 0	8,5	0,0	0,0	1,3	133	70000	54000	0	0	600	4,0	0,0	0,3	21	3,3	2	
2005-08-17	713	713	AQUA-DRILL	1,15	3,2	0,0	1	0	0 / 0	8,5	0,0	0,0	1,3	133	70000	54000	0	0	600	4,0	0,0	0,3	21	3,3	2	
2005-08-18	713	713	AQUA-DRILL	1,15	3,2	0,0	1	0	0 / 0	8,5	0,0	0,0	1,3	135	71000	54000	0	0	600	4,0	0,0	0,3	21	3,3	2	
2005-08-19	713	713	AQUA-DRILL	1,15	3,3	0,0	1	0	0 / 0	8,4	0,0	0,0	1,4	133	70000	54000	0	0	600	4,0	0,0	0,3	21	3,3	2	
2005-08-20	713	713	AQUA-DRILL	1,15	3,2	0,0	1	0	0 / 0	8,5	0,0	0,0	1,4	135	71000	54000	0	0	540	4,0	0,0	0,3	21	3,3	2	
2005-08-21	713	713	AQUA-DRILL	1,15	3,3	0,0	1	0	0 / 0	8,5	0,1	0,0	1,2	135	71000	54000	0	0	560	4,0	0,0	0,3	21	3,3	2	

Hole section : P&A **WATER BASED SYSTEM**

Date	Depth [m]		Mud Type	Dens	Filtrate		Filtcake		HPHT	pH	Alcalinity			Inhib	K+	CL-	Ca++	Mg++	Tot	Percentage			CEC	ASG	LGS	Glycol
					API	HPHT	API	HPHT	Press/Temp		Pm	Pf	Mf	Chem					hard	Solid	Oil	Sand				
	MD	TVD		[sg]	[ml]	[ml]	[mm]	[mm]	[bar/DegC]		[ml]	[ml]	[ml]	[Kg/m3]	[mg/l]	[mg/l]	[mg/l]	[mg/l]	[mg/l]	[%]	[%]	[%]	[Kg/m3]	[sg]	[Kg/m3]	[%]
2005-08-22	416	416	AQUA-DRILL	0,00	0,0	0,0	0	0	0 / 0	0,0	0,0	0,0	0,0	0	0	0	0	0	0	0,0	0,0	0,0	0	0,0	0	
2005-08-23	416	416	AQUA-DRILL	1,10	0,0	0,0	0	0	0 / 0	9,7	0,0	0,0	0,0	0	0	17000	0	0	0	0,0	0,0	0,0	0	0,0	0	
2005-08-24	416	416	AQUA-DRILL	1,10	0,0	0,0	0	0	0 / 0	0,0	0,0	0,0	0,0	0	0	0	0	0	0	0,0	0,0	0,0	0	0,0	0	
2005-08-25	431	431	AQUA-DRILL	1,10	0,0	0,0	0	0	0 / 0	10,0	0,0	0,0	0,0	0	0	0	0	0	0	0,0	0,0	0,0	0	0,0	0	
2005-08-26	431	431	AQUA-DRILL	0,00	0,0	0,0	0	0	0 / 0	0,0	0,0	0,0	0,0	0	0	0	0	0	0	0,0	0,0	0,0	0	0,0	0	
2005-08-27	431	431	AQUA-DRILL	0,00	0,0	0,0	0	0	0 / 0	0,0	0,0	0,0	0,0	0	0	0	0	0	0	0,0	0,0	0,0	0	0,0	0	
2005-08-28	431	431	AQUA-DRILL	0,00	0,0	0,0	0	0	0 / 0	0,0	0,0	0,0	0,0	0	0	0	0	0	0	0,0	0,0	0,0	0	0,0	0	

Norsk Hydro 2006-12-28

TOTAL CONSUMPTION OF MUD ADDITIVES

Well: 35/2-1 **PO:** 1

Section	Product/ Additive	Unit	Total Amount Used
17 1/2"	AQUAPAC LV	kg	1724,00
	CACO3 C	kg	200,00
	CACO3 M	kg	13000,00
	CITRIC ACID	kg	200,00
	MIL-PAC	kg	525,00
	PERMALOSE HT	kg	1500,00
	SODA ASH	kg	75,00
	SODIUM BICARBONATE	kg	200,00
	UNDEFINED	xx	109,00
	XANTHAN GUM	kg	825,00

Section	Product/ Additive	Unit	Total Amount Used
12 1/4"	AQUAPAC LV	kg	225,36
	CACO3 M	kg	16000,00
	CITRIC ACID	kg	300,00
	SODIUM BICARBONATE	kg	225,00
	UNDEFINED	xx	517,90
	XANTHAN GUM	kg	50,00

Section	Product/ Additive	Unit	Total Amount Used
9 7/8"	BARITE	kg	42000,00

Section	Product/ Additive	Unit	Total Amount Used
8 1/2"	BARITE	kg	16000,00
	CACO3 M	kg	2000,00
	CITRIC ACID	kg	675,00
	LIME	kg	25,00
	MIL-PAC	kg	150,00
	PERMALOSE HT	kg	75,00
	SODA ASH	kg	25,00
	SODIUM BICARBONATE	kg	575,00
	XANTHAN GUM	kg	850,00

Section	Product/ Additive	Unit	Total Amount Used
0.0	BARITE	kg	44000,00
	SODA ASH	kg	125,00
	UNDEFINED	xx	308000,00
	XANTHAN GUM	kg	250,00

LOGGING INFORMATION

Well: 35/2-1 **PO:** 1 **RKB:**25,0 **m** **Rig:** DEEPSEA TRYM

WL Logging Contractor: SCHLUMBERGER **LWD Contractor:** BHI

Official Data: ☑

Max. Well Deviation: 1,20 [Deg]

Bit Run	LWD Run	WL Run	Run Char	Hole Section	Track	Drilled Top [m MD]	Drilled Bottom [m MD]	Log Suite	Log Tool Offset [m]	Logging Start	End Last Logging	Measured Temp [Deg C]	Circ. Prior to Log [min]	Time Since Circulation [min]
1	1			9 7/8"		409,0	544,0	MPR	4,37- 12,14	2005-07-21 22:00	2005-07-22 11:00			
5	4			17 1/2"		483,0	543,0	MPR	3,75- 11,68	2005-07-28 22:00	2005-07-29 09:00			
6 RR	5			12 1/4"		543,0	561,0	MPR	4,37- 12,14	2005-08-05 04:30	2005-08-05 19:00			
7	6			8 1/2"		561,0	583,0	OTK	2,76- 6,03	2005-08-08 22:00	2005-08-10 11:30			
7 RR2	8			8 1/2"		583,0	713,0	OTK- ORD- CCN- TESTRAK	2,76- 6,03	2005-08-11 19:30	2005-08-14 14:00			
		1	A	8 1/2"		560,0	713,0	DSI- FMI		2005-08-15 03:30	2005-08-15 14:00	20,0	4260	405
		1	A	8 1/2"		576,0	612,0	MDT		2005-08-15 14:00	2005-08-16 15:00	13,0		
		1	A	8 1/2"		550,0	713,0	ECS- HRLA- PEX- SP		2005-08-17 15:45	2005-08-17 23:00	18,0	290	
		1	A	8 1/2"		440,0	713,0	VSP		2005-08-17 23:00	2005-08-18 05:00	18,0	480	690
		1	A	8 1/2"		613,0	703,0	MSCT		2005-08-18 04:10	2005-08-18 12:00	18,0	480	880

LOGGING INFORMATION

Well: 35/2-1 **PO:** 1 **RKB:**25,0 **m** **Rig:** DEEPSEA TRYM

WL Logging Contractor: SCHLUMBERGER **LWD Contractor:** BHI

Official Data: ☑

Max. Well Deviation: 1,20 [Deg]

Bit Run	LWD Run	WL Run	Run Char	Hole Section	Track	Drilled Top [m MD]	Drilled Bottom [m MD]	Log Suite	Log Tool Offset [m]	Logging Start	End Last Logging	Measured Temp [Deg C]	Circ. Prior to Log [min]	Time Since Circulation [min]
		1	B	8 1/2"		560,0	713,0	HRLA- SP		2005-08-18 22:05	2005-08-19 01:00	18,0	480	1955
		1	B	8 1/2"		575,0	607,5	MSCT		2005-08-19 01:30	2005-08-19 08:00	18,0	480	2160
		1	C	8 1/2"		570,0	575,0	MSCT		2005-08-19 08:30	2005-08-19 11:30	18,0	480	2610
		1	D	8 1/2"		578,0	614,0	MSCT		2005-08-19 11:30	2005-08-19 14:00	18,0	480	2650

DOWNTIME REPORT All installations

Installation: DST **Well:** 35/2-1 **PO:** 1

Startdate	#	Sum hrs	Downtime Type	Responsible Contractor	Manufacturer	Short description	Equipment Type	Activity	Service Type	NSFI Code	NSFI Type	Serial Number
2005-07-23	1	28,5	Other	ODFJELL DRILLING BERGEN A/S		Parting of drill string at drill collar tool joint at seabed level		DRILLING				
2005-07-25	2	4,0	Waiting on weather					CASING				
2005-07-26	3	32,0	Other	ODFJELL DRILLING BERGEN A/S		Breakage of drill string when running in to drill out cement in 30" conductor		DRILLING				
2005-07-30	4	25,5	Other	BJ SERVICES		Pressure build up while displacing 17 1/2" to seawater prior to cementing. Unable to continue circulation.		CEMENTING				
2005-08-01	5	1,0	Equipment failure	ODFJELL DRILLING BERGEN A/S	NATIONAL OILWELL	Made up loose bolts on the dolly arms.	HOISTING EQUIPMENT	BOP INSTALLATIOI AND TESTING	DRILLING CONTRACTOI	303.00	Traveling Equipment	
2005-08-02	6	1,0	Equipment failure	OCEANEERINC A/S	OCEANEERINC A/S	ROV failure.	SERVICE EQUIPMENT/SYS	BOP INSTALLATIOI AND TESTING	ROV	375.02	ROV	
2005-08-02	7	7,0	Equipment failure	ODFJELL DRILLING BERGEN A/S	CAMERON NORGE	Not able to energize all four hydraulic locking pins on the LMPR template.	WELLCONTROL EQUIPMENT/SYS	BOP INSTALLATIOI AND TESTING	SUB-SEA EQUIPMENT	331.00	BOP Stack	
2005-08-03	8	6,5	Equipment failure	PEAK WELL SOLUTIONS	PEAK WELL SOLUTIONS	Could not release running tool from peak packer.	SERVICE EQUIPMENT/SYS	OTHER ACTIVITY	OTHER	372.08	Retrievable packer	
2005-08-07	10	2,0	Equipment failure	ODFJELL DRILLING BERGEN A/S	NATIONAL OILWELL	Installed fan housing on the top drive.	HOISTING EQUIPMENT	OTHER ACTIVITY	DRILLING CONTRACTOI	313.02	Top Drive	
2005-08-09	11	1,0	Equipment failure	BAKER HUGHES INTEQ	BAKER HUGHES INTEQ	Troubleshoot decoding problems on the MWD	DRILLSTRING/DO EQUIPMENT	DRILLING	MWD/LWD	357.02	MWD/LWD	
2005-08-11	12	11,0	Equipment failure	BAKER HUGHES INTEQ	BAKER HUGHES INTEQ	Lost communication to the ORD sub	DRILLSTRING/DO EQUIPMENT	DRILLING	MWD/LWD	357.02	MWD/LWD	
2005-08-13	13	14,5	Waiting on weather					DRILLING				

DOWNTIME REPORT All installations

Installation: DST **Well:** 35/2-1 **PO:** 1

Startdate	#	Sum hrs	Downtime Type	Responsible Contractor	Manufacturer	Short description	Equipment Type	Activity	Service Type	NSFI Code	NSFI Type	Serial Number
2005-08-15	14	4,0	Equipment failure	SCHLUMBERGI OFFSHORE SERVICES LTD	SCHLUMBERG OFFSHORE SERVICES LTD	Unable to communicate with the MDT logging tool. Pulled out with the logging tool and changed the cable head. Found short in line # 2.	SERVICE EQUIPMENT/SYS	LOGGING	ELECTRIC LOGGING	374.01	Electric Logging Eq. in General	
2005-08-16	15	10,5	Equipment failure	SCHLUMBERGI OFFSHORE SERVICES LTD	SCHLUMBERG OFFSHORE SERVICES LTD	Unable to unscrew the connections above and below the LFA tool, this indicating trapped gas inside the MDT tool string.	SERVICE EQUIPMENT/SYS	LOGGING	ELECTRIC LOGGING	374.02	Formation Tester (RFT)	
2005-08-16	16	6,5	Equipment failure	OCEANEERING A/S	OCEANEERING A/S	Lost Power to the ROV. Recovered the ROV, by use of the vessel Far Saga.	SERVICE EQUIPMENT/SYS	LOGGING	ROV	375.02	ROV	
2005-08-17	17	1,0	Equipment failure	SCHLUMBERGI OFFSHORE SERVICES LTD	SCHLUMBERG OFFSHORE SERVICES LTD	Unable to retrieve data from the EDTC tool. Changed out the tool.	SERVICE EQUIPMENT/SYS	LOGGING	ELECTRIC LOGGING	374.01	Electric Logging Eq. in General	
2005-08-18	18	9,0	Equipment failure	SCHLUMBERGI OFFSHORE SERVICES LTD	SCHLUMBERG OFFSHORE SERVICES LTD	Unable to retrack the core bit on the MSCT logging tool.	SERVICE EQUIPMENT/SYS	LOGGING	ELECTRIC LOGGING	374.03	Side Wall Cores (CST)	
2005-08-18	19	9,0	Equipment failure	SCHLUMBERGI OFFSHORE SERVICES LTD	SCHLUMBERG OFFSHORE SERVICES LTD	Unable to repair the HRLA tool. Waited for new tool and Reran the SP-HRLA log.	SERVICE EQUIPMENT/SYS	LOGGING	ELECTRIC LOGGING	374.01	Electric Logging Eq. in General	
2005-08-19	20	2,0	Equipment failure	ODFJELL DRILLING BERGEN A/S	NATIONAL OILWELL	Unable to start mud pump number 1 and 2.	MUD AND BULK SYSTEMS	OTHER ACTIVITY	DRILLING CONTRACTOI	325.00	Mud Supply(incl. HP mudpumps)	
2005-08-22	21	81,5	Other	NORSK HYDRO A/S		Attempted to pressure test cement plug, leak.		PLUG AND ABANDONMEI				
2005-08-26	22	0,5	Equipment failure	ODFJELL DRILLING BERGEN A/S	CAMERON NORGE	Repaired the anti rotating dogs on the diverter running tool.	WELLCONTROL EQUIPMENT/SYS	PLUG AND ABANDONMEI	DRILLING CONTRACTOI	334.00	Diverter w/ Control System	

Norsk Hydro

2006-12-28

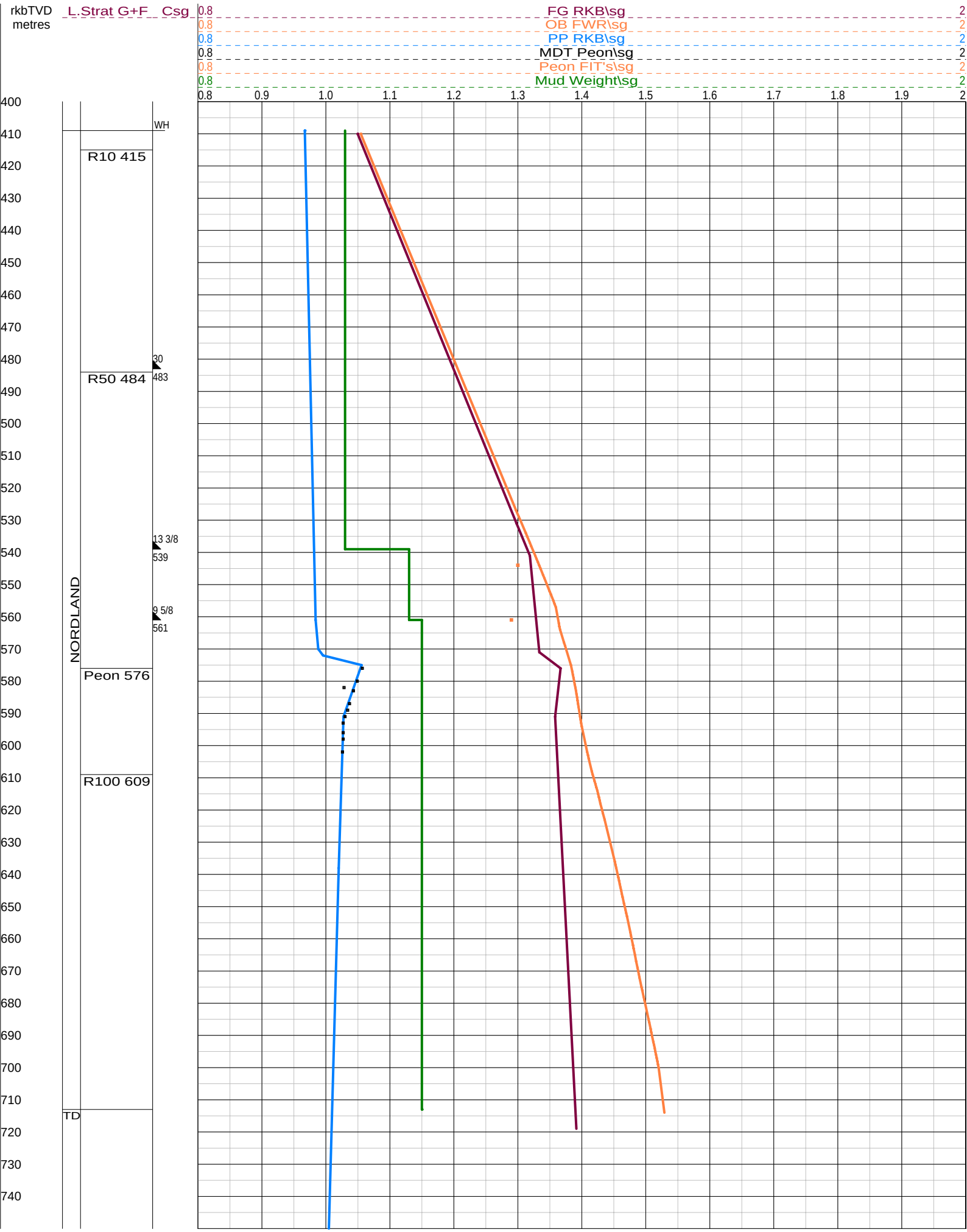
DOWNTIME REPORT All installations

Installation: DST **Well:** 35/2-1 **PO:** 1

Startdate	#	Sum hrs	Downtime Type	Responsible Contractor	Manufacturer	Short description	Equipment Type	Activity	Service Type	NSFI Code	NSFI Type	Serial Number
2005-08-27	23	3,0	Equipment failure	DRIL-QUIP	DRIL-QUIP	Unable to pump corrosion inhibitor fluid into the corrosion cap.	SERVICE EQUIPMENT/SYS	PLUG AND ABANDONMEI	WELLHEAD	376.01	Wellhead	
	Sum:	261,0										
	Total Sum:	261,0										

HYDRO

Well: 35/2-1 (Peon) Fig.



Final Pore Pressure-, Fracture- and Overburden Gradients

Pressure gradient and temperature report.

General: RKB = 25m and water depth = 384m MSL. All depths are given as m TVD RKB, unless otherwise stated. All pressures are in sg.

Pore Pressure Gradient:
It was not observed any overpressure from seafloor to top Peon sand.
Within the peon sand a column of dry gas creates an overpressure of roughly 1,3bar.
The water zone below the gas also indicates overpressure from the MDT samples. Many clinoforms can be observed truncating against the Peon sand and these are often considered to be slightly over pressurised, generally less than 1,10sg.
The shale below the Peon sand exhibits no indications of overpressure but the gradient from the MDT is extrapolated and thus indicating the possibility of a slight overpressure.

Fracture Gradient:
The final fracture gradient is a splice of two datasets. An average shallow LOT trend has been used from seafloor to 540m and spliced to the Breckels & van Eckelen method output from 540m to 713m.
Two FIT's were obtained of 1,30sg and 1,29sg at 539m and 561m respectively.
No losses were observed.

Overburden Gradient:
The overburden gradient is computed based on a splice of two datasets. From 409m to 560m an average density of 2,45sg has been used and then spliced to the RHOB log from 561m.

Temperature Gradient:
No Horner plot was made, so there exist no additional information about the temperature development, but the MWD thermometer and the wireline runs indicates that the temperature is lower or equal to the prognosed 3,95^{o}C / 100m TVD.

Figure 2 B144

LEAK OFF TEST / FORMATION INTEGRITY TEST

B143

Well: Peon 35/2-1 Date 2006-12-28

Rig: Deepsea Trym Sign. Einar Mæland

HYDRO

Hole Size Dia oh	:	12 1/4	Inch	CSG Size D csg	:	13 3/8"	Inch
Hole Depth MD oh	:	544	m	CSG Depth MD csg	:	539	m
Hole Depth TVD oh	:	544	m	CSG Depth TVD csg	:	539	m
Mud Weight in Use MW	:	1,13	s.g.	FITest , EMW fit	:	1,30	s.g.
Leak Off Pressure Pl	:	9,1	bar	Pressure Test Lines	:	30	bar
Equivalent Mud Weight	:	MW + Pl / TVD csg X 10,2 =			:	1,30	s.g.
Formation Integ. Press.	:	Pfit = (EMW fit - MW) x TVD csg / 10,2 =			:	9,09	bar

Volume ltr	Pressure bar
0	1
5	1,5
10	2,1
15	3,0
20	4,4
25	6,0
30	7,7
35	9,1
1	8,4
2	8,2
3	8,0
4	7,9
5	7,7
6	7,6
7	7,6
8	7,7
9	7,6
10	7,5

650	ltr bled back

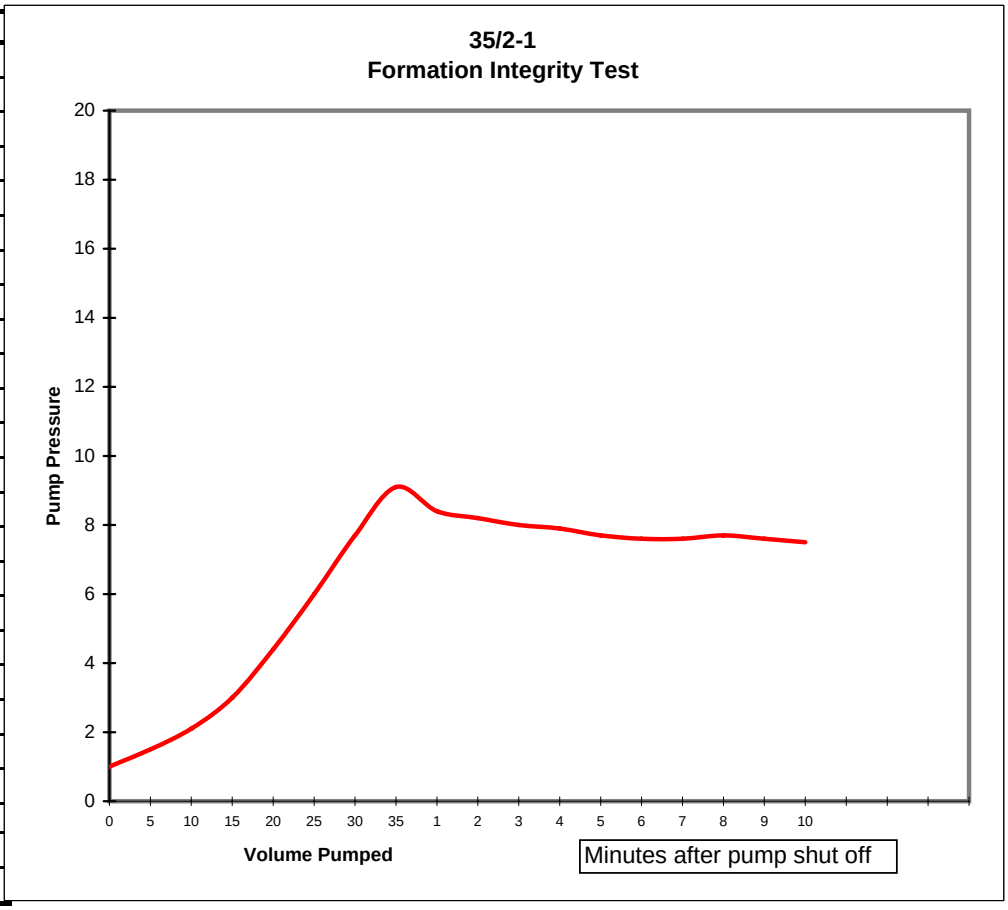


Figure 3 B145

LEAK OFF TEST / FORMATION INTEGRITY TEST

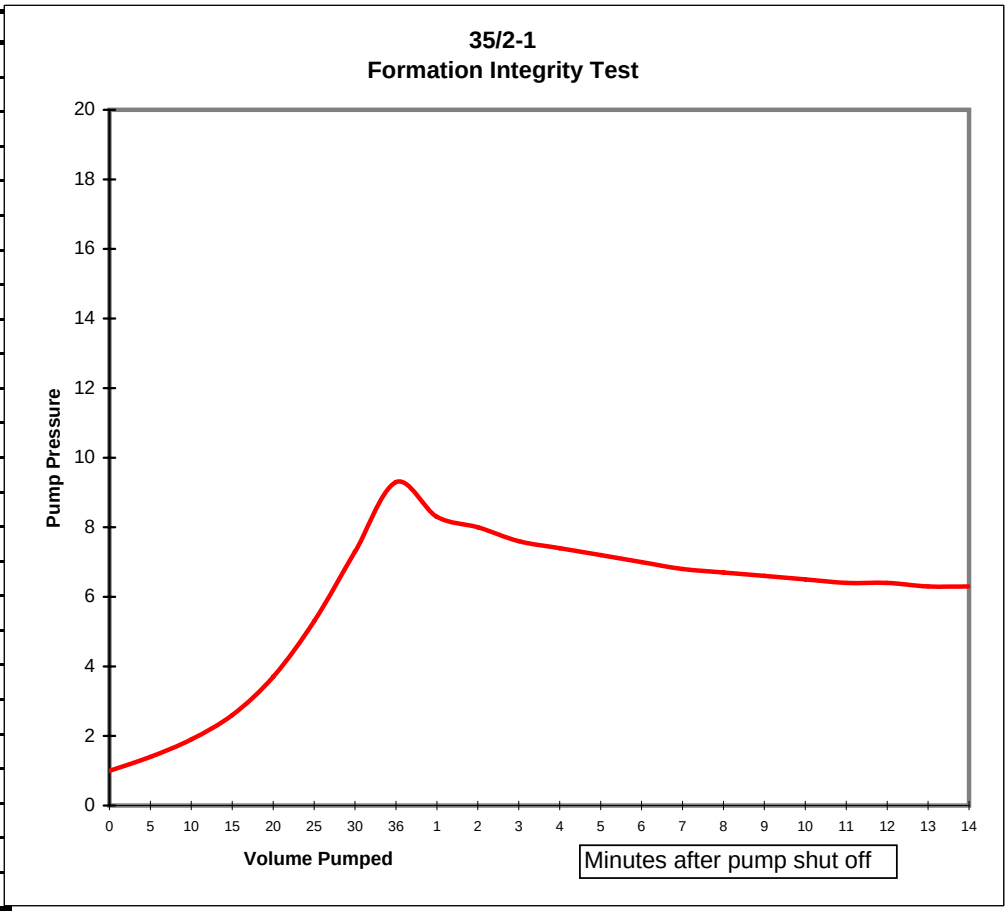
Well: Peon 35/2-1 Date 2006-12-28

Rig: Deepsea Trym Sign. Audstein Dybvad

HYDRO

Hole Size Dia oh	:	8 1/2	Inch	CSG Size D csg	:	9 5/8	Inch
Hole Depth MD oh	:	562	m	CSG Depth MD csg	:	560	m
Hole Depth TVD oh	:	562	m	CSG Depth TVD csg	:	560	m
Mud Weight in Use MW	:	1,13	s.g.	FITest , EMW fit	:	1,30	s.g.
Leak Off Pressure Pl	:	9,3	bar	Pressure Test Lines	:	20	bar
Equivalent Mud Weight	:	MW + Pl / TVD csg X 10,2 =			:	1,30	s.g.
Formation Integ. Press.	:	Pfit = (EMW fit - MW) x TVD csg / 10,2 =			:	9,33	bar

Volume ltr	Pressure bar
0	1
5	1,4
10	1,9
15	2,6
20	3,7
25	5,3
30	7,3
36	9,3
1	8,3
2	8,0
3	7,6
4	7,4
5	7,2
6	7,0
7	6,8
8	6,7
9	6,6
10	6,5
11	6,4
12	6,4
13	6,3
14	6,3
28	ltr bled back



2006-12-28

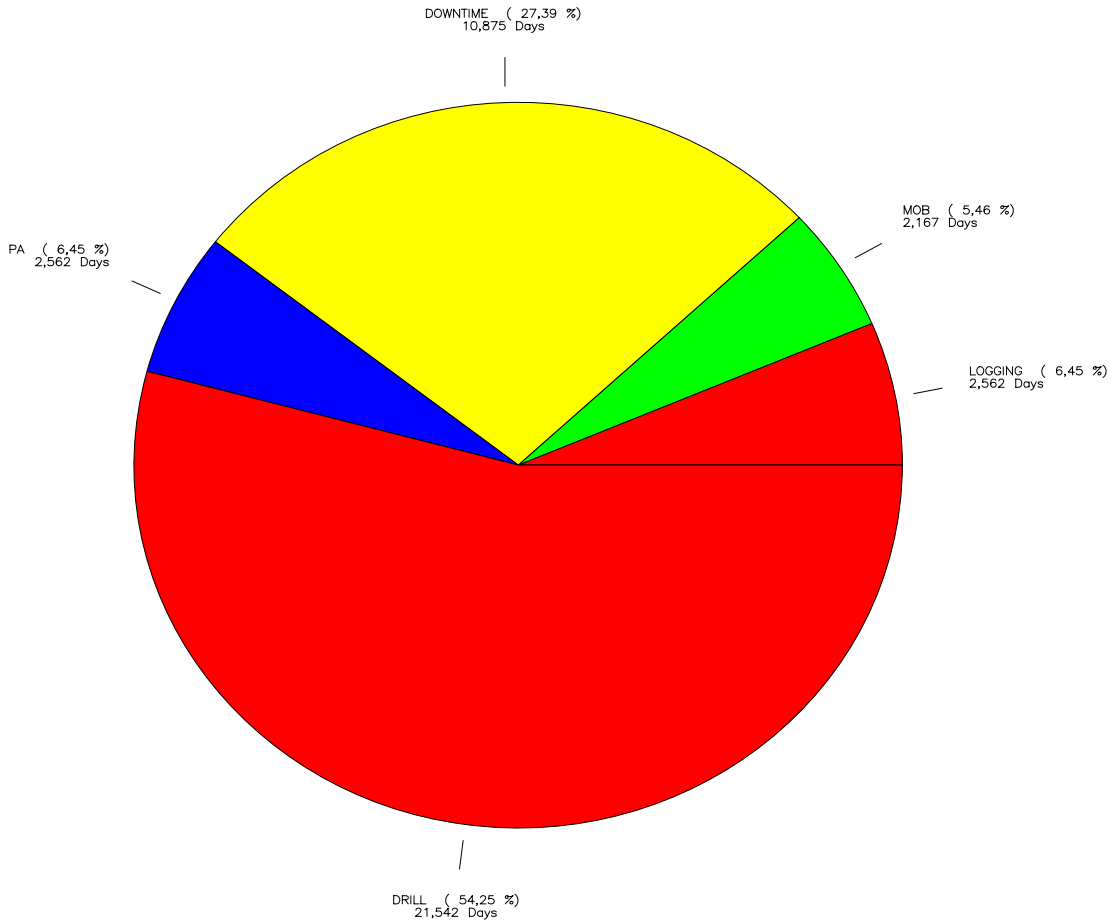
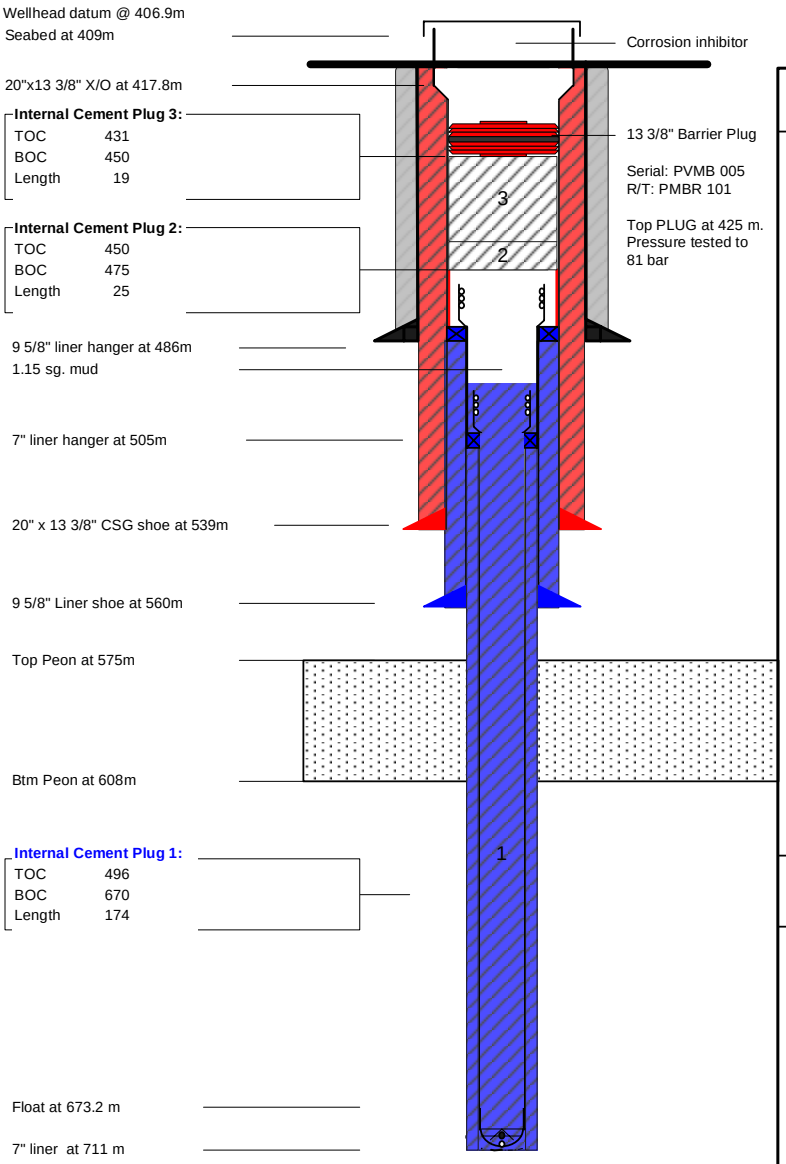


Figure 1		Time Distribution 35/2-1	**HYDRO**



	DESCRIPTION OF BARRIER ELEMENTS	MONITORING OF BARRIER ELEMENTS
BARRIER # 1	Internal Cement plug Cement plug (shoetrack) Casing cement (gas tight) 9 5/8" liner 7 " Casing (reservoir liner)	N/A after initial acceptance

	DESCRIPTION OF BARRIER ELEMENTS	MONITORING OF BARRIER ELEMENTS
BARRIER # 2	Mechanical barrier plug Casing cement 20 x 13 3/8" Casing	N/A after initial acceptance

NOTE: All depths refer to Deepsea Trym RKB 25 m above MSL

2005-08-29	P&A Program - 35/2-1 Peon Long Term Abandonment	REV 1