

FINAL DRILLING REPORT
VALKYRIE 1
Licence no: PL128
Well: NO 6608/11-5

Title: FINAL DRILLING REPORT Valkyrie 1 Licence no: PL128 Well: NO 6608/11-5		
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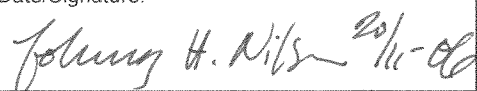
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1 General well data

Licence number: PL128
 Well name: Valkyrie 1; 6608/11-5
 Type of well: Exploration, wildcat
 Water depth / airgap: 342 m MSL / 22 m RT
 Primary objective: Prove oil in the Lower Jurassic Åre 1 Formation, Båt Group and Triassic Grey Beds.
 TD well is 2252 m

Section	Start time	End time	Rig name
NO 6608/11-5 MOVE	12.06.2006 06:30	18.06.2006 08:30	OCEAN VANGUARD
NO 6608/11-5 36"	18.06.2006 08:30	21.06.2006 03:30	OCEAN VANGUARD
NO 6608/11-5 12 1/4"	21.06.2006 03:30	27.06.2006 01:30	OCEAN VANGUARD
NO 6608/11-5 8 1/2"	27.06.2006 01:30	07.07.2006 11:00	OCEAN VANGUARD
NO 6608/11-5 PERM P&A	07.07.2006 11:00	15.07.2006 23:30	OCEAN VANGUARD

Geographical coordinates (surface) :

66deg. 11' 09.57" N Datum : ED50
 08deg. 28' 50.39 E Spheriode : INT.1924

UTM coordinates :

7 340 924.8 mN UTM zone : 32
 476 600 mE C.M. 09 deg. E

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2 Exemption data

Exception from	Report no	Date	Title
NPD	None		
WR	None		
Drilling program	None		

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

3.1 RUH

Type (colour code)	Synergi code	Number of
Yellow	3	1
Green	4	1
Green	5	3
Sum		5

3.1.1 RUH details

WELLBORE: NO 6608/11-5

Synergi no	Hazard	Description
396193	3	Synergi 396193 (Closed) - 18.06.2006 - Accident - Dislocated left shoulder The Deck crew were assisting the Sub Sea department with re-installing a ram block for the BOP stack. The ram block was being lowered down through the roof of the BOP house. The IP was looking up at the load, he then stepped back, and stood on a hose which was laying on the deck. The IP fell backwards, his left hand breaking his fall. When the IP pushed himself upright he felt a sharp pain in his shoulder.
399276	4	Synergi 399276 (Closed) - 07.07.2006 - Accident - Laceration to left hand middle finger Laceration to left hand middle finger. Whilst closing Geoservices sliding door I/P accidentally closed door on left hand middle finger
396402	5	Synergi 396402 (Closed) - 15.06.2006 - Condition - Potential Dropped Object Noticed bolts in bolt storage area in port 2 column that were close to the hatch. With rig motion the bolts could have fallen to the lower level. Moved the bolts to a more secure place.
396541	5	Synergi 396541 (Closed) - 14.06.2006 - Condition - Big bolt rolling around on BOP While working in the moonpool area I observed a big bolt rolling around on the BOP with the potential to fall.
396546	5	Synergi 396546 (Closed) - 08.06.2006 - Condition - Loose dogcollar on top of pipe bundle When lifting an spaghetti bundle from starboard pipedock a roustabout discovered a loose dogcollar lying on top of bundle.

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3.2 Experience listing

Subject:	Conductor landed on cuttings heap 1m above seabed before we took weight running in with the conductor		
Section:	NO 6608/11-5, 36"		
Rep date:	20.06.2006		
Keywords:	DRILLING		
Downtime:	Pot time improvements:		
Comp inv:	Statoil		
References:			
Synergi no:	Cost:		
Synergi title:			

Description:

When running in with the 30" conductor we landed the PGB on the cuttings heap 1 m above seabed, without getting any indications on the weight gauge that we had tagged bottom with the shoe. It was planned for a 3 m stick-up. Seabed was found to be 364.5 m when spudding the well. The conductor was 50.5 m, so the 36" hole opener was drilled to 412 m.

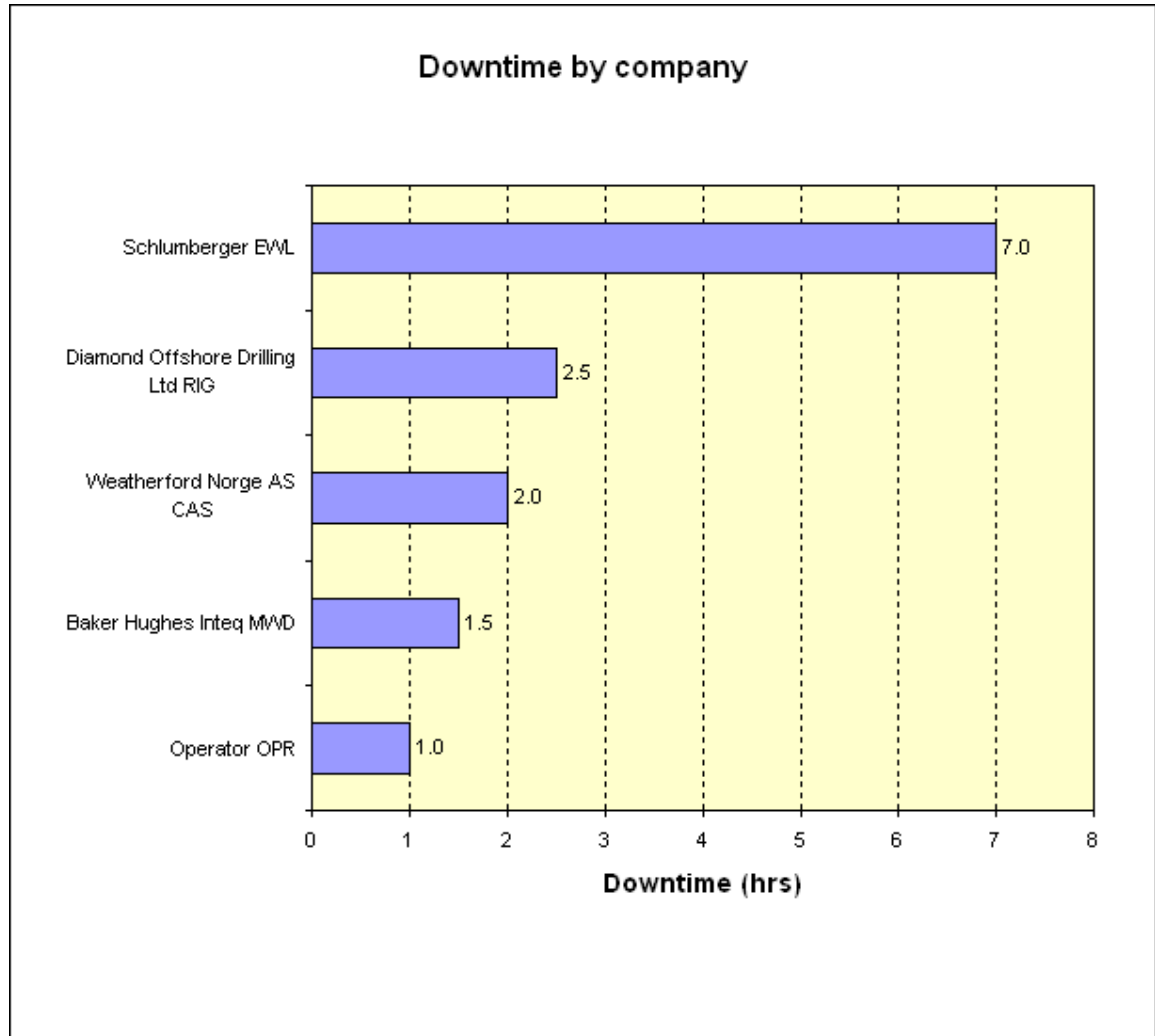
Immediate solution:

Picked up string 2 m to give 3 m stick-up. Tensioned up/slacked off guidewires in attempt to improve bullseye readings. Cemented 30" conductor in tension. WOC for 7 hrs before backing out running tool. Bullseye readings : 1 deg. and 2m stick-up

Future recommended solution:

Planned 3 m stick-up on 30" conductor. LET OPR to decide on best practice on how to place 30" conductor (26" / 36" hole) and releasing (RT) procedures

3.3 Incidents by service and company



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SERVICE COMPANY: Casing Crew Service CAS Weatherford Norge AS
WELLBORE: NO 6608/11-5

Incident start time	Failure code	Synergi no	Title	Quality cost		Downtime		
				NOK	NOK/d	Total hrs	Comp share %	Comp share hrs
23.06.2006 00:00:00	CAS-03 Procedure not followed	396860	Started to run casing with manual elevators (backup) and changed to automatic elevators when we got those from other rig.	71000	1704000	1,0	100	1,0
23.06.2006 06:00:00	CAS-E03 Hydraulic operated tongs	397120	Had to stop running casing due to wrong alignment on PowerScope and problem with backup door on casing tong.	71000	1704000	1,0	100	1,0
			Total	142000				2,0

SERVICE COMPANY: Electric Wireline Logging EWL Schlumberger
WELLBORE: NO 6608/11-5

Incident start time	Failure code	Synergi no	Title	Quality cost		Downtime		
				NOK	NOK/d	Total hrs	Comp share %	Comp share hrs
30.06.2006 20:30:00	EWL-E05 Downhole electronic	398253	VSP logging string	142000	1704000	2,0	100	2,0
01.07.2006 18:30:00	EWL-E03 Acquisition/Computers	398318	Schlumberger e-line, data transfer problems	284000	6816000	1,0	100	1,0
01.07.2006 21:30:00	EWL-E03 Acquisition/Computers	398318	Schlumberger e-line, data transfer problems	284000	3408000	2,0	100	2,0
02.07.2006 01:30:01	EWL-E03 Acquisition/Computers	398318	Schlumberger e-line, data transfer problems	284000	6816000	1,0	100	1,0
06.07.2006 00:30:00	EWL-E06 D/H Mechanical equipment	399048	MDT logging string. Negative to set isolation packer.	71000	1704000	1,0	100	1,0
			Total	1065000				7,0

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SERVICE COMPANY: Measurement While Drilling MWD Baker Hughes Inteq
WELLBORE: NO 6608/11-5

Incident start time	Failure code	Synergi no	Title	Quality cost		Downtime		
				NOK	NOK/d	Total hrs	Comp share %	Comp share hrs
21.06.2006 06:00:00	MWD-03 Procedure not followed	396651	Not able to decode MWD signal	142000	2272000	1,5	100	1,5
			Total	142000				1,5

SERVICE COMPANY: Operator OPR Operator
WELLBORE: NO 6608/11-5

Incident start time	Failure code	Synergi no	Title	Quality cost		Downtime		
				NOK	NOK/d	Total hrs	Comp share %	Comp share hrs
02.07.2006 22:00:00	DRF-05 Stuck pipe	398506	Stuck MDT logging toolstring at 1697 m	71000	1704000	1,0	100	1,0
			Total	71000				1,0

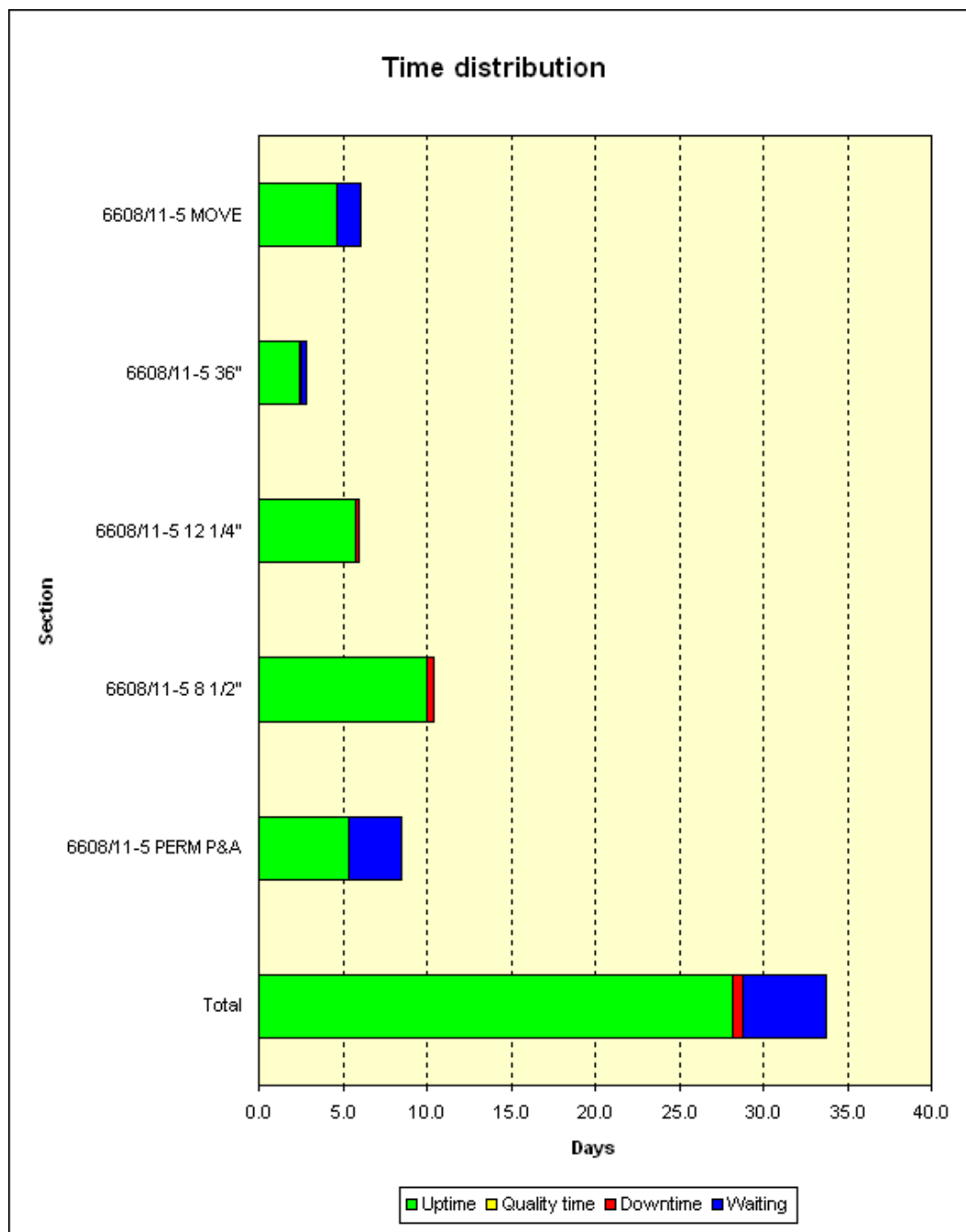
SERVICE COMPANY: Rig Operations RIG Diamond Offshore Drilling Ltd
WELLBORE: NO 6608/11-5

Incident start time	Failure code	Synergi no	Title	Quality cost		Downtime		
				NOK	NOK/d	Total hrs	Comp share %	Comp share hrs
03.07.2006 17:30:00	RIG-E09 Electric power system	398716	Unable to assign power to draw work	177500	2130000	2,0	100	2,0
10.07.2006 00:00:00	RIG-E386 Riser handling	399564	Pulling BOP and riser. Observed flow on BOP panel	35500	1704000	0,5	100	0,5
			Total	213000				2,5

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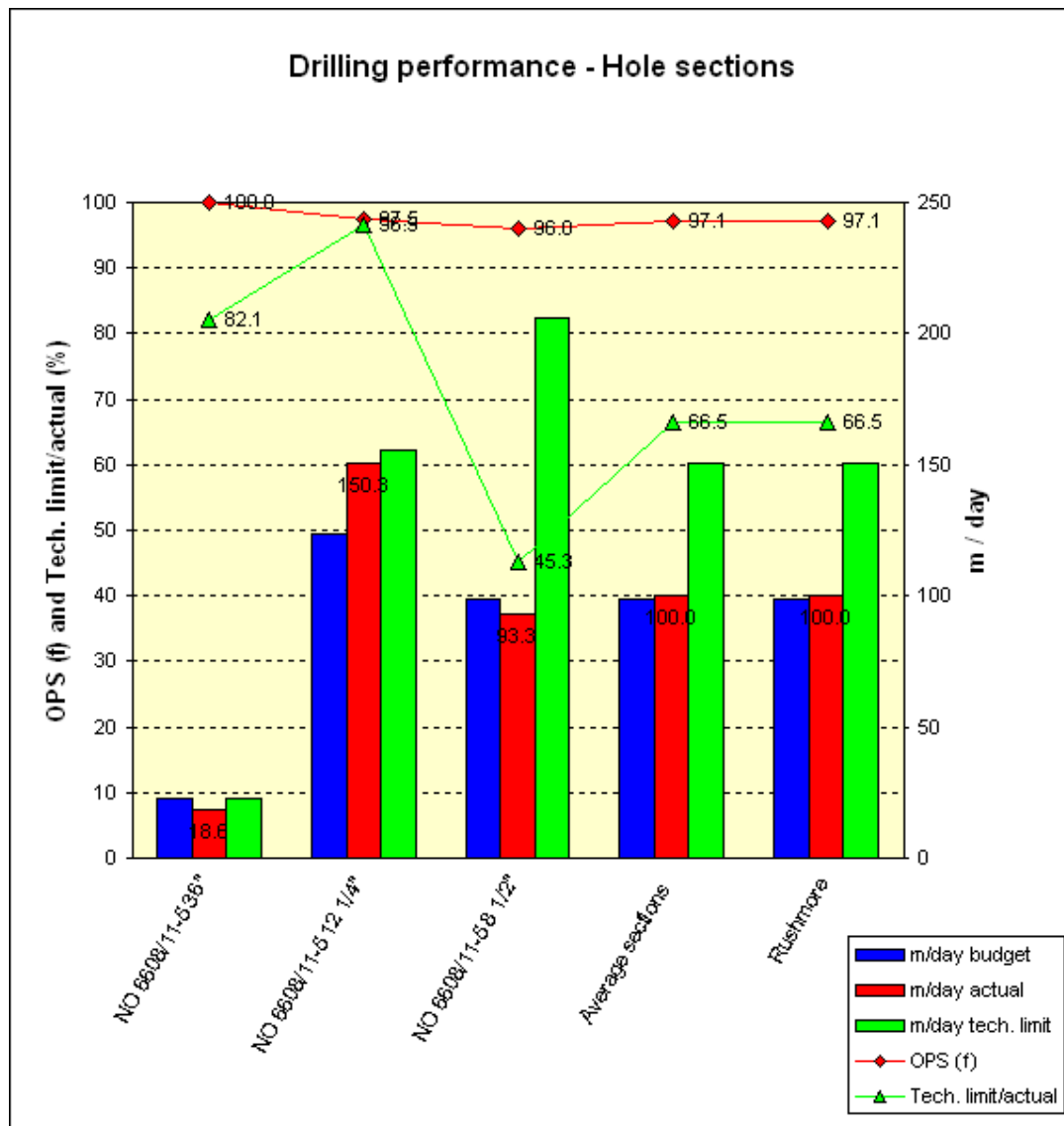
3.4 Time distribution

Section	Start time	Length m	Budget		TL		Actual		Ops (f)
			hrs	days	hrs	days	hrs	days	
NO 6608/11-5 MOVE	12.06.2006 06:30	364,0	115,0	4,8	127,0	5,3	146,0	6,1	100,0
NO 6608/11-5 36"	18.06.2006 08:30	52,0	55,0	2,3	55,0	2,3	67,0	2,8	100,0
NO 6608/11-5 12 1/4"	21.06.2006 03:30	889,0	173,0	7,2	137,0	5,7	142,0	5,9	97,5
NO 6608/11-5 8 1/2"	27.06.2006 01:30	970,0	235,0	9,8	113,0	4,7	249,5	10,4	96,0
NO 6608/11-5 PERM P&A	07.07.2006 11:00	0,0	129,0	5,4	177,0	7,4	204,5	8,5	99,6
Sum			707,0	29,5	609,0	25,4	809,0	33,7	



The graph above is based on the following details:

Section	Downtime	Uptime	Quality time	Waiting time	Total time
6608/11-5 MOVE	0,0	4,6	0,0	1,4	6,1
6608/11-5 36"	0,0	2,4	0,1	0,3	2,8
6608/11-5 12 1/4"	0,1	5,8	0,0	0,0	5,9
6608/11-5 8 1/2"	0,4	10,0	0,0	0,0	10,4
6608/11-5 PERM P&A	0,0	5,3	0,0	3,2	8,5
Total	0,6	28,2	0,1	4,9	33,7



3.5 Cost

Project kind	WBS	Currency	Budget	Actual cost
Drilling and P&A	T.O128A.AP.21320 / 330	NOK		
Planning	T.O128A.AP.21310	NOK		
Total				

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4 Activity highlights

4.1 NO 6608/11-5, MOVE (12.06.2006 06:30)

START: 12.06.2006 06:30 0 mMD
END : 18.06.2006 08:30 364 mMD

OBJECTIVE

Move rig from Apollo location to Valkyrie 1 location.

SUMMARY

The rig was handed over from the Apollo project to the Valkyrie 1 project at 06:30 hrs on the 12 June 2006. The distance of 355 Nm to Valkyrie 1 location was made in 65,5 hrs given an average transit speed of 5,4 knots. WOW for 34,5 hrs prior to running anchors. Ran and set anchors, cross tensioned same and de-ballasting rig to operational draft in 24 hrs.

Final spud-in position for Valkyrie 1 was :
Geographical coordinates
66deg. 11' 09.57" N Datum : ED50
08deg. 28' 50.57" E Spheriode : INT.1924

UTM coordinates
7 340 924.8 mN UTM zone : 32
476 600 mE C.M. 09 deg. E

4.2 NO 6608/11-5, 36" (18.06.2006 08:30)

START: 18.06.2006 08:30 364 mMD
END : 21.06.2006 03:30 416 mMD

OBJECTIVE

Drill 36" top hole from seabed to 412 m. Run and cement 30" conductor with 3,0 m stick up. Release conductor running tool directly after cementing.

SUMMARY

RIH and tagged seabed with 1 ton weight at 364 m RT without pumping and with no rotation.
The 36" section was drilled in 30 hrs, 1,8 m/hr. Problems with high angle/boulders.
Drilled 36" hole to 371 m ; WOB 0-5 T, 1000 lpm and 40-50 RPM. Survey : depth 361 m - 0,5 deg.
Drilled 36" hole to 383 m ; WOB 5-10 T, 4400 lpm and 80-100 RPM. Survey : depth 371 m - 1,75 deg.
Drilled 36" hole to 386 m ; WOB 3 T, 3100 lpm and 60-150 RPM. Survey : depth 375 m - 0,5 deg. (Mud pump #2 down)
Drilled 36" hole to 400 m ; WOB 3-8 T, 4100 lpm and 150-160 RPM. Survey : depth 379 m - 1 deg. , depth 390 m - 2 deg.
Pumped 5 m3 hi-vis pill every single. Reamed hole for 1,5 hrs in attempt to lose angle. Survey : depth 390 m - 1,5 deg.
Drilled 36" hole to 412 m (17 1/2" hole at 416 m) ; WOB 3-5 T, 4500 lpm and 120-160 RPM. Survey : depth 395 m - 1,75 deg. , depth 400 m - 1,5 deg. and depth 406 m - 1,75 deg.
Circulated hole clean and displaced hole to 1,35 sg mud. POOH.
Run 4 joints (50,45 m) of 30" X-52 conductor.
PGB / 30" conductor was held in tension while cementing (WOC for 7 hours) to ensure low angle on PGB (1 deg) and 2 m stick-up (plan was 3 m stick-up). The 30" conductor was not set on bottom, 36" hole. 30" con. shoe at 410 m.
RIH with 12 1/4" BHA. Drilled hard cement from 406 to 412 m and easily reamed to bottom at 416 m.
Reamed through shoe and rathole several times, no resistance seen.

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BIT RUNS

Section drilled with 1 bit run. BHA consisted of 17 1/2" bit and 26" x 36" HO from Odfjell. As directional service a Anderdrift tool was run. Surveys varied within same station but was in section between 0.5 - 2 deg. Due to boulders the section was not reamed.

DRILLING FLUID

The section was drilled with SW and CMC sweeps. The hole was displaced to WBM with 1.35 sg MW before pulling out prior to running 30" conductor.

CASING

4 joints (50,45 m) of 30" X-52 conductor was run.

MWD/BHA

A Anderdrift tool was used as survey tool and worked ok.

CEMENTING

A 1,52 sg Tune-Light slurry was used to cement 30" conductor, 300 % excess of OH volume. PGB / 30" conductor was held in tension for 7 hours to ensure low angle on PGB (1 deg) and 2 m stick-up (plan was 3 m stick-up). The 30" conductor was not set on bottom, 36" hole.

LOGGING

N/A

4.3 NO 6608/11-5, 12 1/4" (21.06.2006 03:30)

START: 21.06.2006 03:30 416 mMD

END : 27.06.2006 01:30 1305 mMD

OBJECTIVE

The objective for the 12 1/4" section was to place the 9 5/8" casing shoe at sufficient depth (1300 m) to provide formation integrity to be able to drill 8 1/2" hole into the possible reservoir.

SUMMARY

Drilled 12 1/4" hole from 416 to 428 m with restricted RPM until all stabilizers in open hole.

Drilling parameters : WOB 3-5 ton, 60-80 RPM and flow 3000 lpm.

At 550 m unable to get good survey data from Baker MWD tool. 1,5 hrs were spent on rigging up Baker pressure skid to standpipe manifold and tested out same for good survey data.

The 12 1/4" section was drilled to 1305 mMD into Naust formation. No boulders were experienced.

Drilling parameters: WOB 5-15 ton, 140-150 RPM and flow 3000-3500 lpm.

After drilled to 1305 m, section TD, the well was displaced to 1.35 sg WBM prior to running casing. The casing was run and cemented, shoe at 1299 m. Took 20 ton weight at 1280 m, washed casing down to 1299 m.

Run / landed and locked BOP/Riser to 18 3/4" well head. Pressured tested connector / 9 5/8" casing to 172 bar against BSR. (all done in 43,5 hrs). New 8 1/2" BHA was made up and 5" DP was PU from deck while RIH. Taged cement at 1267 m.

Drilled cement, floate and shoe in 6 hrs. Drilling parameters : WOB 3-5 ton, 60-80 RPM and flow 1500-2000 lpm. An X-LOT was performed after exposure of 3 m new formation. LOT was logged to 1.57 sg EMW (as prognosed).

BIT RUNS

The section was drilled in 1 bitrun (29,2 m/hrs). A milled tooth tricone bit, Security DBS (EBXLC1) was used and did the job well. The bit was worn but drilled at good ROP. Grading : 5-3-WT-M-E-I-NO-TD. Drilled 4 m cement inside 30" conductor.

DRILLING FLUID

The section was drilled with seawater and CMC pills. At TD the well was cleaned with a CMC pill before it was displaced to 1.35 sg WBM prior to pulling out of hole to run casing.

CASING

A 9 5/8" casing with x-over to 20" casing joint (9 m) with 18 3/4" well head was run. The shoetrack was 27.3 m and the 5 lowermost joints had 1 centralizer installed on each joint. The casing was run without problems and the annulus displaced back to seawater before cementing.

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MWD/BHA

The MWD services was covered by the use of a Baker Hughes Inteq MPR Lite combination. A survey was taken after each stand with the exemption of the first 100 m below the 30" shoe. Problems with decoding of the signal caused this interval to be the maximal allowed by regulation. The problem was solved by downlinking and changing the transmission rate.

CEMENTING

The 9 5/8" casing was cemented with a lead and a tail slurry. The lead slurry volume included 50% open hole excess. The tail slurry was 15 m3 (as best practice). The plug in the float collar was bumped and no backflow was confirmed before the running tool was released. When drilling shoetrack top of cement was confirmed at 1267 m (we had 500 l cement behind the plug). The cement was very hard the upper 5 m but was drilled with good ROP from there to shoe. The plugs were drilled without any problems.

LOGGING

The LWD consisted of GR and resistivity tools (Ontrak). Annulus pressure while drilling was also pulsed up real-time.

4.4 NO 6608/11-5, 8 1/2" (27.06.2006 01:30)

START: 27.06.2006 01:30 1300 mMD

END : 07.07.2006 11:00 2270 mMD

OBJECTIVE

The objective for the 8 1/2" section was to penetrate Åre fm (primary objective) and possible sandstone below Triassic evaporates (secondary objective).

SUMMARY

Drilled off from 1308 m with good ROP (30 - 50 m/hr). Drilling parameters : WOB 3-5 ton, flow 2500 lpm, 150 rpm and torque 4-7 kNm.

Limited ROP to 20 m/hr from 1400 m due to sampling/picking coring point at 1559 m. Top Åre at 1552 m.

Cut one core from 1559 m to 1574 m, core jammed off. Drilling (coring) parameters : 900 lpm, 90 -110 rpm and 2-6 ton WOB.

Circulated hole clean at 1200 lpm and flowchecked at TD. POOH, got 12,8 m core, 85,3 % recovery.

RIH with same drilling bit and BHA (Baker).Reamed and logged cored intervall. Drilled from 1574 m to 1900 m with limited ROP to 20 m/hr due to sampling/picking coring point. Drilling parameters : 2500 lpm, 140 -160 rpm, 3-10 ton WOB and ECD 1,43-1,45 sg. Flowchecked and POOH.

Had some tight spots from 1787 to 1654 m and from 1594 to 1561m, worked through tight spots and cleared before pulling out of hole. Laid down Baker BHA.

El wireline logging :

1. run : VSP-GR (Total time 13 hrs, 2 hrs down time ; laid out two geophones)
2. run : PEX-HRLA-CMR-ECS (Total time 24 hrs, 4 hrs down time ; data transfer problems/computer problems/rebooted computer. 10 hrs were spent on preparing and rigging up toolstring)
3. run : MDT-GR (Total time 22 hrs, 1 hrs down time ; stuck MDT toolstring at 1697 m, worked same free. 5 hrs were spent on preparing and rigging up MDT toolstring)
4. run : DSI-FMI (Total time 10 hrs, 2 hrs were spent on preparing and rigging up DSI-FMI toolstring)

RIH with new 8 1/2" bit and new BHA/MWD (PERISCOPE/TELESCOPE) from Schlumberger. Worked through tight spots from 1550 to 1560 m, at 1630 and at 1670 m, no pumping. Max 40 tons. Washed down through tight spots from 1760 to 1770 m.

Drilled from 1900 to 2270 m (TD) with limited ROP to 20 m/hr due to sampling/picking coring point. Drilling parameters : WOB 1-8 ton, flow 2500 lpm, 140-160 rpm, ECD 1,43-1,45 sg. Flowchecked and circulated bottom up at 2172 m, no gas at bottom up. At TD flowchecked, circulated hole clean and POOH. Worked (rotated and circulated) BHA through tight area from 1963 to 1955 m, top of evaporites.

El wireline logging :

5. run : MDT-GR (Total time 15,5 hrs, 1 hrs down time ; packer inflation, no pressure increase in packer. Negative to recover samples at 1554 m. POOH due to plugged lines in MDT tool.)
- 11 hrs were spent on redressing and reconfigured MDT logging tool assembly before run 6.
6. run : MDT-GR (Total time 11 hrs, aborted attempts for HC and water sampling due to dual packer damage and probe plugging)

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BIT RUNS

The 8 1/2" section from 9 5/8" casing shoe to 2270 m was drilled with two bits (FM2665, M323, Security DBS) and one coring bit.

The upper part of the section to 1559 m and from 1574 to 1900 m was drilled with BHI assembly. It consisted of corefinder (nearbit GR) and Annulus pressure sensor. Slightly behind a resistivity tool was run together with MWD (D&I sensors). 2 stands of 6 1/2" DC below and 1 stand 6 1/2" DC above the jar.

The same bit was run to 1559 m and from 1574 to 1900 m, the grading of the bit after drilled to 1900 m was : 2-2-BT-A-X-I-WT-TD

Cut one core from 1559 m to 1574 m, core jammed off. Drilling parameters : 900 lpm, 90 -110 rpm and 2-6 ton WOB.

Circulated hole clean at 1200 lpm and flowchecked at TD. POOH, got 12,8 m core, 85,3 % recovery.

0-0-NO-A-X-I-TD, no wear on bit at all

DRILLING FLUID

The well was displaced to low sulphate KCl mud (Glydril 99% KCl) after performing the X-LOT operation without any problems. Tracer was added (Tritium) from the start. All seawater taps in pumproom was locked off and secured as the mud would be contaminated with seawater. The mudweight was 1.30 sg from start and throughout the section.

CASING

Option 7" liner.

No 7" liner was run.

MWD/BHA

For the upper part of the section to 1900 m a Baker Hughes Inteq MPR Lite assembly was used. The assembly behaved well. When pumping 2000 lpm or more the decoding was good.

For the lower part of the section, from 1900 to 2270 m, a new Schlumberger Periscope / Telescope assembly was used.

CEMENTING

Option 7" liner else P&A.

No 7" liner was run/cemented.

LOGGING

Dry hole logging suite: PEXlite- DSI, MDT-GR (pressure points) and VSP (zero offset).

HC logging suite: PEX-HRLA-HNGS-DSI-ECS, MDT-GR (pressure points and samples), FMI-CMR, more MDT, VSP, even more MDT, MSCT and finally if we are not satisfied more MDT.

At 1900 m (planned depth 1732 m) the following logging program was run :

1. run : VSP-GR (Total time 13 hrs, 2 hrs down time ; laid out two of four geophones)
2. run : PEX-HRLA-CMR-ECS (Total time 24 hrs, 4 hrs down time ; data transfer problems/computer problems/rebooted computer. 10 hrs were spent on preparing and rigging up toolstring)
3. run : MDT-GR (Total time 22 hrs, 1 hrs down time ; stuck MDT toolstring at 1697 m, worked same free. 5 hrs were spent on preparing and rigging up MDT toolstring)
4. run : DSI-FMI (Total time 10 hrs, 2 hrs were spent on preparing and rigging up DIS-FMI toolstring))

At 2270 m (planned depth 2252 m) the following logging program was run :

5. run : MDT-GR (Total time 15,5 hrs, 1 hrs down time ; packer inflation, no pressure increase in packer. Negative to recover samples at 1554 m. POOH due to plugged lines in MDT tool.)
- 11 hrs were spent on redressing and reconfigured MDT logging tool assembly before run 6.
6. run : MDT-GR (Total time 11 hrs, aborted attempts for HC and water sampling due to dual packer damage and probe plugging)

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4.5 NO 6608/11-5, PERM P&A (07.07.2006 11:00)

START: 07.07.2006 11:00 2270 mMD

END : 15.07.2006 23:30 2270 mMD

OBJECTIVE

Permanent P&A the Valkyrie 1 well

SUMMARY

RIH with 290 m (30 joints, open ended) 3 1/2" DP and 920 m 5" DP on 5 1/2" DP to 2270 m (TD). Set cement plug #1, #2, #3 and #4 from 2270 m to 1180 m, all cement plugs 11 m3 1,90 sg. 8 m3 spacer were pumped with rig pumps before each 11 m3 cement slurry. (9 5/8" casing shoe at 1299 m). POOH, washed area from 610 to 590 m. WOC for 15 hrs, meanwhile laid down 3 1/2", 5" and 5 1/2" DP. Pressure tested plug #4 to 110 bar/ 1,30 sg mud.

Installed 9 5/8" EZSV(as bridge plug) at 603 m. Weight and pressure tested EZSV to 5 ton/110 bar. Displaced well to seawater.

Set cement plug #5 on top of EZSV, from 600 m to 385 m, 7,9 m3 1,95 sg. Pulled above cement plug to 375 m, dropped two sponge balls and circulated hole volume. POOH.

RIH with jet sub and wearbushing retrieving assembly, washed BOP and wellhead area, pulled 9 5/8" WB.

Pulled riser and BOP to surface.

Ran in hole 20" x 30" cutting assembly and MOST tool. Cut 20" casing joint / 30" conductor at 369 m (5 m below sea bed) and retrieved BHA & casing cut to surface. Released 30" housing from PBG in moonpool. Pulled 30"/18 3/4" WH to drillfloor with use of 18 3/4" WHRT.

ROV performed seabed survey.

5 Formation evaluation

5.1 Coring summary

WELLBORE ID: NO 6608/11-5

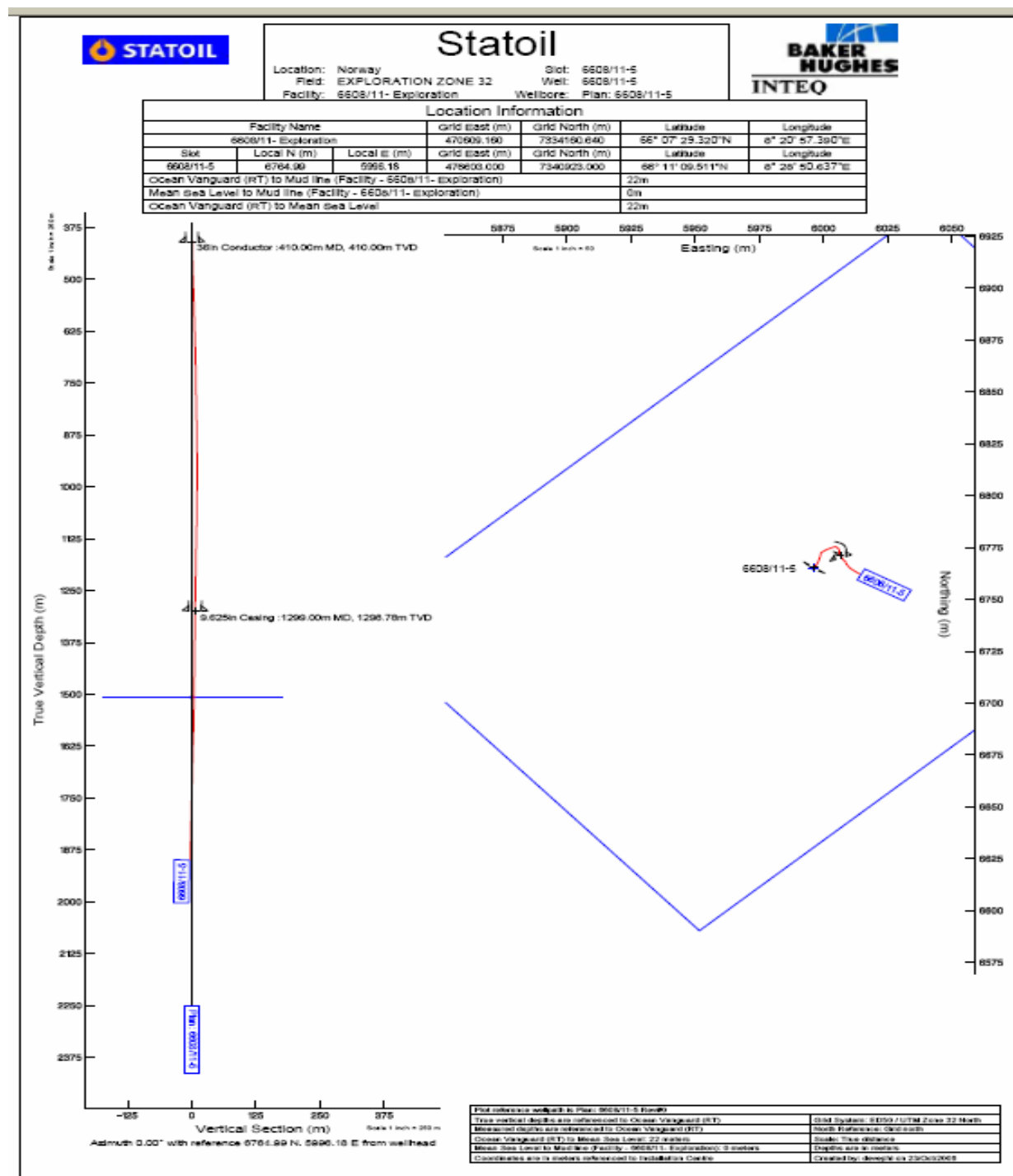
Cored interval m MD	m	Rec %	Cbbl length m	Core Head type	ROP m/hr	RPM	LPM	Remarks
1559 / 1574	12,8	85,3	18,8	CT103 M623	5	90-110	900	Core jammed off at 1574 m

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6 **Appendix 1: Directional data**

Directional plot and survey listing.

Well plot



STATOIL - Norway

EXPLORATION - UTM Zone 32

6608/11-5

6608/11-5

5

Design: 5

Standard Survey Report

, 08 januar, 2007

Statoil
Survey Report

Company: STATOIL - Norway
Project: EXPLORATION - UTM Zone 32
Site: 6608/11-5
Well: 6608/11-5
Wellbore: 5
Design: 5

Local Co-ordinate Reference: Site 6608/11-5
TVD Reference: WELL @ 22,00m (Ocean Vanguard)
MD Reference: WELL @ 22,00m (Ocean Vanguard)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM Oracle

Project	EXPLORATION - UTM Zone 32, Norway					
Map System:	Universal Transverse Mercator		System Datum:		Mean Sea Level	
Geo Datum:	European 1950 - Mean		Using Well Reference Point			
Map Zone:	Zone 32N (6 E to 12 E)		Using geodetic scale factor			
Site	6608/11-5, 6608/11-5					
Site Position:		Northing:	7 340 923,00 m		Latitude:	66° 11' 9,511 N
From:	Lat/Long	Easting:	476 603,00 m		Longitude:	8° 28' 50,637 E
Position Uncertainty:		0,00 m	Slot Radius:	in	Grid Convergence:	-0,48 °

Well	6608/11-5					
Well Position	+N/-S	0,00 m	Northing:	7 340 923,00 m	Latitude:	66° 11' 9,511 N
	+E/-W	0,00 m	Easting:	476 603,00 m	Longitude:	8° 28' 50,637 E
Position Uncertainty		0,00 m	Wellhead Depth:	342,00 m	Water Depth:	342,00 m

Wellbore	5					
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)	
	GEOMAGNETICR	21.12.2006	0,12	76,21	52 057	

Design	5				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	386,00
Vertical Section:	Depth From (TVD) (m)	+N/-S (m)	+E/-W (m)	Direction (°)	
	386,00	0,00	0,00	58,68	

Survey Program	Date	05.01.2007			
From (m)	To (m)	Survey (Wellbore)	Tool Name	Description	
448,90	1 279,80	12 1/4" BHI MWD (5)	Magnetic, std, mag-corr	Magnetic Tools (MWD, EMS)	
1 900,80	2 255,05	8 1/2" SLB (5)	Magnetic, std, mag-corr	Magnetic Tools (MWD, EMS)	

Survey

Measured Depth (m)	Inclination (°)	Azimuth (°)	Vertical Depth (m)	+N/-S (m)	+E/-W (m)	Vertical Section (m)	Dogleg Rate (°/30m)	Build Rate (°/30m)	Turn Rate (°/30m)
386,00	0,00	0,00	386,00	0,00	0,00	0,00	0,000	0.00	0.00
448,90	1,75	33,84	448,89	0,80	0,53	0,87	0,835	0.83	0.00
536,30	1,62	18,70	536,25	3,08	1,67	3,03	0,159	-0.04	-5.20
564,80	1,73	15,67	564,74	3,87	1,92	3,65	0,149	0.12	-3.19
593,90	1,43	16,46	593,83	4,64	2,14	4,24	0,310	-0.31	0.81
622,10	1,31	13,75	622,02	5,29	2,32	4,73	0,145	-0.13	-2.88
650,60	1,43	10,22	650,51	5,96	2,46	5,20	0,154	0.13	-3.72
679,90	1,18	9,29	679,81	6,62	2,57	5,64	0,257	-0.26	-0.95
710,60	0,96	33,92	710,50	7,14	2,77	6,08	0,493	-0.21	24.07
738,70	1,57	52,00	738,59	7,58	3,20	6,67	0,771	0.65	19.30
767,50	1,26	56,76	767,38	7,99	3,78	7,38	0,345	-0.32	4.96
798,80	1,47	56,34	798,68	8,40	4,40	8,13	0,202	0.20	-0.40

08.01.2007 13:31:55

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COMPASS 2003.14 Build 65

Statoil Survey Report

Company:	STATOIL - Norway	Local Co-ordinate Reference:	Site 6608/11-5
Project:	EXPLORATION - UTM Zone 32	TVD Reference:	WELL @ 22,00m (Ocean Vanguard)
Site:	6608/11-5	MD Reference:	WELL @ 22,00m (Ocean Vanguard)
Well:	6608/11-5	North Reference:	Grid
Wellbore:	5	Survey Calculation Method:	Minimum Curvature
Design:	5	Database:	EDM Oracle

Survey

Measured Depth (m)	Inclination (°)	Azimuth (°)	Vertical Depth (m)	+N/-S (m)	+E/-W (m)	Vertical Section (m)	Dogleg Rate (°/30m)	Build Rate (°/30m)	Turn Rate (°/30m)
826,10	1,70	63,42	825,97	8,78	5,05	8,88	0,331	0.25	7.78
854,30	1,70	66,61	854,15	9,13	5,81	9,71	0,101	0.00	3.39
883,80	1,56	67,44	883,64	9,46	6,58	10,54	0,144	-0.14	0.84
912,90	1,24	62,44	912,73	9,76	7,23	11,25	0,353	-0.33	-5.15
941,60	0,92	72,19	941,43	9,97	7,72	11,78	0,385	-0.33	10.19
970,70	0,85	71,41	970,52	10,11	8,15	12,22	0,073	-0.07	-0.80
999,70	1,23	131,27	999,52	9,97	8,59	12,52	1,126	0.39	61.92
1 028,80	0,86	128,46	1 028,61	9,63	8,99	12,69	0,385	-0.38	-2.90
1 057,80	0,70	146,07	1 057,61	9,35	9,26	12,77	0,296	-0.17	18.22
1 086,80	0,91	136,50	1 086,61	9,04	9,52	12,83	0,257	0.22	-9.90
1 115,70	0,85	174,45	1 115,51	8,66	9,70	12,78	0,597	-0.06	39.39
1 144,70	1,07	169,38	1 144,50	8,18	9,77	12,60	0,244	0.23	-5.24
1 174,10	0,88	179,34	1 173,90	7,68	9,82	12,38	0,259	-0.19	10.16
1 202,70	0,96	196,13	1 202,49	7,23	9,76	12,10	0,294	0.08	17.61
1 231,80	0,97	159,07	1 231,59	6,77	9,78	11,87	0,632	0.01	-38.21

1 260,80	0,83	159,16	1 260,59	6,34	9,94	11,79	0,145	-0.14	0.09
1 279,80	0,70	138,09	1 279,59	6,13	10,07	11,78	0,486	-0.21	-33.27
1 900,80	1,97	120,70	1 900,41	-2,15	21,78	17,49	0,064	0.06	-0.84
1 931,31	1,99	117,78	1 930,90	-2,66	22,70	18,01	0,101	0.02	-2.87
1 960,55	2,10	111,39	1 960,12	-3,09	23,65	18,59	0,260	0.11	-6.56
1 989,01	2,30	106,86	1 988,56	-3,45	24,68	19,29	0,279	0.21	-4.78
2 017,76	2,32	99,97	2 017,28	-3,72	25,80	20,11	0,290	0.02	-7.19
2 046,58	2,27	101,43	2 046,08	-3,93	26,94	20,97	0,080	-0.05	1.52
2 074,76	2,35	106,43	2 074,24	-4,20	28,04	21,77	0,231	0.09	5.32
2 105,11	2,37	109,51	2 104,56	-4,59	29,23	22,58	0,127	0.02	3.04
2 134,59	2,34	108,13	2 134,02	-4,98	30,37	23,36	0,065	-0.03	-1.40
2 163,52	2,17	102,66	2 162,93	-5,29	31,47	24,14	0,284	-0.18	-5.67
2 191,79	2,18	101,21	2 191,18	-5,51	32,52	24,92	0,059	0.01	-1.54
2 220,52	2,15	92,01	2 219,89	-5,63	33,59	25,77	0,364	-0.03	-9.61
2 249,62	2,40	95,77	2 248,96	-5,71	34,75	26,71	0,300	0.26	3.88
2 255,05	2,34	93,69	2 254,39	-5,73	34,97	26,89	0,579	-0.33	-11.49

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7 Appendix 2: Operational experience

See : 3.2 Experience listing.

7.1 Appendix 2.1: Operational listing

WELLBORE ID: NO 6608/11-5

INTERVAL: MOVE

START TIME: 12.06.2006 06:30

END TIME: 18.06.2006 08:30

Report date	Description
13.06.2006	Rig on tow to location Valkyrie
14.06.2006	Rig on tow to location Valkyrie.
15.06.2006	Rig arrived at Valkyrie location and hove to awaiting suitable weather window to allow anchoring.
16.06.2006	Rig stood off Valkyrie location waiting on suitable weather window to anchor up.
17.06.2006	Waited until weather conditions abated sufficiently for anchoring to commence. Made final approach and anchored up on location. Cross tensioned anchors and commenced ballasting the rig down to operational draft.
18.06.2006	Completed ballasting rig to operational draft. Picked up and racked drill pipe. Picked up, made up and ran 36" BHA.

INTERVAL: 36"

START TIME: 18.06.2006 08:30

END TIME: 21.06.2006 03:30

Report date	Description
19.06.2006	Ran down with 36" BHA and tagged seabed. Drilled 36" hole from 364m to 401m.
20.06.2006	Drilled 36" hole to TD of 412m - 17 1/2" pilot to 416m. Swept and displaced well. POOH nad ran 30" conductor. Landed 30" conductor and prepared to cement.

INTERVAL: 12 1/4"

START TIME: 21.06.2006 03:30

END TIME: 27.06.2006 01:30

Report date	Description
21.06.2006	Cemented 30" conductor in place. Waited on cement. Released running tool and POOH. Laid out 36" BHA. Picked up 12 1/4" BHA and ran in well. Drilled out cement and shoe. Drilled new formation 416m 504m.
22.06.2006	Drilled 12 1/4" hole from 504 m to 1156 m.
23.06.2006	Drilled 12 1/4" hole to 1305m - section TD. Circulated and displaced well to 1.35 SG mud. POOH and racked BHA. Rigged up and ran 9 5/8" casing to 403 m.
24.06.2006	Run 9 5/8" casing. PU casing hanger. Land and lock casing hanger in well head. POOH with running tool. Jet wellhead and LD 12 1/4" BHA and cement head. Prepar for running BOP.
25.06.2006	Run BOP and riser.
26.06.2006	Run BOP on marin riser. Land and lock BOP stack to wellhead. Performed connection test against casing. LD BOP running equipment. PU and MU 8 1/2" BHA.

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INTERVAL: 8 1/2"

START TIME: 27.06.2006 01:30

END TIME: 07.07.2006 11:00

Report date	Description
27.06.2006	Drilled shoetrack and cleaned rate hole. Performed (X)LOT. Drilled 8 1/2" section.
28.06.2006	Drilled from 1373mMD to coring point at 1559mMD. Circulat hole clean and POOH. PU coring BHA.
29.06.2006	PU and MU coring assy and RIH. Cut core from 1559mMD to 1574mMD. POOH with coring assy. and laid out core. RIH 8 1/2" drilling BHA from derrick.
30.06.2006	Drilled 8 1/2" from 1573 mMD to 1870mMD
01.07.2006	Drilled to 1900mMD. POOH and rack back BHA. RU for wiring logging. RIH and logged VSP.
02.07.2006	Logged PEX-HRLA-CMR and ECS
03.07.2006	Logged MDT
04.07.2006	Logged FMI-DSI. Pick up 8 1/2" drilling BHA and RIH.
05.07.2006	Continued to run in hole to 1900mMD. Drilled from 1900mMD to 2231mMD wiht max. 20m/hr.
06.07.2006	Drilled to section TD at 2270mMD. Circulated hole clean and POOH. Laid down jar, MWD core barrel. RU and run MDT on wireline
07.07.2006	Attempt to sample with MDT. Unable to pump sample. POOH and redressed MDT tools and RIH for new samples.

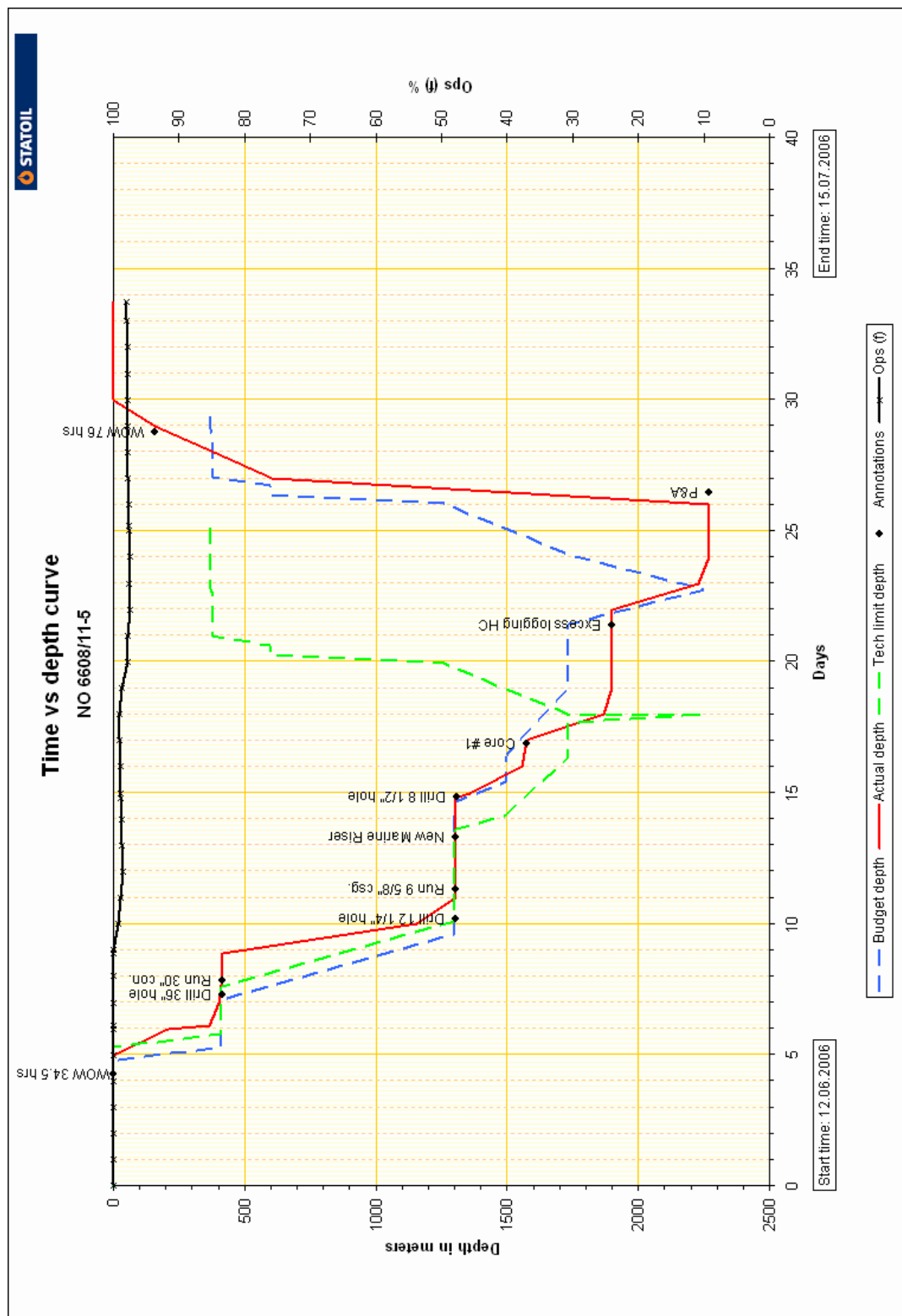
INTERVAL: PERM P&A

START TIME: 07.07.2006 11:00

END TIME: 15.07.2006 23:30

Report date	Description
08.07.2006	Finished MDT logging. RIH with cement stinger and plugged back well from 2270mMD to 1180mMD.
09.07.2006	POOH while L/D 5" DP and 3 1/2" DP, L/D 5 1/2" DP, Press tested cement plug to 110 bar, Ran and sat 9 5/8" EZSV at 603 m, Press tested plug to 110 bar, Displaced well to seawater, Set a cement plug from 600 to 385 m, Pulled to 375m, Circulated, POOH while L/D 5" DP.
10.07.2006	L/D 5" DP and 5 1/2" HWDP, RIH and washed BOP / WH, Retrieved 9 5/8" wearbushing, Prepared and pulled BOP.
11.07.2006	Pulled BOP on marine riser. Landed BOP on carrier. M/U MOST tool and RIH with same. Cut 20" x 30" casing. Pulled same to surface. Landed PGB in moonpool area. L/O MOST tool and M/U 18 3/4" WHRT. Enganged same to housing in moonpool. Released housing from PGB and L/O same together with WHRT. Moved PGB from moonpool area.
12.07.2006	Lay down excess tubulars from derrick. Waited on weather.
13.07.2006	Waited on weather prior to start deballasting and anchorhandling.
14.07.2006	Waited on weather prior to start deballasting and anchorhandling.
15.07.2006	WOW. Deballasted rig to transit draft. WOW for pulling anchors.

8.2 Time/depth curve



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8.3 Project planner

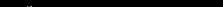
PROJECT NAME: Valkyrie 1 ; 6608/11-5

PROJECT NUMBER: T.O128A.MAIN

Start time	End time	Budget time hrs	Acc budget days	Tech limit hrs	Acc tech days	Plan time hrs	Act time hrs	Acc actual days	Down time	Description	Companies
12.06.2006 06:30	18.06.2006 08:30	115,0	4,8	127,0	5,3	127,0	146,0	6,1	0,0	MOVE [NO 6608/11-5]	
12.06.2006 06:30	16.06.2006 13:30	89,0	3,7	89,0	3,7	89,0	103,0	4,3	0,0	1 Transit Apollo to Valkyrie location (355 Nm)WOW 34,5 hrs	DODI
16.06.2006 13:30	17.06.2006 10:30	18,0	4,5	18,0	4,5	18,0	21,0	5,2	0,0	2 Anchor handling. Ballasting rig.	DODI
17.06.2006 10:30	18.06.2006 00:30	0,0	4,5	12,0	5,0	12,0	14,0	5,8	0,0	2a Pick up and rack 1300m of 5 1/2" drill pipe.	DODI
18.06.2006 00:30	18.06.2006 08:30	8,0	4,8	8,0	5,3	8,0	8,0	6,1	0,0	3 MU 36" BHA and RIH to seabed at 364 m	DODI,BHI,Ocean
18.06.2006 08:30	21.06.2006 03:30	55,0	2,3	55,0	2,3	61,0	67,0	2,8	0,0	36" [NO 6608/11-5]	
18.06.2006 08:30	19.06.2006 14:30	12,0	5,3	12,0	5,8	12,0	30,0	7,3	0,0	4 Drill 36" hole from 364 to 412 m (17 1/2" at 416 m)1,8 m/hr	BHI,DODI,Geo,MI,Ocean
19.06.2006 14:30	19.06.2006 16:00	4,0	5,5	4,0	6,0	4,0	1,5	7,4	0,0	5 Circulate hole clean and displace to 1,35 sg mud	BHI,DODI,Geo,MI,Ocean
19.06.2006 16:00	19.06.2006 20:30	5,0	5,7	5,0	6,2	5,0	4,5	7,6	0,0	6 POOH, top up hole with 1,35 sg mud. LD 36" BHA.	BHI,DODI,Geo,MI,Ocean
19.06.2006 20:30	20.06.2006 03:00	10,0	6,1	10,0	6,6	10,0	6,5	7,9	0,0	7 RU and run 30" conductor to seabed	DODI,DQ,Ocean
20.06.2006 03:00	20.06.2006 05:00	2,0	6,2	2,0	6,7	2,0	2,0	7,9	0,0	8 Stab in and land 30" conductor. 30" shoe at 410 m	DODI,DQ,Ocean
20.06.2006 05:00	20.06.2006 08:30	3,0	6,3	3,0	6,8	3,0	3,5	8,1	0,0	9 Circulate, pump and displace 1,52 sg Tuned light cement	DODI,Geo,Hall,MI,Ocean,DQ
20.06.2006 08:30	20.06.2006 15:30	0,0	6,3	0,0	6,8	6,0	7,0	8,4	0,0	10 OPTIONAL : WOC if required	
20.06.2006 15:30	20.06.2006 18:30	3,0	6,4	3,0	6,9	3,0	3,0	8,5	0,0	11 Release RT and wash 30" conductor housing. POOH	DODI,DQ,Ocean
20.06.2006 18:30	20.06.2006 22:00	4,0	6,6	4,0	7,1	4,0	3,5	8,6	0,0	12 MU cmt.stand and 18 3/4" WH housing	DODI,DQ,Hall
20.06.2006 22:00	21.06.2006 02:00	6,0	6,8	6,0	7,3	6,0	4,0	8,8	0,0	13 MU and RIH with 12 1/4" BHA to 406 m (top cement)	BHI,DODI,Ocean
21.06.2006 02:00	21.06.2006 03:30	6,0	7,1	6,0	7,6	6,0	1,5	8,9	0,0	14 Drill out and ream 30" conductor shoe (406-416 m)	BHI,DODI,Geo,MI,Ocean
21.06.2006 03:30	27.06.2006 01:30	173,0	7,2	137,0	5,7	169,0	142,0	5,9	3,5	12 1/4" [NO 6608/11-5]	
21.06.2006 03:30	22.06.2006 11:30	60,0	9,6	60,0	10,1	60,0	32,0	10,2	1,5	15 Drill 12 1/4" hole to 1305 m (ROP= 27,8 m/hr)	BHI,DODI,Geo,MI,Ocean
22.06.2006 11:30	22.06.2006 15:30	5,0	9,8	2,0	10,2	5,0	4,0	10,4	0,0	16 Circulate hole clean and displace to 1,35 sg mud	BHI,DODI,Geo,MI,Ocean
22.06.2006 15:30	22.06.2006 21:00	10,0	10,2	8,0	10,5	10,0	5,5	10,6	0,0	17 POOH, top up hole. Wash 30" con.housing. Rack BHA	BHI,DODI,Geo,MI,Ocean
22.06.2006 21:00	23.06.2006 15:00	32,0	11,5	1,0	10,5	32,0	18,0	11,4	2,0	18 RU and run 9 5/8" csg./18 3/4" WH housing on 5 1/2" DP	DODI,DQ,Geo,Ocean,Weath
23.06.2006 15:00	23.06.2006 21:00	5,0	11,7	5,0	10,7	5,0	6,0	11,6	0,0	19 Circulate, pump and displace cement	DODI,DQ,Geo,Hall,Ocean
23.06.2006 20:59	23.06.2006 21:00	0,0	11,7	0,0	10,7	0,0	0,0	11,6	0,0	20 OPTIONAL : WOC if required	

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Start time	End time	Budget time hrs	Acc budget days	Tech limit hrs	Acc tech days	Plan time hrs	Act time hrs	Acc actual days	Down time	Description	Companies
23.06.2006 21:00	24.06.2006 03:00	4,0	11,9	4,0	10,9	4,0	6,0	11,9	0,0	21 Release RT and wash 18 3/4" WH. POOH	DODI,DQ,Ocean
24.06.2006 03:00	25.06.2006 14:30	24,0	12,9	24,0	11,9	24,0	35,5	13,3	0,0	22 RU and run BOP/RISER	DODI,Ocean
25.06.2006 14:30	25.06.2006 16:30	4,0	13,1	4,0	12,1	4,0	2,0	13,4	0,0	23 Land, lock and test connector/9 5/8" csg. against BSR	DODI,Ocean
25.06.2006 16:30	25.06.2006 22:30	6,0	13,3	6,0	12,3	6,0	6,0	13,7	0,0	24 RD BOP landing joint and install diverter	DODI
25.06.2006 22:29	25.06.2006 22:30	4,0	13,5	4,0	12,5	0,0	0,0	13,7	0,0	25 Install HWB protector if not preinstalled (Done onshore)	DODI,DQ
25.06.2006 22:30	26.06.2006 16:00	10,0	13,9	10,0	12,9	10,0	17,5	14,4	0,0	26 MU/RIH with 8 1/2" BHA. Function test BOP on both pods	BHI,DODI,Geo,MI
26.06.2006 16:00	26.06.2006 23:00	6,0	14,2	6,0	13,2	6,0	7,0	14,7	0,0	27 Drill out shoe track and 3 m new formation	BHI,DODI,Geo,MI
26.06.2006 23:00	27.06.2006 01:30	3,0	14,3	3,0	13,3	3,0	2,5	14,8	0,0	28 Circulate hole clean,spot WBM pill on bottom. XLOT	BHI,DODI,Geo,MI
27.06.2006 01:30	07.07.2006 11:00	235,0	9,8	113,0	4,7	181,0	249,5	10,4	10,0	8 1/2" [NO 6608/11-5]	
27.06.2006 01:30	27.06.2006 03:00	8,0	14,6	8,0	13,6	8,0	1,5	14,9	0,0	29 Displace well to 1,30 sg low sulphate WBM	BHI,DODI,Geo,MI
27.06.2006 03:00	28.06.2006 04:00	19,0	15,4	12,0	14,1	12,0	25,0	15,9	0,0	30 Drill 8 1/2" hole to 1559m.(coring point)POOH,rack BHA	BHI,DODI,Geo,MI
28.06.2006 04:00	29.06.2006 04:00	24,0	16,4	0,0	14,1	20,0	24,0	16,9	0,0	30A OPTIONAL : Coring, 1559-1573 m (one core)	MI,DODI,BHI,Geo
29.06.2006 04:00	30.06.2006 19:30	60,0	18,9	53,0	16,3	33,0	39,5	18,5	0,0	30B: Continue drilling to 1900m.POOH,LD Baker BHA.	BHI,DODI,Geo,MI
30.06.2006 19:30	03.07.2006 16:30	60,0	21,4	32,0	17,7	52,0	69,0	21,4	7,0	31RU, perform wirelin logging. 4 runs	DODI,Geo,MI,Schlum
03.07.2006 16:30	05.07.2006 22:00	32,0	22,8	8,0	18,0	32,0	53,5	23,6	2,0	32 Continue drill to 2270m. POOH,LD Schlum.BHA & core brl.	DODI,Geo,MI,Schlum
05.07.2006 22:00	07.07.2006 11:00	32,0	24,1	0,0	18,0	24,0	37,0	25,2	1,0	33 Wireline logging: MDT for sample	Schlum
07.07.2006 11:00	15.07.2006 23:30	129,0	5,4	177,0	7,4	178,0	204,5	8,5	0,5	PERM P&A [NO 6608/11-5]	
07.07.2006 11:00	08.07.2006 18:30	48,0	26,1	48,0	20,0	36,0	31,5	26,5	0,0	34 RIH w/3 1/2"cem.stngr.Set 4 plugs 2270-1180. LD DP	DODI,Geo,Hall,MI
08.07.2006 18:30	08.07.2006 19:00	6,0	26,3	6,0	20,2	4,0	0,5	26,5	0,0	35 Test cmt to 70bar above LOT.	DODI,Geo,Hall,MI
08.07.2006 18:59	08.07.2006 19:00	0,0	26,3	0,0	20,2	0,0	0,0	26,5	0,0	36 OPTIONAL : WOC if required	
08.07.2006 19:00	09.07.2006 00:00	5,0	26,5	5,0	20,5	5,0	5,0	26,7	0,0	37 RIH w/ 9 5/8" EZSV on DP. set @ 603m. Press test.	DODI,Geo,Hall,MI
09.07.2006 00:00	09.07.2006 01:00	4,0	26,7	4,0	20,6	3,0	1,0	26,8	0,0	38 Displace well to SW.	DODI,Geo,MI
09.07.2006 01:00	09.07.2006 11:00	8,0	27,0	8,0	21,0	6,0	10,0	27,2	0,0	39 Set surface cem.plug 600 to 385 m. Wash BOP. POOH	DODI,Geo,Hall
09.07.2006 11:00	09.07.2006 14:30	2,0	27,1	2,0	21,0	2,0	3,5	27,3	0,0	40 Retrieve WB	DODI,DQ
09.07.2006 14:30	10.07.2006 16:00	24,0	28,1	24,0	22,0	18,0	25,5	28,4	0,5	41 Pull RISER and BOP	DODI,Ocean
10.07.2006 16:00	11.07.2006 02:00	12,0	28,6	12,0	22,5	12,0	10,0	28,8	0,0	42 RIH w/MOST cut assy. cut WH 5 m below seabed.POOH	DODI,Ocean,Weath
11.07.2006 02:00	11.07.2006 19:30	6,0	28,9	6,0	22,8	20,0	17,5	29,5	0,0	43 LD 18 3/4" WH and tubulars from derrick. Backload equip.	DODI,Ocean
11.07.2006 19:30	14.07.2006 11:30	0,0	28,9	48,0	24,8	48,0	64,0	32,2	0,0	43a Waiting on weather	DODI,Ocean
14.07.2006 11:30	15.07.2006 23:30	14,0	29,5	14,0	25,4	24,0	36,0	33,7	0,0	44Deballast rig and pull anchors. Insp.seabed w/ROV	DODI,Ocean

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8.4 Bit record

WELL: NO 6608/11-5

Run no	Bit size	Bit no	BHA no	Bit type	IADC code	Bit manufacturer
1	17 1/2"	1	1	EBXT02DSLCL	415W	Security DBS
2	12 1/4"	2	2	EBXLC1	117W	Security DBS
3	8 1/2"		3	FS2565E	S424	Security DBS
4	8 1/2"	1	4	CT103	M623	DIAMANT BOART S
5	8 1/2"	5 RR	5	FS2565E	S424	Security DBS
10	8 1/2"		9	FM2665	M323	Security DBS

Run no	Bit size	Bit no	BHA no	Serial no	Nozzles (n/32")				Flow area in
					no x n	no x n	no x n	no x n	
1	17 1/2"	1	1	742172	3 x 18	1 x 14	x	x	0,8960
2	12 1/4"	2	2	10763378	2 x 16	1 x 18	x	x	0,6420
3	8 1/2"		3	10795401	5 x 13	x	x	x	0,6490
4	8 1/2"	1	4	10849395	x	x	x	x	
5	8 1/2"	5 RR	5	10795401	5 x 13	x	x	x	0,6490
10	8 1/2"		9	5013666	1 x 11	5 x 12	x	x	0,6460

Run no	Bit size	Pump rate l/min	Pump press bar	Depth in mMD	Depth out mMD	Form drld m	Total drld m	Drld hrs	Circ hrs	ROP m/hrs
1	17 1/2"			364,5	416,0	51,5	51,5	20,9	30,0	2,5
2	12 1/4"	3450	242	416,0	1305,0	889,0	889,0	21,4	33,7	41,5
3	8 1/2"			1267,0	1559,0	292,0	292,0	292,0	25,4	1,0
4	8 1/2"			1559,0	1574,0	15,0	15,0	3,2	6,9	4,7
5	8 1/2"	2500		1574,0						
10	8 1/2"									

Run no	Bit size	Min WOB ton	Max WOB ton	Min RPM	Max RPM	Torque Min Nm	Torque Max Nm	Con drag Min 1000 daN	Con drag Max 1000 daN
1	17 1/2"								
2	12 1/4"	10	15	124	149	6	10		
3	8 1/2"								
4	8 1/2"								
5	8 1/2"	3	10	140	160				
10	8 1/2"								

Run no	Bit size	I	O	DC	L	B	G	OC	RP
1	17 1/2"	1	1	WT	A	E	I	NO	TD
2	12 1/4"	5	3	WT	M	E	I	NO	TD
3	8 1/2"	2	3	CT	A			BT	CP
4	8 1/2"	1	4	CT	T	F	i	BT	TD
5	8 1/2"	3	3	BT	A	X	I	LT	TD
10	8 1/2"	0	0	NO	A	X	I		TD

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Run no	Bit size	Remarks
1	17 1/2"	Ran to spud well ahead of 26" x 36" hole opener. Bit to 36" cutters - 4.06 m.
2	12 1/4"	Drilled 4m cement inside 30" conductor
3	8 1/2"	
4	8 1/2"	The corehead jammed off at 1573,8mMD
5	8 1/2"	
10	8 1/2"	NO wear on bit at all.

WELLBORE: NO 6608/11-5
BHA NO: 1
BHA KIND:
DESCRIPTION: 17 1/2" x 26" x 36" HO assy
BHA NAME: 1

String component	OD in	ID in	Length m	Acc length m
EBXT02DSLCL~17 1/2"	17,500	2,000	0,41	0,41
WEIGHT SUB W/FLOAT	9,500	3,000	2,01	2,42
HOLE OPENER~38 1/4"	36,000	3,000	3,86	6,28
BIT SUB W/FLOAT	9,500	3,000	0,84	7,12
ANDERDRIFT	9,500	3,000	3,02	10,14
DRILL COLLAR	9,500	3,000	54,90	65,04
XO SUB	8,000	3,000	1,21	66,25
DRILL COLLAR	8,250	2,875	54,62	120,87
XO SUB	8,000	3,000	1,11	121,98
HW DRILL PIPE	5,500	3,375	85,90	207,88

BHA NO: 2
BHA KIND:
DESCRIPTION: 12 1/4"
BHA NAME: 2

String component	OD in	ID in	Length m	Acc length m
EBXLC1~12 1/4"	12,250		0,30	0,30
BIT SUB W/FLOAT	8,250	3,000	0,81	1,11
STOP SUB	8,250	3,000	0,72	1,83
ON TRAK	8,250	3,000	5,74	7,57
STAB MODULAR	8,250	3,000	1,85	9,42
BCPM	8,250	3,000	3,58	13,00
STOP SUB	8,000	2,825	0,78	13,78
STRING STAB, NM	8,250	3,000	2,04	15,82
DRILL COL	8,000	2,825	72,81	88,63
JAR	8,000	2,825	9,70	98,33
DRILL COL	8,000	2,825	28,02	126,35
X-OVER	7,500	2,825	1,11	127,46
HW DRILL PIPE	5,500	3,500	95,59	223,05
DART SUB	7,250	2,825	0,64	223,69

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BHA NO: 3
BHA KIND:
DESCRIPTION: 8 1/2" Drilling BHA
BHA NAME: 3

String component	OD in	ID in	Length m	Acc length m
FS2565E~8 1/2"	8,500		0,50	0,50
STAB STRING	8,250	2,250	1,50	2,00
ON TRAK	6,750	3,000	5,70	7,70
MWD, STAB	7,000	2,250	1,30	9,00
BCPM	6,750	1,000	3,70	12,70
FLOAT SUB	6,500	2,750	1,00	13,70
STAB STRING	8,375	2,250	2,00	15,70
COLLAR	6,750	2,250	54,00	69,70
JAR	6,500	2,250	10,00	79,70
DRILL COLLAR	6,750	2,250	27,00	106,70
HW DRILL PIPE	5,000	3,000	81,00	187,70
DP 5"	5,000	4,276	9,00	196,70
FLOAT SUB	6,500	2,750	1,00	197,70
DP 5"	5,000	4,276	900,00	1097,70

BHA NO: 4
BHA KIND:
DESCRIPTION: Coring BHA
BHA NAME: 4

String component	OD in	ID in	Length m	Acc length m
CT103~NA	8,500	4,000	0,36	0,36
CORE BARREL W/FLOAT	6,750	4,000	20,59	20,95
DRILL COL	6,750	2,250	54,00	74,95
JAR	6,500	2,250	10,00	84,95
DRILL COL	6,750	2,250	27,00	111,95
HW DRILL PIPE	5,000	3,000	81,00	192,95
DP 5"	5,000	4,276	900,00	1092,95

BHA NO: 5
BHA KIND:
DESCRIPTION: 8 1/2" drilling BHA
BHA NAME: 5

String component	OD in	ID in	Length m	Acc length m
FS2565E~8 1/2"	8,500		0,50	0,50
STAB STRING	8,250	2,250	1,50	2,00
ON TRAK	6,750	3,000	5,70	7,70
MWD, STAB	7,000	2,250	1,30	9,00
BCPM	6,750	1,000	3,70	12,70
FLOAT SUB	6,500	2,750	1,00	13,70
STAB STRING	8,375	2,250	2,00	15,70
COLLAR	6,750	2,250	54,00	69,70
JAR	6,500	2,250	10,00	79,70
DRILL COLLAR	6,750	2,250	27,00	106,70
HW DRILL PIPE	5,000	3,000	81,00	187,70
DP 5"	5,000	4,276	9,00	196,70
FLOAT SUB	6,500	2,750	1,00	197,70
DP 5"	5,000	4,276	900,00	1097,70

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BHA NO: 7
BHA KIND:
DESCRIPTION: PEX-HRLA-CMR-ECS
BHA NAME: 7

String component	OD in	ID in	Length m	Acc length m
CMR			4,74	4,74
HRLA			8,00	12,74
PEX			6,00	18,74
ECS			2,00	20,74
SGT-N			3,35	24,09
ACTS-B1			3,43	27,52

BHA NO: 8
BHA KIND:
DESCRIPTION: MDT logging
BHA NAME: 8

String component	OD in	ID in	Length m	Acc length m
LEH-ECRD	6,750		0,89	0,89
TCC-BF			0,91	1,80
ACTS-B1			1,22	3,02
SGT-L			1,68	4,70
MRPC			1,52	6,22
MRHY			2,57	8,79
MRPS			7,53	16,32
LFA			1,55	17,87
MRPO			3,24	21,11
MRPO			3,24	24,35
MRSC			1,86	26,21
MRSC			1,86	28,07
MRSC			2,88	30,95
MRMS			4,29	35,24

BHA NO: 9
BHA KIND:
DESCRIPTION: 8 1/2" Drilling BHA
BHA NAME: 10

String component	OD in	ID in	Length m	Acc length m
FM2665~NA	8,500		0,31	0,31
NB STAB W/FLOAT	6,750		1,89	2,20
PERISCOPE	6,750		6,61	8,81
IN LINE STAB (ILS)	6,875		1,52	10,33
TELESCOPE 675	6,750		8,40	18,73
ARC 675	6,750		5,97	24,70
STABILIZER	6,500		1,45	26,15
NM DRILL COLLAR	6,625		9,40	35,55
COLLAR	6,500		57,90	93,45
JAR	6,500		9,52	102,97
COLLAR	6,500		29,24	132,21
HW DRILL PIPE			81,21	213,42

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BHA NO: 10
BHA KIND:
DESCRIPTION: FMI-DSI logging
BHA NAME: 9

String component	OD in	ID in	Length m	Acc length m
FBST-B			7,43	7,43
DSST-B			15,53	22,96
SGT-N			1,70	24,66
DTC-H			0,63	25,29
ACTS-B1			1,50	26,79
SAH-F			1,49	28,28
LEH-ECRD			0,66	28,94

BHA NO: 11
BHA KIND:
DESCRIPTION: MDT logging second run
BHA NAME: 11

String component	OD in	ID in	Length m	Acc length m
MRMS			18,67	18,67
LFA			9,89	28,56
MRPC			11,62	40,18
ACTS-B1			4,70	44,88

BHA NO: 12
BHA KIND:
DESCRIPTION:
BHA NAME: 12

String component	OD in	ID in	Length m	Acc length m
MRMS			18,67	18,67
LFA			9,89	28,56
MRPC			11,62	40,18
ACTS-B1			4,70	44,88

8.5 Drilling fluids

DRILLING FLUIDS SUMMARY																						
Well: 6608/11-5		Ocean Vanguard																				
Field: Valkyrie																						
Rig: Ocean Vanguard																						
HOLE		CASING		MUD TYPE	MW	LGS	10 sec.	10 min.	Funnel Visc.	Fann 3 rpm	O / W ratio	PV	API FL	HTHP FL	MBT	pH	KCl	Glyc.	Ca ++	Sulphate	Usage Volume	
SIZE	TVD MD	SIZE	TVD MD		[Sg]	[KG m ³]	[Pa]	[Pa]				[m ² .s]	[mL]	[mL]	[mL]	[KG m ³]		[KG m ³]	[%]	[mg /l]	[m ³]	
36"	416 416	30"	412 412	SW/polymer Bentonite WBEM	1.03 - 1.35				100 +								8.8 - 9				163	
COMMENTS: Mixed Bentonite/CMC EHV /drill water mud for HI-vis pills. Pumped mainly approxim. 7 m ³ HI-vis a number of times per single, a final pill of 22 m ³ at TD and finally displaced the hole with 1,35 sg mud (Bentonite/CMC EHV. Barte, Drill Water) prior to pull out of hole. Used 114m ³ HI-Vis pills and 80m ³ 1.35 sg mud. The 30" conductor was ran, landed and cemented without problems. The use of high viscous Bentonite/CMC EHV sweeps to clean the hole, worked satisfactorily for this section. The reason why Bentonite was used was to consume excess from previous wells left in the Bentonite tank. To increase the Funnel Viscosity further, additional CMC EHV was added in some pills. This quickly increased the FV.																						
12 1/4"	1305 1305	9 5/8"	1303 1303	SW/polymer Bentonite WBEM	1.03 - 1.30				100 +								7.5 - 8.8				768	
This section was drilled from 416 m to 1305 m using seawater and HVI/s-sweeps as programmed. At TD displaced whole with 1,4 hole volume of 1.35 SG Bentonite/polymer mud. The standard use of high viscous CMC EHV sweeps to clean the hole, worked satisfactory for this section. The Funnel Viscosity couldn't been increased higher than 100 sec because of restricted efficiency of the mixing facilities.																						
8 1/2"	2270 2270	N/A	Plugged back	Glydri WBEM w/ 99% KCl	1.30 - 1.30	5 - 13	6 - 7	11.5 - 12	na - 19	6 - 7	na - 19	10 - 2.8	2 - 2.8	na	5		8 - 9	160 - 165	4.5 - 4.7	250 - 165	<200	405
COMMENTS: The 99% KCl/Glydri was premixed onshore and was weighted up to 1.30 SG and slightly viscosified prior to displacing. During drilling, coring and logging down to 1900 m no maintenance was required as mud properties stayed very stable within specifications. From logging depth and down to TD at 2270 m, the formation tended to be rather sticky and more reactive than earlier in this section. KCl powder was added to maintain k+ level in the mud and unweighted premix was added to maintain the weight at 1.30 SG. Drop in k+ level was partly due to hosing the sticky clay off the shakerscreens, partly due to reactive formation. All cement plugs caused the mud to deteriorate and was in no state to be re-used on other operations and was operationally discharged. The total amount of discharged Glydri MC exceeded the discharge permit. This was not discovered and reported until after the discharge was done.																						

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8.6 Cementing program

CEMENT SUMMARY															
Well: 6608/11-5 Field: Valkyrie Rig: Ocean Vanguard															
HOLE	CASING SHOE	TOC	VOLUME/ EXCESS	CEMENT SLURRY DESIGN										SPACER	DISPLACEMENT Fluids and Rates
				SIZE	TVD MD	TVD MD	Components	Lead (m tonnes)	Tail (m tonnes)	Density (kg/l)	Yield (m ³ /tonne)	Stat./Circ. Temp [°C]	Thickening time (Burst to 30 Bc)		
36"	410 410	30"	410 410	Sea bed Sea bed	Slurry 10 - DWLSP X-lite cement NF-6 Seawater		0.10 60.05	1.52	104.14	6-8 API	05:21 (to 70 Bc)	n/a	n/a	800	Sea water
	1299 1299	20" X 9 5/8"	1299 1299	Sea bed Sea bed	L: Slurry 5 - STL40 T: Slurry 24 B-MPT14 Norcem "G" + 0.1 % EZ-FLO Econolite HR-4L Halled-59L.E+ NF-6 Sea water Fresh water	3.20 2.00 - 0.10 93.46 -	- 1.00 0.50 0.10 42.34	L: 1.56 L: 129.94 T: 1.92 T: 75.12	L: 129.94 T: 75.12	44/36 API	L: 5.00 T: 3.32	L: < 0.8 T: < 0.9	n/a	L: 400 T: 1500	Sea water 1800 lpm
P&A Plugs 1-3		8 1/2"	2270 2270 1960 1960 1710 1710	2020 2020 1740 1740 1460 1460	Slurry 16B - GTT90 Norcem "G" + 0.1 % EZ-FLO Gascon HR-5L Halled-400L CFR-8L NF-6 Fresh water		3.50 1.30 2.50 1.00 0.10 38.15	1.90	77.73	81/60	04:53	0	52	2500	WBM 8 m3 Tuned spacer 3T on each plug 1.60 SG
P&A Plug 4		8 1/2"	1430 1430	1180 1180	Slurry 40 - KOPMP Norcem "G" + 0.1 % EZ-FLO Gascon HR-5L Halled-400L CFR-8L NF-6 Fresh water		3.00 1.30 2.50 1.50 0.10 34.09	1.95	73.67	53/42	04:54	0	n/a	2720	WBM 8 m3 Tuned spacer 3T 1.60 SG
P&A Plug 5			600 600	385 385	Slurry 4 - STLT Norcem "G" + 0.1 % EZ-FLO NF-6 Fresh water		0.10 41.46	1.95	72.64	15/13	±4	n/a	n/a	n/a	Sea water

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9 Appendix 4: Contractors list

Service	Contract no	Contractor
Plug	SAP4600004878	Weatherford Norge AS
Measurement While Drilling	SAP4600004881	Schlumberger
Mud Logging	SAP4600002064	Geoservices
Subsea WH/X-mas tree	SAP4600005076	Drill Quip
Rig Operations	SAP4600006269	Diamond Offshore Drilling Ltd
Cementing	SAP4600002160	Halliburton
Casing Crew Service	SAP4600004001	Weatherford Norge AS
Electric Wireline Logging	SAP4600007180	Schlumberger
ROV Systems	SAP4600002882	Oceaneering
Drilling Fluids	SAP4600002159	M-I Drilling Fluids
Measurement While Drilling	SAP4600002063	Baker Hughes Inteq