FINAL WELL REPORT

Number

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Revision: 01

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FINAL WELL REPORT WELL 34/6-1 S

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1 EXECUTIVE SUMMARY

1.1. WELL SUMMARY

Well 34/6 - 1 S was an exploration well located in the northern part of the Tampan Spur area. Block 34/6 is situated in the northern part of the Norwegian sector of the North Sea, approximately 120 km west of the Norwegian coast. The block lies on the eastern flank of the Tampen Spur, separated from the North Viking Graben to the east by the Visund Fault Trend. The well was targeting potential hydrocarbon bearing sands in the Jurassic Brent, Cook & Statfjord formations. The well was drilled directionally to evaluate all three formations at adequate structural locations to ensure that the risk of leaving economic reserves untested up-dip, was minimal.

34/6 - 1 S drilled to the planned TD of 4360 m MD (3922 m TVD MSL). The well terminated in Lunde Formation.

NCAS accepted the semi submersible drilling unit, Transocean Winner, from AS Norske Shell at 1930 hrs on 14 July 2002. The rig arrived at the 34/6 - 1 S location at 0430 hrs on 16 July 2002, and the well was spudded at 0530 hrs on 18 July 2002. Total depth of 4360 m MD RKB / 3922 TVD MSL was reached at 2330 hrs on 12 August 2002. Wireline logging indicated a non commercial well with no hydrocarbon bearing sands. Upon completion of the data acquisition program, the well was permanently plugged and abandoned at 1800 hrs on 27 August 2002. No follow up work had been procured for the rig and the rig was towed to quayside in Ølen. The rig was released from 34/6 - 1 S at 1800 hrs on 30 August 2002.

A 36” hole was drilled to 495 m and 30” conductor set at 492 m. No shallow gas was indicated from the shallow seismic information; therefore, a pilot hole was not needed for the 26” hole section. The 30” casing was cemented to the mudline. The 26” hole was drilled riserless to 1350 m using seawater with high viscosity sweeps. 20” casing was set at 1341 m and cemented to the mudline. The 26” hole section was drilled with one Hughes GTX CM00 Insert Bit.

After running the BOP and riser, the 20” casing was drilled out with MI’s KCl/Glydril water based mud. A 1.55 sg leak-off was obtained at the 20” shoe before drilling ahead in the 17½” hole section. Total depth for the 17½” hole section was 2422 m. The 17½” hole section was drilled with one Hughes MX-DDT Insert Bit. No wireline logs were run in the 17½” hole section. 13 $^{3}/_{8}$” casing was set at 2411 m and cemented to 1750 m.

The 13 $^{3}/_{8}$” was drilled out using MI’s Versavert Oil based mud system and a 1.82 sg formation integrity test was obtained before drilling the 12¼” section into the Lower Cretaceous. The 12¼” hole section was directional; building 2,3°/ 30m from 2490m to an inclination of ± 49°. Inclination and direction were held to TD at 3395m MD / 3228m TVD. The 12¼” hole section was drilled to TD in one run using a Hycalog DS130 PDC Bit on the PowerDrive 900 Rotary Steerable Drilling System (RSS). No wireline logs were obtained in the 12¼” hole section. 9 $^{5}/_{8}$” casing was set at 3392m MD / 3227m TVD and cemented to 2750m MD.

The 9 $^{5}/_{8}$” casing was drilled out with 1,65 sg Versavert OBM. An FIT to 1,98 sg was obtained prior to drilling ahead in the 8½” hole section. During the hole section, the mud weight was increase three (3) times based on indications of increasing pore pressure. MW at

TD was 1,74 sg. The well was drilled to TD at 4360m MD/3922m TVD. No indications of hydrocarbons were observed, hence no cores were obtained.

The logging programme commenced. The first log did not reach TD so a wiper trip was made. The logging programme continued as follows:

Log 1: GR/DSI/AIT
Log 2: GR/DENS/NUE
Log 3: Cased hole VSP
Log 4: MDT in Brent formation
Wiper Trip #2
Log 5: MDT in Cook & Statfjord (log down) then Open Hole VSP on Drillpipe (log up)

The logging programme ended at 2400 hours 19 August 2002. The abandonment commenced and was executed without any lost or trouble time. The abandonment was complete at 1800 hrs 27 August 2002.

The rig was released from 34/6 - 1 S at 1800 hrs on 30 August 2002 after towing the rig to the Ølen.

1.2. GENERAL INFORMATION

License : PL268

Block : 34/6

Well Identification : 34/6 - 1 S

Well AFE Number : 268BEA0001

Well Classification : Exploration

Surface Location : Geographical: 61º 34’ 56.34” North; 02º 41’ 7.70” East
UTM: 6 827 854.8m North; 483 300.1m East

Bottom Hole Location : Geographical: 61º 34’ 38.622” North; 02º 42’ 13.430” East
UTM 6 827 301.89m North; 484 266.94m East

TD is 553.13m S and 967.22m E relative to Spud location.

Reference : International Spheroid, ED 50; UTM, Zone 31, CM 9º E

Rig Heading : 225º

Target Depth : The primary target for 34/6 - 1 S was the Brent, Cook & Statfjord at 3277m, 3516m & 3802m TVD RKB respectively.

Total Depth : 3922 m TVD RKB, 4360 m MD RKB

Formation at TD : Upper Triassic (Lunde)

Water Depth : 380 m MSL; 406,5 m RKB

RKB-Sea Level : 26,5 m

Duration : 46.8 days

Casing Depths

Casing Size	Depth MD-RKB	Depth TVD-RKB	LOT/FIT	Cement top MD-RKB
30”	492 m	492 m	NA	406,5 m
20”	1341,5 m	1341,5 m	1.55 sg L	406,5 m
13 3/8”	2411 m	2411 m	1.82 sg F	1750 m
9 5/8”	3392 m	3227 m	1.98 sg F	2750 m

Mud Type : Seawater with high viscosity sweeps from the mudline to 1350 m. Water based KCl/Glycol from 1350 m – 2422 m, Versavert

		Oil Based mud from 2422 – 4360m (TD)	
Well Status	:	Permanently plugged and abandoned.	
Drilling Rig	:	Semi submersible Transocean Winner	
Wellhead System	:	Dril-Quip, SS-15, 15 K psi with Vetco H4. Standard 4-hanger wellhead system.	
BOP	:	Hydrill 18 ¾" 15 K Vetco H4 connector and suitable for hydrogen sulphide environment.	
Milestone Dates	:	Rig on contract	14 July, 2002 @ 1930 hrs
		Rig arrived on location	16 July, 2002 @ 0430 hrs
		Spudded well	18 July, 2002 @ 0530 hrs
		Reach TD	12 Aug, 2002 @ 2330 hrs
		Rig under tight tow	28 Aug, 2002 @ 1830 hrs
		Rig released	30 Aug, 2002 @ 1800 hrs
PL 268 Partnership	:	Norske Conoco AS (Operator)	40.0 %
		Norsk Chevron	30.0 %
		Fortum Petroleum	30.0 %

1.3. GOALS AND OBJECTIVES

Well 34/6 - 1 S is being drilled to test hydrocarbon potential in the Akkar prospect. The main objectives of the well were:

- Meet the commitment of the well by testing the prospectivity of the Statfjord Formation and drilling 50m MD into the Lunde Formation of the Hegre Group.
- Explore for the presence of hydrocarbon bearing sands within three (3) primary targets: the Brent Group, the Cook Formation and the Statfjord Formation.
- Acquire data necessary to evaluate the prospect and the remaining exploration potential of the licence.
- In the event of a dry well, acquire sufficient data to demonstrate the well to be dry and explain the absence of hydrocarbons.
- Perform operations efficiently with equal priority to the safety of personnel and the preservation of the environment
- Complete operations with no lost time accidents
- Complete operation with no spills.

1.4. LOCATION MAP

Refer to Section 1, Figure 1.

1.5. DEPTH VS DAYS PLOT

Refer to Section 1, Figure 2.

1.6. FINAL WELLBORE DIAGRAM

Refer to Section 1, Figure 3.

Figure 1

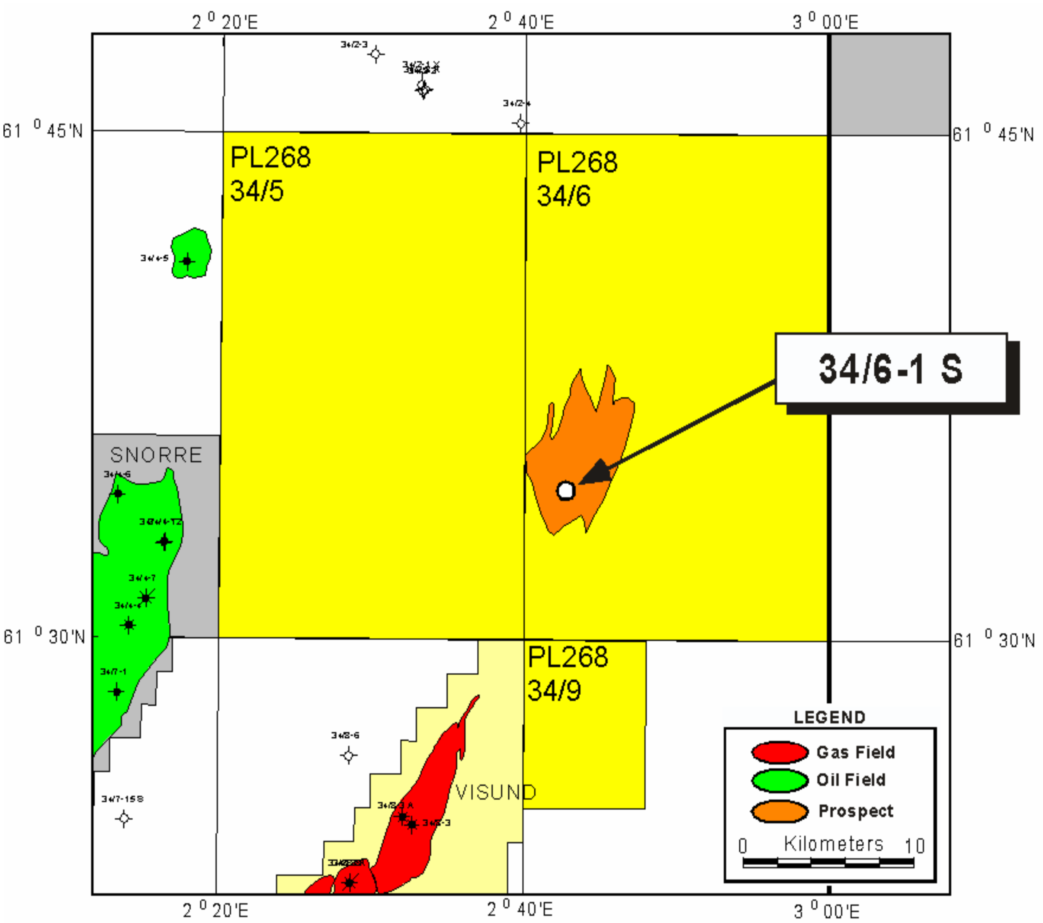
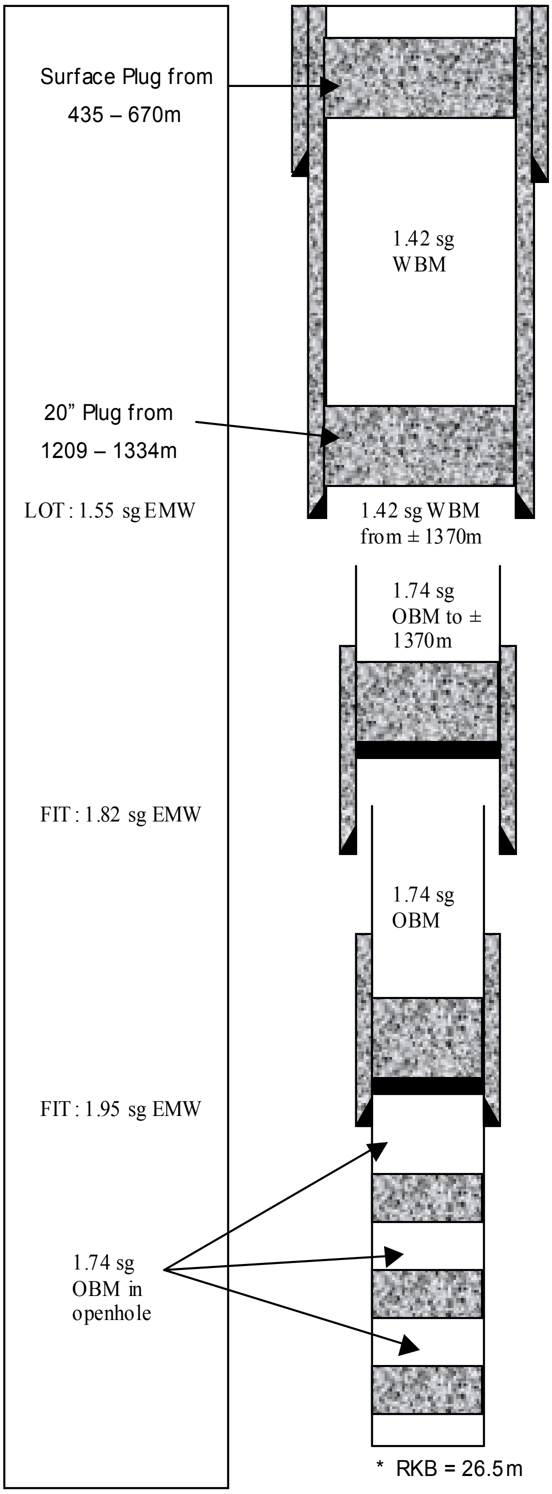

2 0 20'E
2 0 40'E
3 0 00'E
61 0 45'N
61 0 30'N
PL268
34/5
PL268
34/6
PL268
34/9
34/6-1 S
SNORRE
VISUND
LEGEND
Gas Field
Oil Field
Prospect
0 Kilometers 10

Figure 2


"Akkar" 34/6-1 S AFE Days Vs Depth
0
500
1 000
1 500
2 000
2 500
3 000
3 500
4 000
4 500
5 000
Depth (m MD)
0
10
20
30
40
50
60
Time (Days)
AFE Curve
ACTUAL

Figure 3

ACTUAL ABANDONMENT DIAGRAM



	mMD *RKB	mTVD *RKB
Mudline	406,3	406,3
Cut 20” & 30”	412	412
30" Shoe	492	492
20" Shoe	1341	1341
Cut 13 3/8”	1338	1338
Cement Top	1750	1750
EZSV	2075	2075
Cut 9 5/8”	2101	2101
13 3/8" Shoe	2411	2411
Cement Top	2800	2790
EZSV	3348	3248
9 5/8" Shoe	3395	3227
Plug 3410 – 3520m MD		
Plug 3750 – 3900m MD		
Plug 4150 – 4260m MD		
TD	4360	3922

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2 GEOLOGY AND GEOPHYSICS

2.1. OBJECTIVES

Well 34/6-1 S was drilled to test the hydrocarbon potential of the "Akkar" prospect in block 34/6. The main objectives of the well were to:

- Meet the commitment of the well by testing the prospectivity of the Statfjord Formation and drilling 50 m MD into the Lunde Formation of the Hegre Group.
- Explore for the presence of hydrocarbon bearing sands within 3 primary targets: the Brent Group, the Cook Formation and the Statfjord Formation.
- Acquire data necessary to evaluate the prospect and the remaining exploration potential of the licence.
- In the event of a dry well, acquire sufficient data to demonstrate the well to be dry and explain the absence of hydrocarbons.

2.2. POST WELL RESULTS.

The well satisfied the 4 main objectives.

Well 34/6-1 S was drilled to a TD of 4360 m MD (-3896.5 m TVDSS), 50 m beneath the top of the Lunde Formation of the Hegre Group. The well was logged and a logger's TD of 4366 m MD (-3900.5 m TVDSS) recorded.

Reservoir quality sands were encountered at all levels identified prior to drilling as potential targets, namely: the Brent Group, Cook Formation and Statfjord Formation. In addition, sand was encountered within the Lunde Formation.

The well was permanently plugged and abandoned as a dry hole.

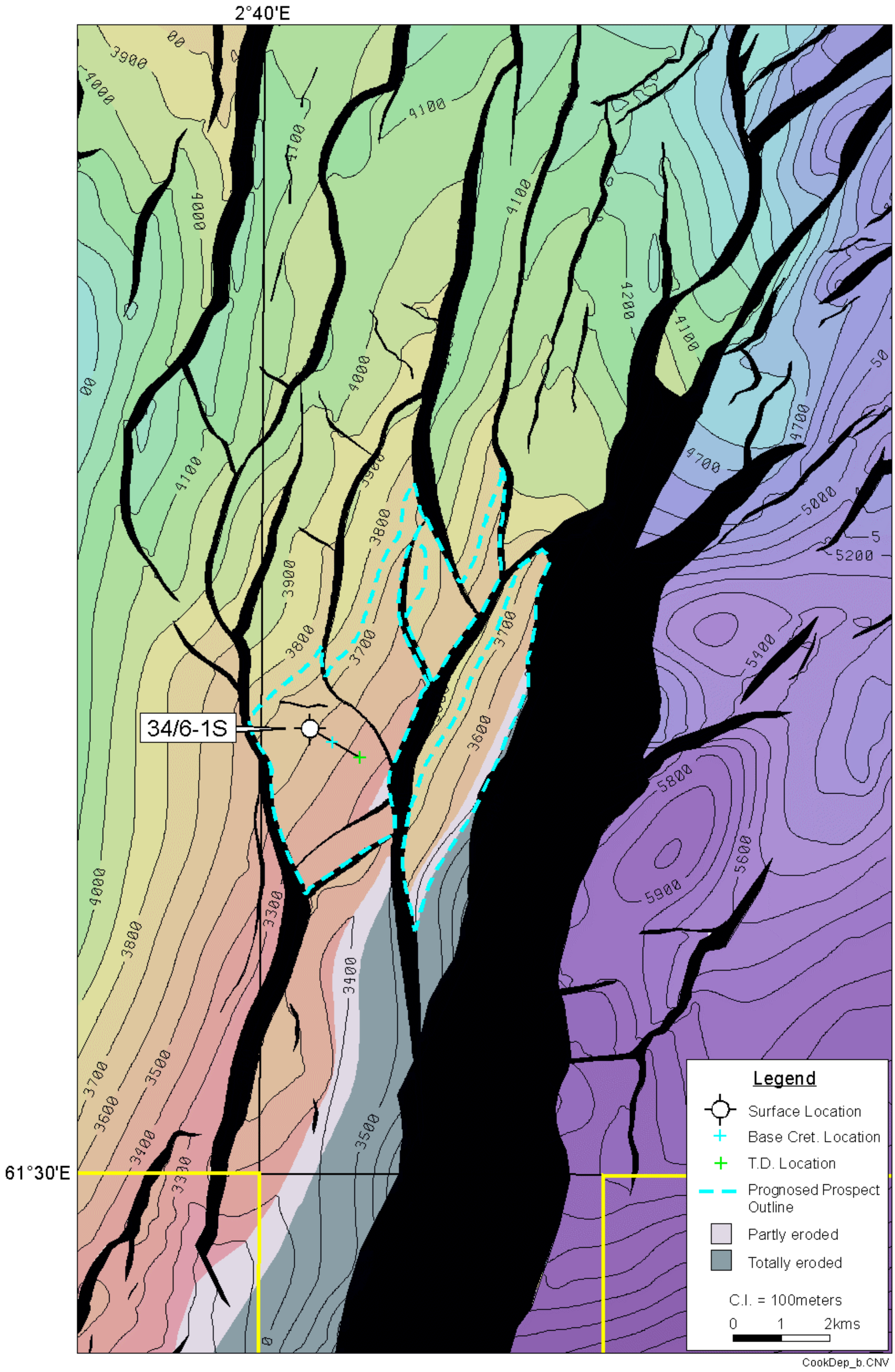


Figure 1 Post-drill Prospect Map – Top Cook Formation Depth Map

2.3. GEOLOGICAL BACKGROUND

Block 34/6 is situated in the northern part of the Norwegian sector of the North Sea, approximately 120 km west of the Norwegian coast. The block lies on the eastern flank of the Tampen Spur, separated from the North Viking Graben to the east by the Visund Fault Trend.

The “Akkar” prospect was interpreted as comprising stacked Brent, Cook and Statfjord reservoirs in a series of tilted fault blocks, down faulted with respect to the bounding fault to the west. The main bounding fault to the east separates the structure from the deep North Viking Graben. Within the fault blocks beds appear to dip largely to the northwest. The Brent and Cook reservoir levels were interpreted as subcropping beneath the Base Cretaceous unconformity.

Top seal for the Brent and Cook reservoirs was expected to be provided by both Jurassic and Lower Cretaceous claystones. The Statfjord Formation does not subcrop the base Cretaceous Unconformity and Jurassic claystones thus form the primary top seal. The hydrocarbon phase was predicted to be wet gas.

Four Jurassic intervals were considered as potential source rocks: the Draupne Formation, Heather Formation, Brent Group and Dunlin Group. The organic rich claystones of the Draupne Formation have the greatest hydrocarbon generation potential of the source horizons.

2.4. SAMPLING PROGRAM

2.4.1. Routine Cuttings Sampling

The 36” and 26” hole sections were drilled riserless with returns taken to the seabed. Sampling began at the start of the 17½” section at a depth of 1350 m MD, and continued to TD in the 8½” hole section, at a depth of 4360 m MD. A total of 3 sets of cuttings samples, 1 set of geochemical cans and 1 set of mud sample were collected at the rigsite, as follows:

Table 1A: Cuttings collection.

TYPE	COMPANY	NO. OF SETS	WEIGHT
Mud sample	Conoco	1	0.3 litre
Washed and dried cuttings	Conoco	1	100 grams
Wet cuttings	Conoco Biostrat	1	100 grams
Wet cuttings	Split at Corpro Laboratory	1	5 kg bucket
Geochemical, unwashed cuttings, canned and sealed	Conoco	1	1 litre

The 5 kg buckets of wet samples were split onshore at Corpro's laboratories to provide, along with the separate sets collected on the rig, the following sets for distribution:

Table 1B: Cuttings distribution.

TYPE	COMPANY	NO. OF SETS	WEIGHT
Wet cuttings	Conoco Biostrat	1 (Set E)	100 grams
Wet cuttings	Conoco	1 (Set B)	500 grams
Wet cuttings	NPD	1 (Set A)	1000 grams
Washed and dried cuttings	Conoco	3 (Sets C, F, I)	100 grams
Washed and dried cuttings	Chevron	1 (Set D)	100 grams
Washed and dried cuttings	OLF*	10	100 grams
Geochemical, unwashed cuttings, canned and sealed	Conoco	1 (Set G)	1 litre
Mud sample (Geochem)	Conoco	1 (Set H)	

* OLF are the trade operator and are based at the Reslab facility in Forus, Stavanger.

Table 2: Sampling intervals in 34/6-1 S.

TYPE	DEPTH m MD	SAMPLE INTERVAL
Wet cuttings (Sets A + B)	1350 – 3350 m 3350 – 4360 m	10 m 3 m
Biostratigraphy samples (Set E)	1350 – 3350 m 3350 – 4360 m	10 m 3 m
Washed and dried cuttings (Sets C, D, F + I)	1350 – 3350 m 3350 – 4360 m	10 m 3 m
Geochem canned samples (Set G)	1350 – 2422 m 2450 – 4355 m	100 m 45 m
Mud samples (Set H)	1450 – 3530 m 3575 – 4340 m	100 m 45 m

2.4.2. Sidewall cores

No sidewall cores were taken in the well.

2.4.3. Conventional cores

No conventional cores were taken in the well.

2.5. WIRELINE AND MWD LOGS

2.5.1. Wireline Logs

Wireline logging was performed by Schlumberger. The initial through casing VSP was carried out by Read Well Services.

Table 3: Wireline Logging

RUN NO.	HOLE SIZE	LOGS	LOGGED INTERVAL (m MDRT)	
			Start	**Finish**
1A	8 ½”	DSI/AIT/IPLT/HNGS	3552	3394
	8 ½”	DSI (through casing to top cement)	3394	2750
	8 ½”	GR (through casing to seabed)	3394	406
1B	8 ½”	DSI/AIT/GR	4359	3394
1C	8 ½”	IPLT/HNGS	4365	3394
1D	8 ½”	VSP/GR	3380	760
1E	8 ½”	MDT/GR	n/a	n/a
2E	8 ½”	MDT/GR	n/a	n/a
3E	8 ½”	MDT/GR	3470	3473
1F	8 ½”	MDT/GR-VSP/GR Pipe-conveyed:		
1F	8 ½”	MDT/GR (down pass)	3473	4299.5
1F	8 ½”	VSP/GR (up pass)	4325.8	3183

Run 1A: DSI/AIT/IPLT/HNGS
The “Quadcombo” tool was run in the hole, but would not pass 3547 m and had to be pulled free with 5100 lbs overpull. A through-casing gamma ray/sonic log was acquired, with the sonic taken to the top of cement inside 9⅝” casing at 2750 m and the gamma ray logged to the seabed at 406.3 m. A wiper trip was performed after the failure of this run to get to TD.

Run 1B: DSI/AIT/GR
Following the wiper trip, the combination logging sonde was split into 2 runs, the first of which - DSI/AIT/GR - was successfully run in hole to TD. A resistivity/sonic/gamma ray log was acquired with only local intervals of slightly to moderately sticky hole. The sonic was recorded in P&S mode.

Run 1C: IPLT/HNGS
The second part of the split combination logging sonde – the density/neutron/spectral gamma ray tool - had to be worked to TD through several tight zones. During logging the tool hung up many times and, on several occasions (4209 m, 4180 m, 4168 m, 3962 m and 3958 m) only came free after closing the caliper. Individual log traces ‘flatline’ at the sensor measure point corresponding to the closing of the caliper and at other tight spots.

Run 1D: VSP/GR
The Read Well Services VSP tool failed to pass rathole beneath 9⅝" casing shoe. The tool was run with too short a sinker bar to bridge across the rathole into the open hole. A longer sinker bar was not available at the rig site. A rig-sourced VSP was recorded inside casing using an 8-level, 3-component tool. The source array consisted of 3 x 150 cubic inch sleeve guns at a depth of 3.5 m below MSL, offset 58 m from the wellbore on an azimuth of 135°. The following table summarizes the levels acquired in Run 1D:

From	To	Spacing
1950 m	3380 m	10 m
1800 m	1940 m	20 m
1560 m	1700 m	20 m
1360 m	1500 m	20 m
1160 m	1300 m	20 m
960 m	1100 m	20 m
760 m	900 m	20 m

A velocity control shot was taken at 3000 m whilst running in and pulling out. Data quality was good through the 9⅝" casing up to 2540 m, but shallower than this depth no first arrival times could be picked.

Run 1E: MDT/GR
A tool malfunction was observed while running in hole at 2100 m. The tool was pulled out and the GR and telemetry cartridges replaced.

Run 2E: MDT/GR
A similar tool malfunction was observed while running in hole at 1600 m. The tool was pulled out and the back-up tool picked up.

Run 3E: MDT/GR
Six pressure tests (Nos.1-6) were attempted in Brent Group Tarbert Sand between 3470 m – 3473 m, of which 1 test was successful, 2 supercharged and 3 tight. The tool was then worked down through tight hole but would not pass 4025 m. It was attempted to log out, but this had to be abandoned for fear of losing the tool. The constant and exceptionally high overpulls, caused by the tight hole prevented a GR correlation log being acquired. A wiper trip was performed after the failure of this run, in order to condition the hole before a final MDT-VSP pipe-conveyed logging run.

Run 1F: MDT/GR-VSP/GR
Following the wiper trip, a new MDT tool combined with a rigid Schlumberger 2-level VSP tool was RIH on pipe to 3146 m (246 m above the 9⅝" shoe). The side-entry sub was made up and the wet connect pumped down and latched. MDT pressures were acquired logging down. A total of 26 pressure tests (Nos. 7–32) were attempted in the Brent, Cook, Amundsen and Statfjord of which 10 tests were successful. A further 4 tests gave formation pressures that were "not fully stable", while 8 tests were aborted (tight, failed or unstable) and 4 tests were aborted as supercharged. The tool was switched to VSP mode and a rig-sourced VSP recorded from 4326 m to 3183 m. The station spacing was 15 m measured along borehole trajectory, approximating a 10 m spacing vertically. An overlap zone of 200 m with Run 1D was recorded to ensure a good splice in processing.

CST/GR

Sidewall cores were not attempted given the extreme hole problems experienced with the MDT in Run 3E. The similarity of MDT and CST operations, and the inabiltity in Run 3E of acquiring a depth correlation pass on wireline, let alone a stationary measurement, indicated that to be successful the CST would have to be run on pipe. The CST guns could not be run in combination with the MDT-VSP in Run 1F, and so a separate pipe-conveyed run would have been necessary. This run, had it been performed, would have delayed the departure of the rig beyond the start of the planned strike of the rig crews with extreme operational consequences. The sidewall coring program was therefore abandoned.

Schlumberger Abbreviations

Mnemonic:	*Tool Name:*	*Type:*
ACTS	***A**uxiliary **C**ompression **T**ension **S**ub*	*Cable Head Tension*
AIT	***A**rray **I**nduction **T**ool*	*Resisitivity*
CST	***C**oring **S**idewall **T**ool*	*Percussion Sidewall Cores*
DSI	***D**ipole **S**hear **I**mager*	*Sonic*
GR	***G**amma **R**ay*	*Gamma Ray*
HNGS	***H**ostile Environment **N**atural **G**amma Ray **S**onde*	*Spectral Gamma Ray*
IPLT	***I**ntegrated **P**orosity **L**ithology **T**ool*	*Density- Neutron*
MDT	***M**odular Formation **D**ynamic **T**ester*	*Formation Tester and Sampler*
VSP	***V**ertical **S**eismic **P**rofile*	*Seismic*

2.5.2. LWD/MWD Logs

Anadrill/Schlumberger provided the LWD/MWD service. A Directional only MWD service was run in the top hole 36" and 26" hole sections. This was augmented by LWD logging suites in 17 ½" hole, 12 ¼" hole and 8 ½" hole sections, as tabulated below:

Table 4: LWD and Wireline Summary (all depths in MDRT)

CASING	HOLE SIZE	MAXIMUM HOLE ANGLE	MWD/LWD LOG RUNS	WIRELINE LOG RUNS
30" 492m	36" 495m	0.87	Directional	NONE (1A GR through casing)
20" 1342m	26" 1350m	1.84	Directional	NONE (1A GR through casing)
13⅜" 2411m	17½" 2422m	0.99	Directional CDR (gamma ray/ resistivity)	NONE (1A GR through casing)
9⅝" 3392m	12¼" 3395m	50.60	Directional CDR/iSONIC (gamma ray/ resistivity/sonic)	NONE (1A GR through casing) (1A SONIC through casing to top of cement at 2750m)
Open Hole	8½" TD 4360m (driller) TD 4366m (wireline)	50.37	Directional Vision675/RAB (gamma ray/ resistivity) and (resistivity at bit + gamma ray)	1A DSI/AIT/IPLT/HNGS 1B DSI/AIT/GR 1C IPLT/HNGS 1D VSP 1E MDT (failed) 2E MDT (failed) 3E MDT 1F MDT/GR-VSP/GR (pipe-conveyed)

2.6. GEOPHYSICAL RESULTS

Due to hole conditions, two rig-sourced VSPs were acquired: a cased hole survey by Read Well Services and an open hole, pipe-conveyed survey by Schlumberger. The surveys, which were acquired with a 200 m overlap, were merged and processed by Read Well Services. Offshore operations took place on the 16th and 19th August 2002, respectively. The cased hole survey used an 8-level, 3-component tool. The 161 m long tool string was run on wireline with a 1.2 m sinker bar, but was unable pass the 3 m rathole beneath the 9⅝" casing. The Schlumberger 2-level, 3-component VSP tool was then used to log the open hole in a pipe-conveyed run combined with the MDT.

The Read Well Services VSP was acquired with a 10 m station spacing from 3380 m to 1950 m, then 20 m station spacing for six shots from 1950 m to 760 m. Eight levels were recorded simultaneously with a sampling rate of 1 ms. The seismic source consisted of a cluster of three sleeve airguns with a total volume of 450 cubic inches, operated at an air-pressure of 2000 psi. These were positioned at a depth of 3.5m below MSL with an offset of 58 m at an azimuth of 135° from the surface location. The open hole survey was performed by Schlumberger using a rigid 2-receiver tool, with a 15 m receiver spacing, from 4325.8 m to 3183 m. The same Read Well Services source configuration was used.

Full details of the acquisition and processing can be found in the final VSP report by Read Well Services.

No first arrival times could be picked above 2540 m, which is 129 m below the 13⅜" casing point. Therefore the calibrated time vs depth report and calibrated sonic and velocity logs provide reliable ties from 2540 m down to T.D. Hence, stratigraphically, the youngest reliable seismic tie point is in the latest Santonian. Data quality from 2540 m to TD was generally good and the overlap zone between the two VSP runs allowed for a good match during processing. The best tie between 3D surface seismic (cn01m02 survey) and the zero phase VSP is achieved by applying a shift of –25 ms to the surface seismic. This is illustrated in Figure 2.

A detailed examination of the seismic response of the reservoir section shows that the pre-drill prognosis of TWT was in general very good when compared to the post-drill, calibrated seismic events, taking into account the –25 ms shift to the surface seismic. Figure 3 is a composite display of impedance, reflection coefficient series, synthetic seismogram and VSP illustrating the main horizon ties in the reservoir section. Table 5 shows the prognosed vs actual TWTs and depths for the key horizons.

Table 5: Prognosed versus Actual TWTs and Depths for Key Horizons

Horizon Name (Seismic Surface)	Prognosed		Actual		Difference to Prognosis*		Prognosed Uncertainty
	TWT (ms)	TVDSS (m)	TWT (ms)	TVDSS (m)	TWT (ms)	TVD (m)	TVD (m)
KB		-26.5	-	-26.5	-	-	
Seabed	511	-378	-	-379.8	-	-1.8	±2
Base Miocene	1292	-1228	-	-	-	-	±25
Base Oligocene	1532	-1479	-	-1533.4#	-	-54.4	±25
Top Balder	1946	-1906	-	-1850.8	-	+55.2	±50
Base Tertiary	2082	-2040	-	-2028.3	-	+11.7	±50
Base Cretaceous	2967	-3275	2956	-3213.1	+11	+61.9	±100
Top Brent	2983	-3299	2981	-3250.7	+2	+48.3	±100
Top Dunlin	3042	-3388	3056	-3379.4	-14	+8.6	±125
Top Cook	3108	-3498	3123	-3490.1	-15	+7.9	±125
Top Statfjord	3244	-3768	3279	-3775.6	-35	-7.6	±150
Top Lunde	3300	-3870	3323.5	-3860.6	-23.5	+9.4	±150
TD	3323	-3916.5	3341.5	-3896.0	-18.5	+20.5	±150

* + = High, - = Low to prognosis. # Base Oligocene was picked from biostrat.

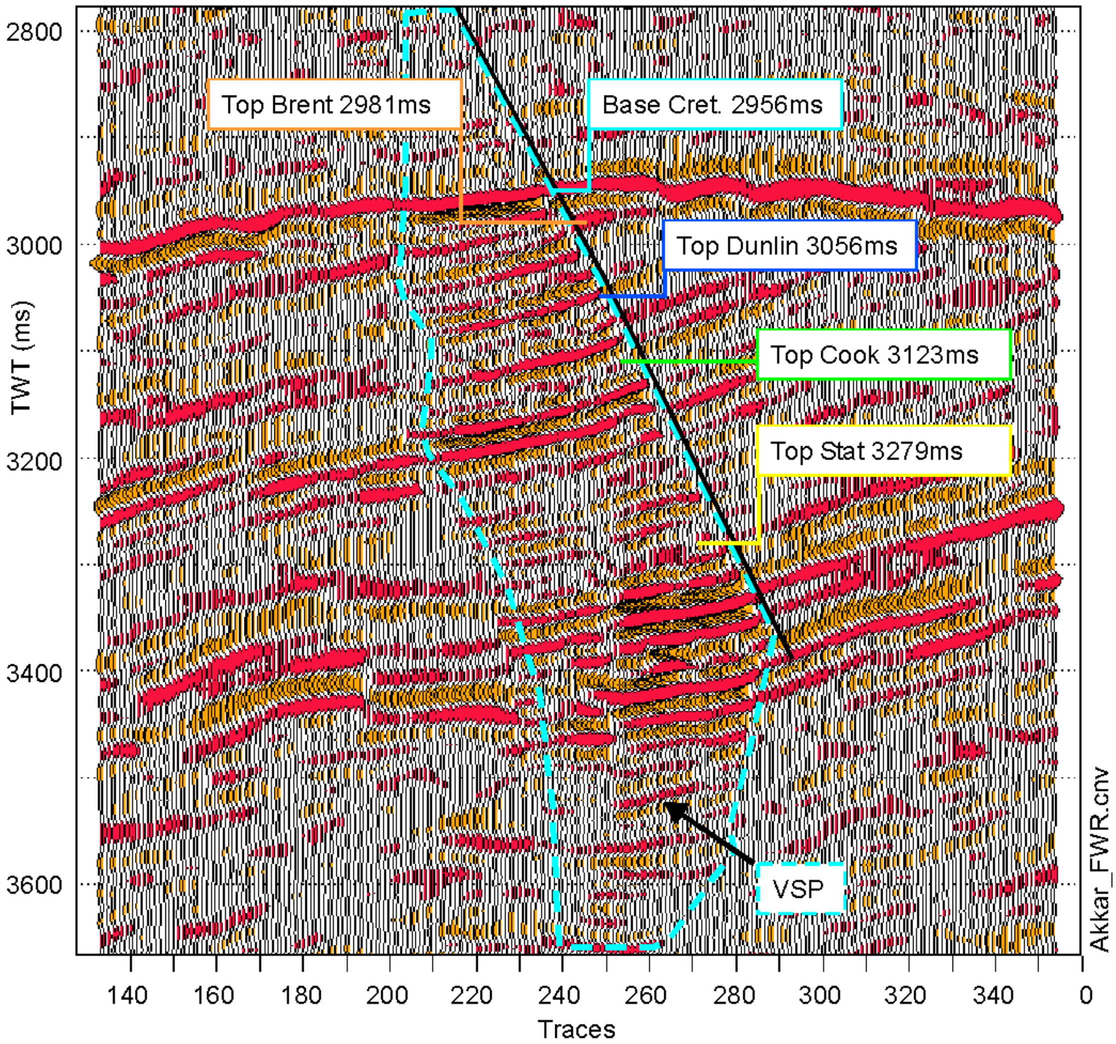


Figure 2. Zero phase VSP spliced into surface 3D seismic with -25ms shift applied. Surface seismic is an arbitrary line along the well path taken from the cn01m02 survey. SEGY normal polarity i.e. downward increase in acoustic impedance = peak (red).

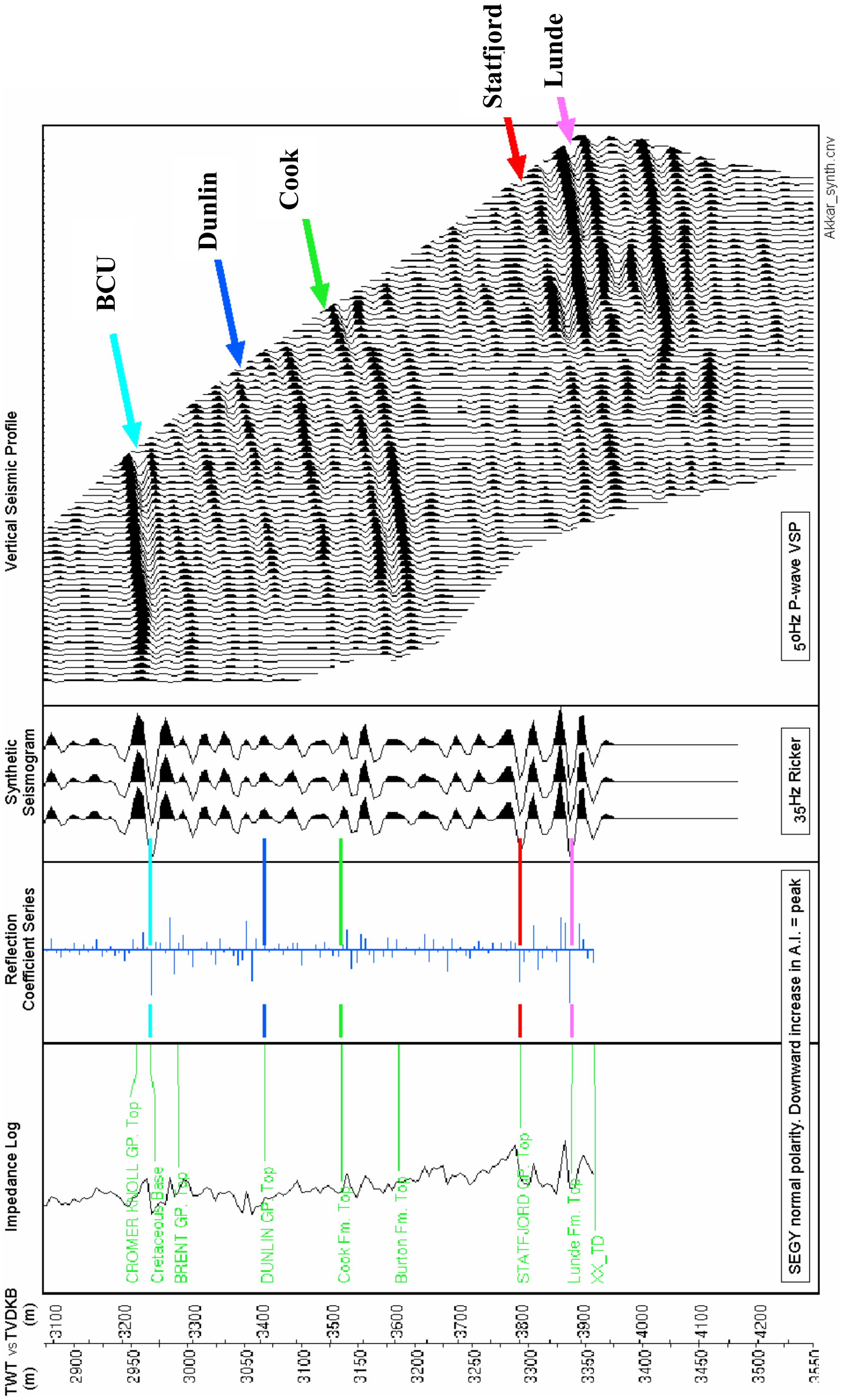


Figure 3. Composite well tie display showing impedance log, reflection coefficient series and resulting synthetic seismogram together with VSP for comparison. Horizon ties on VSP panel are indicated by respective coloured arrows.

2.7. BOTTOM HOLE TEMPERATURE FROM LOGS

Bottom hole temperatures were recorded on 7 electric log runs, the results of which are summarized in Table 6. A maximum temperature of 139°C was recorded.

Table 6. Bottom Hole Temperature From Logs

DATE	LOG	DEPTH m MDRT	MAX TEMP	TIME SINCE LAST CIRCULATION
13/08/02	1A DSI/AIT/IPLT/HNGS	3552	111°C[1]	14 hrs 55 min
15/08/02	1B DSI/AIT/GR	4359	129°C	15 hrs 22 min
15/08/02	1C IPLT/HNGS	4365	133°C	23 hrs 55 min
16/08/02	1D VSP/GR	3380	108°C[1]	33 hrs 45 min
16/08/02	3E MDT/GR	4025	118°C[1]	73 hrs 40 min
19/08/02	1F MDT on pipe	4299.5	139°C[1]	27 hrs 15 min
19/08/02	1F VSP on pipe	4325.8	139°C[1]	42 hrs 20 min

[1] Runs did not reach TD.

Note: Wiper trips were performed after Run 1A and Run 3E. MDT Runs 1E and 2E are not included as the tools failed in casing.

2.8. STRATIGRAPHY

2.8.1. Chronostratigraphical Summary

Depths	Series	Stage
1350 m	Unassigned	Unassigned
1360 m – 1420 m	Late Oligocene (or older)	Chattian - Rupelian
1430 m – 1550 m	Early Oligocene	Rupelian
------------------------------	Stratigraphic Break----------------	------------------------------
1560 m – 1820 m	Middle Eocene	Lutetian
1830 m – 1900 m	Early Eocene	Ypresian
1920 m – 2030 m	Late Palaeocene	Thanetian
2040 m	Early Palaeocene	Danian
------------------------------	Stratigraphic Break----------------	------------------------------2053 m log
2050 m – 2220 m	Late Cretaceous	Late Maastrichtian
2240 m – 2250 m	Late Cretaceous	Early Maastrichtian
2300 m – 2400 m	Late Cretaceous	Late Campanian
2410 m – 2500 m	Late Cretaceous	Early Campanian
2510 m – 2760 m	Late Cretaceous	Late Santonian
2770 m – 2850 m	Late Cretaceous	Early Santonian
2880 m – 3000 m	Late Cretaceous	Late Coniacian
3020 m – 3220 m	Late Cretaceous	Early Coniacian
3240 m	Late Cretaceous	Late - Middle Turonian
3260 m – 3375 m	Late Cretaceous	Middle Turonian
------------------------------	Stratigraphic Break----------------	------------------------------
3378 m	Early Cretaceous	earliest Albian - latest Aptian
3381 m	Early Cretaceous	?Late Barremian
3384 m – 3393 m	Early Cretaceous	Late Barremian
3399 m	Early Cretaceous	Early Barremian
------------------------------	Stratigraphic Break----------------	------------------------------
3402 m	Early Cretaceous	Early Hauterivian
3405 m	Early Cretaceous	Late Valanginian
------ ------------------------	Stratigraphic Break----------------	------------------------------3411.5 m log
3408 m – 3417 m	Late Jurassic	Late - Middle Oxfordian
------------------------------	Stratigraphic Break----------------	------------------------------3419 m log
3420 m – 3468 m	Middle Jurassic	Bathonian (or older)
------------------------------	Stratigraphic Break----------------	------------------------------3469.5 m log
3471 m – 3480 m	Middle Jurassic	?Late Bajocian
3489 m – 3627 m	Middle Jurassic	Early Bajocian
3630 m – 3657 m	Middle Jurassic	Late - Middle Aalenian
3663 m – 3672 m	Middle Jurassic	Early Aalenian
3675 m – 3705 m	Early Jurassic	Late Toarcian
3714 m – 3759 m	Early Jurassic	Middle Toarcian
3768 m – 3924 m	Early Jurassic	Early Toarcian (or older)
3933 m – 4113 m	Early Jurassic	Late Pliensbachian
4122 m – 4191 m	Early Jurassic	Late - ?Early Pliensbachian
4200 m – 4257 m	Early Jurassic	?Late Sinemurian (or older)
4266 m – 4275 m	Early Jurassic	?Hettangian
4284 m – 4360 m	Early Jurassic - ?Triassic	Indeterminate

2.8.2. Lithostratigraphical Summary

Based on wireline logs, LWD logs (depth shifted to match wireline), cuttings and biostratigraphic analyses, the following lithostratigraphical subdivision is suggested (see Table 5 and Figures 3 and 4 for prognosed vs. actual depths). LWD logs were required to be shifted, on average, 5m deeper (down) to match wireline (fuller details of depth shifting are given in Section 2.10.1 on page 28).

Table 7: Lithostratigraphical Summary well 34/6-1 S

Group	Formation	MD RT (m)	TVDSS (m)
Hordaland Group (TNS)	Undifferentiated	1350	-1332.4
Rogaland Group	Balder Formation	1877.5	-1850.8
	Sele Formation	1900	-1873.3
	Lista Formation	1911	-1884.3
	Våle Formation	2043	-2016.3
Shetland Group	Jorsalfare Formation	2053	-2026.3
	Kyrre Formation	2300	-2273.3
	Tryggvason Formation	3240	-3099.5
Cromer Knoll Group	Undifferentiated	3378	-3191.2
Viking Group	Draupne Formation	3411.5	-3213.1
	Heather Formation	3419	-3218
Brent Group	Tarbert Formation	3469.5	-3250.7
	Ness Formation	3476	-3254.9
	Etive Formation	3512	-3278
	Rannoch Formation	3583	-3325.1
Dunlin Group	Drake Formation	3658.5	-3379.4
	Cook Formation	3807	-3490.1
	Burton Formation	3932	-3583.2
	Amundsen Formation	3941	-3589.8
	Statfjord Formation	4198.5	-3775.6
Hegre Group	Lunde Formation	4313	-3860.6
	TD Driller	4360	-3896
	TD Logger	4366	-3900.5

TNS = Top Not Seen

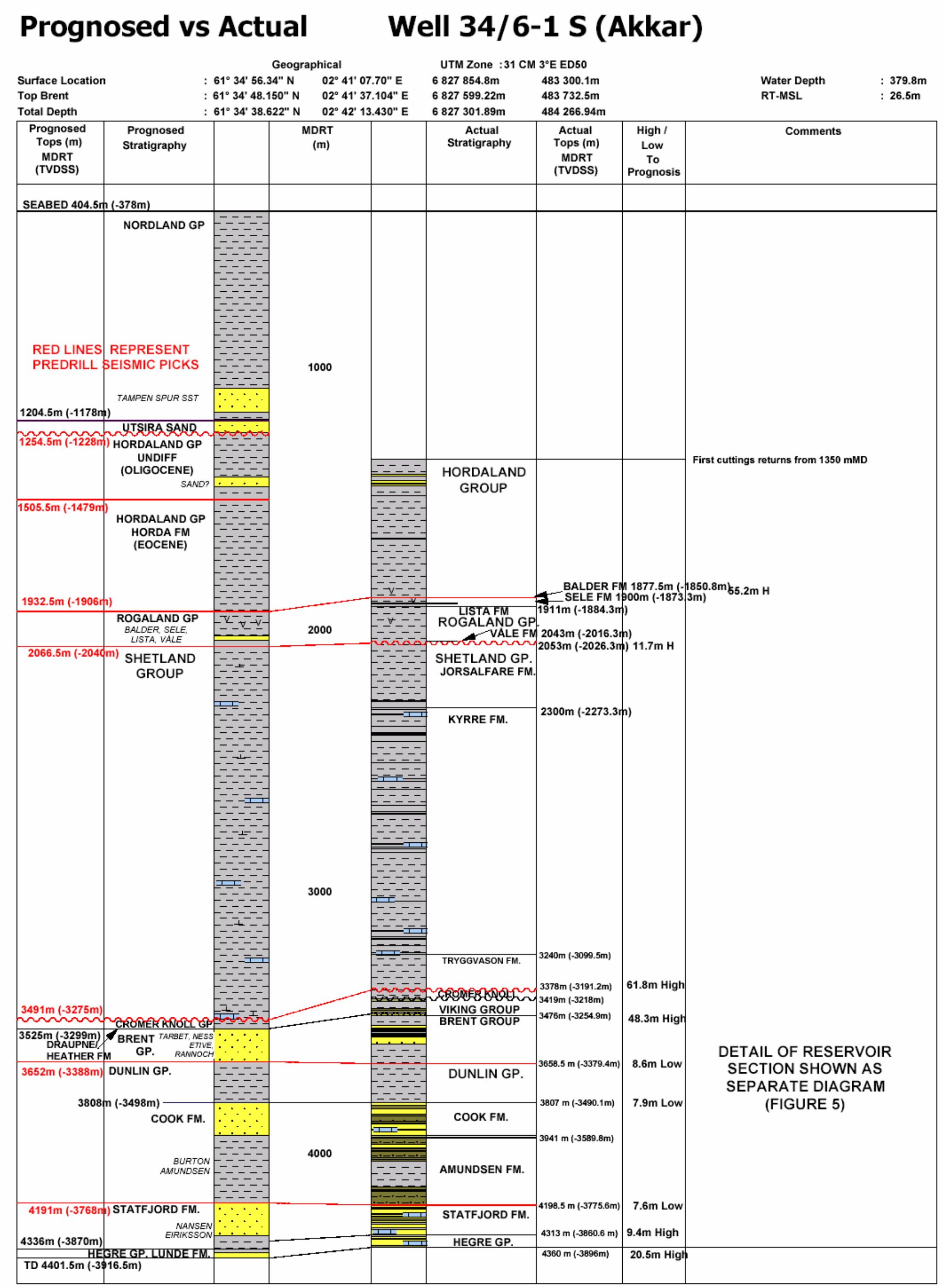


Figure 4 Geological Column Prognosed vs Actual

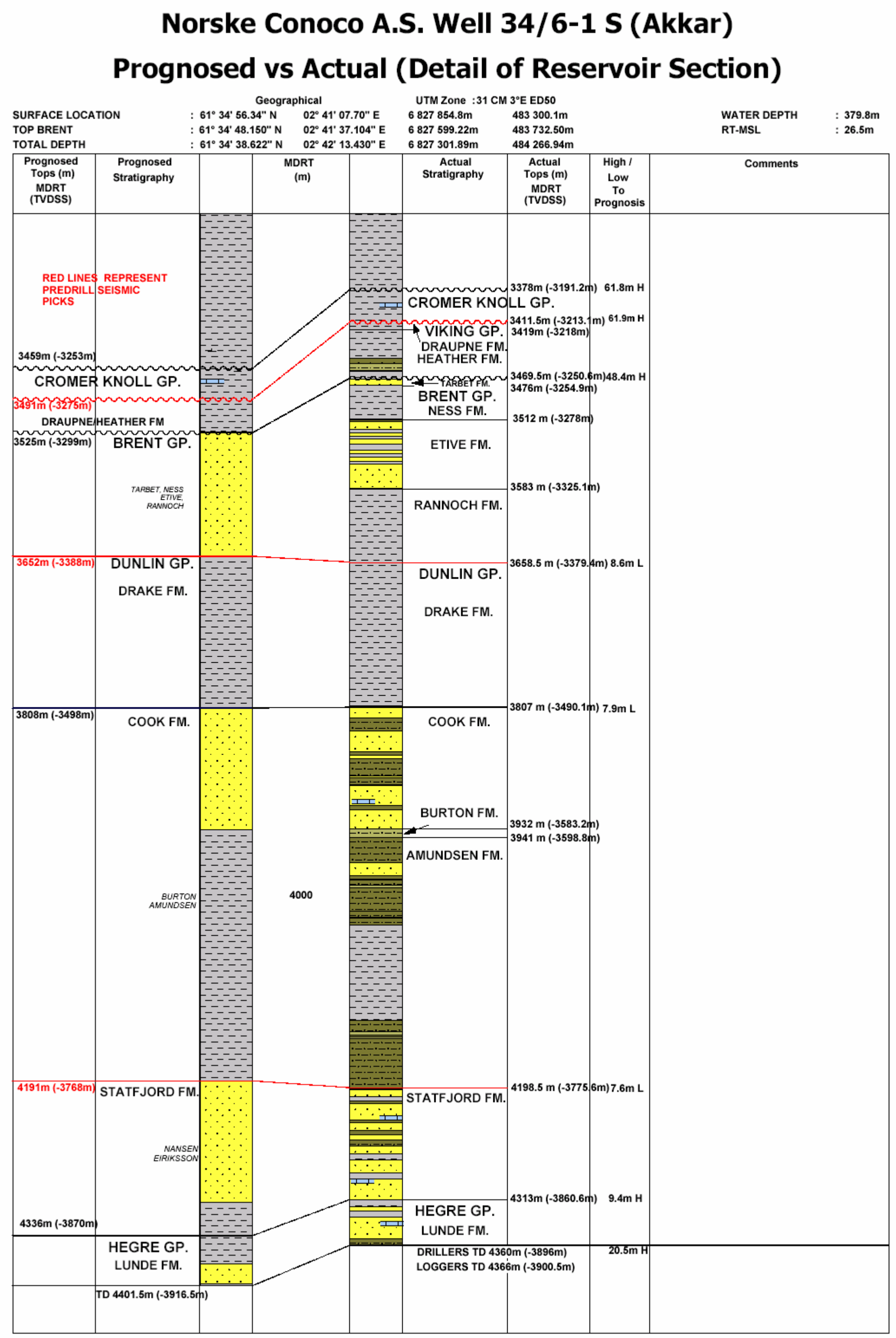


Figure 5 Geological Column Prognosed vs Actual – Detail of Reservoir Section

2.8.3. Lithological Description 34/6-1 S

First returns were taken at 1350m MDRT (-1332.4 m TVDSS). The lithology above this depth has been left unassigned.

Hordaland Group 1350 to 1877.5 m MDRT (-1332.4 to -1850.8 m TVDSS)
Undifferentiated (1350 to 1877.5 m MDRT)

The Hordaland Group is dominated by claystone with minor sandstone.

The claystone is medium to dark grey, commonly medium bluish grey and occasionally brownish grey in colour. It is firm to moderately firm, subblocky to blocky, occasionally micromicaceous with rare disseminated micropyrite and microcarbonaceous material. It is non- to slightly calcareous. At the base of the Horda Formation there is a clear marker in the appearance of red brown and brownish grey claystone with traces of tuffaceous material, which is very pale blue to pale blue green.

The sandstones (best developed between 1420 – 1455 m MDRT) are generally seen in the cuttings as loose quartz grains. These are clear to translucent, colourless to very pale grey, fine to medium grained, subrounded, rarely subangular, subspherical, and poor to moderately sorted. Commonly, a greyish green argillaceous matrix and loose calcite cement is present; in addition to abundant glauconite. There is no visible porosity or fluorescence. Traces of micropyrite were also noted.

Rogaland Group 1877.5 to 2053 m MDRT (-1850.8 to -2026.3 m TVDSS)

The Rogaland Group comprises claystones and tuffaceous claystones.

Balder Formation (1877.5 to 1900 m MDRT)

The claystone is medium to dark grey, occasionally dark bluish grey, commonly brownish grey to red brown, soft to firm, blocky to subblocky, rarely splintery, occasionally amorphous, micromicaceous in places, commonly tuffaceous, commonly carbonaceous, and non to slightly calcareous. The tuffaceous claystones are pale blue to pale black green, occasionally moderately blueish green to pale blue green, soft to firm, subblocky, non- to slightly calcareous.

Sele Formation (1900 to 1911 m MDRT)

The claystones and tuffaceous claystones in the thin Sele Formation are as described for the overlying Balder Formation.

Lista Formation (1911 to 2043 m MDRT)

The claystone is medium grey to greenish grey, occasionally brownish grey, occasionally light bluish grey, firm, blocky to subblocky, rarely splintery, occasionally micromicaceous, occasionally carbonaceous, occasionally tuffaceous. A couple of thin limestone stringers were noted. These are described as milky white to pale yellowish orange, moderate hard, subblocky, microcrystalline with a mudstone to wackestone texture.

Våle Formation (2043 to 2053 m MDRT)

The claystone is medium grey to greenish grey to bluish grey, occasionally brown grey, commonly pale green, firm, blocky to subblocky, rarely splintery, and occasionally micromicaceous, carbonaceous and/or tuffaceous.

Shetland Group 2053 to 3378 m MDRT (-2026.3 to -3191.2 m TVDSS)

The Shetland Group consists of calcareous claystones with stringers of limestone (occasionally dolomite) present throughout.

Jorsalfare Formation (2053 to 2300 m MDRT)

The claystones are light to dark grey, commonly medium bluish grey to greenish grey, They are soft to firm, blocky to subblocky, occasionally amorphous, rarely splintery, slightly sticky in places, and occasionally micromicaceous. They are typically moderately calcareous though range from non- to very calcareous. Traces include: micropyrite and glauconite.

The limestones, seen as thin stringers, are initially off white to white to bluish white, soft to firm, subblocky to amorphous, cryptocrystalline, occasionally microcrystalline and slightly argillaceous in places. They have a mudstone texture.

Kyrre Formation (2300 to 3240 m MDRT)

The claystones are medium to dark grey, commonly medium bluish grey to greenish grey, becoming predominantly olive grey to black. They are soft to firm, blocky to subblocky, occasionally amorphous, rarely splintery, slightly sticky in places, and occasionally micromicaceous. They are typically moderately calcareous though range from non- to very calcareous. Traces include: micropyrite and glauconite.

The limestones, seen as thin stringers, are initially off white to white to bluish white, soft to firm, subblocky to amorphous, cryptocrystalline, occasionally microcrystalline and slightly argillaceous in places. They have a mudstone texture. Passing down the limestones become typically pale to dark yellowish orange to yellowish brown or grey, cryptocrystalline to microcrystalline, and argillaceous or dolomitic in places. The cuttings are moderately hard, brittle and blocky

Trygvasson Formation (3240 to 3378 m MDRT)

The claystones are medium to dark grey, commonly olive grey to black. They are firm to soft in places, occasionally moderately hard, blocky to subblocky, occasionally amorphous, rarely splintery, slightly sticky in places, and occasionally micromicaceous or slightly silty. They are typically moderately calcareous though range from non- to very calcareous. Traces include: micropyrite and glauconite.

The limestones, seen as thin stringers, are dark to pale yellow brown, cryptocrystalline to microcrystalline, and slightly argillaceous in places. The cuttings are moderately hard, brittle and blocky.

Cromer Knoll Group 3378 to 3411.5 m MDRT (-3191.2 to -3213.1 mTVDSS)

The top of the Cromer Knoll Group is marked by a colour change in the claystones to red brown (compared with the overlying grey claystones of the Shetland Group). The claystones are reddish brown to pale reddish brown, also medium to medium dark to light grey, firm, subblocky to blocky, occasionally splintery and micromicaceous in part. There is an associated increase in the calcareous content of the claystones, which grade into marls and argillaceous limestones.

Viking Group 3411.5 to 3469.5 m MDRT (-3213.1 to -3250.7 m TVDSS)
Draupne Formation (3411.5 to 3419 m MDRT)

The top of the Viking Group is here represented by the Draupne Formation. The organic-rich claystones are soft, friable, slightly silty and carbonaceous. Their distinctive olive black to brownish black colouration stands in marked contrast to the red brown calcareous claystones and marls of the overlying Cromer Knoll Group.

Heather Formation (3419 to 3469.5 m MDRT)

The Heather Formation is also dominated by organic-rich claystone, with additionally, several thin limestone stringers. The claystone is olive to brownish black, black, soft to firm, subblocky to blocky, part micromicaceous, silty and carbonaceous in part. The limestone is very light grey, firm to moderately hard, blocky, brittle, microcrystalline and argillaceous in part. A distinct change in log character occurs at 2460 m MDRT from a high gamma ray/low resisitivity shale into a low gamma/higher resisitivity unit. During the well, while looking for indications of hydrocarbon-bearing sandstone and a potential coring point, drilling was halted based on the high LWD resisitivity response and a sample circulated. The sample was seen to be a well-cemented silstone, confirmed later by sonic logs as acoustically hard.

Brent Group 3469.to 3658.5 m MDRT (-3250.7 to - 3379.4 mTVDSS)

Tarbert Formation (3469.5 to 3476 m MDRT)

The thin Tarbert sandstone overlies the claystone-dominated Ness Formation with its occasional limestone stringers and rare sandstone. The Tarbet sandstone is medium grey to light olive grey to light brownish grey to pale yellowish brown and locally light grey in colour. The clear quartz grains are very fine to occasionally fine, subrounded to subangular, subspherical, moderately to well sorted, friable to loose. The sandstone is non- to locally slightly calcareous, rarely very calcareous, with a silty, locally argillaceous matrix. There are traces of micromica and carbonaceous material. No visible porosity, stain, or direct fluorescence was recorded. However, a slow blooming weak blue white fluorescent crush cut left a trace of yellow white fluorescent residue. There was no visible cut or residue.

Ness Formation (3476 to 3512 m MDRT)

The Ness Formation consist predominantly of claystone with occasional limestone stringers and rare sandstones.

The claystones are dark grey to olive black, moderately hard to firm, friable, deformed to subblocky, non to locally slightly calcareous, silty, locally very silty grading to siltstone, micromicaceous, carbonaceous, with local traces of pyrite and micropyrite. The sandstones are as described for the overlying Tarbet Formation.

Etive Formation (3512 to 3583 m MDRT)

The Etive Formation consists of interbedded sandstone and claystone, the former predominant in the lower part of the Formation. Thin limestones and rare coals are also seen.

The sandstone is predominantly medium grey to olive grey, locally light grey to light olive grey, and rarely olive grey to olive black in colour. Quartz grains are very fine to fine, subrounded to subangular, subspherical, and well to moderately sorted. The matrix is silty locally grading to siltstone and though generally non calcareous is locally moderate to very calcareous. Trace of carbonaceous material and micromica were noted. No visible porosity, stain, or direct fluorescence was recorded. However, a slow blooming weak blue white fluorescent crush cut left a trace of yellow white fluorescent residue. There was no visible cut or residue.

The claystones are dark grey to olive black, moderately hard to firm, friable, deformed to subblocky, non to locally slightly calcareous, silty, and where locally very silty grade to siltstone. Traces of micromica, carbonaceous material, pyrite and micropyrite were noted. Rare coals were observed, these were black, hard, brittle, blocky and partly vitreous.

Stringers of very light grey to pale yellow brown, microcrystalline to occasionally cryptocrystalline, slightly argillaceous limestone were also seen.

Rannoch Formation (3583 to 3658.5 m MDRT)

The claystones of the Rannoch Formation are dark grey to olive black, dark brownish grey to brownish black in colour. The cuttings are moderately hard to firm, friable, deformed to subblocky, non- to locally slightly calcareous, silty, and where locally very silty grade to siltstone. Traces of very fine sand, micromica, carbonaceous material, pyrite and micropyrite were also noted.

A couple of limestone stringers were observed as white to very light grey, firm, blocky, microcrystalline and arenaceous in parts.

Dunlin Group 3658.5 to 4198.5 m MDRT (-3379.4 to -3775.6 m TVDSS)
Drake Formation (3658.5 to 3807 m MDRT)

The Drake Formation is dominated by claystone (often silty) with rare limestone stringers. The claystone becomes siltier near the base.

The claystones are predominantly olive grey to grey black, moderately hard to firm, deformed to subblocky, moderately to locally very silty grading to siltstone, carbonaceous, micromicaceous, occasionally glauconitic (near base) and rarely calcareous. The limestone stringers are typically olive grey, firm, friable, crypto- to microcrystalline and argillaceous.

Cook Formation (3807 to 3932 m MDRT)

The Cook Formation consists of siltstones, which grade into locally well-developed sandstones with occasional calcareous doggers

Siltstones are olive black to brownish black, medium to dark olive grey, firm to soft, part moderately hard, friable to plastic, and grade into very fine argillaceous sandstones. Traces include carbonaceous material and rare micromica. The sandstones are typically light grey, light to medium olive grey, pale yellowish brown in colour. The quartz grains are very fine to fine, rarely medium, very rarely medium to coarse, subangular to subrounded, subspherical, and moderately to poorly sorted. The sandstones are firm to moderately hard, friable to loose, and locally very silty grading to silststone. They are generally non calcareous with occasional limestone doggers.

Burton Formation (3932 to 3941 m MDRT)

The Burton Formation consists of silty claystones which are olive black to brownish black, medium to dark olive grey and dark grey to rarely black in colour. They are firm to soft, moderately hard in part, friable to plastic, occasionally sandy, with local traces of micromica and carbonaceous material.

Amundsen Formation (3941 to 4198.5 m MDRT)

The Amundsen Formation consists of a claystone unit, overlain and underlain by units of siltstones/sandy siltstones. At the wellsite, the formation appeared considerably more sandy than was evidenced by wireline logs. A 6m thick sand has been interpreted near the top of the formation.

Statfjord Formation 4198.5 to 4313 m MDRT (-3775.6 to -3860.6 m TVDSS)

The Statfjord Formation consists predominantly of sandstone and siltstone, with interbeds of claystone, limestone and to a lesser extent coal.

The sandstones are olive grey to medium grey, white, yellowish grey, and rarely dark olive grey in colour. The quartz grains are very fine to fine, occasionally medium, subrounded, subspherical and moderately sorted. The sandstone is loose and friable and grades to siltstone. It is non to occasionally very calcareous grading to limestone. The matrix is part silty, part argillaceous and kaolinitic. No visible porosity or show was recorded. However, a weak dull yellow direct predominantly mineral fluorescence was seen together with a trace very slow blooming blue white to yellow fluorescent crush cut and trace yellow fluorescent residue.

The siltstones are olive black to dark grey, moderately hard, brittle to friable, deformed, non- to slightly calcareous and argillaceous. They are often very sandy and grade to very fine sandstone. Traces of micromica and carbonaceous material were also noted.

The claystone is olive black to dark grey to grey black, locally medium dark grey, moderately hard to occasionally firm, brittle to friable, deformed, non to slightly calcareous, locally carbonaceous, occasionally grading to coal: black, moderately hard to hard, friable to brittle.

Hegre Group 4313 to 4360 m MDRT (-3860.6 to –3896 m TVDSS)
Lunde Formation (4313 to 4360 m MDRT)

The Lunde Formation is consists of a series of sandstones, siltstones and claystones.

The sandstones are white, yellowish grey, light olive grey and brownish grey in colour. They are very fine to occasionally fine grained, or rarely fine to medium grained; subrounded, subspherical, and moderately sorted. The sandstone is friable to loose, and though often non calcareous, is locally very calcareous grading to limestone. The matrix is silty, part argillaceous/kaolinitic with traces of carbonaceous material/coal. No visible porosity or show was recorded. However, a weak dull yellow direct mineral fluorescence with a trace of a very slow blooming blue white to yellow fluorescent crush cut and a trace of yellow fluorescent residue was noted.

The claystones, which are brown black to brown grey, brown grey and olive black, develop a trace of greenish black from 4311 m. The cuttings are moderately hard to soft, friable to plastic, non- to occasionally slightly calcareous, predominantly slightly silty and where very silty grade to siltstone.

TD (Driller) 4360 m MDRT (-3896 m TVDSS)
TD (Logger) 4366 m MDRT (-3900.5 m TVDSS)

2.9. HYDROCARBON INDICATORS

2.9.1. Gas Shows 34/6-1 S

Gas analysis began from the drilling out of the 20" casing shoe at 1342 m MD. Gas peak data is listed below in Table 8.

Background drilling gas (BG), in the 17½" section, ranged between 0.5% and 2.25% down to 1480 m MDRT drilling with a 1.25 sg water-based mud. Between 1480 and 2422 m MDRT, background gas levels ranged from 0.5% to 1.0% and did not show any marked reduction when the mud weight was raised from 1.25 to 1.40 sg by 1900 m MDRT. The gas consisted primarily of methane with traces of ethane or propane.

From the 12¼" section down to TD, oil-based mud was used with the associated appearance of I-butane and ethane components. In the 12¼" section, background gas levels remained suppressed at 0.10% to 0.20%, drilling with a 1.50 sg mud weight.

The 8 ½" reservoir section was initiated with a 1.65 sg oil-based mud weight. This was raised to 1.72 sg at 3756 m MDRT and again to 1.74 sg at 4130 m MDRT based on pore pressure predictions. The background gas however remained very low and flat, ranging from 0.2% to 0.3%, down to 4190 m MDRT. Increasing connection gas (CG) peaks were recorded between 4062 m MDRT and 4197 m MDRT. Below 4190 m MDRT, down to TD at 4360 m MD, the background gas increased to 0.5% with frequent peaks of formation gas (FG) in the Statfjord sands.

The increase in gas levels coincided with the penetration of the Statfjord and Lunde reservoir intervals and an increase in pore pressure to 1.70 – 1.71 sg while drilling with a 1.74 sg mud. The highest recorded formation gas peak was 1.77% (above a background of 0.35%) at 4271m MDRT. This sample gave a full chromatographic breakdown of components from methane to N-pentane.

Table 8: Gas Summary 34/6-1 S

Depth mMD	Total gas %	Back-ground %	C1 ppm	C2 ppm	C3 ppm	iC4 ppm	nC4 ppm	iC5 ppm	nC5 ppm	Remarks
1478	1.25	0.70	12062	0	10	0	3	4	0	FG
2241	0.90	0.30	8130	28	9	5	6	9	1	FG
3922	0.38	0.15	2994	273	103	11	18	8	3	TG
4062	0.20	0.15	1443	103	59	43	14	8	4	CG
4091	0.24	0.17	1882	122	70	50	17	8	5	CG
4117	0.22	0.13	1462	89	47	57	14	6	3	CG
4147	0.24	0.12	1755	113	46	54	10	7	1	CG
4175	0.28	0.12	2137	131	51	52	10	4	1	CG
4197	0.53	0.15	3518	525	168	63	25	4	0	CG
4214	0.48	0.16	2956	526	166	40	26	4	1	TG
4220	0.62	0.30	3893	660	200	42	35	4	1	FG

Depth mMD	Total gas %	Back-ground %	C1 ppm	C2 ppm	C3 ppm	iC4 ppm	nC4 ppm	iC5 ppm	nC5 ppm	Remarks
4223	0.69	0.51	4455	662	221	48	34	5	1	FG
4233	0.65	0.52	4773	494	171	46	28	4	1	FG
4235	0.62	0.58	4299	601	204	44	31	5	1	FG
4247	1.12	0.50	7550	1090	337	51	44	6	1	FG
4263	0.92	0.50	6979	596	289	62	44	7	1	FG
4271	1.77	0.35	12771	1604	492	52	68	8	2	FG
4336	0.64	0.32	4045	981	317	26	51	4	1	FG
4347	0.67	0.23	4401	798	266	27	43	3	1	FG
4350	0.59	0.33	4286	586	210	27	36	4	3	TG
4360	0.48	0.24	2766	573	185	20	31	3	1	TG

FG = Formation Gas, TG = Trip Gas, CG = Connection Gas

Gas levels recorded while drilling the well were low.

2.9.2. Oil Shows

Propanol was used as solvent for show description.
A summary of the observed shows is given below in Table 9.

Table 9: Observed Shows in 34/6-1 S

SOURCE	DEPTH (m MD)	LITHOLOGY	SHOWS DESCRIPTION
Cuttings	3464-3578	Brent Sandstone	No stain, no direct fluorescence, slow blooming weak blue white fluorescent crush cut, no visible cut, trace yellow white fluorescent residue, no visible residue.
Cuttings	3802-3851	Cook Sandstone	No stain, no direct fluorescence, slow blooming weak blue white fluorescent crush cut, no visible cut, trace yellow white fluorescent residue, no visible residue.
Cuttings	4230-4366	Statfjord Sandstone	No stain, no direct fluorescence, slow blooming weak blue white fluorescent crush cut, no visible cut, trace yellow white fluorescent residue, no visible residue.

2.10. PETROPHYSICAL REPORT

2.10.1. LWD and Wireline data

LWD gamma ray, resistivity and compressional sonic logs were taken in the overburden sections. LWD gamma ray and resistivity logs, which were acquired from 1350 m MDRT to 3384 m MDRT, were augmented by LWD sonic data (in the 12¼" hole section) between 2394 m MDRT and 3384 m MDRT. LWD gamma ray and resistivity data was also acquired in the 8½" reservoir section between 3392 m MDRT and 4360 m MDRT.

Open hole array induction, sonic, density, neutron and spectral gamma ray measurements were made during two separate wireline runs (Runs 1B and 1C) in the reservoir sections below 3394 m MDRT. Cased hole gamma ray and compressional sonic logs were acquired in Run 1A.

LWD and wireline data were spliced and edited in accordance with HQLD specifications. Logtek in Stavanger performed log editing and splicing. Runs 1A and 1B were considered primary for the purposes of depth control. Run 1C was depth matched to these runs.

LWD logs were depth matched to wireline logs. An average downwards depth shift of +5 m was required in the 8½" hole reservoir section to shift the LWD logs onto deeper wireline logs. The following depth pairs have to selected from Logtek's final report to illustrate the range of depth shifting required:

LWD GR	Wireline GR	Shift*
1338.5	1341.7	+3.2 m
2112.9	2115.6	+2.7 m
3036.1	3039.9	+3.8 m
3058.5	3063.1	+4.6 m
3242.3	3247.3	+5.0 m
3272.0	3278.0	+6.0 m
3378.7	3385.1	+6.4 m
3502.8	3507.3	+4.5 m
3600.3	3603.7	+3.4 m
3808.0	3812.1	+4.1 m
4002.6	4006.6	+4.0 m
4200.3	4205.5	+5.2 m
4341.9	4348.6	+6.7 m

* Depth shift (+ = deeper) applied to LWD to match wireline.

Complete details of the log splicing and depth shifting can be found in the Logtek's HQLD documentation. The 'footer' of the composite log also provides details on the composition and splice points of the final presented curves.

2.10.2. Petrophysical Interpretation

The petrophysical interpretation was performed in-house using PETCOM software.

The volume of shale (Vsh) is based on the standard gamma ray measurements, which prove to be a good Vsh discriminator in this well. Other Vsh computations from the thorium log of the spectral gamma ray, and from the density-neutron cross plot were made and deemed not to yield a better shale curve than the regular gamma ray. The following parameters were used for the different reservoir zones:

Linear gamma ray model:

Brent Group.	GR clean = 35 GR shale = 105
Dunlin Group.	GR clean = 28 GR shale = 105
Statfjord/Lunde Formations.	GR clean = 20 GR shale = 105

Cemented zones, limestones and coals were discriminated by the sonic, neutron and density logs.

Porosity was calculated using the density log. Matrix densities from core data in nearby wells in the Visund Field were used, which show an average range from 2.65 g/cc to 2.68 g/cc. The following average matrix densities for the following reservoir zones were estimated for well 34/6-1 S:

Brent Group Sands	3469.5 m – 3583.5 m = 2.66 g/cc
Dunlin Group Sands	3806.9 m – 4034.3 m = 2.68 g/cc
Statfjord/Lunde Formation Sands	4198.2 m – 4355.0 m = 2.68 g/cc

In intervals where the density log is deemed inaccurate due to tool sticking (observed by high over-pull on the tension curve), a modified Hunt-Raymer sonic porosity is calculated. This was applied in the following intervals: 4212 m – 4220 m and 4345 m – 4350 m.

Rw (at reservoir temperature) and a, m, & n for the different reservoir zones were determined by comparing analogue data from similar zones in the adjacent Visund Field, and the Pickett plot method from the well. A temperature gradient of 35 °C/km was employed. The following results were used in the initial water saturation determination:

Brent Group Sands	Rw = 0.080 at 110 °C; a = 1, m = 2.0, n = 1.9
Dunlin Group Sands	Rw = 0.045 at 121 °C; a = 1, m = 2.0, n = 2.0
Statfjord/Lunde Fm. Sands	Rw = 0.045 at 132 °C; a = 1, m = 2.1, n = 2.1

Water saturation was computed by the Simandoux equation. Rt was computed from the invasion corrected deep induction (A090). Shale resistivities of 4 ohmm for the Brent Group and 8 ohmm for the Dunlin Group and Statfjord/Lunde Formations were used.

All reservoir zones are interpreted by the logs to be water wet. For the Brent and Dunlin sands, this conclusion is supported by apparent water gradients from the MDT pressure pre-tests. Possible low hydrocarbon saturation (residual) could be interpreted from logs in the Amundsen and Statfjord/Lunde Formations, though there are presently no other observations/evidence to support this.

Net reservoir was estimated from offset Visund Field core data, where gas permeabilities above 0.1 mD are retained as net. The following cut-offs were used to estimate net reservoir parameters for gas:

Net Sand is where Vcl is less than 50%.
Net reservoir is where Ø is 8% or higher.
No net pay was calculated for the well.

Table 10: Petrophysical Summary

Reservoir zones	Top (mMD)	Base (mMD)	Thick. (mMD)	Net Res. (mMD)	N/G	Avg. Ø (%)	Avg. Sw (%)
Brent Gp. Sands	3469.5	3658.5	189	49	0.26	0.16	0.94
Cook Fm. Sands	3807	3932	125	71	0.57	0.165	0.88
Amundsen Fm.	3941	4031	90	11	0.13	0.14	0.72
Statfjord Fm.	4198.5	4313	114.5	50	0.44	0.15	0.80
Lunde Fm.	4313	4350	37	11	0.31	0.13	0.82

2.11. MDT RESULTS

2.11.1. Pressure Data

Four MDT runs were performed of which two were successful. Runs 1E and 2E were aborted in casing due to tool problems. In Run 3E, 6 tests (1-6) were attempted in the uppermost sand of the Brent Group (Tarbert Formation) of which 2 tests were supercharged, 3 tight and 1 successful. The tool was worked down to, but would not pass, 4025m. No pressure points were taken while logging up as it proved impossible to record a valid depth correlation due to continuous overpull in the tight hole. The logging run was abandoned for fear of losing the tool. In Run 1F, the MDT tool was run pipe-conveyed (in combination with a VSP). A total of 26 pressure tests (7-32) were attempted of which 10 were successful. A futher 4 tests gave "not fully stable" formation pressures, while 8 tests were aborted (tight, failed or unstable) and 4 tests were supercharged aborted.

The pressures, with corresponding water gradients, are plotted in Figure 6A, B and C. The results are presented in Table 11.

A total of 32 pressure tests were taken in 2 MDT runs (Nos. 1 – 6 in Run 3E and Nos. 7 – 32 in Run 1F). The following test results were obtained: 11 successful, 4 "not fully stable", 11 aborted (tight, failed or unstable) and 6 tests supercharged aborted

Table 11: MDT pressures (all pressures are measured in bars, using quartz gauges)

Test No.	Depth m MD	Depth m TVDSS	Formation	Hydrostatic Pressure (bar)	Formation Pressure (bar)	Pore Pressure g/cc	Stab. Time (mins)	Temp (ºC)	Mobility (cp)	Remarks
1	**3473**	**3252.9**	**Tarbert**	**554.811**	**500.727**	**1.57**	**5**	**117.7**	**1.34**	**Good**
2	3472	3252.3	Tarbert	554.624	-		(2)	117.7	-	Tight Aborted
3	3470	3251.0	Tarbert	554.305	-		(3)	117.6	-	Tight Aborted
4	3471	3251.6	Tarbert	554.219	(502.247)		(11)	117.7	0.1	Supercharged Aborted
5	3473	3252.5	Tarbert	554.356	(502.546)		(11)	117.9	0.08	Supercharged Aborted
6	3472.5	3279.1	Tarbert	554.342	(484.906)		(6)	118.0	0.06	Tight Aborted
7	3473	3252.9	Tarbert	557.408	(503.251)		(4)	108.0	0.25	Supercharged Aborted
8	**3515**	**3280.0**	**Etive**	**562.056**	**502.593**	**1.56**	**2**	**109.7**	**18.4**	**Excellent**
9	**3538.5**	**3295.5**	**Etive**	**564.353**	**505.012**	**1.56**	**3**	**112.4**	**0.6**	**Good**
10	3559	3309.0	Etive	566.622	(484.610)		(4)	112.5	0.1	Tight Aborted
11	3808.5	3491.3	Cook	596.935	568.501	(1.66)	(12)	121.1	0.1	Supercharged 2drawdowns
12	3811	3493.2	Cook	596.091	(570.416)	(1.67)	(15)	121.6	0.1	Y? Spchd? 1.665
13	**3836**	**3512.1**	**Cook**	**599.147**	**568.516**	**1.65**	**1**	**122.2**	**97.7**	**Excellent**
14	**3838**	**3513.6**	**Cook**	**599.366**	**568.653**	**1.65**	**2**	**122.7**	**80.8**	**Excellent**
15	**3843**	**3517.4**	**Cook**	**599.713**	**569.016**	**1.65**	**3**	**122.9**	**14.7**	**Good**
16	**3847**	**3520.4**	**Cook**	**600.101**	**569.699**	**1.65**	**12**	**123.1**	**0.5**	**Moderate**
17	**3904**	**3562.6**	**Cook**	**606.961**	**573.799**	**1.64**	**6**	**124.6**	**4.6**	**Moderate**
18	**3914**	**3570.0**	**Cook**	**608.223**	**574.494**	**1.64**	**5**	**124.7**	**14.9**	**Good**
19	3976.5	3615.6	Amundsen	615.690	(581.456)	(1.64)	(12)	125.9	0.1	Supercharged
20	3978.5	3617.0	Amundsen	615.880	(446.911)	-	(6)	126.0	0.1	Tight Aborted
21	4218	3789.9	Statfjord	646.835	(527.368)	-	(5)	130.8	0.0	Tight Aborted
22	4225	3795.0	Statfjord	647.357	(438.625)	-	(10)	132.4	0.4	Tight Aborted
23	4219	3790.6	Statfjord	646.030	(634.863)	(1.71)	(8)	131.3	1.2	Not fully stable (20cc)
24	4219	3790.6	Statfjord	646.310	(634.912)		(12)	131.7	0.1	Unstable Aborted
25	4219	3790.6	Statfjord	646.277	-		(5)	131.9	0.5	Failed
26	4224	3794.4	Statfjord	647.004	(635.041)		(3)	132.1	0.1	Not fully stable (3cc)
27	4248.5	3812.5	Statfjord	650.164	(637.505)		(15)	138.2	0.1	Not fully stable (5cc)
28	**4252**	**3815.1**	**Statfjord**	**650.770**	**636.682**	**1.70**	**5**	**138.3**	**0.4**	**Good (10cc)**
29	4285.5	3840.0	Statfjord	655.165	(639.661)		(12)	138.9	3.7	Not fully stable (20cc)
30	**4286.5**	**3840.8**	**Statfjord**	**655.367**	**639.400**		**10**	**134.0**	**6.2**	**Moderate (not fully stable)**
31	4299.5	3850.5	Statfjord	657.903	(446.412)		(3)	134.3	1.0	Tight Aborted
32	4297	3848.7	Statfjord	657.216	(480.675)		(5)	138.6	0.8	Tight Aborted –probe #2

Tests in **bold** were successful. Figures (in brackets) are the values recorded when an unsuccessful or dubious test was aborted.

2.11.2. Formation Fluid Samples

No fluid samples were attempted.

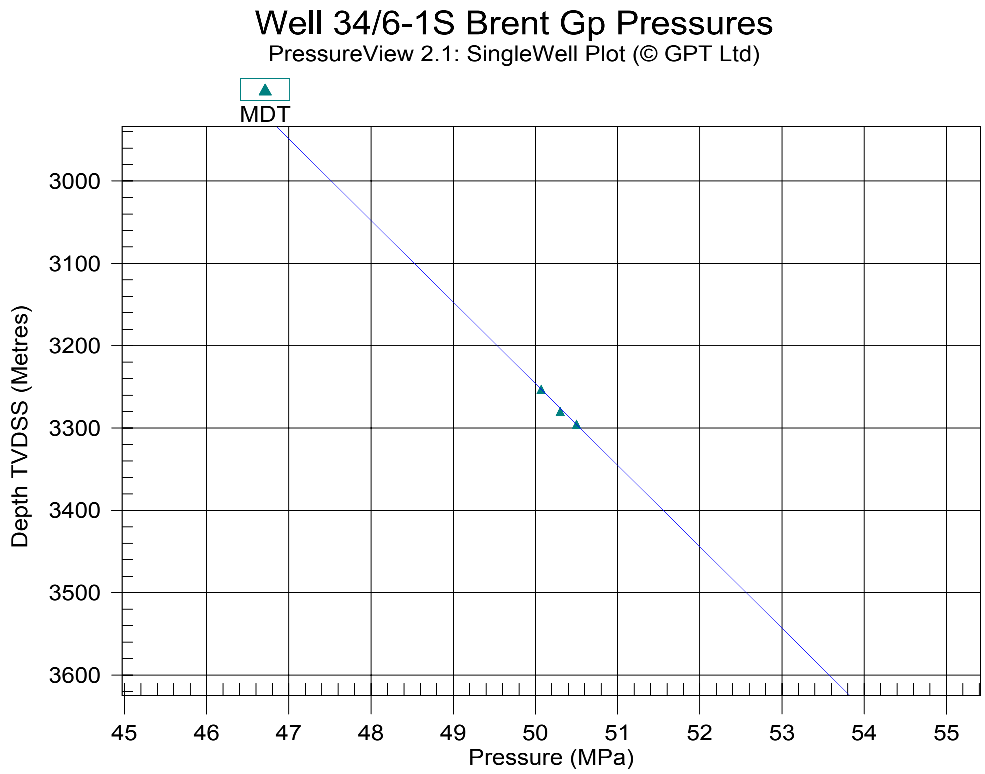


Figure 6A MDT Pressure Data Plot – Brent Group

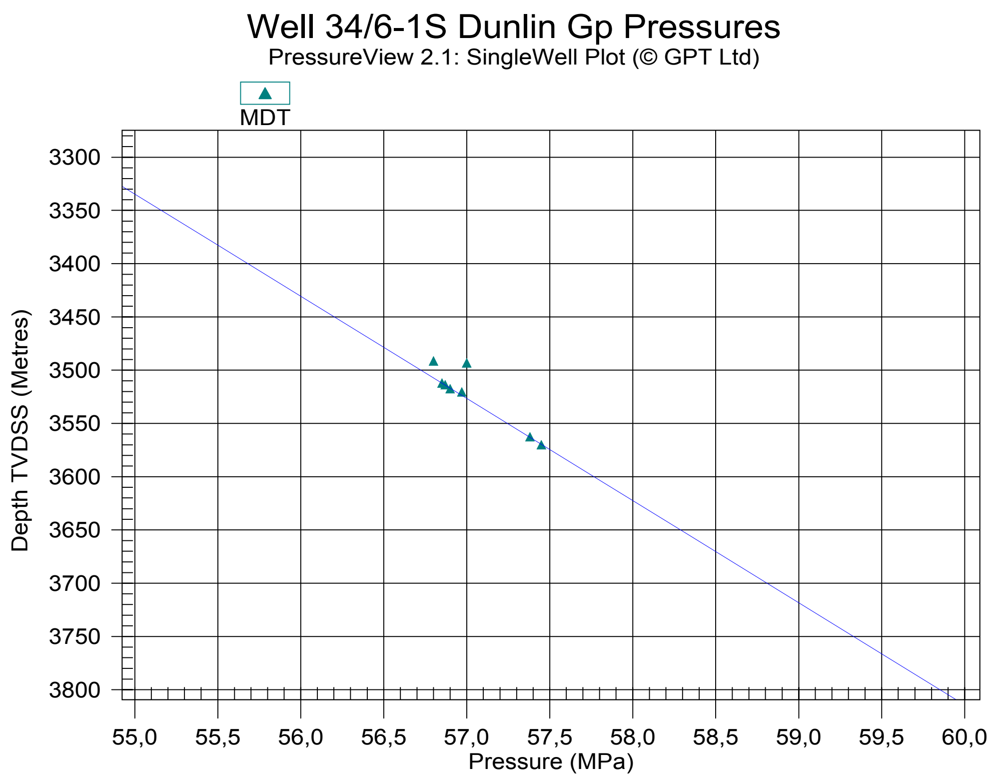


Figure 6B MDT Pressure Data Plot – Dunlin Group

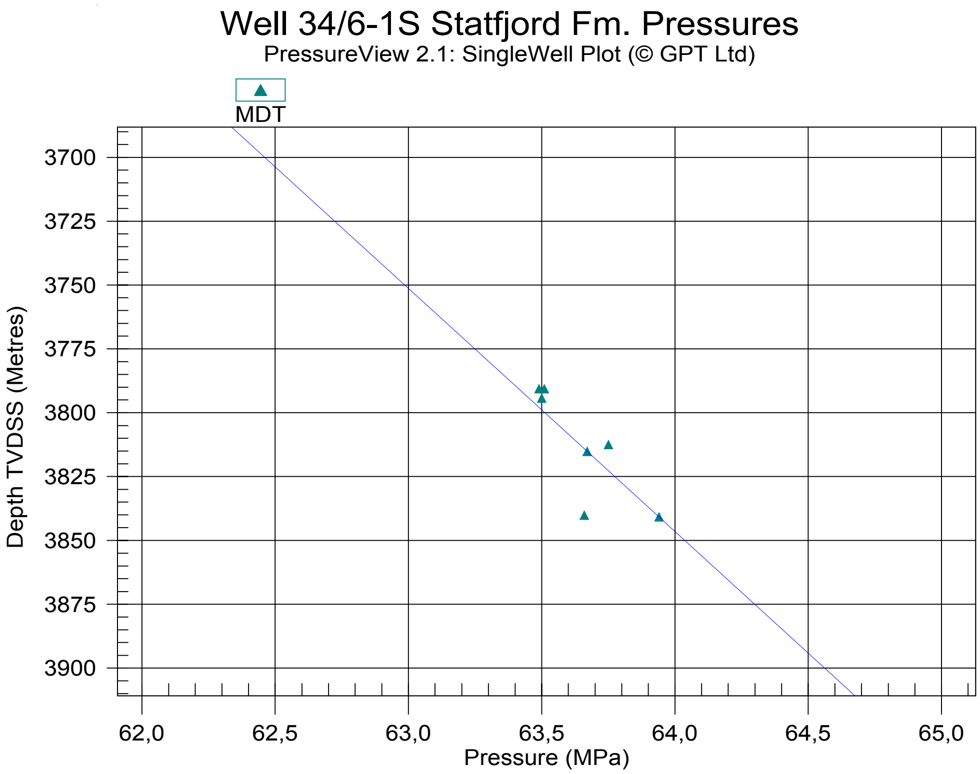


Figure 6C MDT Pressure Data Plot – Statfjord Formation

2.12. FLUID PRESSURE AND FRACTURE GRADIENT PROFILES

2.12.1. Fluid Pressure Gradient

The interpreted fluid pressure gradient in the 34/6-1 S well is shown in Figures 7 and 8. Figure 7 displays the log and interpretation data in true vertical depth (TVDRT). The pre-drill minimum, mid-case and maximum fluid pressure gradient estimates are displayed in track 5 of Figure 7 in thin green, dark blue and purple lines, respectively. The pre-drill pressure interpretations were based on seismic interval velocities down to the top Jurassic interval at about 3200 m TVD. Within the Jurassic interval, the pressures were predicted based on offset data. Figure 8 displays the interpretated data in measured depth (MDRT).

36" and 26" Hole Sections, 406 – 1350 m MDRT / TVDRT
This interval was drilled with seawater with returns to the sea bed. No data is available to interpret fluid pressure; a hydrostatic gradient is assumed. The interpreted fluid pressure gradient is indicated in Figure 7, track 5 in the thick blue line. A leak-off test of 1.55 sg was measured at depth 1353 m MDRT. This value is somewhat lower than the pre-drill mid-case fracture gradient estimate.

17½" Hole Section, 1350 – 2422 m MDRT /TVDRT
This interval was drilled with water-base mud. Data available for interpretation include logging-while-drilling (LWD) gamma ray (track 1, Figure 7), LWD resistivity (track 2, Figure 7), compensated drilling exponent (Dxc, track 3, Figure 7, green), and average drilling gas (track 3, Figure 7, orange). The Dxc and resistivity vary considerably within this interval, but the changes are probably caused by variations in lithology and salinity, rather than fluid pressure. The interval is assumed to be hydrostatic at depth of 1280 m MDRT. Considerable fill was present in the well when casing was run; the casing had to be washed-down in order to reach the drilled depth. Based on this observation, a fluid pressure of 1.35 sg, near the drilling fluid density of 1.4 sg, is interpreted at the base of the interval at 2420 m MDRT.

The trend lines shown on Figure 7 for this interval are constructed to provide a smoothly rising fluid pressure interpretation. They have no physical meaning. The fluid pressure interpretations associated with the resistivity, and Dxc data are shown in track 5 in 'matching' colours. The fluid pressures were interpreted with standard Eaton methods with exponents of 1.2. The overburden curve is shown in track 5 in pink. This curve was calculated from density logs in offset wells. The interpretation of 1.35 sg fluid pressure at 2420 m MDRT is very near the pre-drill mid-case model (track 5, Figure 7).

A formation integrity test (FIT) of 1.82 sg was conducted at depth 2425 m MDRT. This FIT value is essentially identical with the pre-drill mid-case fracture gradient model (track 5, Figure 7), suggesting a fracture gradient somewhat in excess of the mid-case model.

12¼" Hole Section, 2422 – 3395 m MDRT / 2395 – 3229 mTVDRT
This interval was drilled with oil-based mud. Data for fluid pressure interpretation included the logs employed above and also an LWD sonic tool (track 4, Figure 7). The sonic data is interpreted with an Eaton model with an exponent of 3. The sonic-based pressure interpretation is displayed in Figure 7, track 5.

The resistivity-based pressure interpretation (track 5, Figure 7, pink) is somewhat erratic in this interval. A low-pressure zone is indicated between 2600 m and 2700 m TVDRT and a very high pressure zone at about 2800 m TVDRT. These zones are either not present or much less strongly indicated in the sonic and Dxc data. The 'integrated interpretation' is primarily based on the sonic log in this interval. At about 3200 m TVDRT, all three logs (sonic, resistivity, DxC) indicate a rapid pressure rise. Drilling fluid density was increased in response to the log interpretations from 1.5 to 1.55 sg at 3376 m MDRT / 3216 m TVDRT. Shortly after this drilling fluid increase was made, the Cromer Knoll Group was recognized in cuttings and drilling was stopped at the 9⅝" casing point.

A fluid pressure gradient of 1.51 sg is interpreted at a depth of 3382 m MD / 3220 m TVDRT. This value is between the mid-case and low-case pre-drill pressure estimates. An FIT of 1.98 sg was measured at 3392 m MDRT / 3227 m TVDRT. This value is slightly higher than the mid-case, pre-drill fracture gradient estimate (track 5, Figure 7).

8½" Hole Section, 3395 – 4360 m MDRT / 3229 to –3922.5 m TVDRT
This interval was drilled with oil-based mud. Data for fluid pressure interpretation included the logs employed in the previous hole section, with the exception of the LWD sonic tool, which was not run. The initial mud weight was 1.65 sg.

Brent Group sands were encountered between 3469.5 m MDRT / 3277 m TVDRT and 3583 m MDRT / 3352 m TVDRT. Background gas values were very low, less than 0.2% over this interval, suggesting considerable overbalance. MDT measurements, obtained after drilling, indicate a fluid pressure of 1.57 sg, confirming a moderate overbalance.

The shale resistivity values between 3400 m and 3500 m TVDRT (3650 m to 3785 m MDRT) decreased to 2 - 3 ohm-metres. These values were similar to those observed near the base of the 12¼" section and indicated a possible pressure increase relative to the Brent interval (track 2 and 5, Figure 7). Offset data indicated Cook interval pressures in the range of 1.7 to 1.82 sg. At depth 3746 m MDRT / 3480 m TVDRT, the drilling fluid density was increased to 1.72 sg.

The Cook sands were encountered at about 3807 m MD / 3517 m TVDRT, roughly 60 m MD after the fluid density increase. These sands showed increased background gas, relative to the Brent sands. MDT measurements, obtained after drilling, indicate a fluid pressure gradient of 1.64-1.67 sg, confirming the need for the drilling fluid density increase.

The shale resistivity values between 3680 and 3750 m TVDRT (4029 m and 4127 m MDRT) were about 3 - 4 ohm-metres. These values suggested slightly increasing fluid pressure relative to the shales overlying the Cook sands. The Dxc value in this interval was slightly smaller than in the shales overlying the Cook sands, again suggesting increasing fluid pressure. Beginning at 4062 m MDRT / 3704 m TVDRT, a series of three increasing strong connection gas peaks were observed (relative to background levels) At 4130 m MDRT, the drilling fluid density was increased to 1.74 sg.

The Statfjord sands were encountered at 4198.5 m MDRT / 3802 m TVDRT, roughly 60 m MD after the fluid density increase. The Statfjord sands showed the largest amounts of background gas observed in the well. MDT measurements, obtained after drilling, indicate a fluid pressure gradient of 1.70-1.71 sg, confirming a very small overbalance prior to the increase in fluid density increase at 4130 m MD.

The interval below the Statfjord sands, between 4313 and 4360 m MDRT / 3887 – 3922.5 m TVDRT displayed reduced resistivity, characteristic of the Lunde interval. The increased Dxc observed indicated that fluid pressure had not increased substantially. A fluid pressure gradient of 1.71 is interpreted at TD at 4360 m MD / 3922 m TVD.

The wireline sonic log (track 4, Figure 7), which was obtained after drilling, confirms the resistivity, drilling gas and Dxc interpretations made while drilling. This log requires substantially smaller trend line shifts than do the resistivity and Dxc data.

Figure 7 – Pore Pressure Interpretation (depth in metres TVDRT)

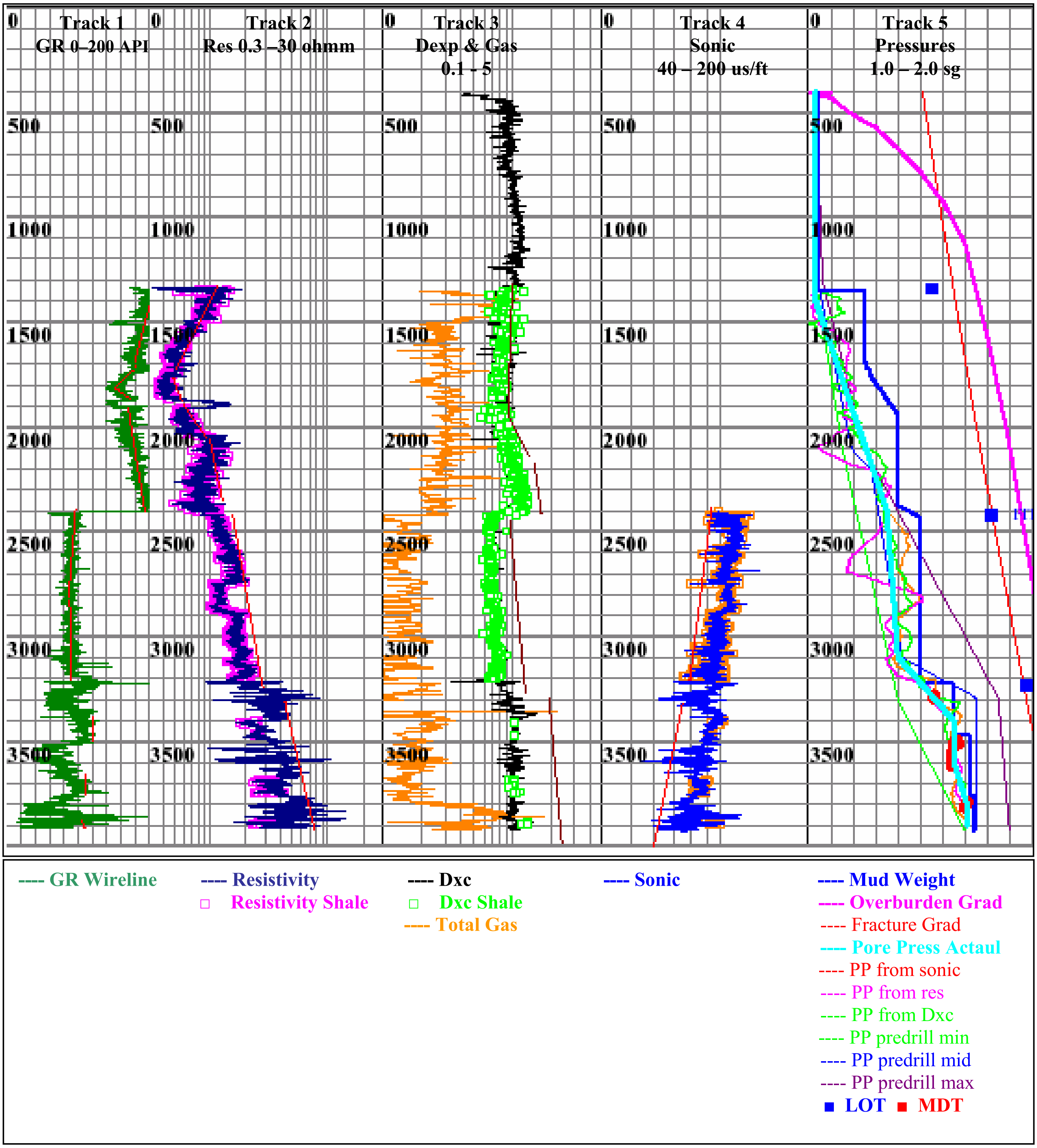
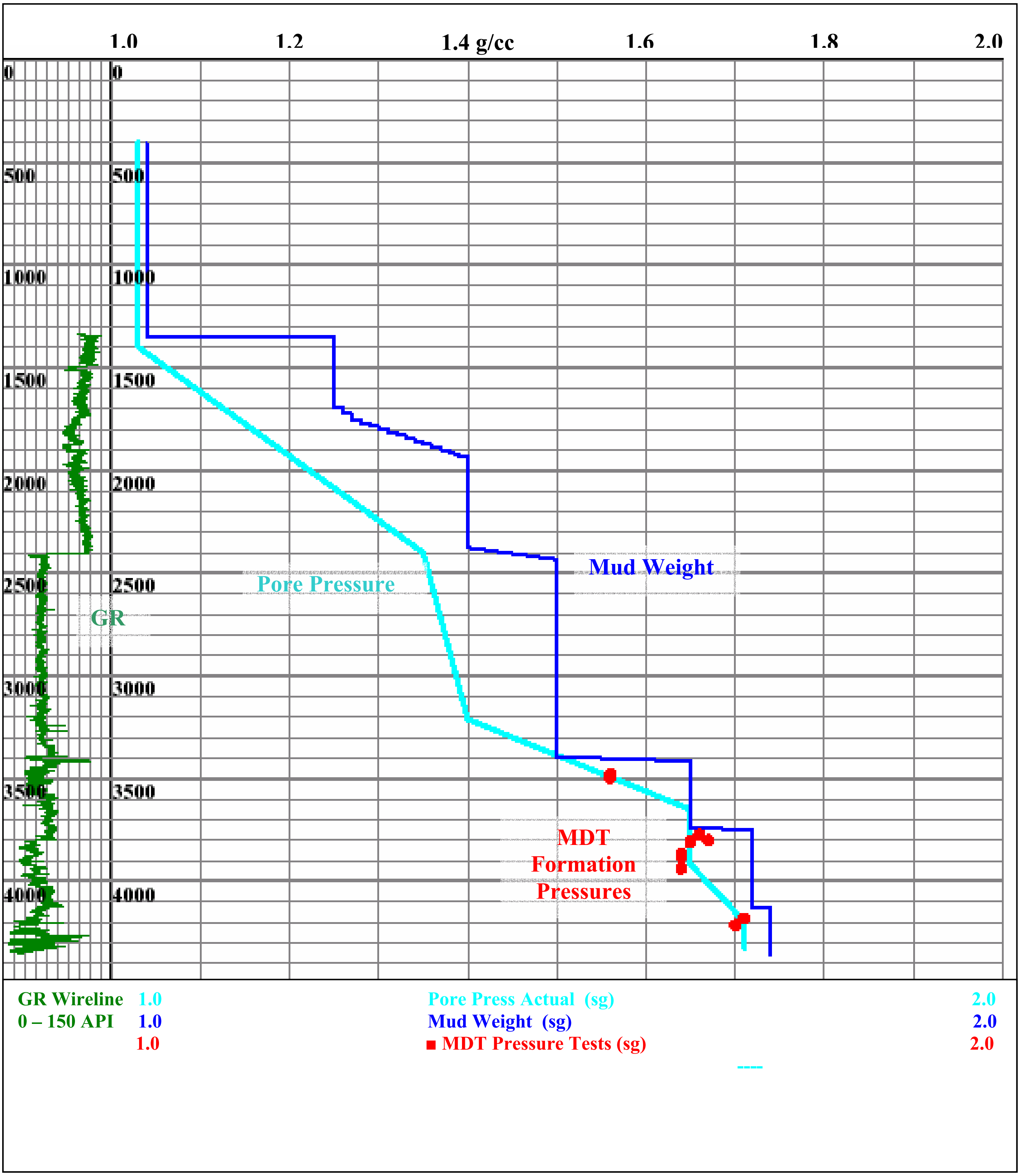


Figure 8 – Final Interpreted Pore Pressure (Depth in metres MDRT)



2.13. SPECIAL STUDIES AND ASSOCIATED REPORTS

Biostratigraphy	: Millennia
Geochemistry	: Geolab Nor
Seal Analysis	: Petrotech Inc.
Zero offset VSP	: Read Well Services
Pore Pressure	: R.Lahann – Conoco Inc.
End of Well Report, Mudlogging	: Geoservices
End of Well Report, MWD	: Anadrill - Schlumberger
Directional drilling	: Anadrill - Schlumberger
Wireline End of Well Report	: Schlumberger
Navigation and positioning	: Racal Survey Norge
Pore Pressure	: KSI
Fluid Inclusion Stratigraphy	: Fluid Inclusion Technologies Inc.

3 DRILLING OPERATIONS

3.1. DAILY OPERATIONS SUMMARY

3.2. DRILLING CRITIQUE AND LOST TIME ANALYSIS

Exploration Well 34/6 - 1 S
Drilling Critique

Introduction

Well 34/6 - 1 S was an exploration well located in the northern part of the Tampan Spur area, approximately 73 nautical miles west of the Norwegian coast The well was targeting potential hydrocarbon bearing sands in the Jurassic Brent, Cook & Statfjord formations.

34/6 - 1 S drilled to the planned TD of 4360 m MD RT (3922 m TVD RT). The well terminated in Lunde Formation, dated to Upper Triassic. NCAS accepted the semi submersible drilling unit, Transocean Winner, from AS Norske Shell at 1930 hrs on 14 July 2002. The rig arrived at the 34/6 - 1 S location at 0430 hrs on 16 July 2002, and the well was spudded at 0530 hrs on 18 July 2002. Water Depth was reported at 380 m MSL. Total depth was reached at 2330 hrs on 12 August 2002. Wireline logging indicated a non commercial well with no hydrocarbon bearing sands. Upon completion of the data acquisition program, the well was permanently plugged and abandoned at 1800 hrs on 27 August 2002. No follow up work had been procured for the rig and the rig was towed to quayside in Ølen. The rig was released from 34/6 - 1 S at 1800 hrs on 30 August 2002.

This report reviews the drilling performance and the lost time problems experienced during the 34/6 - 1 S drilling operations. Recommendations have been made where applicable to aid in future well planning.

<u>Performance Data</u>

Lost Time Accidents	:	0
Recordable Incidents	:	0
Spills	:	0
Near Misses	:	5
Total Well Depth (meters)	:	4360 m MD, 3922 m TVD
Total Days on Well	:	46.8 (Including mob and demob)
Drilling Days Spud to TD	:	26.6 (Excluding mobilization)
Meter/Day Spud to TD	:	163.9
Drilling Lost Time (days)	:	1.31
Data Acquisition Lost Time (days)	:	2.73

The success case drilling time estimate for the well was 64 days at a cost of NOK 169,671,394. The success case included three (3) cores and a boat sourced VSP.

However, the well was dry. A dry hole estimate for the well was NOK 136,785,916 and 48.4 days. The final well cost was not yet available at the time of issuing this report, however the estimate for the final well cost is NOK 120,000,000.

The drilling performance (spud to TD) was the highest of any offset wells in the area. The goal (referenced to the Dry Hole Case) was 122.4 m/day. The actual performance was some 38% HIGHER than the goal at 169.3 m/day. **This was an outstanding achievement!**

Why drill a directional exploration well?

The well was drilled directionally to best test the prospect. The geologic objectives were the Jurassic Brent, Cook and Statfjord formations. It was desired to drill the well such that a complete Brent sequence could be penetrated. In addition, it was desired to test the Statfjord in an up-dip location. In more simple terms, testing the complete Brent section at the crestal location would result in encountering the Statfjord significantly down-dip (leaving economic reserves up-dip). Testing the Statfjord in an up-dip location would result in missing the Brent sequence entirely. As a result, a directional well was planned. *In hindsight, a directional well was a very good decision and all geologic objectives were sufficiently evaluated*. It has to be said that if the well was drilled vertically at a good Brent location, based on the sand quality found in both the Cook and the Statfjord, an updip geologic sidetrack would have been required to ensure that no economic hydrocarbons were left behind. The incremental cost to make the well directional was significantly less than a 2nd well (or even an up-dip sidetrack).

Factors that contributed to the success of the well

- Small, focussed team empowered to take risks and make decisions
    - Limited number of people involved yielded direct accountability and responsibility
    - Limited number of people involved enhanced communication

- Goals developed by well team and partners were accepted by management
- Effective well planning (evaluation of alternative conceptual designs, peer reviews and the Decision & Risk Analysis Process) led to the selection of the appropriate well concept.
- Contracting process included procurement of many agreements from the previous operator which allowed continued utilization of services on board the rig
- Operations planning focussed on doing the right things **not** what to do if things went wrong
- Experienced Conoco rig supervisors from the UK & Venezuela
- An efficient drilling rig with an established Safety Culture was contracted to drill the well
- The team that planned the well, supported all of the drilling operations

Time Analysis

A total of 98.0 hrs (4.08 days) of lost time was incurred during drilling operations on well 34/6 - 1 S. This equates to 8.73% of the total time (including data acquisition). The majority of the lost time occurred during the data acquisition phase 61.5 hrs (2.56 days). A detailed time analysis is included at the end of this section. The major drilling problems and areas of lost time are discussed by major activity or hole section below.

Mobilization

Cooperation with Norske Shell allowed mobilization of some equipment required to spud the well. Therefore the rig was supplied to drill the 36” & 26” hole sections as well as running and cementing 30” casing before it went under tow. NCAS took the rig on contract at 1930 hours 14 July 2002.

The tow to the 34/6 - 1 S location was approximately 213 nautical miles from Rogn South and was done with one large anchor-handling vessel; the Olympic Poseidon (185 T BP/16000 HP). The move to location took approximately thirty three (33) hours (average 6.45 knots towing speed)

Two additional anchor handlers were used at location. The move and subsequent anchoring operations went according to plan. This included changing out the four (4) weather anchors (# 1, 2, 3 & 8) from 17 ton Stevin to 15 ton Stevpris. The Stevpris anchors have a greater holding capacity which was desired due to the limited mount of certified anchor chain available on the rig. There was only enough chain to get the anchors where they needed to be by the mooring analysis resulting in little, if any, chain being left on the seabed. During situations of high anchor chain tension (ie storms), essentially all of the anchor chain would be lifted off the seabed. In addition, many offset wells experienced anchor slippage and subsequent piggy backing on mooring operations Including the change outs, running of the eight (8) anchors took 12 hours.

However, two anchors slipped (# 4 & 7; both 17 ton Stevin) and required piggybacks. The piggy backs were run out of critical path.

36” Hole / 30” Conductor

No advance operations such as picking up BHA’s and drill pipe, preparing the PGB, and picking up wellhead running tools were possible during the tow or anchor handling operations. These activities were started while ballasting the rig down to drilling draft after it had passed through its transition zone.

8.2 hours on bottom time / 10.5 hrs total time were spent drilling 89 meters of 36” hole. The teeth of the 17 ½” insert bit were graded 1/1.

A wiper trip was carried out and no hole problems were evident while running 30” casing.

1.0 hrs of lost time were attributed to an ROV repair just prior to spud.

26” Hole / 20” Casing

A great deal of work was carried out prior to the well evaluating the site survey and offset wells. Thru a risk based process, the pilot hole typically required in exploration wells was eliminated. The 26” hole section was drilled with no problems with seawater (SW) and sweeps to 1350m MD in 33.6 hours on bottom time / 44.5 hours total time. Once at 20” casing point, a short trip was attempted with SW in the hole. Tight hole and overpulls were immediately observed. The well was displaced to 1.2 sg mud and the trip executed. A few tight spots requiring backreaming were seen. The well was again displaced to 1.2 sg mud after the trip and the 20” casing was run and cemented with no problems. It should be noted that all wellhead components including cementing plugs were pre-assembled at Dril-Quip’s Facility in Forus. This saved valuable rig time on each casing job (1 – 2 hours per job).

Run BOP & Riser

No problems occurred while running the BOP & Riser. A total of fifteen (15) hours were required to run the BOP and 23 joints of riser. Once the BOP Stack and riser was run, the rig was shut down for **1.0 hour** to hold a unique Transocean Safety Meeting. This shut down also occurred again later in the well during the 8½” hole section to ensure that all crews had participated in the meeting.

17 ½” Hole / 13 $^{3}/_{8}$” Casing

After drilling out and displacing to 1.25 sg Glydril Water Based Mud (WBM), a Leak Off test (LOT) was obtained at the 20” shoe. The test results were on the low end of the expected range based on offset data. A 2nd test was conducted and a LO value of 1.55 sg was obtained.

Drilling continued in the 17½” hole section. The section was drilled to TD at 2422m MD in 24.1 hours on bottom time / 45.8 hours total time. The MW was increase from 1.25 – 1.42 sg over the hole section. Once at TD the hole was backreamed to the 20” shoe. Based on the hole conditions, the short trip was not made and the 13 3/8” casing was run without significant problems. The last 29 metres required washing to land out. The casing was cemented as planned.

On setting the Seal Assembly (SA), some problems occurred. The SA was initially set and tested but was retrieved inadvertently with the Casing Hanger/ Seal Assembly Running Tool (CHSART). There were lots of cuttings on top of the CHSART. Two (2) Mill & Flush (M & F) runs were made and finally the SA was set and tested. This incident contributed to **12 hours to Lost Time**. A learning in this instance is that as the casing was washed down, the 3rd mud pump should have been used to boost the riser. The washing rate was low; and once the cuttings passed the CHSART, the annular velocity dropped allowing cuttings to fall out of the mud. The cuttings dropping out did not allow the SA to get properly set.

However, the distance from the top of the CHSART to the booster line inlet above the LMRP is ± 10 metres so the use of the booster line may not have made a difference aside from limiting the amount of cuttings available for fallout to the last ± 10 metres of washing.

12 ¼” Hole / 9 $^{5}/_{8}$” Casing

The 13 $^{3}/_{8}$” shoe track was drilled out using 1.42 sg Glydril WBM. Just before drilling out of the shoe, the well was displaced to 1.65 sg Versavert Oil Based Mud (OBM). A 1.82 sg EMW formation integrity test (FIT) was obtained before drilling ahead. The calculated LOT was 1.79 sg. However, due to conducting the test with OBM, the test was shut down prior to achieving a Leak Off Test.

The well was directionally drilled using a Rotary Steerable Drilling System (RSS) which was Schlumberger’s PowerDrive 900. All directional objectives were met and the well achieved an angle of 49.2° in the hole section. The section was drilled to TD at 3395m MD/3228m TVD in 35.4 hours on bottom time / 68 hours total time. Section TD MW was 1.57 sg. This system worked extremely well

A total of **5.5 hours were lost** during the hole section;

3 hours on mud pump repairs

0.5 hour on investigation of an H_2S alarm
1 hour on changing out a leaking Top Drive Saver Sub
1 hour on preparing casing tongs

Casing point pick discussion:

The well was planned as a near HTHP well. One of the critical success factors was the casing point pick for the 9 5/8" casing. The drilling plan was based on the assumption that the pressure transition in the Lower Cretaceous would develop as predicted; a "hard transition" with pore pressure increasing from 1.40 sg to 1.70 sg in ± 150 metres TVD. The 9 5/8" casing would be set in the Lower Cretaceous as deep as possible without crossing the Base Cretaceous Unconformity (BCU) into the Jurassic as there was a great concern on both the pressure environment in the Jurassic and the lithology just below the BCU. The Leak Off Test and nature of the pressure transition would be a key driver in picking the casing point.

However, during the drilling, the pressure transition started as predicted but the "hard" nature of it did not develop as expected and the key formation picks were coming in high to prognosis. As a result, the process of picking the casing point was modified to a more simplistic method based on palaeontology. Cutting samples were studied for the age of the bugs. Once the age group of bugs that indicated the lower Cromer Knoll were identified, drilling stopped. At this point, pore pressure was estimated to be 1.52 sg and the MW was 1.57 sg. The 9 5/8" casing was set and cemented. Upon drilling out, the BCU was penetrated after some 15m MD of 8½" hole.

8 ½" Hole

The 9 $^5/_8$" shoe track was drilled out with the same Versavert OBM system used for the 12 ¼" hole section, weighted up to 1.65 sg. Again, an acceptable formation integrity test was obtained that was slightly higher than expected (1.98 sg). Initially, the FIT was taken to 1.95 sg EMW. Since this was below the expected LOT, the shoe was re-tested to 1.98 sg.

Drilling continued to TD at 4360m MD/3922m TVD. No cores were obtained. The MW was increased three times and TD MW was 1.74 sg based on resistivity and drilling trends indicating pore pressure increases.

The pore pressure monitoring/detection was done in conjunction with a Conoco Inc. Reservoir Technology Professional onshore (day shift) and a KSI engineer offshore (night shift). This worked extremely well and resulted in a very accurate assessment of pore pressure. To support this, the MDT pressure in the Statfjord indicated a pore pressure of 1.71 sg EMW. The MW at TD was 1.74 sg.

During the hole sections, three (3) events occurred resulting in **12.5 hours** of **Lost Time**. These were as follows:

1 hour to perform a 2nd FIT below the 9 5/8" shoe
2 hours to troubleshoot the Resistivity at the Bit (RAB) Tool
9.5 hours to POOH to the 9 5/8" shoe and change out a leaking Kelly Hose.

One bit; a DS56 made the section and graded a 5/4 in 73.5 hours. A conventional steerable directional BHA was run.

Data Acquisition

Once the 8½" drilling BHA was out of the hole, the Schlumberger wireline unit was rigged up. Log #1 was a Quad Combo. This log was run but only got as deep as 3584m. While working the tool, the tool became stuck at 3547m but was worked free. Log #1 was aborted and the toolstring was pulled out of the well. It was suspected that the tool geometry & length (± 43m) combined with the hole geometry (problem area was in a section of the hole where the angle dropped from ± 49° to ± 42°) was the primary reason for the toolstring not getting down. A wiper trip was made. The logging run was then made again, this time breaking the tool down and running it in two runs. After the two logging runs, the Read VSP was run. Unfortunately, this toolstring did not get below the casing shoe. The tool was a very flexible tool with not much weight below it. The VSP was obtained in the cased hole. Next, the MDT was run to obtain pressure points. However, the tool could not get below 4020m so the string was pulled. Next, another wiper trip was made and finally a Schlumberger VSP & the MDT were run together on drillpipe; obtaining thirty two (32) pressure points on the trip in and shooting the VSP on the trip out. In all, 6.38 days were spent on completing the formation evaluation program. In all, a total of 2.73 days were considered Lost Time. See the breakdown below:

25 hours lost on Wiper Trip #1
4 hours lost while troubleshooting the MDT Tool at surface
23 hours on Wiper Trip #2
13½ hours to MU Tools on drillpipe and TIH

The MDT & VSP Programs went very good on drillpipe. Looking back, once the well reached TD, a 10 stand short trip was conducted. A full trip of the entire 8½" section was considered but hole conditions appeared to be very good. In retrospect, a full trip should have been made.

Plug and Abandonment

The entire P & A operation went as planned with only **1 hour** of **Lost Time**. The P & A was quite extensive; with three (3) plugs spotted in the openhole across permeable formations, and plugs set in casing as required. In addition, approximately 1700m of 9 5/8" casing was recovered, the well displaced back to 1.42 sg WBM and approximately 900m of 13 3/8" casing was recovered. The cut on the 20" & 30" took only 58 minutes despite the 20" being cut in a casing collar. The Lost Time event was due to a repair of the 9 5/8" casing tongs. The P & A in total took 7.75 days.

Demobilisation

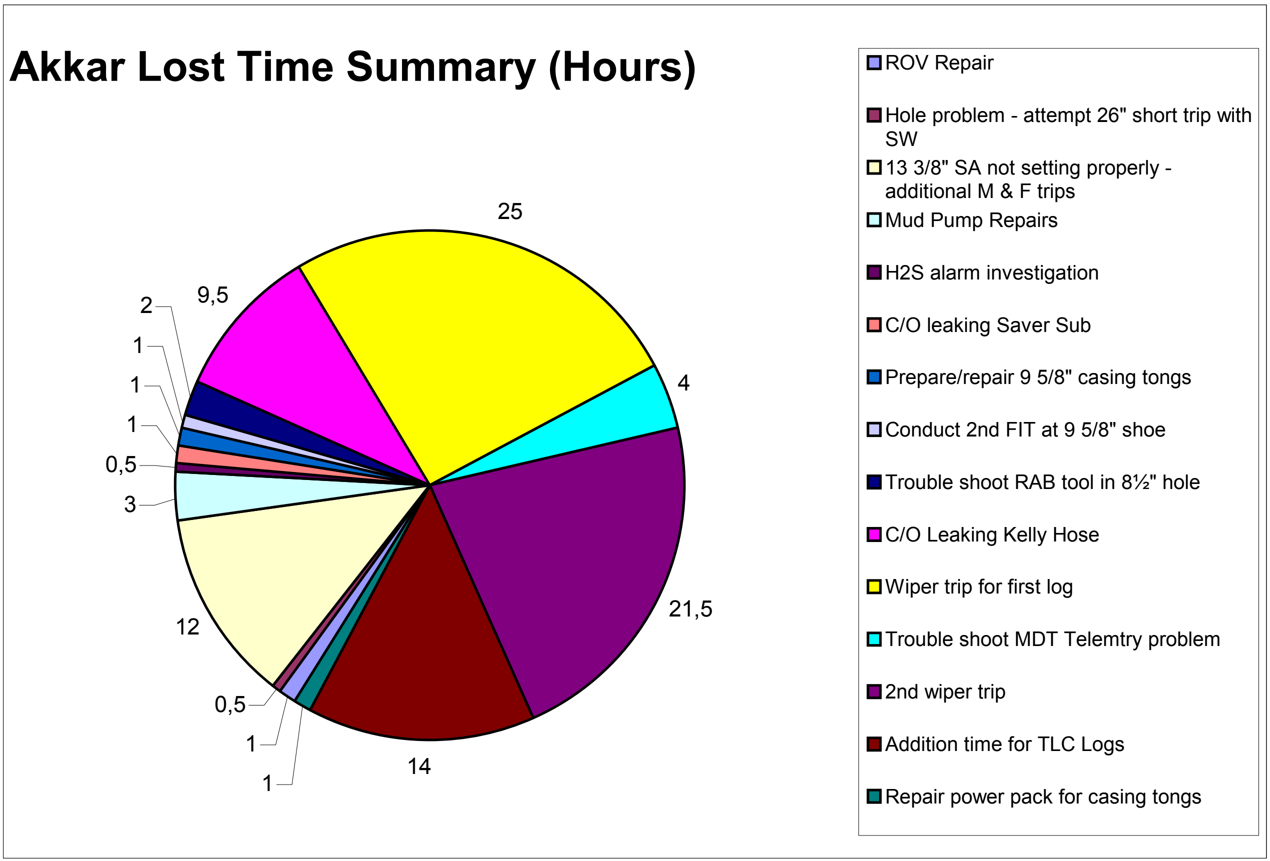
Once the P & A was complete, an additional eight (8) hours was spent backloading equipments. During this time, the piggyback anchors were also pulled. The rig was then de-ballasted from drilling draft (24.26 m) to transit draft (10.98 m) in seven (7) hours. The eight (8) remaining anchors were pulled in 9.5 hours.

No follow up work was available for the Transocean Winner after the 34/6 - 1 S well. The rig was therefore demobilized to Ølen using one AHTV, the Far Fosna. The tow was made in stages. The first stage being from location to the entrance to the fjord at Marstein. This passage took 21.5 hours at 5.1 knots (110 nautical miles). The next passage was from Marstein to the final approach location to Ølen. This passage took 8 hours. 3.5 hours were spent waiting on daylight to make the approach to Ølen. Then, the final approach to Ølen was made in 3.5 hours. Once at the dock in Ølen, 11 hours were required to secure the rig and run 4 anchors out into the fjord. The anchor running at Ølen took longer than planned due to a Floatel and the Transocean Arctic being moored at the same facility.

The rig was released at 1800 hours 30 August 2002.

34/6 - 1 S Lost Time Summary

Cause Of Lost Time	Hours	%
Data Acquisition Related (2 Wiper Trips)	48	48.9%
13 3/8" Seal Assembly Failure	12	12.2%
Change out leaking Kelly Hose	9.5	9.7%
Mud Pump Repairs	3.0	3.1%
Investigate an H2S alarm at 3158m	0.5	0.5%
ROV Repair just prior to spud	1	1%
Attempt short trip in 26" hole with SW	0.5	0.5%
Change out leaking saver sub	1	1%
Repair 9 5/8" casing tongs (two incidents)	2	2.1%
Trouble shoot the RAB Tool	2	2.1%
Trouble shoot MDT	4	4.1%
Conduct 2nd FIT at 9 5/8" shoe	1	1%
RU Drillpipe logs and TIH	13.5	13.8%
Total	98	100%



3.3. SAFETY SUMMARY

34/6 - 1 S Results: 0 LTA's
0 Reportable Spills
5 Near Miss Reports

The overall HSE performance during this operation has been good. All involved in this drilling operation has demonstrated their professionalism in this relation.

a) Health and Hygiene

There were neither health nor hygiene incidents onboard the rig. The company doctor cooperated closely with Transocean's medical staff. To assist the medical staff onboard Conoco engaged a 24-hrs/d duty-doctor service for service to the rig.

b) Safety

The safety statistics from this operation shows that there were no lost time accidents, but 5 near misses:

The near misses in brief:	Preventive actions
Climbing down a fixed ladder in the derrick a hammer snagged across a member and pulled free from securing line. It fell 30 m to rig floor.	Special tools for use in derrick installed and permit to work introduced for work in derrick
When pulling the grab handle on a container the weld failed	Inspection improved
A sling lifting a 700 kg tool parted and tool fell 2 m, due to corroded wire rope.	Restriction on slinging, re-inspected all lifting equipment
A short wire roped fore runner, unloaded, swung and came off the main hook. Safety latch opened inwards	Safety latch for hook modified to close both ways
1 of 2 tools strapped to a pallet came loose and fell to main deck. Single strap used to tie tools to pallet	Procedure for specialized loads modified

Well 34/6-1 S was the fourth well drilled back-to-back by the rig. During the three previous wells Conoco had close contact with Transocean on HSE issues. Through this contact Conoco could familiarize itself with Transocean's system for managing the HSE activities. Transocean managed the operations onboard the rig well also within the area of health, safety and environment. It had implemented several safety initiatives (Start, Think, Focus, Synergi, Tofos and Empac), which together have served to keep the rig's crew and the third party service contractors focused on safety.

Transocean had the principal enterprise role during the operation.

c) Environmental Concerns

There were no accidental spills to the environment. During the displacement from water-based mud to oil-based mud, Conoco had a representative from the SQEA Department onboard the rig. The objective was to convey Conoco's commitment to an operation free of accidents and accidental spills.

Below is an overview of discharges of chemicals during the operation with reference to the limits set by SFT in the discharge permit. Conoco has succeeded in its efforts to minimize discharges of all types of chemicals as verified by the relatively low values for discharge compared to the SFT limits as shown in table below.

Chemical Code	Usage [ton]	Discharges [ton]	SFT limits Discharge [ton]
Green	2927	1367	***No limit***
Yellow	35	24	64,5
Red	371	0,230	0,280
Black	0,153	0,017	0,040

d) Emergency Preparedness

Three weeks before spud Conoco arranged an emergency preparedness exercise to test the emergency organizations at Conoco and Transocean. Focus was primarily put on next of kin and media handling. The exercise concluded that the organization was well prepared for the operation ahead.

3.4. VENDOR'S FAILURE REPORT

No Vendor Failures to report.

BIT DATA

3.5. CORING REPORT

No Coring operations were conducted on the well.

3.6. BHA DATA

3.7. SURVEY DATA

3.8. CASING AND CEMENTING REPORTS

3.9. MUD RECAP

3.10. LEAK-OFF DATA

Shoe	Shoe Depth (metres TVD)	MW (sg)	Surface Test Pressure (bar)	Equivalent Test (sg)	Leak Off (L) or Formation Integrity (F)
20”	1341	1,25	39	1,55	L
13 $^{3}/_{8}$”	2411	1,50	78	1,82	F
9 $^{5}/_{8}$”	3227	1,65	103,5	1,98	F

4 POST WELL – SITE SURVEY REPORT / SHALLOW GAS REPORT

The site survey for the 34/6-1 S well was acquired, processed and interpreted by Fugro Survey AS in the period July to October 2001. The survey number is cn0101. The shallow hazard assessment was based on a grid of high resolution 2D seismic lines (line spacing 500m) integrated with the available 3D seismic data and offset well data from 34/8-3, 3a and 34/8-6. Side scan sonar, deeptow boomer and single beam echosounder data were also analysed.

Fugro divided the shallow section into five main units from Quaternary to Miocene in age and concluded that there were no indications that shallow gas would be encountered at the well location. The nearest anomaly that could be indicative of gas was 190 m to the northeast within the Plio-Pleistocene Unit III.

Subsequent to Fugro issuing their report, Norske Conoco received the merged 3D seismic dataset cn01m02. This was interpreted, together with the high resolution 2D seismic data, to further investigate amplitude anomalies around the 34/6-1 S well location and calibrate them to similar anomalies penetrated by 34/8-6. The objective of this further interpretation was to investigate the possibility for drilling the 34/6-1 S well without a pilot hole.

The results of this additional interpretation supported the view that no shallow gas hazards existed at the 34/6-1 S location. Calibration was provided by the 34/8-6 well which penetrated a high amplitude anomaly in the Pliocene-Miocene age Unit IV with no gas encountered.

34/6-1 S was drilled riserless, with no pilot hole, to a depth of 1350 m with the 20” casing being set at 1341 m. Hence no returns or MWD logs were acquired above 1350 m and no verification of the shallow geological prognosis was possible. No signs of gas were detected during the drilling of this section.

References:

Fugro Survey AS. Regional Site Survey, within block 34/5 & 34/6 in preparation for drilling well 34/6-A, CN0101. October 2001. DOCS number 230699.

Norske Conoco AS, internal report. 34/6-1 S Site Survey Interpretation. Summary of Fugro Interpretation and Additional Interpretation of Unit IV. May 2002. DOCS number 248938.

WELL DATA:

1	**Distance from rig floor to sea level:**	26.5 metres
2	**Water depth (MSL):**	379.8 metres
3a	**Setting depth for conductor (m RKB):**	492 metres
3b	**Leak Off / Formation Integrity Test (g/cc):**	n/a
4a	**Setting depth for casing on which BOP is mounted (m RKB):**	1341 metres
4b	**LOT / FIT (g/cc):**	1.55

5 Depth (m RKB) & two way time to formation/section/layer tops:

No returns or MWD above 1350 m. Age of first returns is late Oligocene, hence no information obtained about age of Neogene "Tampen Sandstone Member"and "Utsira Sands". The following picks are made based on ROP data and with gamma-ray through casing and should therefore be treated as very tentative:

Top "Utsira Sand" 1236 m RKB (1245ms)
Base Miocene 1260 m RKB (1267ms)

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

As stated above, a tentative "Utsira Sand" is picked from 1236 m to 1260 m RKB (1245ms to 1267ms TWT). No gas seen whilst drilling, therefore any sand layers penetrated are interpreted as water bearing.

7 By what means is the presence of gas proven:

No gas seen whilst drilling.

8 Composition and origin of gas: n/a

9 Description of all measurements carried out on the gas containing strata: n/a

SEISMIC DATA:

10 Given depth (m RKB & TWT) of unconformities at the well location:

From the site survey data some key unconformity surfaces were prognosed at the well location:
Top Unit II (Pleistocene) at 413.5 m RKB (521ms TWT)
Top Unit III (Pliocene) at 474.5 m RKB (595ms TWT)
Top Unit IV (Pliocene) at 524.5 m RKB (644ms TWT)

11 Given depth and extent of sand layers (communication, continuity, truncation etc.):

No sand layers were prognosed in the shallow section covered by the site survey interpretation. However, the presence of the "Utsira Sand" has been well documented in the area. The Base Miocene unconformity surface was mapped using the surface seismic and the "Utsira Sand" prognosed to lie immediately above this at 1204.5 m RKB. This is a highly continuous sand body in the area which varies in thickness as it infills the unconformity topography.

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

No gas blanking.
Seismic anomalies identified in the regional site survey report are generally very small in area and widely scattered. The nearest seismic anomaly to the 34/6-1 S well location was 190 m to the northeast.

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

No indication of gas seeping from deeper layers.

14 How does the interpretation of the site survey correspond to the well data with respect to:

- shallow gas: Good correspondence - site survey predicted no levels of potential shallow gas and none were observed in the well.

- sand bodies: Good correspondence – the site survey predicted no sand bodies and none were identified.

- unconformities: It was not possible to validate the prognosis of the unconformities due to the limited data collection through that section.

- correlation to nearby wells:
Good seismic correlation from 34/6-1 S to the wells on Visund field.

5 COMPOSITE WELL LOG 34/6-1 S