HYDRO

Final Well Report

Well: 15/5 - 4

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Norsk Hydro a.s Oslo

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FINAL WELL REPORT

WELL 15/5-4

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Final Well Report, 15/5-4

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Drilling Operations Resume
Completion Log
Post Site Survey

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NORSK HYDRO A.S.

FINAL WELL REPORT

WELL 15/5-4

LICENCE 048

DECEMBER 1991

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PREFACE

Licence 048 was awarded in 1977. The present licencees are Norsk Hydro/Statoil/Elf/BP, with Norsk Hydro acting as the operator.

The licence area is located in block 15/5 on the Norwegian continental shelf of the North Sea.

The licencees' percentage share of the block is as follow

Norsk Hydro a.s.	17.3%
Statoil	50.0%
Elf	21.8%
BP	10.9%

The well was drilled by Norsk Hydro a.s on behalf of the group during the second quarter of 1991. (see Location Map, page II).

General information

Date: 23/9-1991

Norsk Hydro

System : BORE

Well: 15/5-4

Field:

Structure:

Country: NORWAY

Licence: 048

2

LOCATION Coordinates: Surface : Target

Well UTM	N (m) :	6501162.2
Well UTM	E (m) :	415972.2
Geographical	N :	58°38'28.5"
Geographical	E :	01°33'08.9"

Water depth : 120 m MSL. Rotary Table elevation: 25 m

Lithology data is not registered on this well.

Operator : HYDRO. Operator's share (%): 17.3

Partners, (interests) : ELF 21.8% STATOIL 50.0% BP 10.9%

RIG name		VILDKAT EXPLORER
RIG	contractor	ROSS OFFSHORE
MUD	contractor	NL BAROID
CEMENT	contractor	BJ HUGHES
EL.LOGG	contractor	SCHLUMBERGER
MUD LOGG	contractor	EXLOG
Other	contractors:	

Total depth (m RKB):	Measured	Vertical
	2300 m	2300 m

TIME SUMMARY Spudding date: 910605 Abandonment date: 910704

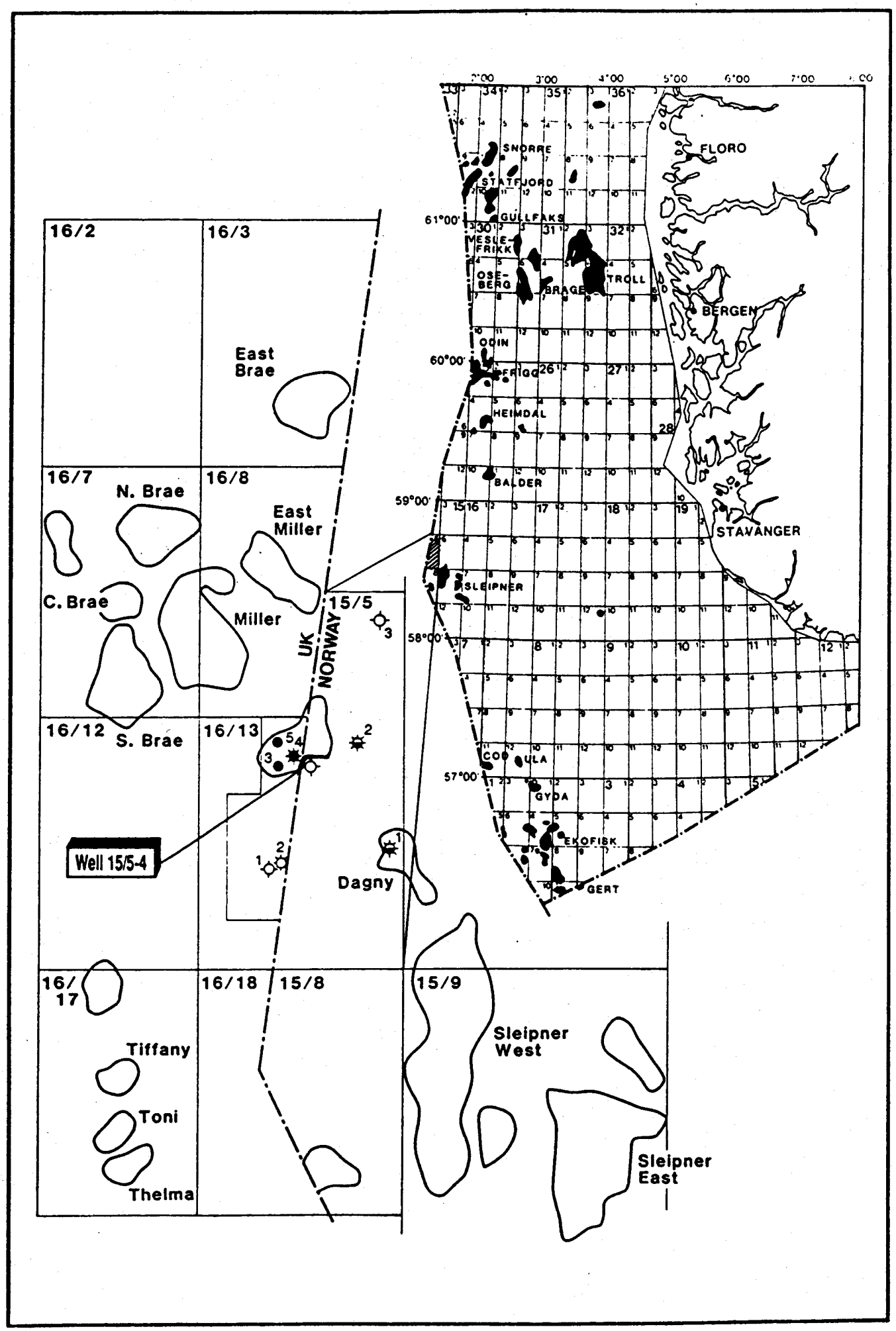
MainOp:	Moving	Drill	Form Eval	Prod test	Comp letion	Work over	Well service	Plug Aband	Down time
Hours :	46	245	157	150	0	0	0	60	39
Days :	1.9	10.2	6.5	6.3	.0	.0	.0	2.5	1.6
% :	7	35	23	22	0	0	0	9	6

TOTAL : 696 hrs, 29 days

Hole and Casing record

Hole	Depth m,MD	Casing	Depth m,MD
36	231	30	230
17 1/2	1027	13 3/8	1012
12 1/4	2300	9 5/8	2248

Well status : Permanent abandoned



Location Map, Well 15/5-4

HYDRO

S E C T I O N A

G E O L O G Y

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1 OBJECTIVES

Well 15/5-4 was located on a structure straddling the border between the U.K. and the Norwegian sector of the North Sea. Hydrocarbons have been proven by three wells in the U.K. sector (U.K. 16/13a-3, 16/13a-4, and 16/13a-5). Well 16/13a-4 penetrated a gas cap at the top of the structure and an oil column down to base reservoir. The other two wells penetrated an oil zone and a water leg.

The objectives of well 15/5-4 were to:

- Assess the extension of hydrocarbon bearing Sele Sand towards the west, into PL048.

- Acquire reservoir information to characterise the reservoir properties in an appropriate manner, and to give necessary data for equity determination.

- Drill the well in a position suitable for subsequent use in a production phase.

2 RESULTS

The well was spudded on the 6th June 1991 and a reached total depth of 2300 m on the 20th June 1991, in the Heimdal Formation. One production test was performed and the well was plugged and abandoned as a dry hole on the 3rd July 1991.

The main results were as follows:

- The Sele Formation was encountered at 2120 m and a total of 7.25 m of net reservoir sand sand was calculated between 2120 m and 2135.5 m, with an average water saturation of 89.7% and an average porosity of 26.4%.

- The entire reservoir sequence was cored. Selected intervals were preserved in rubber sleeve and injected with resin.

- The sandstones of the Heimdal Formation were penetrated below the oil/water contact and were totally water wet.

- One production test was conducted in the Sele Formation over the perforated interval 2123.4 - 2135.9 m. Water was produced but not to surface.

Details of the petrophysical evaluation of the well and RFT data are given in the Norsk Hydro report: "Petrophysical Evaluation Report, Well 15/5-4".

Details of the production test are given in the Norsk Hydro report: "Well Test Report, Well 15/5-4".

3 BIOSTRATIGRAPHY

The biostratigraphical evaluation of well 15/5-4 was carried out by The Robertson Group.

The analysis is based on ditch cutting samples, sidewall cores and conventional core chips. The interval from 1040 m down to 2300 m (TD) was analysed.

The results of the analysis can be summarised as follows:

Tertiary

- The youngest sediments analysed are Middle Miocene claystones of the Hordaland Group, with Early Miocene sediments recognised from 1050 m. Deposition took place in deepwater open marine conditions.

- Late Oligocene to Early Oligocene sediments are present from 1160 to 1556 m, which were deposited in a similar deepwater environment with restricted marine circulation.

- The conformable Oligocene/Eocene contact is placed at 1556 m. Late Eocene to Early Eocene claystones and sandstones are present throughout the lower part of the Hordaland Group down to 2072.5m. The Frigg Formation is recognised over the interval 1587 - 1697 m. Deposition took place within a bathyal environment.

- The section across the Hordaland/Rogaland boundary at 2072.5 m is complete but condensed, due to a significant uphole environmental change from restricted to open marine depositional conditions.

- The Rogaland Group is represented by the Balder, Sele, Lista, and Heimdal Formations. Earliest Eocene to Latest Paleocene claystones and tuffs of the Balder Formation occur from 2072.5 to 2085 m, and deposition took place in a stratified water column with dysaerobic or fluctuating dysaerobic/anoxic bottom conditions.

- The environment was similar during deposition of Late Paleocene claystones and sandstones of the Sele Formation. The Lista Formation, however, consists of claystones and minor sandstones and was deposited within very deepwater bathyal conditions.

- The well terminated within sandstones of the Late Paleocene Heimdal Formation.

HYDRO

WELL: 15/5-4

DEPTH RKB: ELEVATION KB: 25m NB! Not to scale All depth in meters

CHRONOSTRATIGRAPHY

SYSTEM	SERIES/STAGE	DEPTH m	THICKNESS m
		145	
QUAT.			383
		528	
TERTIARY			522
		1040	
	MIDDLE MIOCENE		10
		1050	
	EARLY MIOCENE		110
		1160	
	LATE OLIGOCENE		130
		1290	
	EARLY? OLIGOCENE		50
		1340	
	EARLY OLIGOCENE		210
		1556	
	LATE EOCENE		54
		1610	
	MIDDLE EOCENE		390
		2000	
	EARLY EOCENE		72.5
		2072.5	
	EARLIEST EOCENE-LATEST PALEOCENE		12.5
		2085	
	LATE PALEOCENE		215
		2300(TD)	

LITHOSTRATIGRAPHY

GROUP	FORMATION/MEMBER
SEABED	145
NORDLAND GROUP	782
	UTSIRA FM. 896
HORDALAND GROUP	1585.5
	FRIGG FM. 1695.5
	2072.5
ROGALAND GROUP	BALDER FM. 2120
	SELE FM. 2173.5
	LISTA FM. 2198
	HEIMDAL FM. 2300 (TD)

4 LITHOSTRATIGRAPHY

The lithostratigraphic summary is based on a study of ditch cuttings, sidewall cores, conventional cores, wireline logs and formation logging data while drilling. The well was drilled with returns to sea bed down to 1027 m, and any interpretation above this depth is based on data from the MWD log.

4.1 Tertiary (1027 - 2300 m MD)

HORDALAND GROUP (1027 - 2072.5 m MD)

1027 - 1300 m MD

This undifferentiated interval consists predominantly of claystone, with interbedded siltstone horizons.

CLAYSTONES: dark greenish grey to olive grey, soft to firm, occasionally plastic, slightly to moderately silty, generally amorphous.

SILTSTONES: medium brownish grey to olive brown, soft to firm, arenaceous, generally amorphous, micromicaceous in part, occasionally glauconitic, locally slightly calcareous, rare bivalve fragments, grading to very fine sandstone.

1300 - 1585.5 m MD

This section is composed entirely of claystone, with rare thin stringers of limestone.

CLAYSTONES: dark grey brown to olive grey, firm, sub blocky to blocky, slightly silty, micromicaceous in part, locally very finely glauconitic, occasionally slightly calcareous, rare traces of carbonaceous material.

LIMESTONES: off white to white, occasionally pink, blocky to angular, hard, micro to cryptocrystalline, locally argillaceous, occasional shell fragments.

Frigg Formation 1585.5 - 1695.5 m MD

The Frigg Formation is typified by the development of thick sandstone beds interbedded with claystones.

SANDSTONES: light grey to light brown grey, quartz, translucent to white, very fine to fine, becoming medium grained with depth, angular to subrounded, spherical, moderately well sorted, generally friable, local argillaceous matrix, micaceous in part, traces of glauconite, poor to moderate visible porosity.

CLAYSTONES: light greenish grey to medium grey, blocky to platy, slightly silty, rare traces of carbonaceous material.

1695.5 - 2072.5 m MD

This interval consists of claystones and minor sandstones in the upper part, with claytones interbedded with thin dolomites below 1870 m.

LITHOSTRATIGRAPHY

CLAYSTONES: medium to dark grey, dark green grey, firm, blocky, amorphous, slightly silty, trace fine carbonaceous matter, becoming varicoloured, red, blue grey and yellow brown from 2030 m.

SANDSTONES: loose, colourless to translucent quartz, fine to medium, predominatly subrounded, spherical, well sorted, trace calcareous cement, trace siliceous cement, good inferred porosity.

DOLOMITE: light brown to light yellowish brown, hackly to angular, very hard, microcrystalline, occasionally sucrosic, common traces of finely disseminated pyrite, no visible porosity.

ROGALAND GROUP 2072.5 - 2300 m MD

Balder Formation 2072.5 - 2120 m MD

The Balder Formation is recognised by a change in formation to light bluish grey claystones with thinly interbedded limestones and discreetly interbedded tuffaceous material.

CLAYSTONES: light blue grey to light grey, locally red brown towards the base of the formation, blocky, waxy, soft to firm, slightly calcareous in part, rare chlorite, glauconite, micropyrite.

LIMESTONE: white to light grey, locally light greenish grey, splintery, hard, argillaceous in part, locally dolomitic and siliceous.

TUFF: light blue grey, pale grey, occasionally speckled black, soft, granular.

Sele Formation 2120 - 2173.5 m MD

The Sele Formation is represented by a subtle change in colour of the claystones and by the development of reservoir sandstones.

CLAYSTONES: medium grey to olive grey, subfissile to blocky and subplaty, firm to moderately hard, variably silty to very finely sandy, micaceous, common disseminated carbonaceous material.

SANDSTONES: light grey to light brown grey, quartzitic, medium to fine grained, occasionally coarse, subrounded to subangular, spherical, poor to moderately sorted, firm to friable, local weak siliceous cement, very occasional patchy argillaceous matrix, moderately micaceous, occasional carbonaceous material, moderate to good visible porosity.

Lista Formation 2173.5 - 2198 m MD

This thin formation is represented by intebedded sandstones and claystones.

SANDSTONES: light grey to white, very fine to coarse, subangular to subrounded, poorly sorted, friable, trace argillaceous matrix, trace mica, trace glauconite, poor visible porosity.

CLAYSTONES: medium dark grey, firm, non calcareous, occasional trace pyrite.

Heimdal Formation 2198 - 2300 m MD (TD)

The Heimdal Formation is characterised by a high net sand ratio and is represented by the development of relatively thick sand units and thin interbedded claystones.

SANDSTONES: light grey to off white, quartzitic, very fine to coarse, subangular, spherical, fair sorting, generally friable to moderately hard, local argillaceous matrix, poorly cemented, fair to good inferred porosity.

CLAYSTONES: olive grey, occasionally medium greenish grey, blocky to subfissile, moderately hard, rare very finely disseminated carbonaceous fragments, generally amorphous.

5 HYDROCARBON SHOWS

Hydrocarbon shows in ditch cuttings, cores and sidewall core samples were evaluated according to the procedures described in Norsk Hydro's "Wellsite Geologist's Manual".

Exlog Norge a.s. provided a fluoroscope, a total gas detector (calibrated to read 1% methane in air as 50 gas units) and a flame ionisation gas chromatograph for the analysis and evaluation of hydrocarbon shows.

5.1 Gas Record

A summary of all gas data is presented in the table on the next page.

HYDRO GAS SUMMARY WELL: 15/5-4

Not to scale

Litho-stratigraphy			Depth (m)	Gas Summary: Background (%)	Gas Summary: Peaks (%)	Gas Summary: Tripgas (%) CG & SWAB gas	MW rd	Shows	Cores	Casing and Comments
			1027	RETURNS TO SEABED						13 3/8" 1011.5 m
TERTIARY	HORDALAND GP		1160	0.10 - 0.26 C_1	0.33 C_1		1.20			
			1260	0.24 - 0.32 C_1	0.40 C_1	0.43 C_1				
			1535	0.05 - 0.09 C_1	0.14 C_1	0.28 C_1				
		FRIGG	1610	0.17 - 0.20 C_1	0.26 C_1					
			1820	0.05 - 0.12 C_1	0.18 C_1	0.36 C_1				
			1960	0.02 - 0.08 C_1	0.10 C_1					
			2072.5	0.05 - 0.08 C_1 - C_2	0.11 C_1 - C_2					
	ROGALAND GP	BALDER	2120	0.03 - 0.09 C_1 - C_3		0.20 C_1 - C_3	1.22	☼	2106	
		SELE FM	2173.5	0.05 - 0.07 C_1 - nC_4	0.11 C_1 - nC_4	0.25 C_1 - C_3	1.25		#1-6 2146.5	
		LISTA	2198	0.16 - 0.20 C_1 - nC_4	0.23 C_1 - nC_4					
		HEIMDAL FM	2257	0.05 - 0.07 C_1 - C_3						9 5/8" 2248m
			2280	0.05 - 0.08 C_1 - nC_4						
			2300	0.05 - 0.07 C_1 - C_3						

5.2 Oil stain and fluorescence

5.2.1 Shows in drilled cuttings

No shows were observed in drill cuttings.

5.2.2 Shows in cores

(i) Conventional Cores:

Shows were observed in the following cored intervals:

Core No.1 2122 - 2123 m

Good shows were recorded in a thin sandstone interval in the first core.

ON SANDSTONE: moderate hydrocarbon odour, no oil stain, moderate bright yellowish white direct fluorescence, fast streaming bright yellow to white cut fluorescence, no visible cut, dull yellow residual fluorescence, no visible fluorescence.

Core No.2 2126 - 2128 m

Good shows were observed over a two metre interval in the second core.

ON SANDSTONE: moderate petroleum odour, faint uniform light brown oil stain, uniform bright white to yellow direct fluorescence, instant bright white cut fluorescence, faint pale brown visible cut, dull yellow residual fluorescence, light brown residue.

Core No.3 2129 - 2132 m

Good shows were again observed throughout Core no. 3.

ON SANDSTONE: moderate hydrocarbon odour, no oil stain, uniform to patchy bright yellowish white direct fluorescence, fast streaming bright yellow cut fluorescence, faint pale brown visible cut, dull yellow to white residual fluorescence, faint pale brown visible residue.

(ii) Sidewall cores:

Hydrocarbon shows were observed on two sidewall cores taken in the 12-1/4" hole.

1909 m

ON CLAYSTONE: poor shows, very weak pale yellow white direct fluorescence, very weak cloudy pale yellowish white cut fluorescence, no visible cut, no residue.

2182 m

ON SANDSTONE: patchy pale yellow to yellowish white direct fluorescence, intermediate streaming cloudy bluish white to yellowish white cut fluorescence, very weak light brown visible cut, pale yellowish white residual fluorescence, no visible residue.

6 CORING

6.1 Conventional cores

Details of coring operations are presented in the table below. A full description of the cores can be found in Appendix I and on the Completion Log.

Core	Interval cut (m)	% Recovery	Interval recovered (m)
1	2106.0 - 2124.5	100%	2106.00 - 2124.50
2	2124.5 - 2129.0	100%	2124.50 - 2129.00
3	2129.0 - 2132.0	100%	2129.00 - 2132.00
4	2132.0 - 2134.0	98%	2132.00 - 2133.95
5	2134.0 - 2140.5	96%	2134.00 - 2140.26
6	2140.5 - 2146.5	90%	2140.50 - 2145.90

TABLE 3 : CONVENTIONAL CORES

6.2 Sidewall cores

Sidewall cores were taken over the interval 2194 to 1501 m. A total of 30 cores were requested in one run as summarised below.

A full description of the sidewall cores can be found in Appendix II, and the gross lithology for each of the cores is reported on the Completion Log.

Run No.	Requested	Misfired	Empty	Lost	Recovery
1A	30	0	0	3	90 %
Total	30	0	0	3	90 %

TABLE 4 : SIDEWALL CORES

7 LOGGING

7.1 Wireline Logs

The following presentation is a summary of wireline logs run in the well, and shows the date run, logged intervals and run numbers of each log.

The first attempt to run an RFT log failed as the tool was unable to pass from the 12-1/4" to the 8-1/2" hole. The rathole, from 2106 m to 2300 m was subsequently opened out to 12-1/4" and RFT run 1A was logged. The internal flow lines and sample chambers became congested with sand when a fluid sample was taken. The resultant sample consisted entirely of drilling mud. RFT runs 1B and 1C also suffered from sand plugging. Run 1B recovered mud with some mud filtrate, while both sample chambers in Run 1C contained mud filtrate with traces of oil.

LOG	DATE	LOGGED INTERVAL	RUN NO.
DIL/SDL/LDL/NGL/SP/CAL/AMS	20/06/91	2254.0 - 1007.0 m	1A
DLL/MSFL/GR/CAL/AMS	21/06/91	2226.0 - 2068.0 m	1A
FMS-4/GR/CAL/AMS	21/06/91	2229.0 - 1007.0 m	1A
RFT/HP/GR	22/06/91	2206.0 - 2125.3 m	1A
VSP	23/06/91	2235.0 - 800.0 m	1A
RFT/HP/GR	24/06/91	2125.3 - 2143.8 m	1B
RFT/HP/GR	24/06/91	1832.0 - 2134.3 m	1C
CST/GR	24/06/91	2194.0 - 1501.0 m	1A

TABLE 5 : WIRELINE LOGGING

7.2 MWD logs

An MWD service providing gamma ray, resistivity and directional survey measurements was run from 145 m to 2298 m TD.

7.3 Bottom hole temperatures from logs

BOTTOM HOLE TEMPERATURES FROM WIRELINE LOGS							15/5-4
LOG	RUN	LOGGERS DEPTH (mRKB)	TEMPERATURES T1	T2	T3	TIME SINCE CIRC.STOPPED	CIRC TIME
DIL/LSS	1A	2248.0 m	62	62	62	07 hr 20 min	02hr 10min
DLL/MSFL	1A	2230.5 m	63	63	63	18 hr 00 min	02hr 10min
FMS-4	1A	2229.0 m	64	64	64	24 hr 25 min	02hr 10min
RFT/HP	1A	2206.0 m	57.7	-	-	33 hr 44 min	02hr 10min
RFT/HP	1B	2128.5 m	60.8	-	-	33 hr 35 min	00hr 55min
RFT/HP	1C	2129.5 m	62.8	-	-	43 hr 15 min	00hr 55min

TABLE 6 : BOTTOM HOLE TEMPERATURES FROM LOGS

8 POST SITE SURVEY REPORT

Shallow Gas

Shallow gas was predicted at 563 m and 694 m RKB. The warnings were based on amplitude anomalies mapped 200 m from the well location at both levels. The anomalies were observed as isolated areas with in extensions of 100-500 m.

Results

Shallow gas prediction	Findings	Problems
563 m RKB	None.	None.
694 m RKB	None.	None.

The predicted gas levels were drilled with 17.5" bit and mudweight of 1.05 rd. The lack of observations indicate that the anomalies are too far from the well location to obtain any information of their origins.

BOREHULL: 15/5-4 **PL:** 048 **OPERATØR:** Norsk Hydro a.s **avslutningsdato:** 3.07.91

BOREHULLSDATA:

1 **Avstand fra boredekk til havnivå** 25 m

2 **Vanndyp** 120 m RKB

3a **Settedyp for lederør (m RKB)** 1011 m

3b **Evt. formasjonsstyrketest (g/cc):**

4 **Settedyp for foringsrør hvorpå BOP monteres** 1011 m

4b **Formasjonsstyrketest (g/cc):**1.35rd. (1030 m)

5 **Dyp (m RKB og toveis gangtid) til formasjons-/ledd-/lag-topper**

Bunn Coal Pit fm.?: 183 m (204 ms). Bunn Fisher fm. : 200 m (224 ms).

Bunn Ling Bank fm.?: 285 m (308 ms). Bunn pleistocen? : 528 m (565 ms).

Topp Utsira fm.: 782 m (831 ms). Bunn Utsira fm. : 896 m (943 ms).

6 **Dybdeintervall (m RKB og TVG) og alder for sandlag grunnere enn 1.000 m under havbunnen. Oppgi hvilke lag som evt. inneholder gass.**

Pleistocen: 154-157 m (172-175 ms), 188-194 m (210-216 ms), 205-207 m (228-231 ms), 219-221 m (242-244 ms), 226-240 m (249-263 ms), 242-248 m (265-271 ms), 250-253 m (273-276 ms), 256-264 m (279-287 ms), 274-275 m (297-298 ms), 282-285 m (305-308 ms).

Miocen : 782-790 m (831-839 ms), 793-800 m (843-850 ms), 802-834 m (851-881 ms), 843-845 m (891-893 ms), 859-863 m (907-910 ms), 871-882 m (918-929 ms), 890-896 m (937-943 ms).

7 **På hvilken måte er gassen påvist?** Ingen indikasjoner på gass.

8 **Sammensetning av og opprinnelse til gassen.** -

9 **Beskriv alle målinger foretatt i gassførende lag.** -

SEISMISKE DATA:

10 **Angi dyp (m RKB og TVG) til inkonformiteer i borehullsposisjonen.**

Bunn Coal Pit fm.?: 183 m (204 ms). Bunn Ling Bank fm.?: 285 m (308 ms).

11 **Angi dyp og utbredelse til sandlagene (kommunikasjon, kontinuitet, trunkering etc.)**

154 m : 3 m tykt sandlag med antatt liten utbredelse.

188 m : Sandlag med antatt regional utbredelse.

205 m og 219 m : Sandlag med antatt liten utstrekning.

226 m, 242 m, 250 m, 256 m, 274 m og 282 m : Antatte kanalinnfyllinger (Ling Bank fm).

782 m, 793 m og 802 m : Regional utbredelse (Utsira fm.)

802 m, 843 m, 859 m, 871 m og 890 m : Regional utbredelse (Utsira fm.), men med variasjon i tykkelse og sandinnhold.

12 **Angi dyp og utbredelse til evt. gass-skygging ("gas blanking"). Seismiske anomalier etc.**

Anomalier i dyp 563 m (580 ms) er kartlagt 200 m vest for brønnlokasjon.

Anomalier i dyp 694 m (755 ms) er kartlagt 200 m sør-øst for brønnlokasjonen.

13 **Angi evt. seismiske indikasjoner på at gassen stammer fra dypere nivå. Beskrivesle dersom gassen stammer fra dypere nivå.** Ingen indikasjoner på grunn gass.

14 **Hvordan samsvarer tolkningen av borestedsundersøkelsen med borehullsdata m.h.t.:**

- **grunn gass.** Mulig grunn gass er prediktert i dyp 563 m og 694 m. Ingen indikasjoner på gass er observert.
- **sandlag.** Predikterte sandlag i leiravsetningene er ikke observert. Generelt mer sand enn prediktert i Ling Bank fm.
- **inkonformiteter.** Bunn Coal Pit inkonformitet er observert i samme dyp som antatt. Inkonformiteten ved bunn Ling Bank er observert 11 m dypere enn antatt.
- **korrelasjon til nærliggende borehull.** God stratigrafisk korrelasjon til tie-brønn 15/5-2.

9 STANDARD AND SPECIAL STUDIES

The biostratigraphical evaluation of well 15/5-4 was carried out by The Robertson Group. The results of these analyses are presented in the report: "Well 15/5-4 Biostratigraphy of the Interval 1040 - 2300m".

The geochemical evaluation of the well was undertaken by Norsk Hydro's research centre in Bergen. The results of which may be found in the report entitled "Petroleum Geochemistry, Well 15/5-4".

The core description and mineralogical analysis of the cored section is presented in the Norsk Hydro Report: "Standard Core Description, Well 15/5-4".

Conventional core analysis was performed by Norcore a.s. and the results are presented in the report: "Conventional Core Analysis, Well 15/5-4".

The petrophysical evaluation of the well is presented in the Norsk Hydro report: "Petrophysical Evaluation Report, Well 15/5-4".

APPENDIX I

CORE DESCRIPTIONS

HYDRO

WELL NO. 15/5 - 4	CORE REPORT	CORE NO'S 1

INTERVAL	AREA	CUT	DATE
2106 - 2111m	Norwegian North sea	2106 - 2124.5m	16.06.91
SCALE	**WELL RKB**	**RECOVERY**	**GEOLOGIST**
1:25	25m	2106 - 2124.77m (100%)	Gahlla/Tammemagi

DEPTH SCALE mRKB	RE-COV-ERY	LITHO-LOGICAL COLUMN	DEPTH m	DESCRIPTION	SHOWS
2106				**Clyst:** md gy-md dk gy,hd,blky,micro Pyr dism,non calc,wxy	No shows
2107				a/a,blky-subfiss	No shows
2108				a/a	No shows
2109				a/a,occ slty	No shows
2110		M		a/a,micromic,occ carb mat	No shows
2111		M		a/a,md dk gy	No shows

HYDRO

WELL NO. 15/5 - 4	CORE REPORT		CORE NO'S 1
INTERVAL 2111 - 2116m	AREA Norwegian North Sea	CUT 2106 - 2124.5m	DATE 16.06.91
SCALE 1:25	WELL RKB 25m	RECOVERY 2106 - 2124.77m (100%)	GEOLOGIST Gahlla/Tammemagi

DEPTH SCALE mRKB	RE-COV-ERY	LITHO-LOGICAL COLUMN	DEPTH m	DESCRIPTION	SHOWS
2111					
2112		M		a/a	No shows
2113		II		a/a,occ slty	No shows
2114				a/a,occ lt gy bnd	No shows
2115				a/a	No shows
			2115.70m Sealed smpl 2116.0m		
2116				a/a,not bnd	No shows

HYDRO

WELL NO. 15/5 - 4	CORE REPORT	CORE NO'S 1

INTERVAL	AREA	CUT	DATE
2116 - 2121m	Norwegian North Sea	2106 - 2124.5m	16.06.91
SCALE	**WELL RKB**	**RECOVERY**	**GEOLOGIST**
1:25	25m	2106 - 2124.77m (100%)	Gahlla/Tammemagi

DEPTH SCALE mRKB	RE-COV-ERY	LITHO-LOGICAL COLUMN	DEPTH m	DESCRIPTION	SHOWS
2116				a/a	No Shows
2117				a/a	a/a
2118				a/a,plty-subfiss	a/a
2119				a/a	a/a
2120			2120.0m Sealed smpl 2120.30m	a/a	a/a
2121				a/a	a/a

HYDRO

WELL NO.	CORE REPORT	CORE NO'S
15/5 - 4		1

INTERVAL	AREA	CUT	DATE
2121 - 2124.77m	Norwegian North Sea	2106 - 2124.5m	16.06.91
SCALE	**WELL RKB**	**RECOVERY**	**GEOLOGIST**
1:25	25m	2106 - 2124.77m	Gahlla/Tammemägi

DEPTH SCALE mRKB	RE-COV-ERY	LITHO-LOGICAL COLUMN	DEPTH m	DESCRIPTION	SHOWS
2121				a/a	
2122		M	2122.0m Sealed smpl 2122.30m	**Sst:** md gy-brn gy,f-md,mod srtd,pr-mod vis por,frm,carb mat,sl calc cmt,subang-subrnd,occ micromic	Mod HC od,no oil stn, pch,mod bri,yel wh flu, fast strmg yel wh cut, yel resd flu
2123		M		**Clyst** w/Sst lam: **Clyst:** a/a **Sst:** a/a	Mod HC od,no oil stn, pch,mod bri,yel wh flu, fast strmg yel wh cut, yel resd flu
2124				**Clyst:** a/a	
		M	2124.77m	**Sst:** Intbd w/Clyst **Sst:** a/a,v f-f,mod vis por,fri **Clyst:** a/a	Even mod-bri yel flu,fast strmg yel wh cut,bri yel wh resd flu. Gd HC od, no oil stn
2125					

HYDRO

WELL NO. 15/5 - 4	CORE REPORT	CORE NO'S 2

INTERVAL	AREA	CUT	DATE
2124.5 - 2129m	Norwegian North Sea	2124.5 - 2129m	17.06.91
SCALE	**WELL RKB**	**RECOVERY**	**GEOLOGIST**
1:25	25m.	4.57m (100%)	E.Tammemägi/S.S.Gahlla

DEPTH SCALE mRKB	RE-COV-ERY	LITHO-LOGICAL COLUMN	DEPTH m	DESCRIPTION	SHOWS
2124.5		M, C		**Clyst:** m gy,frm-hd,subfis,sl slty,carb,v f dism Pyr,micromic	
2125					
2125.5		C, M		**Clyst:** m-dk gy,frm,slty,aren in pt,grdg v arg Sst,carb,micromic	
2126					
2126.5		M	2126.5 Sealed smpl	**Sst:** pl brn,fri,Qtz g,m-f g,subrnd,sph,mod srtd,w/lithic frag,pr cmt,arg mtx,mic,fair vis por	Good show: mod pet od,overall bri wh-yel dir flu,inst bri wh cut,lt brn resd & stn
2127			2126.8		
2127.5		M		**Sst:** a/a	Show: a/a
2128					
2128.5				**Clyst:** pred a/a w/micro lam of Sd and Mic. Insect remains	
2129				**Clyst:** a/a w/thin (up to 3mm) intercalations of f g Sst,Mic	No shows

HYDRO

WELL NO. 15/5-4	CORE REPORT	CORE NO'S 3

INTERVAL	AREA	CUT	DATE
2129-2132m	Norwegian North Sea	2129-2132m	18.06.91
SCALE	**WELL RKB**	**RECOVERY**	**GEOLOGIST**
1 : 25	25m	2129-2132m (100%)	Bulman/Gahlla

DEPTH SCALE mRKB	RE-COV-ERY	LITHO-LOGICAL COLUMN	DEPTH m	DESCRIPTION	SHOWS
2129		M		**Clyst:** md dk gy, frm-mod hd, plty-subfiss, v mic, slty, occ sdy, non calc, carb mat	
2130		M M		**Sst:** md lt-md gy qtz, pred f-md, occ crs, pr-mod srtd, subang-subrnd, frm-fri, mod mic, occ carb mat, occ arg, non calc, no vis cmt, pr-mod vis por	Mod hc od, no oil stn pcn, mod bri yel wh flu, fast strmg bri yel wh cut, yel wh, resd flu
		M	2130.70m *(Sst) Sealed sample	a/a, fri sl mic	
2131			2131.0m		
		M		a/a,md lt gy	
2132		M		a/a	
				*(Sst: soft sediment tool)	

HYDRO

WELL NO. 15/5-4	CORE REPORT	CORE NO'S 4

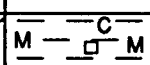
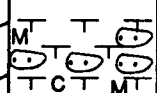
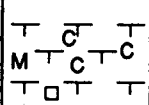
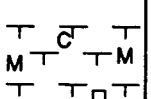
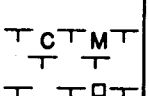
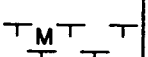
INTERVAL	AREA	CUT	DATE
2132-2134m	Norwegian North Sea	2132-2134m	18.06.91
SCALE	**WELL RKB**	**RECOVERY**	**GEOLOGIST**
1 : 25	25m	2132-2133.95m (98%)	Bulman/Gahlla

DEPTH SCALE mRKB	RE-COV-ERY	LITHO-LOGICAL COLUMN	DEPTH m	DESCRIPTION	SHOWS
2132		II C M II C II II		**Clyst:** m gy, subfis-subblky, frm, sl slty, sl mic, com dism carb mat	No Shows
2133		II C C		**Clyst:** m gy, subfis, frm, slty-vf sdy, v mic, v com dism carb mat, loc Sst lenses, wh, Qtz, vf, ang, sph, w srtd, com Musc Chlor, fair por	No Shows
2134		M P C	2133.95m No recovery 2134.0m	**Clyst:** m dk gy, subfis-subplty, frm-mod hd, v com Mic, abdt dism carb mat, abdt framboidal Pyr	No Shows

HYDRO

WELL NO. 15/5-4	CORE REPORT	CORE NO'S 5

INTERVAL	AREA	CUT	DATE
2134-2139m	Norwegian North Sea	2134-2140.5m	19.06.91
SCALE	**WELL RKB**	**RECOVERY**	**GEOLOGIST**
1 : 25	25m	2134-2140.26 (96%)	Gahlla/Bulman

DEPTH SCALE mRKB	RE-COV-ERY	LITHO-LOGICAL COLUMN	DEPTH m	DESCRIPTION	SHOWS
2134				**Clyst:** m dk gy, frm, subfis, micromic, micropyr dism, occ carb mat, non calc, occ slty-sdy	No Shows
2135				**Clyst:** a/a **Sst:** lt-mgy, Qtz, f-m, frm, mic, abd carb mat, mod srtd, subang-subrnd, pr vis por, v arg, non calc	No hc od, no oil stn, sl pp yel wh flu, slo strmg, yel-gold res flu, no vis res
2136				**Clyst:** a/a, abd carb mat	No Shows
2137				**Clyst:** a/a, occ carb mat, plnt foss	No Shows
2138				**Clyst:** a/a	
2139					

WELL NO. 15/5-4	CORE REPORT	CORE NO'S 5

INTERVAL	AREA	CUT	DATE
2139-2140.26m	Norwegian North Sea	2134-2140.5m	19.06.91
SCALE	**WELL RKB**	**RECOVERY**	**GEOLOGIST**
1 : 25	25m	2134-2140.26m (96%)	Gahlla/Bulman

DEPTH SCALE mRKB	RE-COV-ERY	LITHO-LOGICAL COLUMN	DEPTH m	DESCRIPTION	SHOWS
2139		C M		**Clyst:** A/A, also lt gy bnd, occ v slty	No Shows
2140		C M	2140.26m No Recovery 2140.50m	**Clyst:** A/A, plnt foss, one 8cm long foss	No Shows
2141					

WELL NO. 15/5-4	CORE REPORT	CORE NO'S 6

INTERVAL	AREA	CUT	DATE
2140.5-2145m	Norwegian North Sea	2140.5-2146.5m	19.06.91
SCALE	**WELL RKB**	**RECOVERY**	**GEOLOGIST**
1 : 25	25m	2140.5-2145.9m (90%)	Bulman/Gahlla

DEPTH SCALE mRKB	RE-COV-ERY	LITHO-LOGICAL COLUMN	DEPTH m	DESCRIPTION	SHOWS
2140.5		II C C M		**Clyst:** m dk gy, plty, mod hd, loc sl slty, com vf dism carb mat, sl micromic, rr framboidal pyr	No Shows
2141		C P M		**Clyst:** m dk gy, plty, mod hd, gen amor, rr micromic, occ microxln Pyr, rr vf dism carb mat	No Shows
2142		C C C M C P		**Clyst:** m dk gy, plty, mod hd, micromic, com f dism carb mat, occ carb plnt rmns, v com pyr plnt rmns	No Shows
2143		M C		**Clyst:** m dk gy, plty-blky, loc sl slty, gen amor, rr micromic, v rr carb plnt rmns, rr sdy lams, 0.2mm thick, vf, ang, sph, w srtd, mod silic cmt, pr vis por	No Shows
2144		C P II C II		**Clyst:** m gy, plty-subfis, mod hd, mod slty, mic, v com dism carb mat t carb plnt rmns, com pyr plnt rmns	No Shows
2145					

WELL NO. 15/5-4	CORE REPORT	CORE NO'S 6

INTERVAL	AREA	CUT	DATE
2145-2146.5m	Norwegian North Sea	2140.5-2146.5m	19.06.91
SCALE	**WELL RKB**	**RECOVERY**	**GEOLOGIST**
1 : 25	25m	2140.5-2145.9m (90%)	Bulman/Gahlla

DEPTH SCALE mRKB	RE-COV-ERY	LITHO-LOGICAL COLUMN	DEPTH m	DESCRIPTION	SHOWS
2145		II II M C P		**Clyst:** m dk gy, plty, mod hd, sl slty, loc sdy lenses, 0.5-2.0mm thick, qtz, vf-m, subang, sph, pr srtd, strng silic cmt, rr Glau, no vis por	No Shows
2146			2145.9m No Recovery	**Clyst:** m dk gy, plty, mod hd, micromic, in pt, com f dism carb mat, rr Pyr	No Shows
2146.5			2146.5		

APPENDIX II

SIDEWALL CORE DESCRIPTIONS

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HYDRO

SIDEWALL CORE DESCRIPTION

Well : 15/5-4

Rig : Vildkat Explorer

Run No: 1A	Date : 24 June 91	Service Co: Schlumberger	Page No : 1 of 3

Shot : 30	Misfired : 0	Lost : 3	Empty : 0	Recovered: 27	Geologist : T. Stump

No.	Depth m RKB	Rec cm	Lithology and Show Description	Fluorescence Direct Tr	Direct M	Direct G	Cut Tr	Cut M	Cut G
1	2194	4.8	**CLYST:** m dk gy-dk gy, frm, noncalc, occ glau, intlam w/ **SST:** v lt gy-clr Qtz g, vf-f, subrnd-rnd, mod srtd, fri, noncalc, tr arg (Kao?) mtx, tr Mica, tr Glau, pr vis por, no shows						
2	2182	5.5	**SST:** v lt gy-wh, clr Qtz g, vf-crs, pred vf-f, subang-subrnd, fri, noncalc, tr arg(Kao?) mtx, tr Musc, tr glau, pr vis por, shows: pch strg pl yel-yel wh dir flu, v wk v lt brn vis cut, strg cldy bl wh-yel wh flu cut, no vis resd, pl yel wh flu resd		M				G
3	2172	5	**CLYST:** m gy-grn gy, sft-frm, noncalc						
4	2160	0	*LOST*						
5	2148	0	*LOST*						
6	2098	3	**CLYST:** m gy-grn gy, sft-frm, noncalc						
7	2085	4	**CLYST:** m gy, frm, noncalc, tr glau, tr micropyr						
8	2073	6.5	**CLYST:** m lt gy, sft-frm, noncalc, tr glau						
9	2071	6.5	**CLYST:** m dk gy-dk gy, frm, noncalc, micropyr, tr glau						
10	2058.5	6.5	**CLYST:** mod brn, frm, calc						

Tr:trace M:medium G:good

Comments :

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(ooo)
HYDRO

SIDEWALL CORE DESCRIPTION

Well : 15/5-4

Rig : Vildkat Explore

Run No: 1A	Date : 24 June 91	Service Co: Schlumberger	Page No : 2 of 3

Shot : 30	Misfired : 0	Lost : 3	Empty : 0	Recovered: 27	Geologist : T. Stump

No.	Depth m RKB	Rec cm	Lithology and Show Description	Fluorescence Direct Tr	M	G	Cut Tr	M	G
11	2032	5.5	**CLYST:** gy brn-mod brn, sft-frm, stky, noncalc, tr micromic tr micropyr						
12	2000	6.5	**CLYST:** olv gy-olv blk, sft-frm, gen noncalc, loc v sl calc, tr micropyr						
13	1983.5	6.5	**CLYST:** m dk gy- m gy- gy grn, sft-frm, stky, noncalc, micropyr						
14	1954.5	5.5	**CLYST:** m dk gy-dk gy, frm, v sl calc, tr micropyr, tr dk specs						
15	1931	0	*LOST*						
16	1909	6.5	**CLYST:** m gy, frm, v sl calc, tr micropyr, tr dk specs, intlam w/**SST:** v lt gy-wh, clr Qtz g, vf-m, subang-subrnd, pr srtd, fri, noncalc, tr arg(Kao?) mtx, por vis por, tr shows: v wk pl yel wh dir flu, no vis cut, v wk cldy pl yel wh flu cut, no vis resd, no flu resd	Tr			Tr		
17	1874	6.5	**CLYST:** m dk gy-dk gy-olv gy, frm, gen noncalc, tr micropyr tr dk specs						
18	1856	6.5	**CLYST:** m dk gy-dk gy-olv gy, frm, sl calc, tr micropyr, tr dk specs						
19	1824.5	6.5	**CLYST:** m dk gy, frm, noncalc, tr micropyr, tr dk specs						
20	1800	6.5	**CLYST:** m dk gy, frm, gen noncalc, tr micropyr, tr dk specs						

Tr:trace M:medium G:good

Comments :

(((
(ooo)
HYDRO

SIDEWALL CORE DESCRIPTION

Well : 15/5-4

Rig : Vildkat Explorer

Run No: 1A	Date : 24 June 91	Service Co: Schlumberger	Page No : 3 of 3

Shot : 30	Misfired : 0	Lost : 3	Empty : 0	Recovered: 27	Geologist : T. Stump

No.	Depth m RKB	Rec cm	Lithology and Show Description	Fluorescence Direct Tr	M	G	Cut Tr	M	G
21	1778	6.5	**CLYST:** m dk gy-m gy, frm, noncalc, tr micropyr, tr dk specs						
22	1754	5	**SST:** v lt gy-wh, clr Qtz g, vf-m, pred f, subang-rnd, pr srtd, fri, noncalc, tr arg(Kao?) mtx, tr micropyr, tr glau pr vis por, no shows						
23	1738	6	**CLYST:** m dk gy-olv gy, frm, sl calc, tr micropyr						
24	1718	6.5	**CLYST:** dk gy-olv gy-olv blk, frm, v sl calc, micropyr						
25	1697	6.5	**CLYST:** grn blk, frm, sl calc, tr micropyr, tr dk specs						
26	1630	6.5	**CLYST:** m dk gy-dk gy-olv blk, frm, v sl calc, tr micropyr						
27	1593	6.5	**CLYST:** olv blk, frm, noncalc, tr micropyr, tr Pyr, tr dk specs, rr tr microfoss						
28	1561.5	6.5	**CLYST:** olv blk, frm, noncalc, tr micropyr, tr dk specs						
29	1530	6.5	**CLYST:** olv blk, frm, noncalc, tr micropyr, tr glau, tr dk specs						
30	1501	6	**CLYST:** olv blk, frm, sl calc, tr micropyr						

Tr:trace M:medium G:good

Comments :

APPENDIX III

WELL SUMMARY

GEOLOGICAL WELL SUMMARY

RFT RESULTS

HYDRO WELL SUMMARY

Coord: 58°38'28.53"N 01°33'08.87"E	UTM: 6 501 162.2mN 415 972.2mE	On location: 6.6.91	WELL: 15/5-4
Zone: 31	CM: 3°E ED 1950	Spudded: 6.6.91	
Line: NH 9068	Row: 109 Col: 312	At T.D.: 20.6.91	
Rig: Vildkat Explorer		Completed: 4.7.91	COUNTRY: NORWAY
Water Depth: 145m RKB		T.D. Driller: 2300m	
Stopped in: Heimdal Formation		T.D. Logger: Not reached	
		Wireline Logging: Schlumberger	
		Mud Logging: Exlog Norge	

OPERATOR: Norsk Hydro LICENCE:

OWNED BY: Norsk Hydro/Statoil/BP/Elf

TARGETS

Primary: Sele Formation
Secondary: --

RESULTS

Thin sands of Sele Formation, oil bearing.
One well test performed, produced water.

CASING

30" at 230m
13 3/8" at 1011.5m
9 5/8" at 2248m

GAS RECORD

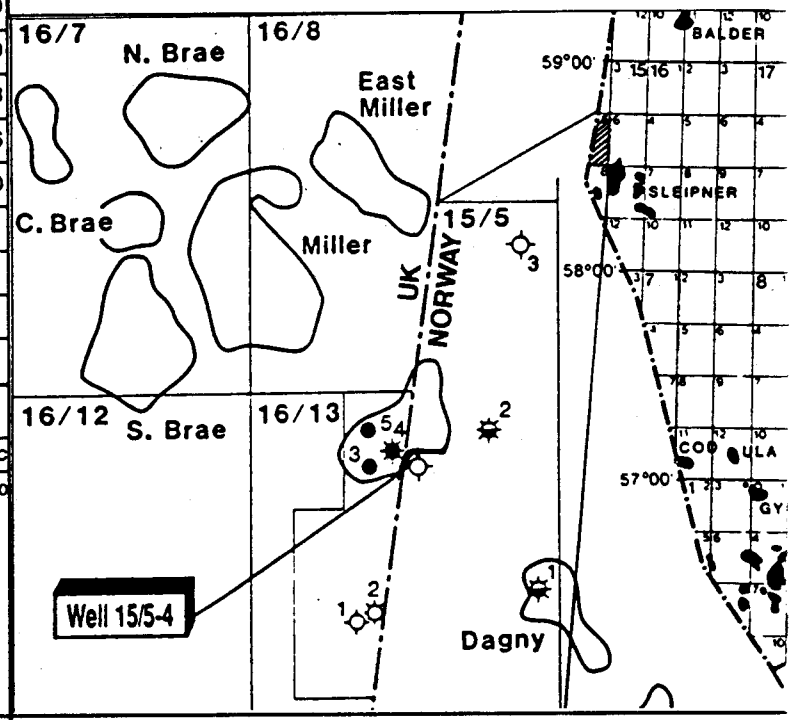
145-1027m	Returns to seabed
1027-1160m	0.10-0.26% C_1
1160-1260m	0.24-0.32% C_1
1260-1535m	0.05-0.09% C_1
1535-1610m	0.17-0.20% C_1
1610-1820m	0.05-0.12% C_1
1820-1960m	0.02-0.08% C_1
1960-2072.5m	0.05-0.08% C_1-C_2
2072.5-2120m	0.03-0.09% C_1-C_3
2120-2173.5m	0.05-0.07% C_1-nC_4
2173.5-2198m	0.16-0.20% C_1-nC_4
2198-2257m	0.05-0.07% C_1-C_3
2257-2280m	0.05-0.08% C_1-nC_4
2280-2300m	0.05-0.07% C_1-C_3

CORES

No.	C = Cut (m) R = Recovered	Rec %
1	2106-2124.5 C 2106-2124.8 R	100
2	2124.8-2129 C 2124.8-2129 R	100
3	2129-2132 C 2129-2132 R	100
4	2132-2134 C 2132-2133.9 R	98
5	2134-2140.5 C 2134-2140.2 R	96
6	2140.5-2146.5 C 2140.5-2145.9 R	90

CST

Run	Interval	Rec
1A	2194-1501m	27/30



LOGS

DIL-SDL-LDL-CNL-NGL-SP-CAL-AMS 2254-1007m	1A	RFT-HP-GR 2125.3-2143.8m	1B
DLL-MSFL-GR-CAL-AMS 2226-2068m	1A	RFT-HP-GR 1832.0-2134.3m	1C
FMS-4 - GR - CAL 2229-1007m	1A	CST-GR 2194-1501m	1A
RFT-HP-GR 2125.3-2206m	1A	MWD 145-2298m	
VSP 2235-800m	1A		

OIL SHOWS

2122-2123m	on **Sst:** mod pet od, no oil stn, med bri yel wh dir flu, fast strmg bri yel to wh cut flu, no vis cut, dull yel resd flu, no vis resd.
2126-2128m	on **Sst:** mod pet od, fnt uni lt brn oil stn, uni bri wh to yel dir flu, inst bri wh cut flu, fnt pa brn vis cut, dull yel resd flu, lt brn resd.
2129.5-2132	on **Sst:** mod pet od, no oil stn, uni to pch bri yel wh dir flu, fast strmg bri yel cut flu, fnt pa brn vis cut, dull yel to wh resd flu, fnt pl brn vis resd.

HYDRO — GEOLOGICAL WELL SUMMARY

Located on: NH9068 | Row: 109 Col: 312 | WELL 15/5-4

Water depth: 145m RKB

DEPTH m MD RKB	LITHO SECTION	SYSTEM	SERIES/STAGE	GROUP	FORMATION	DESCRIPTION	SHOWS
50							
100							
150						Seabed 145mRKB	
200						30" 230m	
250							
300							
350		QUATERNARY				Drilled with returns to seabed to 1027m	
400							
450							
500							
550						528m	
600							
650							
700							
750							
800							
850							
900							
950							
1000						13 3/8" 1011.5m	
1050						**Cly:** dk grn gy, m brn gy, vs ft, plas, amor, slty, w/ tr lse **Sd:** vf-slt, micromic vf Glau sl calc.	0.10-0.32% C_1
1100							
1150	"	TERTIARY				**Slst:** dk brn gy, sft-frm, aren, micromic, v glau, occ sl calc, occ shell frags.	
1200	"						
1250						**Sd:** lse, Qtz, trnsl, f, occ m, subrnd-subang, spn, mod srtd.	

DEPTH m MD RKB							DESCRIPTION	SHOWS
1300							**Clyst:** m grn gy-olv gy, blky, frm, plas, micromic.	
1350								
1400							**Lst:** off wh-pk, blky-ang, hd, cryptoxln, tr shell frags.	
1450								
1500							**Clyst:** dk gy brn, sft-frm, slty in pt, micromic, occ vf glau, occ sl calc.	
1550								
1585,5m								
1600						FRIGG	**Sst:** lt brn gy, Qtz, trnsl, vf-f, ang-subrnd, sph, mod w srtd, fri, non-mod silic cmt, occ arg mtx, mica, tr Glau, pr vis por.	
1650								
1695,5m								
1700								
1750		TERTIARY	EOCENE	HORDALAND			**Clyst:** lt grn gy, blky, frm, amor, occ wxy.	
1800								
1850							**Sst:** lse, Qtz, trnsl, m, subang-subrnd, sph, w srtd, occ mica, no vis cmt, mod por.	
1900								
1950							**Clyst:** m-dk gy, blky, frm tr vf dism carb mat, gen amor.	
2000								
2050								
2072.5m			LT PALAEOCENE	ROGALAND	BALD		**Clyst:** m dk gy, m nr red brn, blky, frm, amor.	
2100								
2120m					SELE		**Sst:** lt gy-lt brn, Qtz, trnsl, m-f, subrnd, sph, mod srtd, pr silic cmt, fri, fair vis por.	
2150								
2173.5m								
2198m					HEIMDAL		**Sst:** Qtz, trnsl, vf-crs, subang, sph, pr srtd, loc arg, micromic in pt, mod vis por.	
2200								
2250							9 5/8" 2248m	
2300							2300m	
2350								
2400								
2450								
2500								

SHOWS: 0.05-0.09% C_1; 0.05-0.20% C_1; 0.02-0.08% C_1; 0.05-0.08% C_1; 0.05-0.07% C_1-C_5; 0.05-0.20% C_1-nC_4

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HYDRO

FORMATION PRESSURE WORKSHEET

Well No. : 15/5-4 | Rig : Vildkat Explorer | Date : 24 June 1991

Pressure Units : bar | RKB-MSL : 25 m | Witnessed by : Andresen

Run No. 1C	Depth (MD)	Depth TVD(RKB)	Initial Hydrostatic Press		Formation Pressure		Final Hydrostatic Press		Time		Remarks	
Test No.			Strain	HP	Strain	HP	Strain	HP	Set	Retract	T°C	Mob. ratio
1	2134.3	2134.15	259.99	259.98			260.00	260.00	10:12	10:14	Seal failure	
2	2134.5	2134.35	260.00	260.03			260.00	260.03	10:20	10:22	Seal failure	
3	2134.7	2134.55	260.02	260.06			260.00	260.06	10:30	10:33	Seal failure	
4	2129.5	2129.35	259.38	259.43	215.03	215.03			10:38		62.8	
	2129.5	2-3/4 gallon sample			214.62	214.63			10:40	11:52	Sample	
	2129.5	1 gallon sample			214.86	214.63	259.34	259.48	11:52	13:02	Sample	
5	2134.6	2134.45	259.97	260.04			259.96	260.02	13:13	13:14	Seal failure	
6	2148.0	2147.85	261.62	261.65	Plugged		261.62	261.70	13.25	13:35	Blocked filter	
7	2145.0	2144.85	261.24	261.34	Plugged		261.2	261.40	13:44	13:49	Blocked filter	
8	2121.0	2120.85	258.30	258.47	Plugged		258.26	258.46	13:55	13:58	Blocked filter	
9	1832.0	1831.85	223.10	223.48	Plugged		223.1	223.38	14:15	14:17	Blocked filter	

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HYDRO

FORMATION PRESSURE WORKSHEET

Well No. : 15/5-4 | Rig : Vildkat Explorer | Date : 24 June 1991

Pressure Units : bar | RKB-MSL : 25 m | Witnessed by : Andresen

Run No. 1B	Depth (MD)	Depth TVD(RKB)	Initial Hydrostatic Press		Formation Pressure		Final Hydrostatic Press		Time		Remarks	
Test No.			Strain	HP	Strain	HP	Strain	HP	Set	Retract	T°C	Mob. ratio
1	2125.3	2125.15	258.90	258.89	214.56	214.44	258.8	258.90	02:00		60.6	
	2125.3	2-3/4 GALLON SAMPLE			243	243	258.8	258.90	02:02	02:55	Sample sanded.	
2	2125.5	2125.35	258.84	258.94			258.84	258.92	03:15	03:18	Seal failure	
3	2125.3	2125.15	258.83	258.91			258.8	258.90	03:22	03:24	Seal failure	
4	2125.1	2124.95	258.79	258.87	214.55	214.52	258.73	258.92	03:29		60.7	
	2125.1	1 GALLON SAMPLE			2.2	2.2	258.73	258.92	03:32	03:45	Plugged flow line.	
5	2125.8	2125.65	258.87	258.99	214.53	214.52	258.80	259.00	03:57			
	2125.8	1 GALLON SAMPLE REOPENED			7	7	258.80	259.00	04:00	05:19	Plugging flow line.	
6	2128.5	2128.35	259.16	259.20	214.60	214.61	259.16	259.31	05:37	05:53	60.8, 0.15	
7	2134.5	2134.35	259.90	259.96			259.89	259.96	06:00	06:06	Seal failure	
8	2134.3	2134.15	259.87	259.96			259.84	260.06	06:17	06:22	Plugging (27 bar)	

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HYDRO

FORMATION PRESSURE WORKSHEET

Well No. : 15/5-4 | Rig : Vildkat Explorer | Date : 22 June 1991

Pressure Units : bar | RKB-MSL : 25 m | Witnessed by : Andresen

Run No. 1A	Depth (MD)	Depth TVD(RKB)	Initial Hydrostatic Press		Formation Pressure		Final Hydrostatic Press		Time		Remarks	
Test No.			Strain	HP	Strain	HP	Strain	HP	Set	Retract	T°C	Mob. ratio
1	2120.5	2120.35	258.40	258.41					21:50		53.7	Seal failure
2	2121.0	2120.85	258.46	258.49			258.40	258.44	22:02	22:06	53.5	Seal failure
3	2125.3	2125.15	258.90	258.89	214.67	214.53	258.90	258.87	22:17	22:20	53.6	u = 8.15
4	2126.0	2125.85	259.00	258.97	214.72	214.64	259.00	258.97	22:30	22:33	53.7	u = 8.40
5	2128.5	2128.35	259.40	259.40			259.40	259.40	22:42	22:45	53.7	Seal failure
6	2129.2	2129.05	259.51	259.47	215.37	215.22	259.48	259.50	22:50	22:55	53.8	u = 0.86 plugging
7	2130.0	2129.85	259.60	259.55	215.40	215.34	259.50	259.56	23:03	23:09	53.8	u = 0.35
8	2130.5	2130.35	259.61	259.61	215.10	214.99	259.60	259.61	23:15	23:19	54.1	u = 16.78
9	2134.5	2134.35	260.10	260.06			260.10	260.07	23:32		54.2	Seal failure
10	2145.0	2144.85	261.45	261.39			261.40	261.42	23:36	23:47	54.5	Seal failure
11	2148.0	2147.85	261.77	261.73					23:55	23:57	54.9	Dry test/plugged
12	2147.8	2147.65	261.75	261.77			261.73	261.76	00:03	00:06	55.2	Seal failure
13	2148.2	2148.05	261.76	261.75	217.96	217.91	261.74	261.79	00:14	00:18	55.3	u = 3.22
14	2200.0	2199.85	268.00	267.81	221.50	221.26	268.20	268.05	00:25	00:32	56.0	u = 9.39

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HYDRO

FORMATION PRESSURE WORKSHEET

Well No. : 15/5-4 | Rig : Vildkat Explorer | Date : 22 June 1991

Pressure Units : bar | RKB-MSL : 25 m | Witnessed by : Andresen

Run No. 1A	Depth (MD)	Depth TVD(RKB)	Initial Hydrostatic Press		Formation Pressure		Final Hydrostatic Press		Time		Remarks	
Test No.			Strain	HP	Strain	HP	Strain	HP	Set	Retract	T°C	Mob. ratio
15	2206.5	2205.85	268.91	268.78	222.20	221.91	268.90	268.82	00:41	00:44	57.7	u = 15.2
16	2125.3	2125.15	259.00	259.20	214.58	214.69			00:58	01:52	Sample. Seal failure while opening chamber	

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HYDRO

FORMATION FLUID SAMPLING

Well : 15/5-4

Rig : Vildkat Explorer

Pretest No. : 16	Sample Depth : 2125.3m / 2130.5m	Witnesses : Andresen	
Run No.: 1A	Sample No. : 1	1st Chamber	2nd Chamber	3rd Chamber
Chamber volume (gals)		2-3/4 gal	1 gal	
Chamber No.				
Filling time (mins.)		21	15	
Shut in press. (bar)/T deg C		244 / 55.4	243 /55.4	/
Chamber press. (surf bar)/T		- / 9.8	- /9.8	/
Gas volume (SCF/Sm3)		No gas	No gas	
Oil volume (litres)		No oil	No oil	
Mud volume (litres)/ MW (sg)		8.9 / 1.24	3.2 / 1.26	
Water / Filtrate (litres)		No filtrate	No filtrate	
Water / Filtrate PPM CL-		N/A	N/A	
Water filtrate pH/pF/Ca++		/ /	/ /	/ /
Mud filtrate PPM CL-				
Mud filtrate pH/pF/Ca++		/ /	/ /	/ /
Gas composition %	C1			
	C2			
	C3			
	IC4			
	NC4			
	H2S			
	CO2			

Remarks : Both chambers contained borehole mud.

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HYDRO

FORMATION FLUID SAMPLING

Well : 15/5-4

Rig : Vildkat Explorer

Pretest No. :	Sample Depth : 2125.3 - 2123.8m	Witnesses : Andresen	
Run No. : 1B	Sample No. : 1	1st Chamber	2nd Chamber	3rd Chamber
Chamber volume (gals/litres)		2-3/4 gal	1 gal	
Chamber No.				
Filling time (mins.)		53	83	
Shut in press. (bar)/T deg C		HPG 214.44/ 60.6	HPG 214.52/ 60.7	/
Chamber press. (surf bar)/T		0 / 10 C	0 / 10 C	/
Gas volume (SCF/Sm3)		No gas	No gas	
Oil volume (litres)		v sl tr	v sl tr	
Mud wt (gm/cc)		1.11	1.10	
Fluid / Filtrate (litres)		10.0 l	2.2 l	
Fluid / Filtrate PPM CL- (mg/l)		42000 / 43000	68000 / 67000	
Fluid / Filtrate pH/pF/Ca++		8.25/ 0.08/ 408	6.7 / 0 / 840	/ /
Mud filtrate PPM CL- (mg/l)		72000	72000	
Mud filtrate pH/pF/Ca++		8.3 / 0.1 /480	8.3 / 0.1 / 480	/ /
Gas composition %	C1	N/A	N/A	
	C2			
	C3			
	IC4			
	NC4			
	H2S			
	CO2			

Remarks :

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HYDRO

FORMATION FLUID SAMPLING

Well : 15/5-4

Rig : Vildkat Explorer

Pretest No. : 4	Sample Depth : 2129.5m	Witnesses : Andresen

Run No.: 1C	Sample No. : 1	1st Chamber	2nd Chamber	3rd Chamber
Chamber volume (gals)		2-3/4 gal	1 gal	
Chamber No.				
Filling time (mins.)				
Shut in press. (bar)/T deg C		HPG 214.62 / 62.8	HPG 214.89 / 62.8	/
Chamber press. (surf bar)/T		0 / 10	4 / 10	/
Gas volume (SCF/Sm3)		0	0	
Oil volume (litres)		0	Tr	
Oil gravity (API/gm/cc)		N/A	N/A	
Water / Filtrate (litres)		10.2	4.0	
Water / Filtrate PPM CL-		55g/l 50,900 ppm	60g/l 56,000	
Water filtrate pH/pF/Ca++		6.9 / 0 / 1800	6.8 / 0 /12,200	/ /
Mud filtrate PPM CL-		72g/l 66,700	72g/l 66,700	
Mud filtrate pH/pF/Ca++		8.3 / 0.1 / 480	8.3 / 0.1 / 480	/ /
Gas composition %	C1	Insufficient to measure.		
	C2			
	C3			
	IC4			
	NC4			
	H2S			
	CO2			

Remarks : Fluids recovered from 1 gallon chamber composed of mud filtrate with trace of oily scum. Faint to moderate petroleum odour.

SECTION B

OPERATIONS

Prepared by: T. ARVESEN for [illegible] Drilling Engineer

Verified by: [illegible] Engineer Group Leader

Approved by: MAGNUS FLORVÅG for S.O. Eide Drilling Operations

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1. LOCATION SURVEY

The site survey for well 15/5-4 was performed in September and October 1990 by A/S Geoteam.

The geographical coordinates for the well were given as:

58° 38′ 28.4" N
01° 33′ 08.9" E

The result of the site survey were summarized as follows:

- Water depth was estimated to 118 m LAT (143 m RKB).

- The overall seabed slope of the area was negligible. The seabed consisted of fine to medium sand. A few scattered pockmarks have been observed.

Sub-seabed geology

Reference is made to section A of this report.

2. POSITIONING AND ANCHORING OF THE RIG

The well 15/5-4 was located on the seismic location NH 9068-109 and NH 9068-312.

Planned position of the well was:

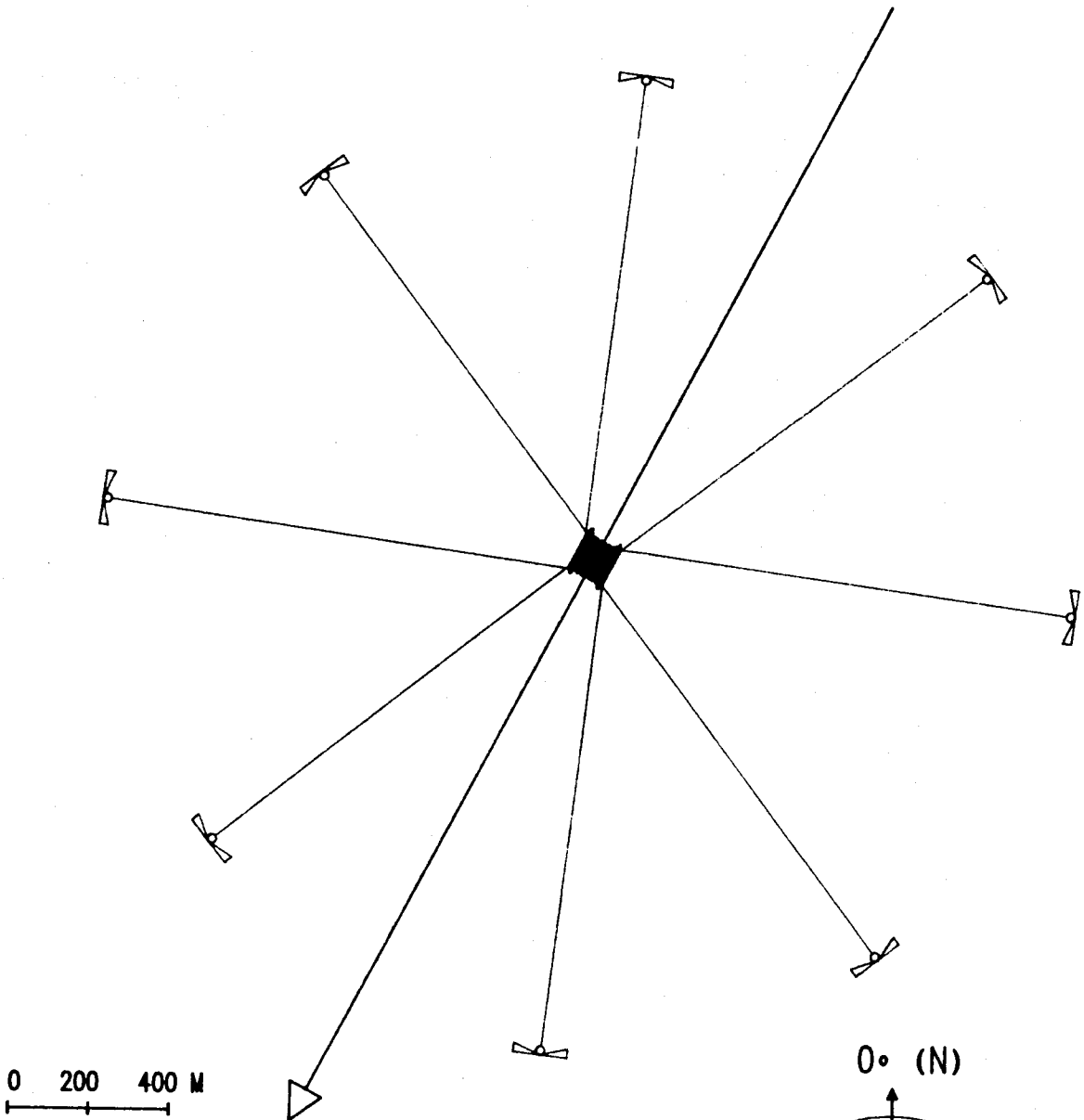
Geographical	UTM
Lat 58° 38′ 28.4" N	6 501 159.7 mN
Long 01° 33′ 08.9 E	415 973.3 mE

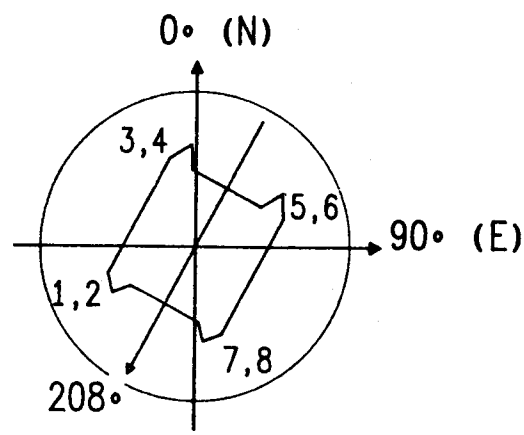
The final position of the well was:

Geographical	UTM
Lat 58° 38′ 28.53" N	6 501 162.2 mN
Long 01° 33′ 08.87" E	415 972.2 mE

The rig heading was 208°. The mooring line pattern is shown in fig. B-1 next page.

16.08.1991 12.11 BY BG3BOR03





ANCHOR NO	DIRECTION DEGREES	LENGTH METERS
1	232	1102
2	278	1146
3	323	1089
4	7	1120
5	53	1127
6	98	1126
7	143	1136
8	187	1153

Norsk Hydro
Drilling Department

Date:19910816

MOORING LINE PATTERN

VILDKAT EXPLORER

15/5-4

Fig. B-1

NORSK HYDRO

3. OPERATION SUMMARY

3.1 Drilling summary

Moving and mooring

Vildkat left well 30/9-12A for well 15/5-4. The rig arrived at the location 06.06.91 at 02:00 hrs. All anchors were run and pretested in few hours.

36" hole section

The well was spudded 06.06.91 at 02:00 hrs, using 17 1/2" bit and 36" hole opener. At 228 m a wipertrip was made up to 10 m below the seabed and ran back in the hole. Displaced to 1.20 rd mud prior to pulling out. The 30" casing was run and cemented with the shoe at 230 m.

17 1/2" hole section

The cement and the 30" casing shoe was drilled out using a 26" bit. 17 1/2" hole was drilled from 230 m to 1027 m in one run. Mudweight was 1.05 rd. Circulate out 15 m^3 high viscous pill and displaced the hole to 1.20 rd mud. 13 3/8" casing was run and cemented with the shoe at 1012 m. Ran BOP and marine riser.

12 1/4" hole section

The 13 3/8" casing shoe was drilled out and a formation integrity test equivalent to 1.35 rd was performed at 1012 m. 12 1/4" hole was drilled to 2106 m in three bitruns. From 1012 m to 1700 m the mudweight was 1.10 rd. From 1700 m to 1900 m the mudweight was 1.20 rd. In the interval from 1900 m to 2106 m the mudweight was 1.23 rd. From 2106 m to 2147 m coring was performed.

Core no. 1:	2106 m to 2124.5 m	
Core no. 2:	2124.5 m to 2129 m	
Core no. 3:	2129 m to 2132 m	
Core no. 4:	2132 m to 2134 m	
Core no. 5:	2134 m to 2140.5 m	
Core no. 6:	2140.5 m to 2147 m	

After coring was completed, 8 1/2" hole was drilled to total depth of the well at 2300 m.

The following logs were run:

Log no. 1:	DIL/SDL/LDL/CNL/NGL
Log no. 2:	DLL/MSFL/GR
Log no. 3:	FMS-4/GR
Log no. 4.	RFT-HP/GR

Unable to pass 2106 m with log no. 4. Opened 8 1/2" hole to 12 1/4" from 2106 to 2294 m. Reran log no. 4: RFT/HP/GR.

Log no. 5:	VSP
Log no. 6:	RFT-HP/GR
Log no. 7:	CST

Ran in the hole to 2243 m for a wipertrip prior to running the casing. The 9 5/8" casing was run and cemented with the shoe at 2248 m.

Plug and abandonment

One production test was performed and then the well was permanently plugged back.

3.2 Production test summary

The test was performed as a standard DST-test with 5" modified tubing bottom hole assembly with tester valve, circulation valves, pressure gauges and slip joints.

A retrievable packer was set at 2080.3 m RKB and the correlation was done against 2 RA-markers in the casing and 2 RA-markers in the test string.

A diesel cushion was used to obtain the required underbalance of approximately 35 bar.

For the perforation a 7" 12 spf. perforation gun with pressure actuated firing head was used. As a back-up for the pressure actuated firing head it was possible to run in with a mechanical latch on firing head.

The well was perforated with a surface pressure of approximately 5 bar, and the pressure built up immediately after the perforation to 28 bar.

When opening up for initial flow and clean up flow the pressure dropped down to 1 bar with a flow rate of 2.3 barrels/hour. The clean up was continued for 7 hours and 5.8 m^3 diesel was the produced volume from the well. A shut in period of 2 hours followed by a bottom hole sampling run ended the test.

During the killing procedure a mini frac test was performed, and then the test string was pulled out of the hole.

3.3 Daily Drilling Reports

((((ooo) Norsk Hydro	Daily report System : BORE	Date 23/8-1991
	Well: 15/5-4 Casing Size (in): 30 / 13 3/8 / 9 5/8 Setting depth m,MD: 230 / 1011 / 2248	3

Report number	Mid. depth m,MD	Est.Pore Pressure (SG)	Mud Dens. (SG)	Stop time	Short Summary
1	0	0		02:00	End of well 30/9-12A.
				24:00	Rig under tow to location 15/5-4.
2	186	0	1.05	02:00	Rig under tow to location 15/5-4.
				12:00	Anchor handling.
				13:30	Made up HWDP and 30" running tool in the derrick.
				18:30	Picked up 36" bottom hole assembly and ran in the hole to 15 m above seabed.
				19:30	Adjusted the top drive with the dolly rollers. Centralized the rotary table.
				21:00	Tagged ~~the~~ bottom. Moved markers on the seabed with the ROV. Spudded the well and drilled 36" hole from 145 m to 156 m.
				21:30	Checked the air filter on the top drive.
				24:00	Drilled 36" hole from 156 m to 185 m.
3	231	1.03	1.05	07:00	Drilled 36" hole from 185 m to 230 m.
				08:00	Circulated out a 15 m3 high viscous pill and displaced the hole to 1.20 rd mud.
				08:30	Performed a wiper trip to 10 m below the seabed and ran back in the hole.
				09:00	Washed down to TD. Circulated out a 15 m3 high viscous pill and displaced the hole to 1.20 rd mud.
				10:00	Installed a marker on bottom with the ROV.
				12:30	Pulled out of the hole with the 36" bottom hole assembly.
				17:00	Rigged up the casing running equipment and ran 30" casing to 228 m.
				19:00	Washed and circulated the 30" casing down from 228 m to 230 m. Picked up 1 m.
				20:30	Cemented the 30" casing.
				22:00	Set the casing on bottom and released the running tool. Pulled out with the running string.
				23:00	Made up the cement kelly and the cement head for the 13 3/8" casing.
				24:00	Made up the 18 3/4" wellhead housing the running tool.
4	597	1.03	1.05	01:00	Continued making up the 18 3/4" wellhead housing and the running tool.
				02:00	Laid down the 36" bottom hole assembly.
				04:30	Made up 26" bit and ran in the hole. Tagged cement at 224 m.
				05:30	Drilled cement and the 30" casing shoe down to 230 m.
				06:00	Drilled the rat hole down to 231 m and new formation from 231 m to 234 m.

((((ooo) Norsk Hydro	Daily report System : BORE	Date 23/8-1991
	Well: 15/5-4 Casing Size (in): 30 | 13 3/8 | 9 5/8 Setting depth m,MD: 230 | 1011 | 2248	3

Report number	Mid. depth m,MD	Est.Pore Pressure (SG)	Mud Dens. (SG)	Stop time	Short Summary
				06:30	Circulated out a 15 m3 high viscous pill and spotted a new 15 m3 high viscous pill.
				07:30	Pulled out of the hole with the 26" bit.
				10:30	Made up 17 1/2" bit and bottom hole assembly and ran in the hole to 234 m.
				24:00	Drilled 17 1/2" hole from 234 m to 597 m.
5	1027	1.03	1.20	17:00	Drilled 17 1/2" hole from 597 m to 1000 m.
				17:30	Circulated out a 15 m3 high viscous pill.
				18:00	Drilled 17 1/2" hole from 1000 m to 1027 m.
				19:30	Circulated out a 15 m3 high viscous pill. Displaced the hole to 1.2 rd mud.
				24:00	Pulled out of the hole with bit No. 3.
6	1027	1.03	1.20	12:00	Ran the 13 3/8" casing.
				16:30	Circulated a preflush, dropped the ball and cemented the 13 3/8" casing.
				18:30	Released the running tool and pulled out of the hole.
				20:00	Ran in the hole with a jet sub and flushed the permanent guide base.
				21:00	Cut and slipped the drilling line.
				24:00	Ran the BOP and the marine riser.
7	1027	1.03	1.10	07:30	Ran and landed the BOP stack.
				10:00	Laid down 17 1/2" bottom hole assembly.
				10:30	Picked up the cement kelly.
				11:30	Tested the rotary hose to 345 bar. Tested the automatic kellycocks and the lower kellycock failed.
				12:30	Made up 2 x kellycocks and tested to 345 bar.
				13:30	Made up the test tool and ran in the hole.
				15:30	Was unable to test the MPR or annulus.
				16:30	Pulled out of the hole. Found a piece of rubber in the test tool.
				20:00	Made up the test tool and ran in the hole. Tested the rams to 35/345 bar and the annulus to 35/240 bar using the blue pod.
				21:00	Pulled out of the hole with the test plug.
				22:30	Ran and set the wearbushing and pulled out of the hole.
				24:00	Made up 12 1/4" bottom hole assembly.

((((ooo) Norsk Hydro	Daily report	Date 23/8-1991
	System : BORE	
	Well: 15/5-4	
	Casing Size (in): 30 / 13 3/8 / 9 5/8	
	Setting depth m,MD: 230 / 1011 / 2248	3

Report number	Mid. depth m,MD	Est.Pore Pressure (SG)	Mud Dens. (SG)	Stop time	Short Summary
8	1370	1.03	1.10	04:00	Made up 12 1/4" bottom hole assembly and ran in the hole to 900 m.
				04:30	Performed a kick drill.
				05:00	Ran in the hole and tagged the top of the cement at 972 m.
				05:30	Washed down to 984 m.
				09:30	Drilled plugs, cement and shoe. Cleaned out the rat hole to 1027 m.
				10:00	Pumped 10 m high viscous pills and drilled to 1030 m.
				10:30	Displaced the hole to mud.
				11:30	Performed a leak off test to 1.35 rd.
				24:00	Drilled 12 1/4" hole from 1030 m to 1370 m.
9	1702	1.03	1.19	13:00	Drilled 12 1/4" hole from 1370 m to 1702 m.
				14:00	Circulated bottoms up.
				15:30	Pulled out of the hole. Had Tight hole from 1515 m to 1346 m. Max overpull was 223 kN.
				16:30	Broke circulation and pulled out of the hole to shoe while circulating.
				17:00	Flowchecked and pulled out to 907 m.
				18:00	Circulated bottoms up and pumped the slug.
				20:00	Pulled out of the hole.
				24:00	Changed the bit and the float,and checked the MWD. Ran in the hole to 1200 m. Pulled out to 1018 m and attempted to circulate.Pulled out to 990 m,unable to circulate. Max overpull was 133kN. Increased the mud weight to 1.20 rd.
10	1911	1.1	1.23	01:30	Pulled out to 878 m and circulated. Ran in the hole to 934 m. Washed down to 1074 m.
				02:00	Continued to run in the hole to 1431 m.
				04:00	Washed down from 1431 m to 1542 m and from 1560 m to 1702 m.
				15:00	Drilled the 12 1/4" hole from 1702 m to 1909 m.
				15:30	Changed the washpipe.
				17:00	Drilled the 12 1/4" hole from 1909 m to 1911 m.
				21:00	Pulled out of the hole due to low rate of penetration. Changed out the MWD.
				24:00	Made up bit no. 6 and junk sub. Added one stand with 8" drill collar and ran in the hole.
11	2106	1.1	1.23	01:00	Continued to run in the hole to 1650 m.

Report number	Mid. depth m,MD	Est.Pore Pressure (SG)	Mud Dens. (SG)	Stop time	Short Summary
				02:30	Washed from 1650 m to 1750 m to repeat the GR log.
				03:00	Ran in the hole to 1850 m.
				04:00	Washed from 1850 m to 1875 m to repeat the GR log.
				18:00	Drilled the 12 1/4" hole from 1911 m to 2106 m.
				19:30	Pumped a high viscous pill around.
				24:00	Pulled out of the hole.
12	2129	1.03	1.21	00:30	Laid down the MWD.
				05:30	Made up 8 1/2" coring assembly and ran in the hole to 2069 m.
				06:30	Broke circulation and washed down. Tagged the bottom at 2106 m and dropped the ball.
				09:30	Cut core no. 1 from 2106 m to 2124.5 m.
				10:30	Pulled out of the hole.
				15:30	Pulled out of the hole.
				16:30	Recovered core no. 1.
				18:00	Made up the core barrel.
				21:00	Ran in the hole to 2060 m.
				21:30	Washed down to 2118 m. Washed and reamed to the bottom.
				22:30	Cut core no. 2 from 2124.5 m to 2129 m.
				23:00	The core jammed. Were unable to restart coring.
				23:30	Pulled out of the hole.
				24:00	Backreamed from 2050 m to 1950 m.
13	2129	1.03	1.25	01:00	Continued to backream to 1824 m.
				02:00	Pulled out to 1570 m.
				05:30	Pulled out of the hole .
				07:00	Recovered core No. 2.
				13:00	Made up 8 1/2" bottom hole assembly and ran in the hole to 2070 m.
				13:30	Washed down to the rathole at 2106 m.
				14:00	Reamed the 8 1/2" rathole to 2129 m.
				16:00	Circulated and conditioned the mud.
				19:30	Pulled out of the hole.
				23:00	Made up 8 1/2" core barrel assembly and ran in the hole to 2095 m.
				24:00	Circulated and washed to 2129 m.
14	2135	1.03	1.25	00:30	Cut core No. 3 from 2129 m to 2132 m.
				01:00	The core jammmed. Were unable to restart
				05:00	Pulled out of the hole with core No. 3.
				07:00	Recovered core No. 3. Serviced the core barrel.
				10:00	Ran in the hole with coring assembly to 2106 m.
				11:00	Circulated and washed the rat hole from

((((ooo) Norsk Hydro	Daily report System : BORE	Date 23/8-1991
	Well: 15/5-4 Casing Size (in): 30 / 13 3/8 / 9 5/8 Setting depth m,MD: 230 / 1011 / 2248	3

Report number	Mid. depth m,MD	Est.Pore Pressure (SG)	Mud Dens. (SG)	Stop time	Short Summary
					2106 m to 2132 m.
				11:30	Dropped the ball.
				13:30	Cut core No. 4 from 2132 m to 2134 m.
				16:30	Pulled out of the hole with core No. 4.
				17:30	Recovered core No. 4.
				19:00	Serviced the core barrel and changed the core head.
				21:30	Ran in the hole with the coring assembly to 2101 m.
				22:30	Circulated and washed down from 2101 m to 2134 m. Dropped the ball and circulated.
				24:00	Cut core No. 5 from 2134 m to 2134.5 m.
15	2147	1.03	1.26	06:30	Cut core No. 5 from 2134 m to 2140.5 m.
				09:30	Pulled out of the hole with core No. 5.
				10:30	Recovered core No. 5.
				11:30	Slipped and cut the drilling line.
				13:00	Serviced the core barrel. Changed the core head.
				15:30	Ran in the hole with the coring assembly to 2077 m.
				16:00	Washed down from 2077 m to 2137 m.
				16:30	Repaired the hydraulic power unit for the shakers.
				17:00	Washed and reamed down from 2137 m to 2140.5 m.
				21:00	Dropped the ball and circulated. Cut core No. 6 from 2140.5 m to 2146.5 m.
				24:00	Pulled out of the hole with core No. 6.
16	2300	1.03	1.26	00:30	Recovered core No. 6.
				01:30	Laid out the core barrel.
				05:30	Made up 8 1/2" bottom hole assembly and ran in the hole to 2092 m.
				06:00	Removed the tripping assembly and installed the screen. Broke circulation and washed to 2101 m.
				07:00	Washed down from 2101 m to 2146.5 m for GR log.
				12:00	Drilled 8 1/2" hole from 2146 m to 2300 m.
				15:00	Pumped a 1 m3 high viscous pill and displaced to 1500 m. Pulled out to 2100 m. Pumped a 11 m3 high viscous pill at a higher pump rate. Circulated the hole clean. Ran in the hole to 2300 m.
				18:00	Pulled out of the hole
				19:00	Rigged up the wireline logging equipment
				24:00	Ran log No. 1: DIL/SDT/LDL/CNL/NGT.
17	2300	1.03	1.25	03:30	Ran log No. 1: DIL/SDL/LDL/CNL/NGL.

((((ooo) Norsk Hydro	Daily report	Date 23/8-1991
	System : BORE	
	Well: 15/5-4	
	Casing Size (in): 30 / 13 3/8 / 9 5/8	
	Setting depth m,MD: 230 / 1011 / 2248	3

Report number	Mid. depth m,MD	Est.Pore Pressure (SG)	Mud Dens. (SG)	Stop time	Short Summary
				06:30	Pulled out of the hole and rigged down the logging tools.
				11:30	Rigged up and ran DLL/MSFL/GR.
				19:00	Rigged up and ran FMS-4/GR. Rigged down the logging tools.
				24:00	Ran RFT-HP/GR log. Was unable to pass 2106 m. Pulled out and added rubber standoffs to bottom of tool. Ran in the hole.
18	2294	1.03	1.25	01:30	Ran RFT-HP/GR log. Was unable to pass 2106 m. Pulled out and rigged down the wireline logging equipment.
				07:00	Made up 12 1/4" bottom hole assembly. Ran in the hole to 2106 m.
				14:00	Opened the 8 1/2" hole to 12 1/4" from 2106 m to 2294 m.
				15:00	Pumped a 10 m3 high viscous pill, circulated the pill out and flowchecked.
				19:00	Pulled out of the hole.
				19:30	Rigged up wireline logging equipment.
				24:00	Ran RFT/HP/GR log.
19	2294	1.03	1.25	03:00	Ran RFT/HP/GR-log.
				06:30	Serviced the RFT-tool.
				23:00	Rigged up and ran VSP-log.
				24:00	Rigged up and ran RFT-HP/GR-log.
20	2294	1.03	1.25	15:00	Ran RFT-HP/GR log.
				19:00	Ran CST.
				19:30	Rigged down the wireline logging equipment.
				20:30	Made up the multi purpose tool and ran in the hole. Retrieved the wear bushing.
				21:30	Made up the BOP test tool and ran in the hole.
				24:00	Tested the BOP.
21	2294	1.03	1.25	00:30	Pulled out of the hole with the BOP test tool.
				01:30	Ran and set the wear bushing.
				03:30	Tested the surface equipment.
				07:00	Ran in the hole to 2243 for a wiper trip prior to running the casing.
				08:30	Washed and reamed from 2243 m to 2294 m.
				09:30	Circulated and cleaned the hole.
				13:00	Pulled out of the hole to run the 9 5/8" casing.
				14:00	Recovered the wear bushing.
				15:00	Installed the plugs and serviced the cement kelly.
				16:00	Picked up the casing hanger and

Report number	Mid. depth m,MD	Est.Pore Pressure (SG)	Mud Dens. (SG)	Stop time	Short Summary
					installed the seal assembly.
				24:00	Rigged up the casing handling equipment.
22	2294	1.03	1.25	06:30	Ran and landed the 9 5/8" casing string. Made up the cement kelly and the hose.
				09:00	Pumped a spacer. Mixed and pumped the cement slurry.Displaced the cement and bumped the plug. Checked for backflow. Set and tested the seal assembly.
				10:00	Pulled out of the hole with the landing string.
				11:00	Ran in the hole with the jet sub. Washed the wellhead area and pulled out of the hole.
				12:00	Ran the 9 5/8" wear bushing.
				15:30	Laid down 12 1/4" bottom hole assembly.
				19:00	Ran in the hole with 8 1/2" bit and 9 5/8" casing scraper to the top of the cement at 2198 m. Worked the casing scraper from 2070 m to 2100 m.
				21:00	Pumped a 10 m3 high viscous pill. Circulated and cleaned the casing.
				24:00	Pulled out of the hole with the bit and the casing scraper.
23	2294	1.03	1.25	06:00	Rigged up the wireline logging equipment and ran CBL/VDL/CET logs. Rigged down the wireline logging equipment.
				06:30	Installed a single drill pipe on the flowhead.
				08:30	Made a check run with the fluten hanger.
				24:00	Made up a test assembly. Tested the bottom hole assembly to 350 bar. Ran in the hole with 5" modified drill pipe. Filled every joint with diesel.
24	2294	1.03		04:30	Ran in the hole with 5" modified drill pipe. Filled every joint with diesel.
				07:00	Picked up and functiontested the sub sea test tree. Pressure tested the string to 350 bar.
				12:00	Ran in the hole with the landing string. Picked up the sub sea lubricator valve and landed the hanger in the wellhead. Rigged up wireline logging equipment with GR/CCL and made a correlation run.
				14:00	Pulled back and layd out one single of drill pipe. Connected control hosefor the sub sea lubricator valve and tested the sub sea lubricator valve.
				16:00	Installed the coflexip hose to the flowline.

Report number	Mid. depth m,MD	Est.Pore Pressure (SG)	Mud Dens. (SG)	Stop time	Short Summary
				18:00	Picked up the flowhead.
				22:30	Pressure tested the surface equipment to 350 bar.
				23:00	Set the production packer at 2080 m.
				24:00	Ran wireline GR/CCL and made a correlation log.
25	2294	1.03		01:00	Ran wireline GR/CCL and made a correlation log.
				02:30	Perforated the well and performed initial flow.
				04:30	Shut in the well for initial buildup.
				11:00	Flow the well to store tank on a 64/64" choke.
				13:00	Shut in the well for final buildup.
				20:00	Performed bottom hole sampling on wire-line.
				21:00	Reverse circulate out two string volumes.
				24:00	Performed a minifrac test.
26	2115	0	1.25	00:30	Completed the minifrac test.
				01:00	Un-sat the packer.
				03:00	Set the packer and opened the OMNI valve and circulated through the tubing.
				17:00	Flushed through the flowhead and surface lines. Laid out the flow head and SSLV. Laid out the landing string and SSTT. Laid out the test string and downhole tools.
				20:00	Set a cement retainer at 2115 m.
				23:00	Ran in the hole with the cement stinger.
				24:00	Stung into the packer. Established injection rate. Stung out of the retainer. Mixed and displaced 3 m3 cement slurry. Stung into the retainer and squeezed 3 m3 cement below the retainer.
27	180	0	1.25	00:30	Pulled out of the retainer. Reverse circulated.
				01:30	Pressure tested the retainer.
				08:00	Pulled out of the hole and laid down drill pipe.
				09:00	Retrieved the wear bushing.
				10:00	Retrieved the 9 5/8" x 18 3/4" seal assembly.
				11:30	Laid down 6 1/2" drill collar from the derrick.
				12:30	Slipped and cut the drilling line.
				16:30	Ran in the hole with 9 5/8" casing cutting assembly.

((((ooo) Norsk Hydro	Daily report System : BORE	Date 23/8-1991
	Well: 15/5-4 Casing Size (in): 30 | 13 3/8 | 9 5/8 Setting depth m,MD: 230 | 1011 | 2248	3

Report number	Mid. depth m,MD	Est.Pore Pressure (SG)	Mud Dens. (SG)	Stop time	Short Summary
				17:00	Cut the 9 5/8" casing at 957 m.
				19:00	Pulled out of the hole with the casing cutting assembly.
				24:00	Ran in the hole with the casing spear. Engaged the casing and pulled out of the hole,and laid down 9 5/8" casing joints.
28	0	0	1.25	02:30	Laid down 9 5/8" casing.
				04:00	Ran in the hole with open ended drill pipe to 1100 m.
				04:30	Set a high viscous pill from 1100 m to 1000 m.
				05:00	Pulled back to 1000 m.
				05:30	Set a cement plug from 1000 m to 840 m.
				07:00	Pulled back to 830 m and reverse circulated.
				09:00	Pulled out of the hole to 380 m and laid down drill pipe.
				09:30	Set cement plug from 380 m to 180 m.
				10:00	Pulled out of the hole to 160 m and reverse circulated.
				11:00	Pulled out of the hole and laid down 3 1/2" drill pipe.
				17:30	Pulled the BOP stack.
				18:00	Laid down the 9 5/8" casing cutting assembly.
				22:30	Made up 20 x 30" casing cutting assembly. Ran in the hole and cut the casing at 152 m. The connection on the 18 3/4" wellhead housing backed off at 150 m.
				24:00	Pulled out of the hole and laid down the 18 3/4" wellhead housing.
29	0	0	1.25	03:00	Made up 30" cutting and pulling assembly and ran in the hole.
				04:00	Cut the 30" casing at 150 m.
				06:00	Pulled out of the hole with 30" housing, 30" casing and permanent guide base. Landed on the trolly.
				07:30	Laid down 30" casing cutting assembly.
				13:30	Laid down pipe from the derrick.
				18:30	Deballasted the rig for anchor handling.
				24:00	Pulled the anchors.
30	0	0		01:30	Pulled anchors. End of well 15/05-04.

3.4 Time distribution

The total time used to perform anchorhandling, drill the well and plug and abandon the well was 695.5 hours (28.98 days).

The time distribution is shown in Table B-1 and fig. B-2.

The operation can be broken down into the following main groups:

- Positioning of the rig	1.92 days
- Drilling the well to TD	10.19 days
- Formation evaluation	6.52 days
- Production testing	6.25 days
- Plug and abandonment	2.50 days
- Lost time	1.31 days

((((ooo) Norsk Hydro	Time distribution System : BORE Well : 15/5-4 Depth: 2300 m,MD Rig: VILDKAT EXPLORER	Date 16/8-1991 7

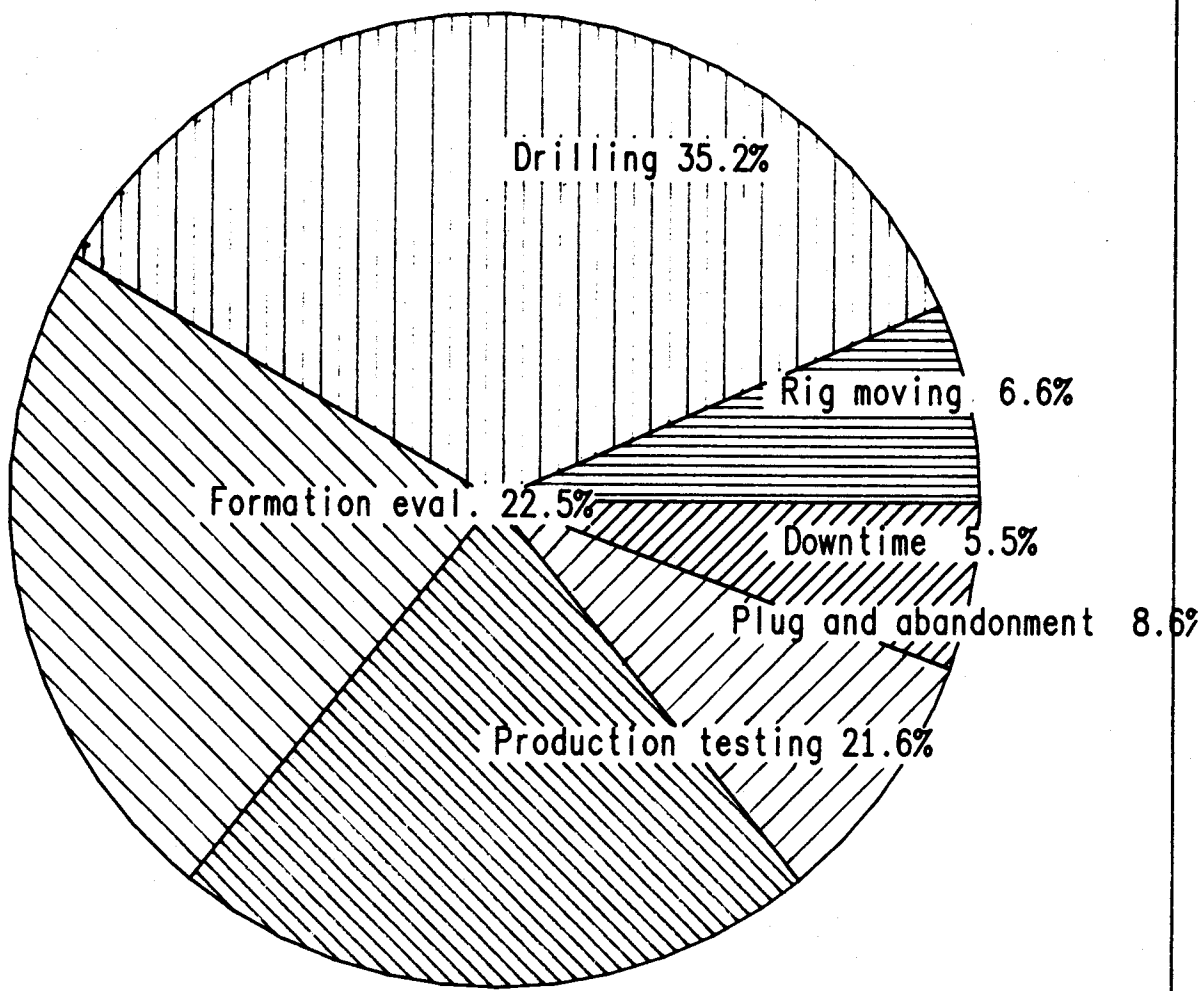
Phase:	Mobili	36	17	12	Test1	Demobi	SUM
1 Rig moving	34.0						34.0
2 Mooring	12.0						12.0
3 Skidding							0.0
4 Jacking							0.0
SUM Rig moving	46.0	0.0	0.0	0.0	0.0	0.0	46.0
5 Drilling		11.0	31.5	61.5			104.0
6 Underreaming							0.0
7 Opening hole				7.0			7.0
8 Tripping		7.5	7.5	37.0			52.0
9 Circ. and cond. hole and mud			1.0	8.5			9.5
10 Pressure detection							0.0
11 Formation leak off test				1.0			1.0
12 Surveying							0.0
13 Wellhead/BOP handling			14.0				14.0
14 BOP testing/activities			7.5				7.5
15 Other equipment testing							0.0
16 Running casing		16.0	24.5				40.5
17 Primary cementing		3.5	4.5				8.0
18 Squeezing							0.0
19 Slip and cut drilling line			1.0				1.0
20 Other							0.0
SUM Drilling	0.0	38.0	91.5	115.0	0.0	0.0	244.5
21 Tripping				56.5			56.5
22 Circ and cond mud/hole				6.0			6.0
23 Circulating for samples							0.0
24 Coring				21.5			21.5
25 Logging				68.0			68.0
26 RFT/FMT				4.5			4.5
27 Slip and cut drilling line							0.0
28 Other							0.0
SUM Formation evaluation	0.0	0.0	0.0	156.5	0.0	0.0	156.5
29 Running Casing					24.0		24.0
30 Primary Cementing					2.5		2.5
31 Circulating					6.0		6.0
32 Wire line operations					18.0		18.0
33 Tripping workstring							0.0
34 Tripping other					55.0		55.0
35 Rigging up/down							0.0
36 Equipment testing					21.0		21.0
37 Flowing/injection					6.5		6.5
38 Pressure build up/fall off					4.0		4.0
39 Milling/underreaming							0.0
40 Plugging and squeezing					6.0		6.0
41 Slip and cut drilling line							0.0
42 Other					7.0		7.0
SUM Production testing	0.0	0.0	0.0	0.0	150.0	0.0	150.0

Table B-1

((((ooo) Norsk Hydro	Time distribution System : BORE Well : 15/5-4 Depth: 2300 m,MD Rig: VILDKAT EXPLORER	Date 16/8-1991 7

Phase:	Mobili	36	17	12	Testl	Demobi	SUM
98 Tripping						18.0	18.0
99 Circ and cond mud/hole						0.5	0.5
100 Perforating							0.0
101 Cement plug						3.0	3.0
102 Mechanical plug							0.0
103 Squeezing							0.0
104 Cutting						14.0	14.0
105 Equipment recovery						16.0	16.0
106 Slip and cut drilling line						1.0	1.0
107 Other						7.5	7.5
SUM Plug and abandonment	0.0	0.0	0.0	0.0	0.0	60.0	60.0
108 Reaming							0.0
109 Wiper trip				25.0			25.0
110 Well control							0.0
111 Lost circulation							0.0
112 Fishing> due to coring							0.0
113 Fishing> due to logging							0.0
114 Fishing> due to RFT/FIT							0.0
115 Fishing> due to wireline							0.0
116 Fishing> due to hole equipme							0.0
117 Fishing> due to tubing							0.0
118 Fishing> other							0.0
119 Sidetracking							0.0
120 Slip and cut drilling line							0.0
131 Production interruption							0.0
148 Commissioning							0.0
149 Other				6.5			6.5
SUM Miscellaneous	0.0	0.0	0.0	31.5	0.0	0.0	31.5
123 Wellhead/BOP equipment repai			1.0				1.0
124 Moving equipment repair							0.0
125 Drilling equipment repair		1.5		1.0			2.5
127 Formation eval equip repair				3.5			3.5
129 Production test equip repair							0.0
132 Completion downhole equip.re							0.0
133 Completion X-mas tree eq. re							0.0
134 Completion tubing hanger eq.							0.0
136 Workover downhole equip. rep							0.0
137 Workover X-mas tree equip.re							0.0
138 Workover tubing hanger eq.re							0.0
140 Wellservice downhole equip.r							0.0
141 Wellservice X-mas tree eq.re							0.0
142 Wellservice tubing hanger eq							0.0
144 Plug and abandon equip repai							0.0
146 Downtime equipment repair							0.0
SUM Repair	0.0	1.5	1.0	4.5	0.0	0.0	7.0

16.08.1991 12.35 BY BG3BOR03



TIME REPORTED (HRS): 695.5 OF TOTAL 695.5

Norsk Hydro
Drilling Department

Date:19910816

TIME DISTRIBUTION

WELL: 15/5-4

Fig. B-2

NORSK HYDRO

(((
(ooo)
Norsk Hydro

Hole deviation

Date 16/8-1991

System : BORE

Well: 15/5-4. Depths, m: RKB 25. Water 119. Assumed vert. 144

Proposed direction (deg): 0 (referensed to grid north)

Offset from template center N: .00 m, E: .00 m.

Meas. Depth (m)	Incli-nation (deg)	Direc tion (deg)	Tool Type	Vert. Depth (m)	Coordinates North (m)	Coordinates East (m)	Depar-ture (m)	Dogleg d/30m	Build d/30m	Turn d/30m
230.0	0.20	13.10	MWD	230.0	0.15	0.03	0.2	0.07	0.07	4.57
272.0	0.75	50.63	MWD	272.0	0.39	0.26	0.5	0.43	0.39	26.81
358.0	0.75	68.03	MWD	358.0	0.96	1.22	1.6	0.08	0.00	6.07
444.0	0.51	91.40	MWD	444.0	1.16	2.12	2.4	0.12	-0.08	8.15
530.0	0.36	73.24	MWD	530.0	1.23	2.77	3.0	0.07	-0.05	-6.33
616.0	0.27	355.86	MWD	616.0	1.51	3.01	3.4	0.14	-0.03	-26.99
644.6	0.20	71.40	MWD	644.6	1.59	3.05	3.4	0.31	-0.07	*
672.6	0.34	181.24	MWD	672.6	1.53	3.10	3.5	0.48	0.15	*
700.6	0.12	106.25	MWD	700.6	1.43	3.12	3.4	0.35	-0.24	*
728.3	0.12	129.08	MWD	728.3	1.41	3.17	3.5	0.05	0.00	24.73
784.9	0.21	97.81	MWD	784.9	1.36	3.32	3.6	0.07	0.05	-16.57
812.9	0.15	73.07	MWD	812.9	1.36	3.41	3.7	0.10	-0.06	-26.51
841.1	1.60	27.62	MWD	841.1	1.72	3.63	4.0	1.59	1.54	-48.35
869.0	1.50	337.69	MWD	869.0	2.40	3.67	4.4	1.41	-0.11	*
897.6	1.11	15.38	MWD	897.6	3.02	3.60	4.7	0.97	-0.41	39.53
925.9	1.06	13.65	MWD	925.9	3.53	3.73	5.1	0.06	-0.05	-1.83
953.7	0.67	6.01	MWD	953.7	3.95	3.81	5.5	0.44	-0.42	-8.24
982.4	0.14	35.19	MWD	982.4	4.14	3.85	5.7	0.58	-0.55	30.50
1010.9	0.33	40.97	MWD	1010.9	4.23	3.92	5.8	0.20	0.20	6.08
1017.0	0.35	27.57	MWD	1017.0	4.26	3.94	5.8	0.40	0.10	*
1114.1	0.52	333.13	MWD	1114.0	4.92	3.88	6.3	0.13	0.05	-16.82
1170.0	0.49	325.77	MWD	1169.9	5.34	3.63	6.5	0.04	-0.02	-3.95
1226.6	0.33	0.80	MWD	1226.5	5.70	3.50	6.7	0.15	-0.08	18.57
1282.6	0.21	293.84	MWD	1282.5	5.91	3.41	6.8	0.17	-0.06	-35.87
1338.1	0.20	58.24	MWD	1338.0	6.00	3.40	6.9	0.20	-0.01	*
1394.0	0.43	279.72	MWD	1393.9	6.09	3.27	6.9	0.32	0.12	*
1450.0	0.49	253.68	MWD	1449.9	6.05	2.84	6.7	0.12	0.03	-13.95
1506.3	0.74	248.95	MWD	1506.2	5.86	2.27	6.3	0.14	0.13	-2.52
1562.7	0.56	230.57	MWD	1562.6	5.55	1.71	5.8	0.15	-0.10	-9.78
1619.0	0.60	284.12	MWD	1618.9	5.45	1.21	5.6	0.28	0.02	28.53
1675.1	0.61	244.37	MWD	1675.0	5.39	0.66	5.4	0.22	0.01	-21.26
1693.8	0.89	258.07	MWD	1693.7	5.32	0.43	5.3	0.53	0.45	21.98
1741.5	1.34	195.97	MWD	1741.4	4.70	-0.09	4.7	0.76	0.28	-39.06
1854.1	1.34	179.84	MWD	1854.0	2.12	-0.45	2.2	0.10	0.00	-4.30
1938.6	1.16	98.19	MWD	1938.5	1.01	0.40	1.1	0.58	-0.06	-28.99
2096.9	0.99	154.11	MWD	2096.8	-0.45	2.59	2.6	0.19	-0.03	10.60
2139.9	1.10	124.20	MWD	2139.7	-1.01	3.09	3.3	0.38	0.08	-20.87
2196.4	0.98	134.26	MWD	2196.2	-1.66	3.88	4.2	0.12	-0.06	5.34
2285.7	0.76	75.19	MWD	2285.5	-2.04	5.00	5.4	0.30	-0.07	-19.84

Table B-2

4. PERMANENT PLUG AND ABANDONMENT OF THE WELL

The permanent plug and abandonment of the well is shown in fig. B-3 and was carried out as follows:

1. The 9 5/8" casing was cut at 957 m.

2. A cement plug was set from 1000 m to 840 m.

3. Set cement plug from 380 m to 180 m.

4. The 20" x 30" casing was cut at 152 m.

PORE PRESSURE, FORMATION INTEGRITY, OVERBURDEN AND FORMATION TEMPERATURE GRADIENTS

This summary is based on information from electric logs, Dxc (corrected drilling exponent), gas data, drilling reports and lithology data. All depths mentioned herein are in mMD below RKB. The RKB to Sealevel distance was 25m and water depth was 120m.

The relevant gradient curves can be seen in the attached figures.

Pore Pressure

Sea bed (144m) to base Hordaland Group (2072.5m)

The maximum pore pressure gradient in this section is estimated to be 1.12rd.

Normal gradient of 1.03rd is thought to exist from the seabed down to about 1200m, the interval to 1027m being drilled with returns to seabed, and no wireline logs were run.

From 1027m to end of section the pore pressure estimates are based on Dxc and sonic log data. The sonic log shows sections of the hole to be severely washed out, and noise and cycle skipping were also observed. This, together with unreliable Dxc because of varying lithology, makes estimation of pore pressure fairly difficult.

The sonic log indicates a minor increase between 1220m and 1260m, to 1.07rd, and this is supported by the presence of

connection gas peaks up to 0.43% over a background of 0.3%, with a 1.10rd mud density. The next zone of abnormal pore pressure is shown on the sonic log between 1500m and 1580m, to a maximum of 1.12rd at 1540m. This is not shown on the Dxc curve but the background gas did increase slightly to between 0.2% and 0.3%.

The estimate of normal pore pressure between 1580m and about 1850m is based on Dxc and gas data, while the sonic log is unusable for pressure estimating purposes. Below 1850m the pore pressure increases gradually to a maximum of 1.12rd, based on a shift in Dxc and on sonic data. Background gas values increased from about 0.03% between 1800m and 1850m to 0.04-0.1% from 1850m to 2070m.

Top Rogaland Group (2072.5m) to TD (2300m)

Pore pressure estimation is based on the results of RFTs run in the Sele and Lista formations, showing a 1.03rd pressure gradient to exist.

Formation Integrity

One formation integrity test (FIT) was performed with the following result:

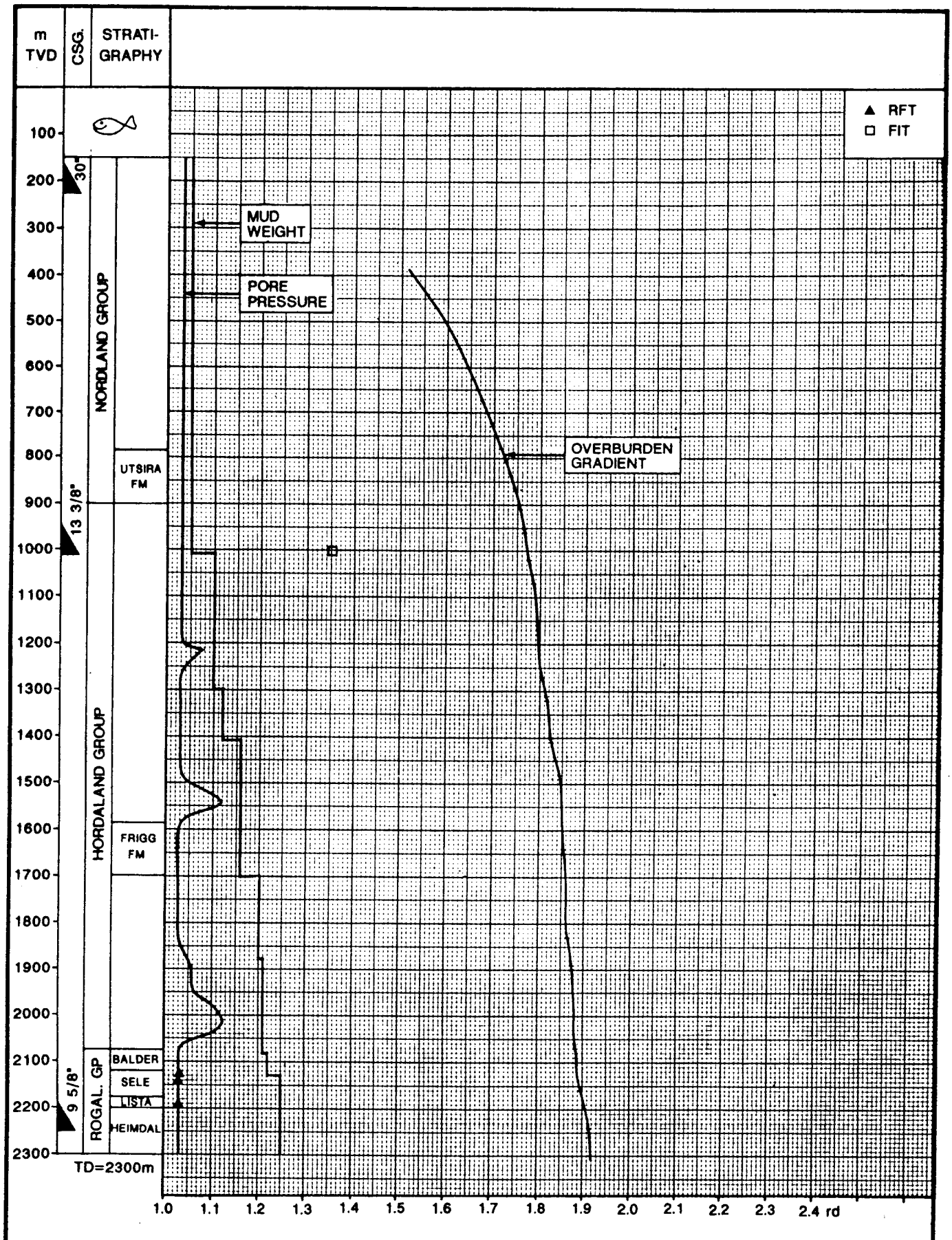
Casing Depth		Open Hole Depth		Mud Wt	FIT
mMD	mTVD	mMD	mTVD	rd	rd
1011	1011	1030	1030	1.10	1.35

Overburden Gradient

Wireline density data were available from 1025m to 2225m and, combined with prognosed data for the upper interval, were used to calculate the OBG.

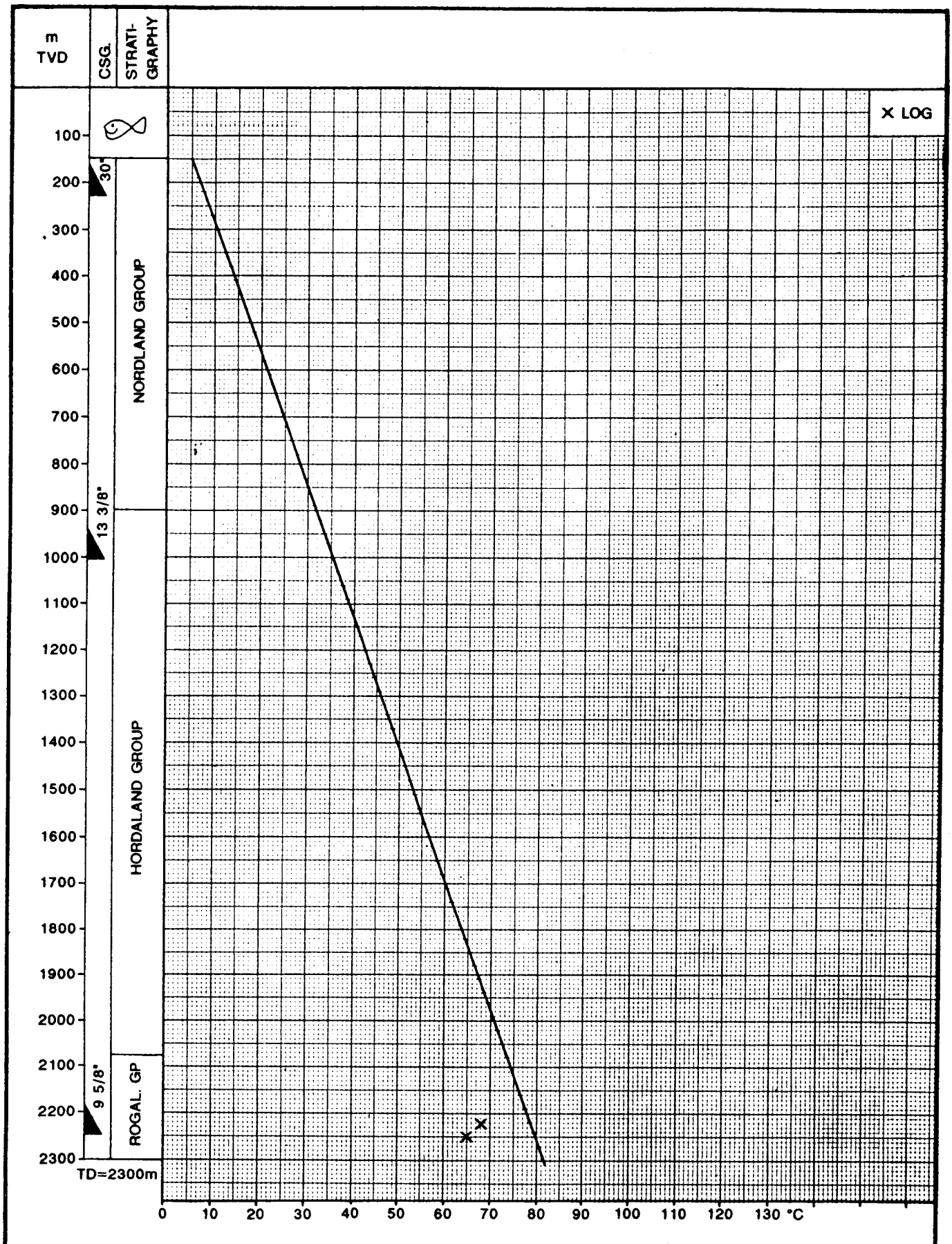
Formation Temperature

Temperature data from wireline log runs were used to calculate Bottom Hole Static Temperature (BHST), via the Horner plot. Maximum BHST of about 68 deg C is estimated, while the maximum RFT temperature seen was 62.8 deg C, at 2129m. It is thought that both these estimates are low, and the gradient used is that calculated in the prognosis, using DST data from an offset well. A seabed temperature of 5 deg C is assumed and the estimated temperature gradient is 3.55 deg C/100m.



FINAL WELL REPORT 15/5-4	FIGURE B-4	FINAL PORE PRESSURE, MUD DENSITY AND OVERBURDEN GRADIENTS	HYDRO

BT22278M91



FINAL WELL REPORT 15/5-4	FIGURE B-5	FINAL TEMPERATURE GRADIENT	HYDRO

BT2228AD91

((((ooo) Norsk Hydro	Formation integrity System : BORE	Date 16/8-1991
	Well: 15/5-4 Seabed at : 144 m RKB Total depth: m,MD,RKB	10

Casing Shoe Depth (m,MD)	Open Hole Depth (m,MD)	Form Int Strenght (SG)
1012	1030	1.35

Table B-4

6. MATERIALS REPORT

Table B-5. Main consumption casing and wellhead.

Table B-6. Main consumption cement and additives.

Table B-7. Cement report

Table B-8. Bit record

Table B-9. Bottom hole assembly

6.1 Mud report

Table B-10. Daily mud properties

Table B-11. Mud material consumption

Norsk Hydro	Main consumptions	Date 21/8-1991
	System : BORE	
	Well: 15/5-4	
	Wellhead:	
	Data from table 8.	6

CASING				
Size (in)	Grade	Weight (kg/m)	Threads Type	Length (m)
30	B		ST-2RB	87
13 3/8	N-80	107.20	BTC	855
20	X-56	192.50	E-60	14
9 5/8	P-110	68.70	NK3SB	2101

Table B-5

((((ooo) Norsk Hydro	Main consumptions System : BORE Well: 15/5-4 Cement contractor: Data from table 9.	Date 21/8-1991

Casing size (in)	Additive name	Total used (l)
30		
Spacer	SEAWATER	34000
Lead-	Cement	6317
	Seawater	18911
	A-3L	706
Tail-	Cement	11143
	Seawater	15591
	A-7L	1246
Flush		
13 3/8		
Spacer	SEAWATER	65000
Lead-	Cement	24794
	Seawater	103217
	A-3L	3468
	R-15L	391
Tail-	Cement	8635
	Seawater	12743
Flush		
9 5/8		
Spacer	FRESHWATER	8000
Lead-	Cement	
Tail-	Cement	5714
	Freshwater	6475
	Emsac	1553
	D-19LG	540
	D-31LN	360
Flush		

Table B-6

(((
(ooo)
Norsk
Hydro

Cement reports

Date 14/10-1991

System : BORE

Well: 15/5-4
Cement contractor: BJ HUGHES
Data from table 9.

Casing Size (in)	Slurry Volume (m3)	Slurry Density (SG)	Thickening Time (hrs)	BHST (deg.C)	Cement/ Additive name	Composition (l/100kg)	Total used (l)
Lead-30	26.0	1.56	5.00	9	Cement		6317
					Seawater	95.03	18911
					A-3L	3.55	706
Tail-30	28.0	1.90	4.33	9	Cement		11143
					Seawater	44.42	15591
					A-7L	3.55	1246
Lead-13 3/8	131.0	1.44	6.00	40	Cement		24794
					Seawater	132.16	103217
					A-3L	4.44	3468
					R-15L	0.50	391
Tail-13 3/8	21.0	1.90	4.00	40	Cement		8635
					Seawater	46.85	12743
Tail- 9 5/8	15.0	1.90	3.66	80	Cement		5714
					Freshwater	35.97	6475
					Emsac	8.63	1553
					D-19LG	3.00	540
					D-31LN	2.00	360

Type of Job	Depth Bot. m,MD	Slurry Volume (m3)	Slurry Density (SG)	Compress. Strenght (Bar/hrs)	Thickening Time (hrs)	Cement/ Additive name	Composition l/100kg	Total used (l)
SQUEEZE	2115	3.00	1.90	130/12	5.80	Cement		1238
						Freshwater	43.45	1695
						D-19-LG	1.50	59
						R-12L	0.85	33
PLUG2	1000	9.20	1.90	100/12	3.50	Cement		3810
						Freshwater	45.39	5447
						R-12L	0.20	24
PLUG3	380	15.00	1.90	40/12	3.66	Cement		6190
						Seawater	44.42	8662
						A-7L	3.55	692

Table B-7

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(ooo)
Norsk Hydro

Bit record

System : BORE

Date 8/10-1991

Well: 15/5-4

Data from table 4.

BIT NUMBER	Size (in)	Manufacturer	Trade Name	Serial number	IADC Code	Nozzles diameter (../32")	BHA no.	Depth: out m,MD	Bit meter (m)	Drill time (hrs)	Rot. hours (hrs)	ROP (m/h)	Rotation min/max (rpm)	Total bit revol.	Weight min/max (KN)	Flow min/max (m3/h)	Wear T B G	Wear Other	Remarks
1P	17 1/2	SMIT	SDGHC	3151	135	18:20:22:16	1	231	86	11.00	7.50	11.5	60/110	37556	30/30	178/178	1:1: 0		TD of sect
1 HO	36	GRAN	SMNSB	19107		18:18:18:18	1	230	85	11.00	7.50	11.3	60/110	37556	30/30	178/178	2:2: 0		TD of sect
2 RR1	26	HTC	CR1	F2HBT	111	22:22:22:	2	234	3	0.50	0.30	10.0	50/70	3302	75/75	205/205	1:1: 0		Drld. cmt.
3	17 1/2	SMIT	MSDGHCE	2717	135	18:18:18:16	3	1027	793	31.00	22.00	36.0	100/140	155034	60/180	225/225	2:2: 0		TD of sect
4	12 1/4	REED	MHP13GJ	JY2226	137	15:15:15:	4	1702	675	25.50	19.30	35.0	160/160	170259	10/17	162/162	2:3: 0		
5	12 1/4	DB	PD10	5901056		14:14:14:14	5	1911	209	9.40	9.40	22.2	150/166	86903	44/66	162/162	8: : 2	BT,N/S	Stopped
6	12 1/4	SMIT	MSDGH	NB 2906		14:14:12:12	6	2106	195	11.30	11.30	17.3	115/115	75216	66/112	168/168	2:2: 0		Core point
1C	8 1/2	DB	CD93	7910513			7	2125	19	3.00	2.90	6.6	60/100		18/18	60/60		2%	
1C RR1	8 1/2	DB	CD93	7910513			8	2129	4	2.00	1.10	3.6	60/100	5400	18/44	60/60		5%	
1C RR2	8 1/2	DB	CD93	7910513			10	2132	3	0.50	0.42	7.1	70/70	2589	22/22	60/60			Jammed
7P	8 1/2	SECU	M44NG	523364	215		9	2129	0										Wipertrip
2C	8 1/2	DB	CD202	7900509			10	2134	2	8.00	7.80	0.3	50/150	86930	13/89	60/72		5 %	
1C RR3	8 1/2	DB	CD93	7910513			10	2147	6	4.00	3.50	1.7	150/150	28440	13/22	63/63		5% worn	
3C	8 1/2	DB	CT303	2910124			10	2141	7	8.00	7.80	0.9	150/150	86930	13/89	72/72		5% worn	
8P	8 1/2	STC	MSDGH	5799	135	14:14:14:	11	2300	153	5.00	3.60	42.5	100/120	23931	133/133	120/120	2:3: 0		TD of sect
6 RR1	12 1/4	SMIT	MSDGH	NB2906	135	14:14:12:12	12	2294	188	7.00	5.50	34.2	100/150	45530	44/178	175/175	3:3: 3		TD of sect

Table B-8

```
==============================================================================
:       :          B o t t o m   h o l e   a s s e m b l y          Date     :
:  (((  :          ----------------------------------------        8/10-1991 :
: (ooo) :                          System : BORE                              :
:-------:  Well: 15/5-4                                                       :
: Norsk :                                                                     :
: Hydro :  Data from table 7 and table 10 ("Depth interval")                 8:
==============================================================================
```

BHA no.:1 Item no./Name/OD,in/Length,m Depth interval md: 145-230

1	Bit	17 1/2	0.44	7	Steel stab	36	2.24
2	Hole Opener	36	1.9	8	DC Steel	9 1/2	36.82
3	Bit Sub	9 1/2	0.83	9	X-over	9 1/2	0.8
4	MWD	9	11.62	10	DC Steel	8	74.45
5	Pres. relief sub	9	0.79	11	X-over	8	1.15
6	Nonmag collar	9 1/2	9.26				

BHA no.:2 Item no./Name/OD,in/Length,m Depth interval md: 230-234

1	Bit	26	0.5	4	X-over	9 1/2	0.8
2	Bit Sub	9 1/2	1.15	5	DC Steel	8	18.67
3	DC Steel	9 1/2	36.82	6	X-over	8	0.67

BHA no.:3 Item no./Name/OD,in/Length,m Depth interval md: 234-1027

1	Bit	17 1/2	0.44	8	X-over	9 1/2	0.8
2	Bit Sub	9 1/2	0.83	9	DC Steel	8	46.38
3	MWD	9	11.62	10	Jar	8	9.78
4	Pres. relief sub	9	0.79	11	DC Steel	8	28.07
5	Nonmag collar	9 1/2	9.26	12	X-over	8	1.15
6	Steel stab	17 1/2	1.71	13	HWDP	5	136.05
7	DC Steel	9 1/2	36.82				

BHA no.:4 Item no./Name/OD,in/Length,m Depth interval md: 1027-1702

1	Bit	12 1/4	0.33	7	DC Steel	8	111.21
2	Bit Sub	8	1.17	8	Jar	8	9.78
3	MWD	8	11.67	9	DC Steel	8	27.97
4	Pres. relief sub	8	0.71	10	X-over	8 1/2	1.15
5	Nonmag collar	8	8.58	11	HWDP	5	136.18
6	Steel stab	8	1.61				

BHA no.:5 Item no./Name/OD,in/Length,m Depth interval md: 1702-1911

1	Bit	12 1/4	0.45	6	Steel stab	8	1.61
2	Bit Sub	8	1.17	7	DC Steel	8	92.91
3	MWD	8	11.67	8	Jar	7 7/8	9.28
4	Pres. relief sub	8	0.71	9	DC Steel	8	27.97
5	Nonmag collar	8	8.58	10	HWDP	5	136.1

Table B-9

Norsk Hydro

Bottom hole assembly

Date 8/10-1991

System : BORE

Well: 15/5-4

Data from table 7 and table 10 ("Depth interval")

8

BHA no.:6 Item no./Name/OD,in/Length,m Depth interval md: 1911-2106

1	Bit	12 1/4	0.31	7	Steel stab	8	1.61
2	Junksub	8	1.17	8	DC Steel	8	111.21
3	Bit Sub	8	1.17	9	Jar	7 7/8	9.28
4	MWD	8	11.54	10	DC Steel	8	27.97
5	Other	8	0.71	11	HWDP	5	136.1
6	Nonmag collar	8	8.58				

BHA no.:7 Item no./Name/OD,in/Length,m Depth interval md: 2106-2125

1	Core bit	8 1/2	0.3	6	Jar	8	9.78
2	Core barrel	6 3/4	19.95	7	DC Steel	8	27.97
3	X-over	6 3/8	1.2	8	X-over	7 7/8	1.15
4	Steel stab	12 1/4	1.61	9	HWDP		136.1
5	DC Steel	8	64.6				

BHA no.:8 Item no./Name/OD,in/Length,m Depth interval md: 2125-2129

1	Core bit	8 1/2	0.3	6	DC Steel	8	64.6
2	Core barrel	6 3/8	19.95	7	Jar	8	9.78
3	DC Steel	6 1/2	28.55	8	DC Steel	8	27.97
4	X-over	6 3/8	1.2	9	X-over	7 7/8	1.15
5	Steel stab	8	1.61	10	HWDP	5	136.1

BHA no.:9 Item no./Name/OD,in/Length,m Depth interval md: 2129-2129

1	Bit	8 1/2	0.23	4	Jar	6 1/2	9.33
2	Bit Sub	6 1/2	1.19	5	DC Steel	6 1/2	28.32
3	DC Steel	6 1/2	113.79	6	HWDP	5	136.1

BHA no.:10 Item no./Name/OD,in/Length,m Depth interval md: 2129-2147

1	Core bit	8 1/2	0.3	4	Jar	6 1/2	9.33
2	Core barrel	6 3/4	19.95	5	DC Steel	6 1/2	28.32
3	DC Steel	6 1/2	113.79	6	HWDP	5	136.1

```
==========================================================================
:       :          B o t t o m   h o l e   a s s e m b l y        Date    :
:  (((  :          ---------------------------------------      8/10-1991 :
: (ooo) :                          System : BORE                          :
:-------:  Well: 15/5-4                                                   :
: Norsk :                                                                 :
: Hydro :  Data from table 7 and table 10 ("Depth interval")            8:
==========================================================================
```

BHA no.:11 Item no./Name/OD,in/Length,m Depth interval md: 2147-2300

1	Bit	8 1/2	0.25	7	Nonmag collar	6 1/2	9.25
2	Bit Sub	6 1/2	1.19	8	Roller Reamer	8 1/2	1.75
3	Other	7	0.22	9	DC Steel	6 1/2	199.15
4	MWD	7	12.6	10	Jar	6 1/2	9.33
5	Pres. relief sub	7	0.71	11	DC Steel	6 1/2	28.32
6	Other	7	0.39	12	HWDP	5	136.1

BHA no.:12 Item no./Name/OD,in/Length,m Depth interval md: 2106-2294

1	Bit	12 1/4	0.31	6	Jar	7 7/8	9.78
2	Bit Sub	8	1.17	7	DC Steel	8	28.07
3	DC Steel	8	18.21	8	X-over	7 7/8	1.15
4	Steel stab	12 1/4	1.61	9	HWDP	5	136.1
5	DC Steel	8	93				

6.1 Mud report

36" hole section

This section was drilled with seawater and high viscosity pills and returns to the seabed.

At TD a 15 m^3 high viscous pill was circulated out and the hole was displaced to 1.20 rd mud prior to running casing.

The 30" casing was run and cemented without problems.

17 1/2" hole section

This section was drilled with seawater and high viscosity pills and returns to the seabed.

At TD the hole was displaced to 1.20 rd mud prior to running casing.

The 13 3/8" casing was run and cemented without problems.

12 1/4" hole section

This section was drilled with a KCl/polymer mud system with a starting weight of 1.10 rd mud.

The mudweight was increased to 1.20 rd at 1700 m and further to 1.23 at 1900 m. This weight was kept down to 2100 m when the coring started. Then the mudweight was increased to 1.26 rd. This mudweight was kept to TD.

Norsk Hydro

Daily mud properties

System : BORE

Date 23/9-1991

Well: 15/5-4
Mud Contractor: NL BAROID
Data: "Mid depth" from table 3, otherwise from table 14.

Date	Mid. depth m,MD	Mud Dens. (SG)	PV cp	YP Pa	GEL 0 Pa	GEL 10 Pa	pH	100 psi (cc)	HP/HT (cc)	Cl- inn/out mg/l	Alkalinity Pf	Alkalinity Pm	Alkalinity Mf	Ca++ inn/out mg/l	Oil %	Sol %	H2O %	V.G. meter at 115 gr. F: 600 rpm	300 rpm	200 rpm	100 rpm	6 rpm	3 rpm	Mud Type
																		14.						4
910606	186	1.05	0	0																				
910607	231	1.05	0	0																				SPUD
910608	597	1.05	0	0																				SPUD
910609	1027	1.20	0	0																				SPUD
910610	1027	1.20	0	0																				SPUD
910611	1027	1.10	12	6	1	2	9.1	7.5		60/60	0.20	0.10	0.80	200/200		2								KCL
910612	1370	1.10	13	7	2	2	8.4	5.2		60/60	0.10		0.60	240/240		6		40	24	21	14	4	3	KCL
910613	1702	1.19	15	9	2	3	8.1	4.6		65/65	0.10		0.40	340/340		11		49	34	27	19	5	4	KCL
910614	1911	1.23	19	14	2	3	8.0	4.6		70/70	0.10		0.40	520/520		7		66	47	39	27	7	5	KCL
910615	2106	1.23	18	13	3	4	8.2	4.1		77/77	0.10		0.40	520/520		12		62	44	35	24	6	5	KCL
910616	2129	1.21	18	13	2	3	8.0	4.1		79/79	0.10		0.50	500/500		12		62	44	35	24	6	5	KCL
910617	2129	1.25	17	11	3	4	8.0	4.1		78/78	0.10		0.60	400/400		13		96	39	32	23	7	5	KCL
910618	2135	1.25	19	13	3	4	7.9	4.1		80/80	0.10		0.50	440/440		13		63	44	36	26	7	5	KCL
910619	2147	1.26	18	11	2	4	8.6	4.0		71/71	0.10		0.50	500/500		9		58	40	32	22	6	4	KCL
910620	2300	1.26	20	15	3	4	8.2	4.2		73/73	0.10		0.40	480/480		7		69	49	39	27	7	6	KCL
910621	2300	1.25	20	14	3	4	8.2	4.2		72/72	0.10		0.40	500/500		7		68	48	39	26	7	6	KCL
910622	2294	1.25	21	15	2	4	8.4	4.1		73/73	0.10		0.40	480/480		7		72	51	40	27	8	6	KCL
910623	2294	1.25	20	14	2	4	8.3	4.1		72/72	0.10		0.40	480/480		7		68	48	37	26	7	6	KCL
910624	2294	1.25	19	12	3	3	8.3	4.2		72/72	0.10		0.40	500/500		13		62	43	35	24	6	4	KCL
910625	2294	1.25	20	14	3	3	8.3	4.8		71/71	0.10		0.40	480/480		11		68	48	38	26	6	4	KCL
910626	2294	1.25	21	15	3	4	9.4	4.5		71/71	0.10	0.30	0.60	580/580		11		72	51	41	28	7	5	KCL
910627	2294	1.25	20	15	3	4	9.4	4.4		71/71	0.10	0.30	0.60	580/580		11		70	50	40	27	6	3	KCL
910630	2115	1.25	19	15	3	4	9.5	4.4		70/70	0.10	0.40	0.60	600/600		11		68	49	39	26	6	4	KCL
910701	180	1.25	19	12	3	4	9.1	4.0		70/70	0.10	0.30	0.60	600/600		11		61	42	34	23	6	4	KCL
910702	0	1.25	19	12	3	3	9.2	4.0		70/70	0.10	0.30	0.60			11		61	42	34	23	6	4	KCL
910703	0	1.25	0	0																				KCL

Table B-10

Norsk Hydro	Mud consumption	Date 23/9-1991
	System : BORE	
Well: 15/5-4		
Mud company: NL BAROID		

13

		Actual used
Drilling of 36 " hole		
BENTONITE	Kg	9600
CAUSTIC	Kg	125
SODA ASH	Kg	175
XCD-POLYMER	Kg	25
Drilling of 17 1/2" hole		
BARASCAV-D	Kg	500
BARITE	Kg	63000
BENTONITE	Kg	28400
CAUSTIC	Kg	600
CITRIC ACID	Kg	50
EZ-MUD DP	Kg	600
KCL	Kg	7000
LIME	Kg	220
PAC-L	Kg	1275
PAC-R	Kg	1075
POT HYDROXYDE	Kg	100
SODA ASH	Kg	775
XCD-POLYMER	Kg	500
KCL BRINE	l	141000
Drilling of 12 1/4" hole		
BARASCAV-D	Kg	375
BARITE	Kg	107000
CITRIC ACID	Kg	50
EZ-MUD	Kg	420
EZ-MUD DP	Kg	1165
EZ-MUD L	Kg	2610
KCL	Kg	25000
LIME	Kg	20
PAC-L	Kg	655
PAC-R	Kg	924
POT HYDROXYDE	Kg	150
XCD-POLYMER	Kg	1300
KCL BRINE	l	161000
KCL-BRINE	l	22000
Test no. 1		
BARITE	Kg	4000
XCD-POLYMER	Kg	25

Table B-11

7. TOTAL COST REPORT

NORSK HYDRO A.S.
DRILLING SECTOR

FINAL COST REPORT

DATE: 12.12.91

WELL	:	15/5-4T
LICENS	:	048
RIG	:	VILDKAT EXPLORER
DEPTH	:	2300
RIG RATE	:	USD 65.000
EXCHANGE	:	USD 1 = NOK 7,0
ACCOUNT	:	UDPK482T
START DATE	:	24.06.91
END DATE	:	01.07.91
DAYS USED	:	6,521
DAYS PLANNED	:	6,521

ESTMATED COST (NOK 1.000)

EQUIPMENT & WORK DESCRIPTION	ACTUAL TO DATE	BUDGET TO DATE
401 Site survey	0	0
402 Resurvey	0	0
403 Location clean up	0	0
404 Positioning	0	0
CLASS 40 SITE SURVEY & POSITIONING	0	0
410 Rig costs	3100	3293
411 Drlg bits, tools & coring	397	130
412 Wellheads	200	0
413 Casing & casing services	1265	1370
414 Cement & cementing services	216	273
415 Mud & mud services	163	234
416 Wireling logging & MWD	723	310
417 Test tool rental & services	2080	1779
418 ROV	42	88
419 Rig pool & other costs	168	326
CLASS 41 RIG CONTROLLABLE COSTS	8354	7803
420/21 Supply vessels/ Standby vessels	591	652
423 Helicopter costs	644	196
429 Other transport	26	65
CLASS 42 TRANSPORTATION COSTS	1261	913
CLASS 43 WAREHOUSE COSTS	40	326
CLASS 44 DRILLING SUPERVISION ON/OFF	316	424
450 Onshore geol. supervision	0	0
451 Offshore geol. supervision	0	0
452 Standard studies geology	0	0
453 VSP	0	0
454 Onshore reservoar assistanc	0	0
		0
CLASS 45 OTHER NH EXPLORATION COSTS	0	0
CLASS 4 WELL COSTS TOTAL	9971	9466

KOMMENTARER TIL KOSTNADSRAPPORT FOR 15/5-4 TEST

KLASSE 40: Kostnadene må estimeres av Utforskning

KONTO 410: Riggraten er belastet i.h.t. aktivitet. Øvrige kostnader inkluderer fuel, catering, kommunikasjon og div. kostnader fra riggselskapet.

KONTO 411: Estimatet omfatter drilling bits, leie av drilling tools, coreheads, div. utstyr og tjenester i.f.m. dette.

KONTO 412: Kostnadene inkluderer brønnhodeutstyr som er brukt i brønnen.

KONTO 413: Kostnadene inkluderer 30" og 13 3/8" casing i tillegg til leieutstyr og tjenester i denne forbindelse.

KONTO 414/415 : Kostnadene viser mud og cement forbruk, mudlogging og tjenester.

KONTO 416: Kostnadene gjelder borelogging og elektrisk logging. Differanse skyldes at det ble kjørt flere logger enn planlagt.

KONTO 417: Testeutstyr.

KONTO 418: ROV kostnader.

KONTO 419: Inkluderer andel av riggpool, ankerhåndteringsutstyr og diverse driftsutgifter.

KLASSE 42: Inkluderer alle transportkostnader vedrørende supply- og standby båter, helikopter og landtransport.

KLASSE 43: Inkluderer andel basepool og direkte kostnader i.f.m. basen.

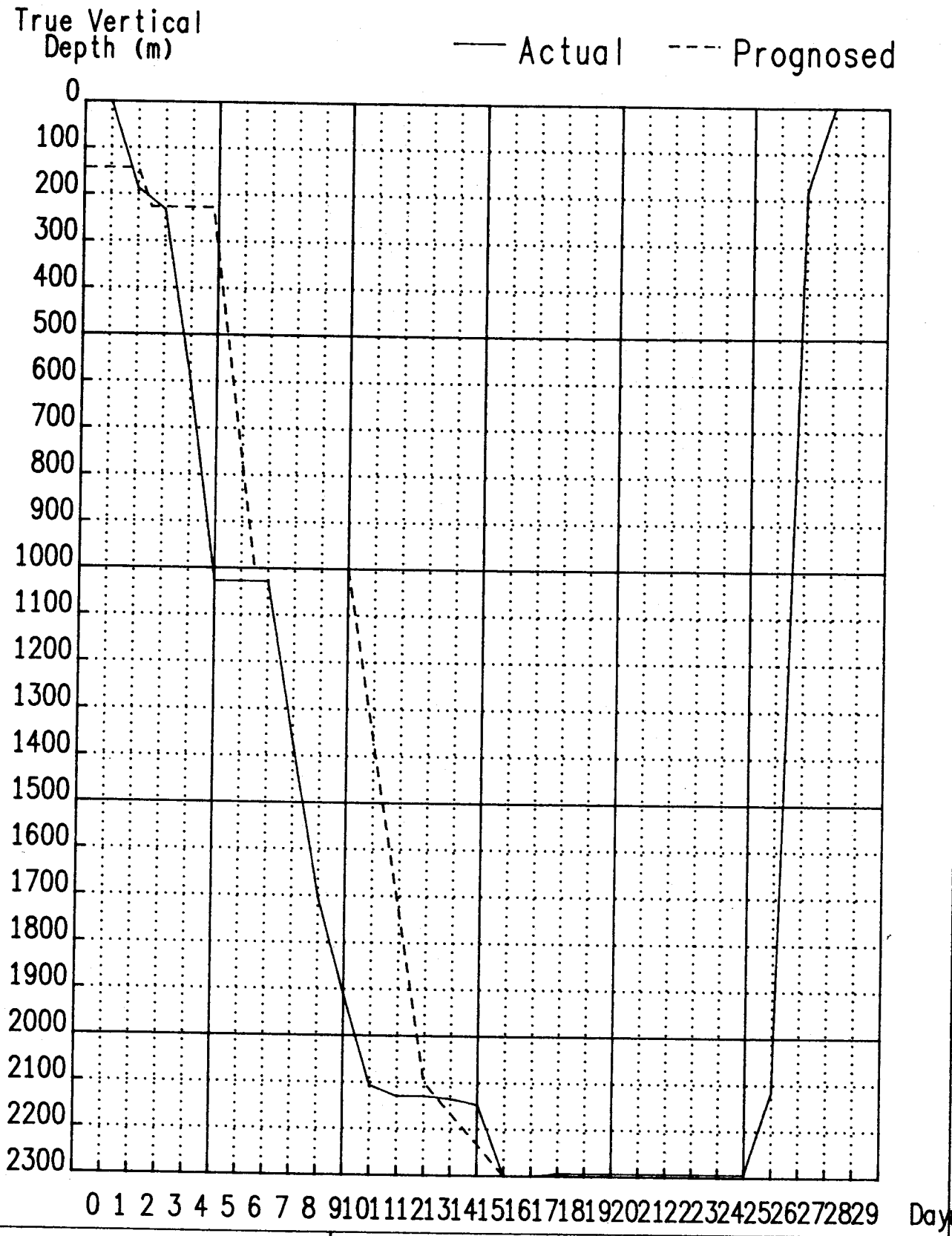
KLASSE 44: Kostnadene inkluderer supervisors offshore, riggruppen på Sandsli og kostnader i forbindelse med planlegging av brønnen.

KLASSE 45: Kostnadene må estimeres av Utforskning.

8. EQUIPMENT FAILURES AND PROBLEMS

DATE	EQUIPMENT	FAILURE
21.06.91	Supercombo log	First repeated section was incorrect.
21.06.91	SHDT-log	Poor response, charged to FMS.
27.06.91	7" power tong	Tong locked on to pipe.

16.08.1991 12.54 BY BG38OR03



Norsk Hydro
Drilling Department

Date:19910816

PROGNOSED AND ACTUAL DRILLING CURVES

WELL: 15/5-4

Fig. B-9

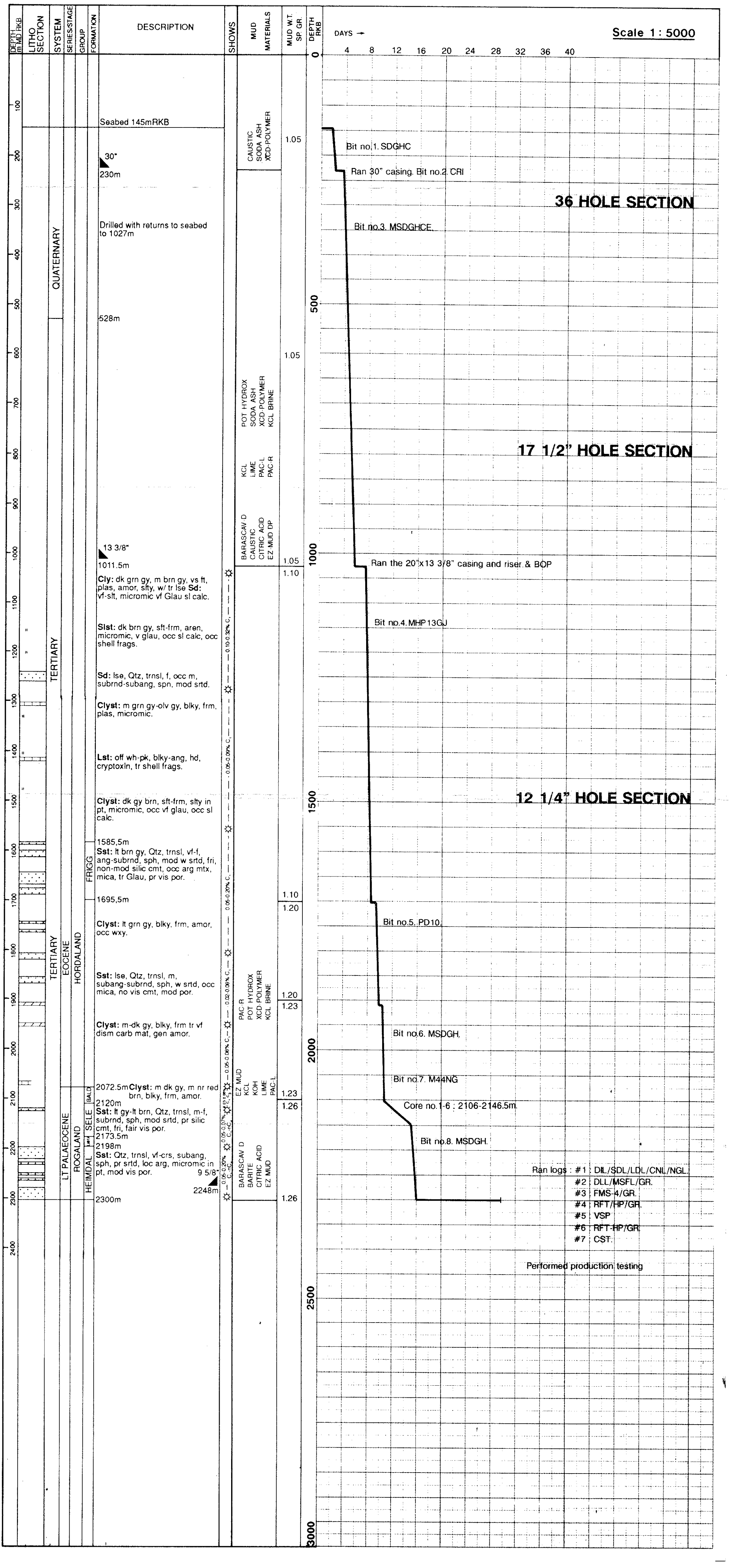
NORSK HYDRO

Norsk Hydro

Oslo - Norway

DRILLING PROGRESS, WELL 15/5-4

OPERATOR	: NORSK HYDRO	SPUD IN	: 6/6-91 kl 20.00	WATER DEPTH	: 120m
COODINATES	: 58° 38' 28.5" NORTH	WELL COMPL.	: 3/7-91 kl 13.30	RKB to MSL	: 25m
	01° 33' 08.9" EAST	RIG	: VILDKAT	RKB to SEABED	: 145m RKB



HYDRO

Completion log

AS-BUILT

Well: 15/5 -4

Licence	P.038
Operator	Hydro
Contractor	Mobil Drilling Norway A.S.
Spud date	1-Jan-1900
Total depth	3000.0 m
Final drilling date	1-Jan-1900
Completion date	1-Jan-1900
Status	Abandoned
Field	Ekofisk
Drilling fluid type	Water based
Max. deviation	0.0 deg.
Water depth	70.0 m
Kelly bushing	23.0 m above rt. datum
Rig release date	1-Jan-1900

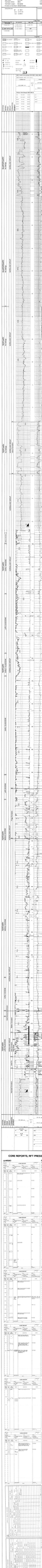
Datum for depth measurements: Kelly bushing

Depth reference: Drilling depth

Depth corrections: No depth corrections applied

Comments: Data from Norwegian Petroleum Directorate's fact pages

Casing type	Casing size	Casing depth	Hole size	Leak off test
Conductor	30 in	70.0 m	36 in	
Surface	20 in	1000.0 m	26 in	
Intermediate	13 3/8 in	2000.0 m	17 1/2 in	
Production	9 5/8 in	3000.0 m	12 1/4 in	
Liner	7 in	3000.0 m	8 1/2 in	



CORE REPORTS, RFT PRESSURES AND TEST RESULTS

AS-BUILT

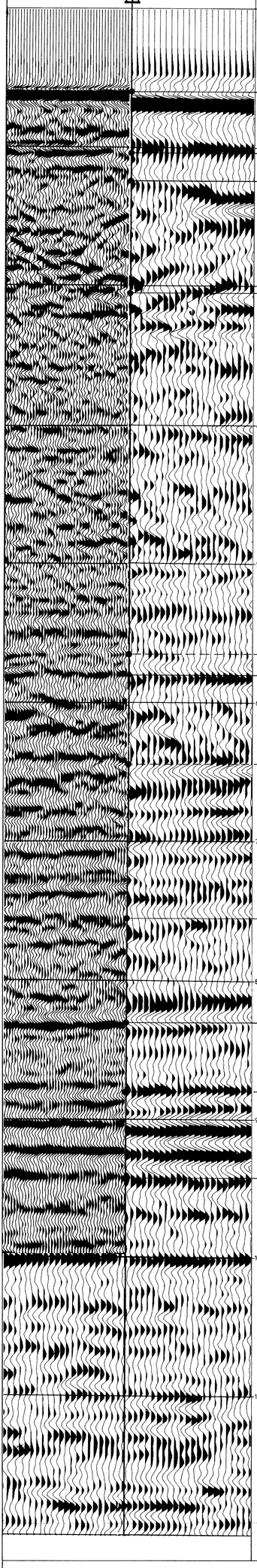
Core number	Cored interval	Recovered interval	Recovery
1	1000.0 - 1000.0 m	1000.0 - 1000.0 m	100 %
2	1000.0 - 1000.0 m	1000.0 - 1000.0 m	100 %
3	1000.0 - 1000.0 m	1000.0 - 1000.0 m	100 %

SITE SURVEY INTERPRETATION RESULTS, WELL 15/5-4 (GEOTEAM)

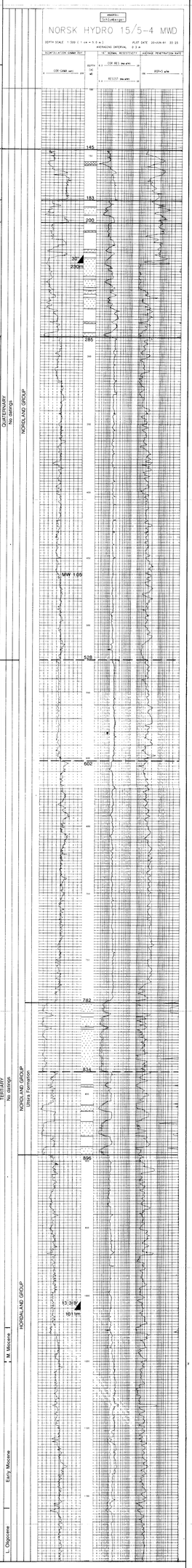
LINE NH9068-506
4x40cu.in.sleeve gun
Sample rate: 1ms
Tow depth: 2-3m
Group interval: 12.5m

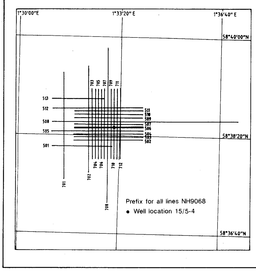
Well location
15/5-4

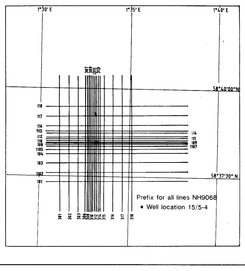
LINE NH9068-109
20x40cu.in.sleeve gun
Sample rate: 2ms
Tow depth: 4-6m
Group interval: 25m



DRILLING RESULTS







LEGEND

Correlation of seismic event with well log event (Seismic pick in site survey report)

Revised picked by Norsk Hydro

NOTES

Coordinates spudded well (ED50):

Geographic: 58°38'28.53"N
01°33'08.87"E

UTM-zone 31 (CM 3°E):
6 501 162.5mN
415 972.2mE

Date spudded: 06.06.91
Date completed: 03.07.91
Drilling rig: Viking Explorer

HYDRO — Oslo - Norway

Marine Surveys Section

Post site survey for well 15/5-4. Comparison of predicted lithology, stratigraphy and shallow gas and obtained drilling results.

Contour interval	Interpreted by KB	Date 2.12.91	
Scale Vertical 1 : 1000	Drawn by	Received	
	Checked by	File no. R-052807 3.1-3-13	