Well 15/3-6
Final Well Report

Volume 1 of 2 (Geoscience Section)

Amoco Norway Oil Company

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Cover Page

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	Name	Sign.
30/06/99	M. Kendall	
1/7/99	T. Olsen	

Date	Approved by	
	Name	Sign.
2/7/99	Jan Erik Kittilsen	

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WELL 15/3-6

FINAL WELL REPORT

VOL. 1 OF 2

GEOSCIENCE SECTION

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1. SUMMARY

1.1. INTRODUCTION

Well 15/3-6 was drilled within license PL187 (Figure 1.1). The Operator for the license is BPAmoco Norway (25%) on behalf of partners Statoil (65%) and Norsk Hydro (10%). License PL025 farmed into the well (Statoil, Elf, Total, Hydro) for 20% of well costs.

The well was drilled to test the Paleocene Balder and Forties sandstones of the Pinnsvin prospect, and had a licence requirement to penetrate Cretaceous age formations.

The well was spudded at 17.00hrs on 15th December 1998, with the semisubmersible rig Mærsk Jutlander, and TD was reached at 03.30hrs on 29th December1998 in the Cretaceous.

The Balder and Forties sandstones were encountered as prognosed but were found to be completely water wet, and no other hydrocarbons were encountered in the well.

The well was permanently abandoned as a dry hole and the rig left the location at 21.30hrs on 5th January 1999.

Pertinent data for the well is shown in Table 1-1.

Attachment 8.6 is the actual versus prognosed lithology and drilling time versus depth montage for the well.

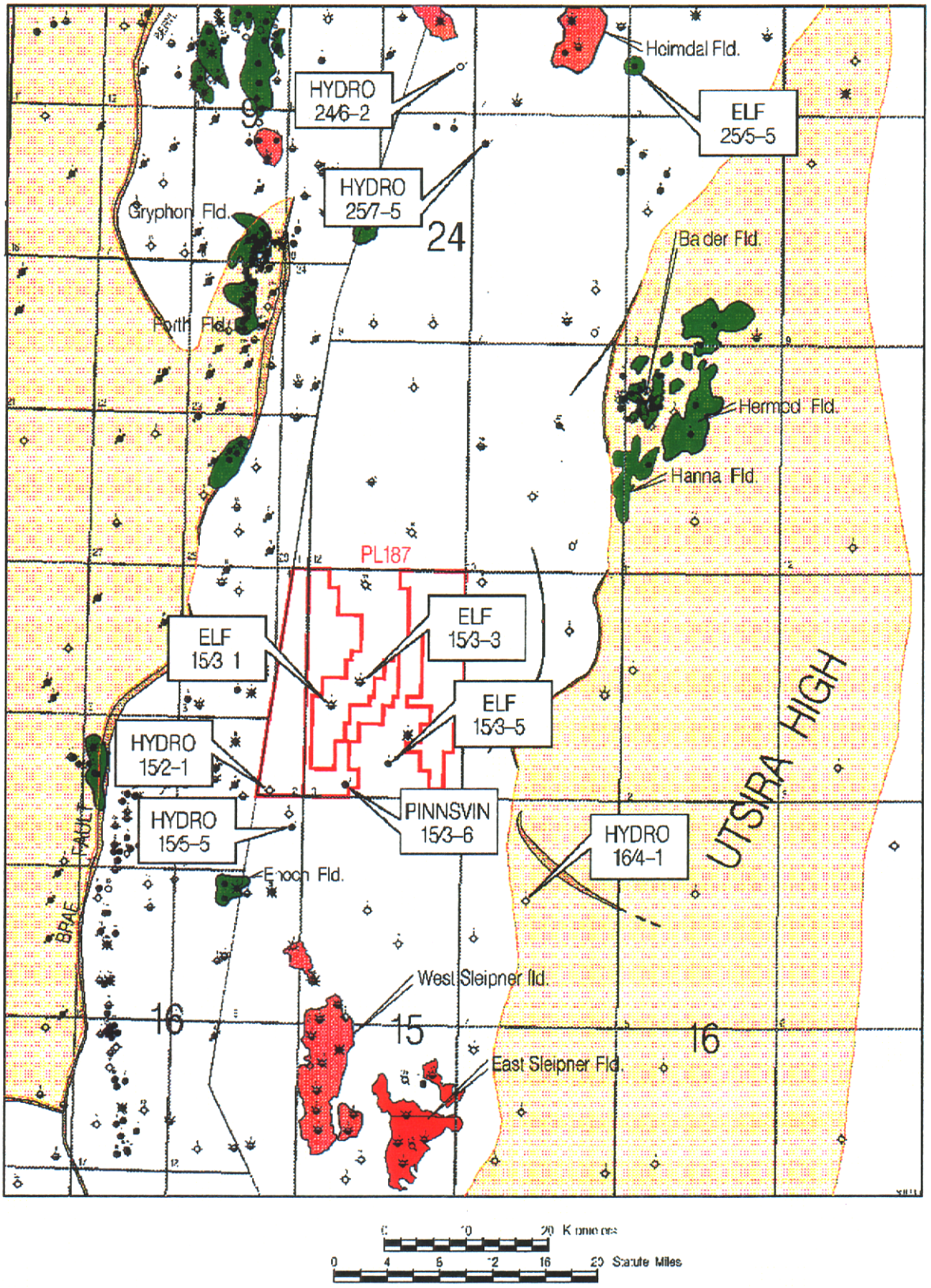

Heimdal Fld.
HYDRO
24/6-2
ELF
25/5-5
HYDRO
25/7-5
Gryphon Fld.
24
Balder Fld.
Frigg Fld.
Hermod Fld.
Hanna Fld.
PL187
ELF
15/3-3
ELF
15/3-1
ELF
15/3-5
HYDRO
15/2-1
PINNSVIN
15/3-6
HYDRO
15/5-5
HYDRO
16/4-1
UTSIRA HIGH
Enoch Fld.
BRAE FAULT
West Sleipner Fld.
16
15
16
East Sleipner Fld.
0 10 20 Kilometres
0 4 8 12 16 20 Statute Miles

Figure 1.1

Table 1.1 Pertinent Data Sheet

LICENCE	PL 187	
BLOCK	15/3	
WELL NUMBER	6	
AREA	South Viking Graben	
CLASSIFICATION	Exploration	
OBJECTIVE	Paleocene Balder and Forties Sandstones	
PARTNERS	**PL187**	
	Amoco Norway Oil Company	25 % (operator)
	Statoil	65 %
	Norsk Hydro	10 %
Licence PL025 farmed into the well for 20% of the well costs:		
	PL025	
	Statoil	46.8 %
	Norsk Hydro	10 %
	Elf Norge	33.2 %
	Total Norge	10 %
	Geographic	**UTM**
LOCATION	Lat 58 deg 46 min 23.41 sec N	6515614.4 N
	Long 01 deg 45 min 14.90 sec E	427951.2 E
RIG	Mærsk Jutlander	
RT ELEVATION	23 m	
WATER DEPTH	105 m	
TOTAL DEPTH	2793 m MD (2763.2 m TVDSS)	
FORMATION AT TD	Tor Formation (Cretaceous)	
SPUD DATE	15th December 1998	
TD REACHED	29th December 1998	
OFF LOCATION	5th January 1999	
NPD WELL REGISTRATION NO	L 941	
WELL STATUS	Plugged and abandoned, dry hole	
CORES	Core 1: Balder Fm :	2140-2158 m MD
	Core 2: Balder Fm:	2158-2176 m MD
	Core 3: Forties Fm:	2278-2297.7 m MD
HOLE AND CASING RECORD	36" hole to 216.5 m MD.	
	30" casing to 212.5 m MD	
	9 7/8" pilot hole to 1015 m MD	
	17 1/2" hole to 1015 m MD	
	13 3/8" casing to 1001 m MD	
	12 1/4" hole to 1018 m MD	
	8 1/2" hole to 2793 m MD	

2. STRATIGRAPHY

The stratigraphy encountered in well 15/3-6 is summarised in Table 2-1 and illustrated in Figure 2.1. All tops are tied to wireline logs. Subsea depths are referenced to mean sea level.

Biostratigraphical analysis for the well was conducted by Robertson Research.

Table 2.1 Actual versus Prognosed Stratigraphic Tops

		Prognosed		Actual	
Group	**Top**	**MDRT m**	**TVDSS m**	**MDRT m**	**TVDSS m**
Nordland	Seabed	25	0	128.0	105.0
	Utsira Formation	685	660	695.0	672.0
Hordaland	Undifferentiated	950	925	910.0	887.0
	Skade Formation	1130	1105	1238.0	1214.8
	Hordaland continued	1295	1270	1267.0	1243.8
	Grid Formation	1565	1540	1560.0	1536.7
	Hordaland continued	N/A	N/A	1849.5	1825.9
	'Lower' Grid Sandstone	N/A	N/A	1977.5	1953.4
	Hordaland continued	N/A	N/A	2015.0	1990.7
Rogaland	Balder Formation	2131	2106	2110.0	2085.3
	Balder Sandstone Member	2160	2135	2155.0	2130.2
	Balder Formation continued	N/A	N/A	2197.5	2172.4
	Sele Formation	2211	2186	2207.0	2181.9
	Hermod (Forties) Formation	2265	2240	2265.0	2239.7
	Lista Formation	N/A	N/A	2347.0	2321.6
	Heimdal Formation	2310	2285	2378.5	2353.0
	Ty Formation	2650	2625	2630.0	2603.0
Shetland	Ekofisk Formation	2710	2685	2724.5	2696.3
	Tor Formation	2760	2735	2788.5	2758.8
	TD	2810	2785	2793.0	2763.2

NOTE: Formation tops corrected to wireline log data.

Pinnsvin 15/3-6

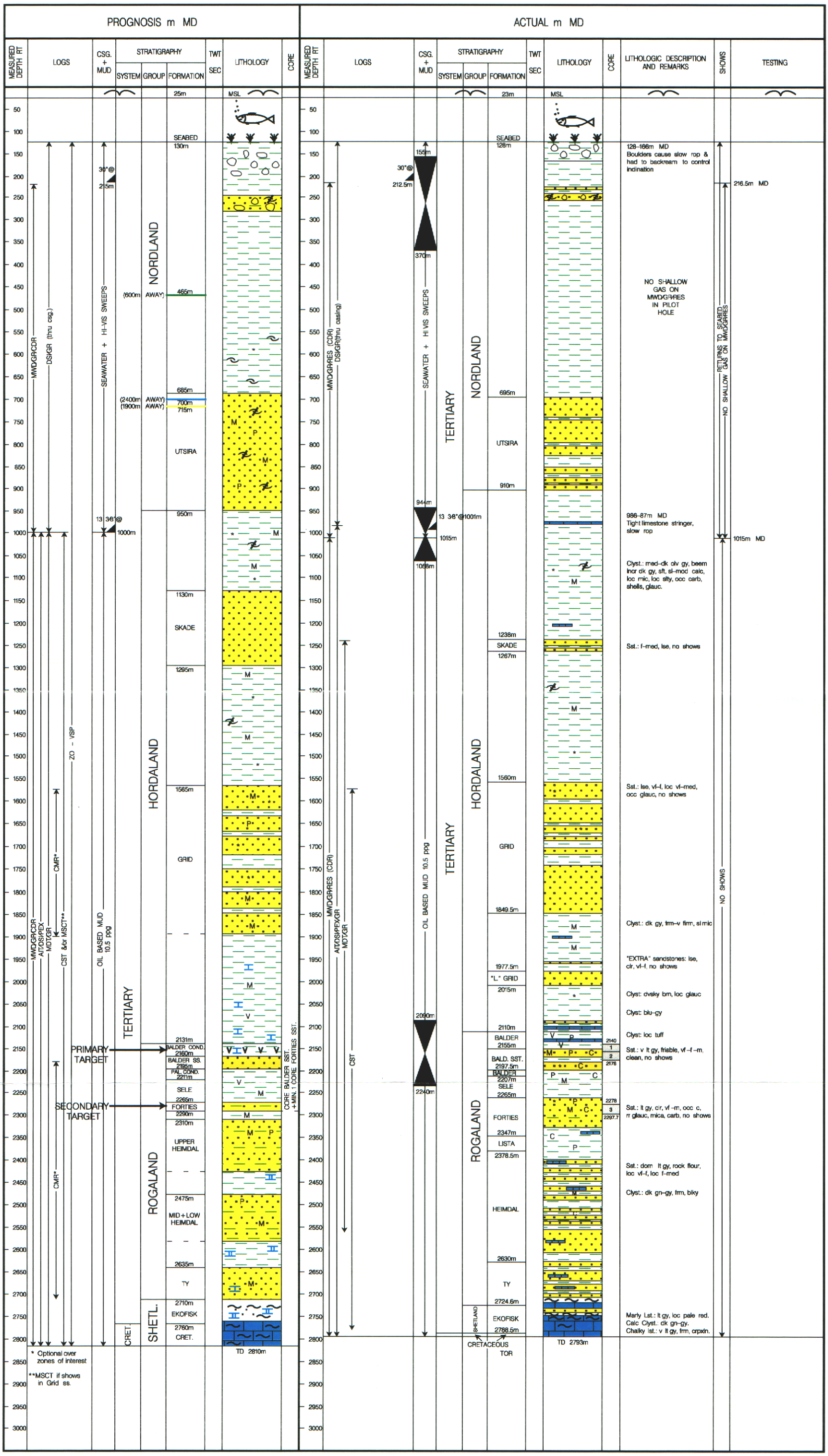


Figure 2.1

2.1. LITHOSTRATIGRAPHIC DESCRIPTION

- The majority of colour descriptions used below are referenced to the Rock Colour Chart produced by The Geological Society of America.
- All depths are meters measured depth, referenced to the rotary table, unless otherwise stated.
- All depths of formation tops are referenced to wireline logs. Subsea depths are Mean Sea Level.
- Returns were to seabed until 1015m, hence the lithostratigraphy above this depth is inferred from analysis of wireline and LWD log response and drilling parameters.

2.1.1. Nordland Group

Depth Interval: 128.0 - 910.0m (105.0 - 887.0m TVDSS)

Thickness: 782.0 mTVD

Age: Undetermined

Nordland Group to Top Utsira Formation

Depth Interval: 128.0 - 695.0m (105.0 - 672.0 mTVDSS)

Thickness: 567.0 mTVD

Age: Undetermined

Lithology: The inference from the logs is that the lithology is predominantly claystone, interspersed with occasional sand horizons.

Probable Quaternary sediments were encountered from spudding of the well. An observed increase in the drilling rate, along with a tendency towards increased drilling inclination suggested that intervals of BOULDER CLAY were probably encountered to a depth of 165m.

Utsira Formation

Depth Interval: 695.0 - 910.0m (672.0 - 887.0mTVDSS)

Thickness: 215.0 mTVD

Age: Undetermined

Lithology: Sandstones with interbedded mudstones.

The upper boundary is characterised by marked decrease in the gamma ray values from the overlying mudstones into the sandstones. The resistivity value also is seen to fall, and sonic velocity decreases. The lower boundary is marked by a reversal of gamma ray values to an increased value in the underlying mudstones.

2.1.2. Hordaland Group

Depth Interval: 910.0 - 2110.0m (887.0-2085.3m TVDSS)

Thickness: 1198.3 mTVD

Age: Undetermined to 1020m, then Middle Miocene to Early Eocene

Hordaland above the Skade Formation

Depth Interval: 910.0 - 1238.0mMD (887.0 - 1214.8mTVDSS)

Thickness: 327.8mTVD

Age: Undetermined to 1020m, then Middle Miocene to Late Oligocene

The upper boundary of the Hordaland Group is picked at the base of the Utsira Formation, and is characterised by a sharp increase in the gamma ray values, increase in resistivity, with the change in lithology to consistent claystones. The first collecting of samples did not occur until 1015m.

Lithology: The Hordaland above the Skade Formation consists of claystone with minor siltstones and limestones in the lower section.

CLAYSTONE: medium dark olive grey, increasing to dark grey with depth, firm, occasionally soft, blocky, slightly to moderately calcareous, locally micromicaceous, very silty in parts, with traces of glauconite.

SILTSTONE: dark green grey, grading to olive grey, firm, crumbly, slightly calcareous, very glauconitic, grading to silty sandstone.

LIMESTONE: light grey to olive grey, firm to slightly hard, blocky, cryptocrystalline, slightly to moderately argillaceous.

Skade Formation

Depth Interval: 1238.0 - 1267.0m (1214.8 - 1243.8m TVDSS)

Thickness: 29.0 mTVD.

Age: Late Oligocene

Lithology: sandstones with subordinate silty mudstones.

The top of the Skade Formation is characterised on the wireline logs by a sharp decrease in gamma ray values.

SANDSTONE: clear, translucent, fine to coarse quartz, subrounded, subspherical, moderately sorted with good visible porosity.

CLAYSTONE: dark grey, firm, blocky to tabular, sub fissile, slightly calcareous, hygroturgid, with occasional carbonaceous specks.

Hordaland Group Continued

Depth Interval: 1267.0 - 1560.0m (1243.8 - 1536.7m TVDSS)

Thickness: 292.9mTVD

Age: Late Oligocene to Late Eocene

At the base of the Skade Formation, gamma is seen to increase sharply. Resistivities below the Skade Formation tend to adopt a uniform value of between 1 and 2 ohmm.

Lithology: claystone with thin interbedded limestones.

CLAYSTONE: dark grey, occasionally brown, becoming olive grey to the base, commonly soft to firm, also moderately hard, micromicaceous to micaceous, locally glauconitic, slightly calcareous, rare shell debris horizons, becoming slightly silty.

LIMESTONE: light grey to grey brown, firm to hard, blocky, slightly argillaceous, microcrystalline, no show.

Grid Formation

Depth Interval: 1560.0 - 1849.5m (1536.7 - 1825.9m TVDSS)

Thickness: 289.2 mTVD

Age: Late Eocene to Middle Eocene

The top of the Grid Formation is marked by a sharp decrease in gamma ray values and an increase in sonic velocities reflecting the change from claystones to sandstones

Lithology: sandstones interbedded with claystones, becoming more homogenous sandstone towards the base.

SANDSTONE: predominantly loose, commonly very fine to fine grained, locally coarse and medium, subangular to subrounded, subspherical, moderately sorted when very fine to fine, occasionally friable, with weak cement, good inferred porosity, no show.

CLAYSTONE: dark grey, olive grey, firm to occasionally soft, blocky to tabular, slightly sticky, hygroturgid in part, non calcareous.

Hordaland Group Continued

Depth Interval: 1849.5 -1977.5m (1825.9 - 1953.4m TVDSS)

Thickness: 127.5 mTVD

Age: Middle Eocene

Lithology: Claystone with thin limestone stringers and minor sandstone beds.

The return to claystones is characterised by a sharp increase in the gamma ray value, decrease in sonic velocity and increase in resistivity.

CLAYSTONE: medium dark grey to dark grey, olive grey, trace dusky brown olive grey, dark blue grey, soft to firm, blocky to subplatey, commonly subfissile, rarely approaching fissile, rare trace disseminated pyrite, occasional carbonaceous specks, non calcareous. At the base if this interval, just above the "Lower" Grid Formation, the claystone becomes dark green grey to green black, splintery, trace carbonaceous.

LIMESTONE: olive grey, olive brown, orange brown, hard, blocky, splintery, microcrystalline.

SANDSTONE: loose, clear, very fine to fine grained, commonly subrounded, occasionally rounded, subspherical to spherical, moderately sorted.

'Lower' Grid Sandstone

Depth Interval: 1977.5 - 2015.0m (1953.4 - 1990.7m TVDSS)

Thickness: 37.3 mTVD

Age: Middle to Early Eocene

Lithology: A thick homogenous sandstone unit.

This sandstone is not commonly recognised as a distinct formation.

This unit is characterised by an abrupt decrease in gamma ray value with an increase in sonic velocity.

SANDSTONE: quartzose, colourless, transparent, very fine to fine grained, subrounded, occasionally subangular, subspherical, moderately sorted with common grey lithic grains, no visible cement, good visible porosity, no show.

Hordaland Group Continued

Depth Interval: 2015.0 - 2110m (1990.7 - 2085.3m TVDSS)

Thickness: 94.6 m TVD

Age: Early Eocene.

The continuation of the Hordaland Group is represented by a sharp increase in gamma ray values and a coincident decrease in sonic velocity.

Lithology: Claystone with a small sandstone unit 2090 to 2095m and thin limestones towards the base.

CLAYSTONE: medium dark grey, firm, blocky, subfissile, slightly micromicaceous, trace carbonaceous, non calcareous. Becomes distinctly dark brown grey, brown grey 2040-2100m, and blue grey, blue green 2105-2110m.

SANDSTONE: the samples 2090 to 2095m were missed and lithology is inferred from logs.

LIMESTONE: yellow grey, very light grey, moderately hard, blocky to angular, cryptocrystalline, no visible porosity, no show.

2.1.3. Rogaland Group

Depth Interval: 2110.0 - 2724.5m (2085.3 - 2696.3m TVDSS)

Thickness: 611.0 mTVD

Age: Earliest Eocene to Early Paleocene.

Balder Formation

Depth Interval: 2110.0 - 2207.0m (2085.3 - 2181.9m TVDSS)

Thickness: 96.6 m TVD

Age: 'Earliest' Eocene to Late Paleocene

The top of Balder Formation is picked on the basis of a sharp peak in gamma radiation. Within the formation, there is a slight decreasing trend in the resistivity.

Lithology: The top of the Balder Formation is possibly unconformable, and the lithology is represented by variably tuffaceous claystones with subordinate interbedded thin limestones and sandstones. One significant arenaceous interval is the Balder Sandstone Member (see below).

CLAYSTONE: medium dark grey, dark blue grey, grey brown, commonly very firm, blocky to sub platey, subfissile, locally pyritic and non calcareous. Occasional to common black to buff tuffaceous specks.

TUFF: light grey, blue grey, firm to slightly hard, speckled, non calcareous.

LIMESTONE: light yellow grey, light grey, blocky, firm to hard.

SANDSTONE: light grey, off white, very fine to fine grained, subangular, moderately friable, locally with moderately hard calcitic cement.

Below the Balder Sandstone Member the Balder Formation lithology reverts to tuffaceous claystone with an interbedded limestone.

Balder Sandstone Member (within Balder Formation)

Depth Interval: 2155.0 - 2197.5m (2130.2 - 2172.4 m TVDSS)

Thickness: 42.2 mTVD

Age: 'Earliest' Eocene to Late Paleocene

The upper boundary of the Balder Sandstone Member is picked on the sharp decrease in the gamma ray value. Clean sandstones are seen as a neutron density crossover and a sharp drop in resistivity is observed due to high water saturation. The sonic velocity is also seen to increase in the sandstones.

Lithology: sandstone with interbedded claystones towards the base, with tuffaceous horizons. Infrequent limestone stringers were also seen .

SANDSTONE: light yellow grey, off white, transparent to translucent, very fine to medium grained, rarely coarse, subangular to subrounded, subspherical, moderate to poorly sorted, clean, locally carbonaceous and micaceous, rare glauconite, poorly cemented with occasionally slightly calcareous cement, friable, good visible porosity, no show.

CLAYSTONE: medium dark grey to olive grey, firm to hard, blocky to tabular, occasionally sub fissile, silty in part, occasionally micromicaceous, occasional trace pyrite, non calcareous.

TUFFACEOUS CLAYSTONE: light blue grey, steely, speckled, blocky, firm, non calcareous

LIMESTONE: light brown, firm to moderately hard, blocky, crumbly, microcrystalline.

Cores 1 and 2 were cut in the Balder Formation and into the Balder Sandstone Member. See core descriptions, section 8.2 and 8.3 and Geologic Core Logging and Thin Section Petrology report by Baker Atlas Geoscience.

Sele Formation

Depth Interval: 2207.0 - 2265.0m (2181.9 - 2239.7m TVDSS)

Thickness: 57.8 mTVD

Age: Late Paleocene

Lithology: claystone, locally tuffaceous towards the top.

This formation is characterised by a sharp increase in gamma ray value, and consistent resistivity and sonic values.

CLAYSTONE: medium dark grey, locally light medium grey and dark olive grey, locally mottled and microlaminated, firm, blocky, slightly micaceous,, locally carbonaceous, trace pyrite in places, slightly calcareous at top becoming non calcareous.

TUFFACEOUS CLAYSTONE: Light grey blue and light steel grey, speckled black, firm, blocky, crumbly.

Hermod (Forties) Formation

Depth Interval: 2265.0 - 2347.0m (2239.7 - 2321.6m TVDSS)

Thickness: 81.9 mTVD

Age: Late Paleocene

The top of the Hermod (Forties) Formation is marked on the wireline logs by a sharp decrease in gamma ray values and an increase in sonic velocity.

Lithology: predominantly sandstone with thinly interbedded claystone and rare limestones.

SANDSTONE: very light grey, off white, clear to translucent, loose quartz, generally very fine to fine grained, occasional medium, rarely coarse, subangular to subrounded, subspherical, moderately sorted, occasional lithic fragments, occasional carbonaceous material, locally silty streaks with lignite and abundant mica, rare glauconite, friable, poor to moderately consolidated, slightly calcareous.

CLAYSTONE: medium dark grey to medium grey, occasional blue grey and dark green grey, very firm, blocky, subfissile, non calcareous, locally highly micromicaceous, occasionally carbonaceous.

LIMESTONE: light yellow grey, hard, blocky, crumbly, slightly argillaceous, microcrystalline.

Core 3 was cut in the Hermod (Forties) Formation. See core description, section 8.4, and Geologic Core Logging and Thin Section Petrology report by Baker Atlas Geoscience.

Lista Formation

Depth Interval: 2347.0 - 2378.5 (2321.6 - 2353.0m TVDSS)

Thickness: 31.4 mTVD

Age: Late Paleocene

The top of the Lista Formation is marked by a drop in resistivity, and a sharp decrease in sonic velocity. There is a consistent gamma ray reflecting the dominant claystone lithology.

Lithology: claystone locally grading siltstone, with limestone stringers.

CLAYSTONE: medium grey to medium dark grey, occasionally dark grey, locally dark green grey and dark blue grey, firm, blocky, locally sub fissile to fissile, locally silty grading to **SILTSTONE**, crumbly, with occasional lignite fragments, slightly micromicaceous and microcarbonaceous, non calcareous.

LIMESTONE: pale yellow brown, light grey to yellow grey, firm to hard, blocky, argillaceous.

Heimdal Formation

Depth Interval: 2378.5 - 2630m (2353.0 -2603.0m TVDSS)

Thickness: 250.0 mTVD

Age: Late Paleocene

The Heimdal formation is marked by a slight drop in gamma value, and a sharp increase in sonic velocity. The gamma curve signature is ratty throughout the upper section of the formation due to the interbedded nature of the lithology. A thick and homogeneous sandstone occurs in the lower section of the formation.

Lithology: Interbedded claystone and sandstone, becoming a homogenous arenaceous unit, with occasional limestone stringers.

SANDSTONE: unfortunately observed predominately in cuttings as light grey to off white rock flour due to the bit action, which destroyed the rock texture, fine to lower very fine grained, subangular, subspherical to spherical, trace pyrite, trace carbonaceous specks, trace glauconite.

LIMESTONE: pale yellow brown, light olive grey, firm to moderately hard, blocky, slightly argillaceous, micro to cryptocrystalline, no visible porosity, no show.

CLAYSTONE: in upper part medium dark grey, firm, blocky, crumbly, silty, micromicaceous, non calcareous, becoming dark green grey, medium grey, medium dark grey, local medium brown grey, firm to very firm, brittle and splintery, to blocky and subfissile, trace carbonaceous, slightly micaceous, waxy, slightly hygroturgid, non calcareous, with silty and sandy lenses in sidewall cores.

In the upper part, **SILTSTONE**: medium dark grey to dark grey, firm, crumbly, hydrophilic, non calcareous.

Ty Formation

Depth Interval: 2630.0 – 2724.5m (2603.0 – 2696.3m TVDSS)

Thickness: 93.3 mTVD

Age: Late Paleocene to Early Paleocene.

The top of the Ty Formation is not an obvious pick from log responses. There is a drop in gamma value, marking the transition to a sandier unit, which sits between two 7 to10 meter argillaceous beds. Other log responses are not diagnostic.

Lithology: sandstone with claystone beds, becoming calcareous claystone grading to marl with depth. Resistivity and sonic values strongly suggest the presence of localised limestone stringers though none was recorded in cuttings.

SANDSTONE: quartzose, light grey to off white, locally clear, friable, fine to locally medium grained, moderately sorted, generally friable with locally slightly calcareous cement.

CLAYSTONE: medium grey, green grey, firm to moderately hard, tabular to subfissile, locally silty and pyritic, micromicaceous, carbonaceous, non calcareous in upper part, but becomes **CALCAREOUS CLAYSTONE:** light to medium grey, firm to very firm, blocky, tabular, local micromicaceous, with thin pyrite veins and disseminated pyrite, calcareous to very calcareous, becoming at the base **MARL**: light grey to off white, medium grey, rarely brown grey, soft to firm, blocky to tabular, very calcareous.

2.1.4. Shetland Group

Depth Interval: 2724.5 - 2793.0 (T.D) , (2696.3 - 2763.2m TVDSS)

Thickness: > 66.9 mTVD

Age: Early Paleocene to Latest Maastrichtian

Lithology: limestones, with subordinate calcareous claystones, and occasional sandstone beds.

Ekofisk Formation

Depth Interval:2724.5 - 2788.5m (2696.3 - 2758.8m TVDSS)

Thickness: 62.5 mTVD

Age: Early Paleocene

Lithology: limestone becoming argillaceous, grading to marl towards the base, with a single sand unit 2736 to 2745 meters.

A decrease in the gamma ray value and associated increase in sonic velocity marks the top of the Ekofisk Formation.

LIMESTONE: light grey to light olive grey, off white, becoming red brown with depth, firm to moderately soft, rarely moderately hard, blocky to tabular, crumbly in part, becomes increasingly argillaceous, and grades to **MARL,** dark green grey, green grey, olive grey, firm, blocky, subfissile, trace carbonaceous.

SANDSTONE: light grey, off white, clear to translucent, fine grained quartz, slightly calcareous cement.

Tor Formation

Depth Interval:2788.5 - 2793.0 m (2758.8 - 2763.2m TVDSS)

Thickness: > 4.4 mTVD

Age: Latest Maastrichtian

Lithology: Chalky limestone and marly limestone.

Other than a marked increase in resistivity, no wireline logs extended over this interval and identification was by micropaleontological evidence derived both at the wellsite and subsequently onshore.

CHALKY LIMESTONE: very light grey to off white, firm, predominantly clean, blocky, occasional carbonaceous specks, cryptocrystalline, no visible porosity, occasional light yellow mineral fluorescence, no show.

MARLY LIMESTONE: medium light to light grey, occasionally light olive green, trace pale red grey, soft to firm, blocky, crumbly, cryptocrystalline, no show.

2.2. BIOSTRATIGRAPHIC SUMMARY

The biostratigraphic analysis were carried out by Robertson Research on cuttings samples, sidewall cores and cores chips over the interval 1020 - 2793m. The preparation and analyses were as follows:

Micropalaeontology: 68 ditch cuttings, 10 core pieces, 24 Sidewall cores.

Log data were made available to Robertson Research to assist them in picking formation tops. For full details refer to the Robertson Research Biostratigraphy report for the well.

Wellsite biostratigraphy was undertaken by Microstrat Services for the interval, and results incorporated into the Robertson Research report.

Table 2-2 Provides a Chronostratigraphic and Lithostratigraphic summary.

Table 2.2 Chronostratigraphic and Lithostratigraphic Summary

Top depths are referenced to wireline logs. Biostratigraphic ranges are referenced to driller's depth where from cuttings or core, whereas sidewall plugs are referenced to wireline logs.

Biostratigraphy evidence ranges m MD	*Biostratigraphic Age*	**Wireline Top Depth m MD**	**Lithostratigraphic Top**
	Seabed	128	Nordland Group
		695	Utsira Formation
		910	Hordaland Group / Base Utsira Formation
1020 - 1050	*Middle Miocene*		*First biostratigraphic analysis*
1080 - 1200	*Early Miocene*		
1230 - 1320	*Late Oligocene*	1238	Skade Formation
1350 - 1550	*Early Oligocene*	1267	Hordaland Continued / Base Skade Formation
	Stratigraphic Break ?	*1560*	
1556 (SWC) - 1610	*Late Eocene*	1560	Grid Formation
1630 - 1970	*Middle Eocene*	1849.5	Hordaland Group Cont'd / Base Grid Formation
		1977.5	"Lower" Grid Formation
	Stratigraphic Break ?	*2015*	
2010 - 2100	*Early Eocene*	2015	Hordaland Group Continued / Base "Lower" Grid Formation
	Stratigraphic Break ?	*2110*	
2110 - 2173 (Core)	*Earliest Eocene to Latest Paleocene*	2110	Rogaland Group / Balder Formation
2175.74 (Core) - 2668	*Late Paleocene*	2155	Balder Sandstone Member
		2200	Balder Formation Continued
		2207	Sele Formation
		2265	Hermod (Forties) Fomation
		2347	Lista Formation
		2378.5	Heimdal Formation
2680 - 2785	*Early Paleocene*	2630	Ty Formation
		2724.6	Shetland Group / Ekofisk Formation
	Stratigraphic Break ?	*2788.5*	
2788 - 2793	*Late Cretaceous*	2788.5	Tor Formation
		2793	TD

Note: where log evidence suggests a top at a differing depth than sample evidence, the log evidence has been used as final top. This is considered a pragmatic solution given depth discrepencies between driller's and log depth. Furthermore logs provide a complete record of well lithologies whereas samples provide a selection of spot records.

3. HYDROCARBON SHOWS

The hydrocarbon shows encountered in the 15/3-6 well are described below. Formation tops, and gas shows are referenced to wireline depths.

3.1. GAS AND OIL SHOW RECORD SUMMARY

Returns were to seabed until the 13 3/8" casing was set at 1001m MD. Prior to this depth show evaluation is from the MWD/GR/Resisitivity logs in 9 7/8" pilot hole drilled from the 30" casing point at 212.5 to 1015m MD.

Gas data were obtained using Sperry Sun mudlogging flame ionisation total gas detector in combination with a flame ionisation chromatograph with readings of C1 to C4 only. For detailed chromotographic breakdowns, refer to the mudlog.

Wellsite monitoring and evaluation of oil shows in cuttings, cores and sidewall cores, was performed using an ultraviolet light fluoroscope to test for both direct and solvent cut fluorescence.

No oil shows were observed throughout the well.

3.1.1. Nordland Group : 128.0 - 910.0 m MD (105.0 - 887.0 m TVDSS)

As prognosed, there were no indications of shallow gas from the MWD/GR/Resistivity logs run in the 9 7/8"pilot hole section from 212.5 to 1015 m MD.

3.1.2. Hordaland Group : 910.0 - 2110.0 m MD (887.0 - 2085.3 m TVDSS)

Gas readings were observed upon obtaining returns to the rig from 1015 m MD. Levels remained low throughout the Hordaland group ranging 0.1 to 0.5 %. Chromatographic breakdowns indicated dominantly C1, but with local minor traces of C2 to C4.

3.1.3. Rogaland Group : 2110.0 - 2724.5 m MD (2085.3 - 2696.3 m TVDSS)

Gas readings remained low throughout the Rogaland group ranging 0.03 to 0.23 %. Chromatograph indicated dominantly C1, with consistent levels of C2 although less than 100 ppm, with C3 up to 15 ppm and local traces C4 .

3.1.4. Shetland Shetland Group : 2724.5 - 2793.0 m MD (2696.3 - 2763.2 m TVDSS)

Gas readings continued to be consistently low in the Shetland group ranging 0.03 to 0.17% and analysed as predominantly C1, with minor C2 ranging 30 to 202 ppm, and traces of C3 to C4 .

4. WELL LOGGING AND SAMPLES

4.1. GEOLOGICAL WELL LOGGING AND SAMPLING

Quad Operations Ltd provided wellsite geological services. Sperry-Sun Drilling Services provided mudlogging and data acquisition services. Continuous monitoring and recording of all relevant drilling and geological operations was performed. An End of Well Report with mudlog was prepared by Sperry-Sun.

4.1.1. Cuttings Samples

Drilling returns were to the seafloor until 1015m after 13 3/8" casing was run at 1001m MD.

Drilling cuttings were collected and prepared as follows:

Table 4.1 Cuttings Collection

INTERVAL	FREQUENCY	REMARKS
1020 - 2000 m MD	10 m	17 washed & dried, 5 unwashed
2000 – 2701 m MD	6 – 9 m	17 washed & dried, 5 unwashed
2701 - 2793 m MD	3 m	17 washed & dried, 5 unwashed
1900 - 4224 m MD	50 m	Composite canned samples for geochemistry

Mudloggers collected 3 sets of washed and dried, composite canned geochemistry cuttings, and a 10kg tin of unwashed for onshore splitting by Oilphase who produced the remaining sets of 14 washed & dried and 5 unwashed.

Cuttings samples were distributed as follows:

Table 4.2 Distribution of Cuttings

AMOCO	1 set washed and dried
NPD	1 set washed and dried
NPD	1 set unwashed
HYDRO	1 set washed and dried
STATOIL	10 sets washed and dried (trade sets), 1 set unwashed
TOTAL	1 set washed and dried
ELF	1 set washed and dried, 1 set unwashed
FIS	1 set washed and dried
Biostratigraphy	1 set unwashed
Geochemistry	1 set washed and dried, 1 set unwashed

4.1.2. Fluid Samples

A single MDT fluid sample was taken at 2162.0 m MD within the Balder Sandstone Member. The sample was sent to Oilphase Petroleum Laboratory to determine the chemical composition of the water sample. Details of analysis are to be found in table 6.3.1

4.2. MWD LOGGING

MWD services were provided by Schlumberger Anadrill. For details refer to the Anadrill MWD End of Well Report and log witness reports in section 4.4.

Table 4.3 MWD Logging Summary

Run	Hole Size	Interval (m MD)	Tool	Comments
1	9 7/8" pilot hole	216.5 -1015	MWD/GR/RES (CDR)	Real time & memory log ok
2	8 ½" hole	1015 - 2140	MWD/GR/RES (CDR)	Real time & memory log ok
3	8 ½" hole	2140 - 2278	MWD/GR/RES (CDR)	Real time & memory log ok Logged over interval cores 1 & 2, 2140-2176 m MD
4	8 ½" hole	2304 - 2793	MWD/GR/RES (CDR)	Real time & memory log ok, apart from interval 2278–2304 m MD, (including core 3 interval), where depth tracking failed.

4.3. WIRELINE LOGGING

Wireline logging services were provided by Schlumberger. The following logs were run:

Table 4.4 Wireline Logging Summary

Run	Date	Hole Size	Interval (m MDBRT)	Logs Run	Notes
1a	29 Dec-98	8 ½"	2799.6–1001.5	PEX/DSI/AIT/GR	Included GR/DSI to seabed
1b	29 Dec-98	8 ½"	2560 - 1246	MDT	12 Pretests, 1 water sample
1c	30 Dec-98	8 ½"	2767 - 1560	CST	27 cores, 2 lost, 1 missfire

It was intended to run a VSP prior to running CST's. This run was cancelled due to the failure of the adapter between the Schlumberger and Read VSP equipment.

4.3.1. Reprocessing of DSI

DSI data was reprocessed by Schlumberger to improve the quality of both the compressional and shear slowness which were affected by the presence of strong casing arrivals over many sections, from 1005m – 260m

4.3.2. MDT Logging

12 Pretests were carried out with the MDT logging tool in the 8 1/2" hole section. MDT pressures confirmed a normal water pressure gradient throughout, including the target Balder and Forties sandstones.

MDT pressure results are to be found in the following Table 4-5 MDT Pressure Data Sheet and Figure 4-1 MDT Pressure Plot.

Table 4.5 MDT Pressure Data Summary

Amoco Norway Pressure Interpretation Sheet

Well	Pinnsvin, 15/3-6	Permit	PL 187
Type of well	Vertical Exploration	Maximum Deviation	12.47 Degrees @ 2779.2m
Type of survey tool	MDT w/ PO, 2x 1gal chambers	Acquisition date	29th December 1998
Reference Datum	MSL	Rotary Table Elevation,m	23,0
Mud Weight	10,5 ppg 0,545 psi/ft		

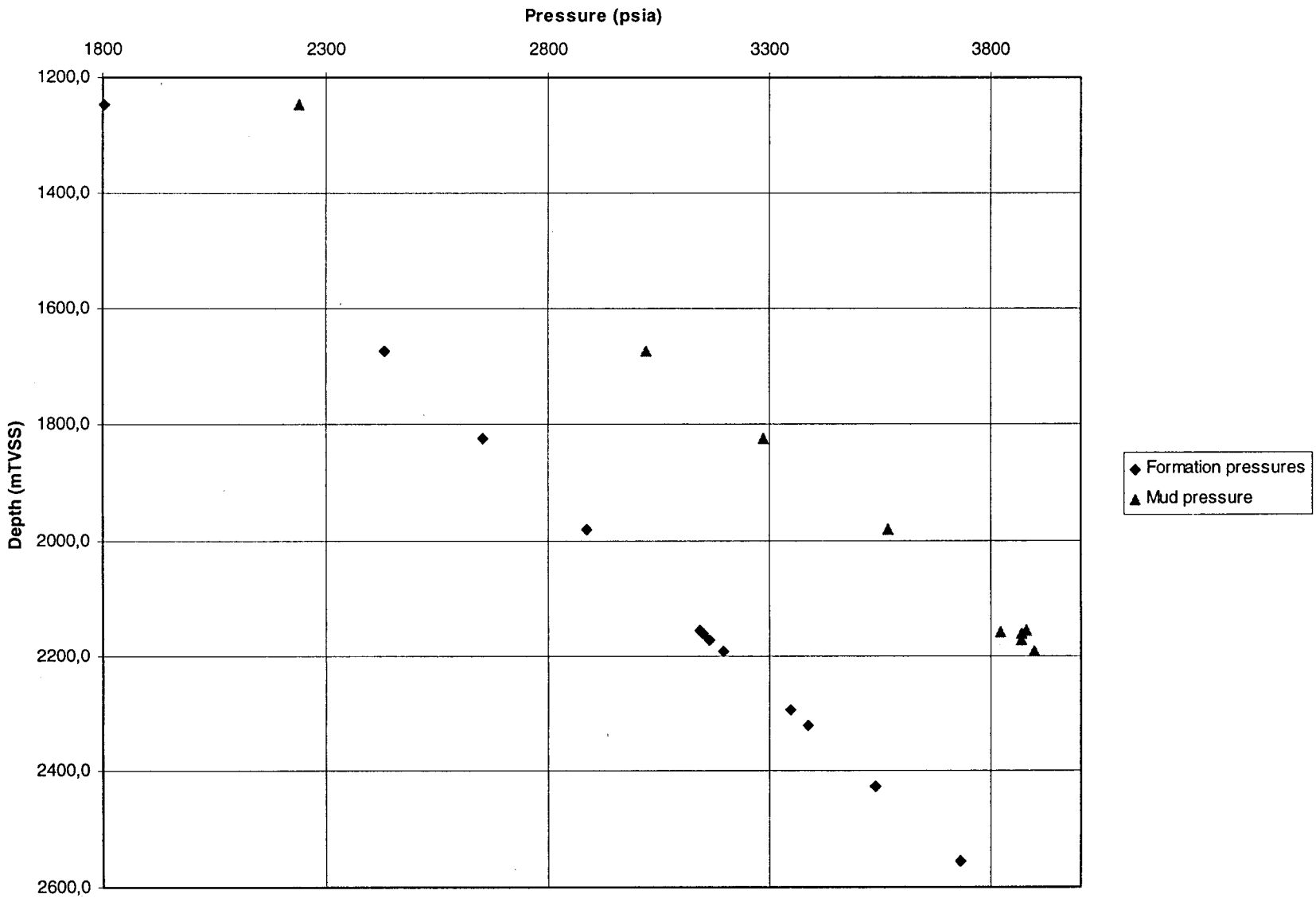
Tool Set	MD mBDF	TVDRT mBDF	TVDSS m	Hydrostatic Press. bef, psia	Hydrostatic Press. after, psia	Fm Pr psia	DDMob mD/cP	T °C	Time	Fm Pr G, psi/ft	Fm Pr G, ppg	Mud G psi/ft	Mud G ppg	Comments, w/ pre-test vol
1	1246,0	1245,8	1222,8	2238,72	2232,55	1802,00	371,7	46,9	23:30	0,446	8,58	0,544	10,48	Limited drawdown, 500psi, 20cc
2	1673,0	1673,0	1650,0	3016,86	3008,64	2430,00	114,5	54,2	0:00	0,446	8,60	0,547	10,54	Limited drawdown 800psi, 20cc
3	1824,0	1823,4	1800,4	3283,09	3276,20	2650,47	54,9	59,1	0:20	0,446	8,60	0,546	10,53	"
4	1984,0	1982,9	1959,9	3566,64	3557,73	2884,80	1026,4	62,9	0:40	0,446	8,60	0,546	10,52	"
5	2159,0	2157,0	2134,0	3876,49	3859,80	3141	1581,5	68,0	1:00	0,446	8,60	0,546	10,51	"
6	2165,0	2163,1	2140,1	3865,36	3851,03	3149,54	1818,9	69,2	1:15	0,446	8,60	0,543	10,45	"
7	2174,0	2172,0	2149,0	3865,64	3854,14	3163	2203,3	69,9	1:30	0,446	8,60	0,540	10,41	"
8	2195,0	2192,9	2169,9	3895,00	3887,05	3193	1298,4	70,5	1:40	0,447	8,60	0,539	10,39	"
9	2298,0	2295,7	2272,7	4091,32	4081,28	3345,94	194,6	72,1	2:05	0,447	8,61	0,541	10,43	"
10	2324,0	2321,6	2298,6	4131,31	4122,38	3383,74	359,6	73,9	2:15	0,447	8,61	0,540	10,41	"
11	2430,0	2427,4	2404,4	4328,88	4318,83	3537,94	359,4	76,4	2:35	0,447	8,61	0,542	10,44	"
12	2560,0	2556,7	2533,7	4568,48	4558,54	3729,38	109,4	79,3	2:55	0,447	8,61	0,543	10,46	"
13														graph on sheet # 3
14														
15	2162,0	2160,1	2137,1	3821,80	3822,40	3143,70				0,446	8,60	0,537	10,35	1 gal sample, pumped out 4litres,
16														flowing press 3110psi, fill up time 30sec,
17														

Comments:

1) After taking the sample to bottle No.1, a back-up sample was attempted at the same point to bottle No.2, but the probe was plugged immediately upon opening the second bottle. The normal probe had to be used as the large diameter probe could not be set.

2)

Figure 4.1 MDT Pressure Plot



4.4. FORMATION EVALUATION

4.4.1. Log Analysis

CPI analysis of the log data was conducted over the Balder and Forties sandstones, attachment 8.5

The underlying Heimdal sandstone was also evaluated as 100% water wet. Heimdal sandstones did not constitute any potential over this prospect and as such the reservoir properties are not reported.

All the sandstones were in hydrodynamic communication as determined from the MDT pressure analysis, figure 4.1.

Vsh was determined from the GR using a linear relationship.
Porosity was determined from the density log.
Sw was determined using the Archie equation.Coates permeability equation was used to establish calculated permeability. A fixed Swirr of 15% was found to give a calculated permeability closely matching the core derived permeability.
Rw measured from water sample

Table 4.6 Log Analysis input parameters and results

Formation	Balder Sst	Base Balder Sst	Sele	Forties Sst	Base Forties Sst
Depth (mMD)	2155	2198	2212	2267	2338
a	1	1	1	1	1
m	2	2	2	2	2
n	2	2	2	2	2
Rw	.045	.045	.045	.045	.045
Dtfl	189	189	189	189	189
Rhofl	1	1	1	1	1
Rhoma	2.66	2.66	2.66	2.66	2.66
Rhosh	2.35	2.35	2.35	2.35	2.35
Rt sh	.7	.7	.7	.7	.7
GR ss	22	22	40	40	40
GR sh	95	95	95	95	95
Sw irr	.15	.15	.15	.15	.15
Cutoffs	Vsh<.4, Ø>.1			Vsh<.4, Ø>.1	
Gross Res	43			71	
Net Res	37.8			64.9	
N : G	.88			.91	
Avg Ø	.32			.26	
Av Sw	.99			.99	
Av K	1168			635	
Av Vsh	.08			.08	

CORE DATA: Using the core GR and wireline GR +5 m depth shift was applied to the Balder core and a +4 m depth shift applied to the Forties core to match log data. The core data was measured under a series of pressures 800, 1500, 2400, and 3000 psi. The 800 psi represents the normal confining pressure applied when making standard core analysis measurements. The 2400 psi data represents reservoir conditions. Both were plotted on the CPI to check porosity. The former match log derived porosity in the Balder and the latter match the log porosity in the Forties. This suggests a little more manipulation of the Balder cementation factor may improve the calculations slightly. Whilst this may reduce the average porosity of the Balder from 32% to 31% it will not change the saturation values. Details of the compressibility of these sandstones can be seen in the Oilphase core analysis report.

4.4.2. LWD Witness Reports

RUN No.1 9 7/8" Pilot Hole (BHA Run #3) : 216.5m MD - 1015.0m MD 6 3/4" MWD/GR/CDR

This tool was run from the 30" shoe to T.D. of the 9 7/8" pilot hole, with the objective of assessing the presence of shallow gas and ensuring that the base of the Utsira Sst was passed by at least 50m before setting the 13 3/8" casing. No tool problems were encountered during this run.

Initialise tool:	07:20 hrs 18th December 1998
Tool run in hole:	09:15 hrs 18th December 1998
Drilling commenced:	13:30 hrs 18th December 1998
Drilling ceased:	04:20 hrs 19th December 1998
Tool out of hole:	08:00 hrs 19th December 1998

Interval drilled:	216.5 - 1015.0m MD
Interval logged:	216.5 - 1010.0m MD
Re logged(For memory):	225.0 - 259.0m MD

Sensor Data

GR-Resistivity collar: Serial No. CDR 768

MWD Collar: Serial No. MDC 169

Distance behind bit:	Directional	13.25m
	Gamma	7.36m
	Resistivity	4.01m

Sampling rates:	Survey	Every Stand
(Memory Log)	GR	4 seconds

	Temp	30 seconds
	Resistivity	4 seconds
Real Time Log	GR	22 seconds
	CDR	17 seconds

Schlumberger Anadrill Engineers

Engineers provided good information and high quality data upon request.

Ross Murray	18-19/12/98
Ed Larsen	18-19/12//98

Data Quality

Approximately 30m of real time data lost from 225-255m just after start of drilling when system failed to recognise a connection. This section was relogged for the memory log only on the trip out of the hole (ie. without circulation). Good quality real time data during the lower (60-120m/hr) ROP zones, fair real time data quality throughout the Utsira Sst interval due to very high ROP(120-200m/hr). Memory data was of a good quality throughout, but with the same missing interval from 225-255m as on the real time log. The relogged was thus spliced into the final log. Note that it took approx 12 hrs from dumping the memory data from the tool to obtaining a final print. This was due to the fact that during the run the tool had reset itself downhole with the result that the data was present but shifted randomly in intervals. Consequently it required a considerable effort on the part of the engineers to rerieve the data into its correct relative position with respect to depth. It is not known what caused the tool to reset but a battery problem is suspected and it would be advisable either replace the batteries or use a different tool for the next run.

BHA Arrangement

SECTION	OD	ID	LENGTH	COMMENTS
BIT	9 7/8"	-	0.27m	SEC-DBS S33TGF, 3x16
BIT SUB W/ FLOAT	8"	-	0.92m	
X-O	6 1/2"	2 7/8"	1.08m	
MWD/CDR	6 3/4"	-	15.25m	CDR 768, MDC 169
NM STAB	9 7/8"	2 7/8"	1.78m	
NM DC(Totco)	6 7/16"	2 7/8"	9.27m	
STAB	9 7/8"	2 3/4"	1.58m	
15 x DC	6 1/2"	2 3/4"	139.66m	
JARS	6 1/2"	2 3/4"	9.46m	
12 x HWDP	4 11/16"	2 1/8"	107.63m	
TOTAL BHA	5"	3"	286.9m	

RUN No.2 8 ½" Hole (BHA Run #6): 1015.0m MD - 2140.0m MD 6 3/4" MWD/GR/CDR

This tool was run from the 13 3/8" casing shoe to the first core point in the 8 ½" hole section. The main objective of this run was to assess the presence of hydrocarbons in the Grid Sandstone and to aid in picking the top of the Balder Condensed and consequently the first core point. No tool problems were encountered during this run.

Initialise tool:	21:30 hrs 23rd December 1998
Tool run in hole:	22:00 hrs 23rd December 1998
Drilling commenced:	02:00 hrs 24th December 1998
Drilling ceased:	22:30 hrs 24th December 1998
Tool out of hole:	04:30 hrs 24th December 1998

Interval drilled:	1015 - 2140.0m MD
Interval logged:	1015 - 2140.0m MD
Re logged(For memory):	0

Sensor Data

GR-Resistivity collar: Serial No. CDR 7010/7007

MWD Collar: Serial No. MDC 169

Distance behind bit:	Directional	12.53m
	Gamma	6.61m
	Resistivity	3.26m

Sampling rates:	Survey	Every Stand
(Memory Log)	GR	4 seconds
	Temp	30 seconds

	Resistivity	4 seconds
Real Time Log	GR	22 seconds
	CDR	17 seconds

BHA Arrangement

SECTION	OD	ID	LENGTH	COMMENTS
BIT	8 ½"	-	0.36m	PDC, HTC BD447P,2x16,2x20
BIT SUB	6 7/16"	2 13/16"	1.15m	
MWD/CDR	6 3/4"	2 13/16"	15.29m	CDR 7010, MDC 169
NM STAB	6 7/16"	2 7/8"	1.46m	
NM DC(Totco)	6 7/16"	2 7/8"	9.27m	
STAB	6 7/16"	3 1/8"	1.80m	
15 x DC	6 1/2"	2 7/8"	139.66m	
JARS	6 5/16"	2 3/4"	9.35m	
12 x HWDP	4 11/16"	2 1/8"	107.63m	
TOTAL BHA			285.97m	

Schlumberger Anadrill Engineers

Engineers provided good information and high quality data upon request.

Ross Murray 24-25/12/98

P. Wilkin 24-25/12//98

Data Quality

Real time data was affected by the very high ROP(120-200m/hr) but was good enough to evaluate whether the Grid Sst was hydrocarbon bearing or not. Towards the base of the run the ROP was controlled to about 60m/hr to aid in the picking of the top Balder Condensed and the first core point. The memory data dumped succesfully and was of good quality.

RUN No.3 8 ½" Hole (BHA Run #9): 2140.0m MD - 2278.0m MD 6 3/4" MWD/GR/CDR

This tool was reamed over the cored interval of cores 1 and 2, 2140 - 2176 m MD, and run to identify the next core point in the Forties Sandstone at 2278 m MD. No tool problems were encountered during this run.

Initialise tool:	08:50 hrs 26th December 1998
Tool run in hole:	09:00 hrs 26th December 1998
Drilling commenced:	13:30 hrs 26th December 1998
Drilling ceased:	22:00 hrs 26th December 1998
Tool out of hole:	03:00 hrs 27th December 1998

Interval drilled:	2177 - 2278.0m MD
Interval logged:	2140 - 2278.0m MD
Re logged(For memory):	0

Sensor Data

GR-Resistivity collar: Serial No. CDR 7010, 7007

MWD Collar: Serial No. MDC 169

Distance behind bit:	Directional	12.43m
	Gamma	6.51m
	Resistivity	3.16m

Sampling rates:	Survey	Every Stand
(Memory Log)	GR	4 seconds
	Temp	30 seconds

	Resistivity	4 seconds
Real Time Log	GR	22 seconds
	CDR	17 seconds

BHA Arrangement

SECTION	OD	ID	LENGTH	COMMENTS
BIT	8 ½"	-	0.26m	REED 44HELD, 3x20
BIT SUB	6 7/16"	2 13/16"	1.15m	
MWD/CDR	6 3/4"	2 13/16"	15.29m	CDR 7010, MDC 169
NM STAB	6 7/16"	2 7/8"	1.46m	
NM DC(Totco)	6 7/16"	2 7/8"	9.27m	
STAB	6 7/16"	3 1/8"	1.80m	
15 x DC	6 1/2"	2 7/8"	130.41m	
JARS	6 5/16"	2 3/4"	9.35m	
12 x HWDP	4 11/16"	2 1/8"	107.63m	
TOTAL BHA			276.62m	

Schlumberger Anadrill Engineers

Engineers provided good information and high quality data upon request.

Ross Murray 26-27/12/98

P. Wilkin 26-27/12//98

Data Quality

Real time data was good with minor gaps in the data due to the high ROP in parts. The memory data dumped succesfully and was of good quality.

RUN No.4 8 ½" Hole (BHA Run #11): 2278.0m MD - 2793.0m MD 6 3/4" MWD/GR/CDR

This tool was run from the base of Core No.3 to TD. The tool was used to identify the formation tops to TD, in particular the top Ekofisk and Tor which were then confirmed by micropalaeontological analysis. No tool problems were encountered during this run but although the interval of core 3 was reamed for the LWD data, both real time and memory data was lost due to a depth tracking failure.

Initialise tool:	14:10 hrs 27th December 1998
Tool run in hole:	16:40 hrs 27th December 1998
Drilling commenced:	20:30 hrs 27th December 1998
Drilling ceased:	03:30 hrs 29th December 1998
Tool out of hole:	09:15 hrs 27th December 1998

Interval drilled:	2297 - 2793.0m MD
Interval logged:	2278 - 2793.0m MD
Re logged(For memory):	0

Sensor Data

GR-Resistivity collar: Serial No. CDR 7010, 7007

MWD Collar: Serial No. MDC 169

Distance behind bit:	Directional	12.47m
	Gamma	6.55m
	Resistivity	3.20m

Sampling rates:	Survey	Every Stand
(Memory Log)	GR	4 seconds
	Temp	30 seconds

	Resistivity	4 seconds
Real Time Log	GR	22 seconds
	CDR	17 seconds

BHA Arrangement

SECTION	OD	ID	LENGTH	COMMENTS
BIT	8 ½"	-	0.30m	SEC FM2745, 4x18
BIT SUB	6 7/16"	2 13/16"	1.15m	
MWD/CDR	6 3/4"	2 13/16"	15.29m	CDR 7010, MDC 169
NM STAB	6 7/16"	2 7/8"	1.46m	
NM DC(Totco)	6 7/16"	2 7/8"	9.27m	
STAB	6 7/16"	3 1/8"	1.80m	
15 x DC	6 1/2"	2 7/8"	130.41m	
JARS	6 5/16"	2 3/4"	9.35m	
12 x HWDP	4 11/16"	2 1/8"	107.63m	
TOTAL BHA			276.66m	

Schlumberger Anadrill Engineers

Engineers provided good information and high quality data upon request.

Ross Murray 27-29/12/98

P. Wilkin 27-29/12//98

Data Quality

Real time data was good with minor gaps in the data due to the high ROP in parts. At the start of the interval it was intended to ream the core 3 interval from 2277m to obtain GR & resistivity data but the hookload malfunctioned temporarily and depth tracking was lost over the desired interval. Hence no data was obtained in real time or recorded to the memory from 2277-2304m. The memory data was dumped successfully at the end of the run and was of good quality.

Report by
Ray Edmunds (Wellsite Geologists)
Iain Greig

4.4.3. Wireline Logging Summary

AMOCO NORWAY WELL: 15/3-6
LOG RUN No.1 Summary
RIG: MAERSK JUTLANDER
DATE: 29th-31st DECEMBER 1998

Introduction

The 8 ½" hole interval was drilled from the 13 3/8" casing point at 1015m to TD at 2793m, which was reached at 0330hrs 29th December 1998. The hole was circulated clean and the following logs were then run by Schlumberger Wireline Services:-

Run 1A AIT-DSI-PEX, 2799.7-1002.3m, (GR & DSI to seabed @ 128m)

Run 1B MDT-GR, 2560-1246m, (12 pre-tests & 1 sample)

Run 1C CST-GR, 2767-1556m, (30 shots attempted, 27 recovered, 2 lost, 1 missfire)

A VSP was planned to be run after the MDT, but the adaptor from the Schlumberger wireline to the READ VSP equipment did not work and so the VSP was cancelled.

Header Information

Surface Location:	Geographical:	Lat: 58° 46' 23.306"N	Long: 01° 45' 15.058"E
	UTM (Zone Central Meridian 3° East):		Y: 6 515 611.08m N, X: 427 953.73m E

Drillers TD:	2793.0 MDRT (2786.2m TVDSS)
Loggers TD:	2799.7 MDRT (2792.7m TVDSS)

Elevations:	RT-MSL	23.0m
	RT-Seabed	128.0m
	Water Depth	105.0m

Last Casing Shoe at 1001.2m

Casing Size: 13 3/8", Casing Weight: 72.0lbs/ft (ID 12.347")

30" Conductor shoe at 212.5m

Mud Type:	VERSAVERT OBM
Mud Weight:	10.5ppg
Viscosity:	84
PV:	26
YP:	24
HTHP Fil:	2.2
HTHP FC:	1/32"
O/W Ratio:	79/21

Sample taken from flowline.

Temperature and Circulation Data

Time circulation stopped prior to logging:	0430hrs 29th December 1998
Duration of last circulation:	32.0hrs

Maximum Recorded Temperatures:

Run 1A	82deg C, 9.75hrs after circulation stopped (At TD 2799.7m)
Run 1B	79.3deg C, 22.5hrs after circulation stopped(Deepest MDT point @ 2560m)
Run 1C	No thermometers were run with the CST gun.

No extrapolated Static Bottom Hole Temperature was possible as there was only one temperature reading at TD.

LOGGING TIME BREAKDOWN
Run 1A AIT-DSI-PEX
29-Dec-98

09:20 Schlumberger MWD Rigged Down

09:30 Safety meeting held with drill crew, drilling supervisor on drill floor
Subject: Radioactive sources, wireline operations

09:35 Rig up started

10:15 Power up tools on surface, pre-sources op-check

10:20 Waiting on chopper to leave to put sources in tools.

10:40 Head Tension not working, remove SAH, works again, decide to log without swivel

10:50 Sources in tools, begin RIH

11:00 Stop before putting compensator on to fix drum, as it is jumping around a lot.
Take cover off. Found that gear box was very loose. Tightened it.

11:20 Compensator on. Continue RIH.

11:45 Entering open hole, checking casing shoe

11:55 Start Down log. Each 300m the tool was pulled up 50m to remove twists from the cable. (This was a new cable) This added to the time required to run the log.

12:55 Start Repeat Section at 2360m to be run over the Balder and Forties formations.
This was run at 1100'/hr to obtain Stoneley data.

13:40 Repeat Section done, continue down log.

14:10 Down Log stopped.

14:15 Main log started on TD. This was run at 1800'/hr in hi res mode.

15:40 Stop main log at 2100, repeat over Balder again due to sonic questions. RIH to 2350m, commence logging at 3200'/hr.-standard logging speed.

16:30 Overpull to 6000 lbs at 1703 M

17:20 Entering casing, continue log up to sea bed.

18:15 Compensator off

18:25 Sources out of tools, begin rig down. Max. Thermometer = 179 degF

19:30 Finish rigging down Pex/AIT/DSI. Correct log at csg point. Increase depth by 4.3m to give revised TD of 2799.6m

Run No.1B MDT-GR
29-Dec-98

19:30 Start MDT Rig-up

21:00 RIH

22:00 Lower sheave not turning properly, stop to investigate

22:25 Problem fixed, continue RIH

23:30 First pretest at 1246m

30-Dec-98

03:00 Last Pretest #12 at 2560m

03:45 Attempted sample with PS_2, large diameter probe would not set, switch to normal probe.

04.15 Water sample at 2162m with normal probe. Details as follows.
Attempted to set MRPS-145 with large diameter probe and gravel-pack filter but set sequence did not complete. Pulled up to same depth bottom PS using standard probe and set for pretest (Formation Pressure 3142psi). Started a new log without retracting, then close ISO valveof PS-2 and opened PSI valve. of PS-1 and started to pump out at 300RPM. Increased slowly to 1000RPM at flowing pressure= 3110psi (POHP = 1150psi).
Pumping aborted due to auto reset of PS. OFA and resistivity showed water in flo-line, so attempted to throttle. Throttling did not start, so had to open seal valve on SC to fill chamber(45 secs. to fill). Attempted to throttle MRSC-BA # 143 (1g), but no success. SG reading fine. Changed set point from 3110psi down to 2900psi, error band from 0.4% to 0.2% etc, etc. Had to open seal valve again, and unconsolidated sand collapsed plugging probe. Attempted to pump out, but POHP built up to max. Decided not to retract and set and clean piston filter as objective of 1 water sample had already been achieved.

04.45 POOH.

06:30 At Surface

06:45 Attempt to set PS_2 with LDP but failure repeated

07:30 Finish Rig-down MDT.

<u>VSP</u>

07:30 Waiting on weather for Read Seismic

09:00 Weather window allowed for deployment of guns, but tool problem prevented this from occurring.

10:00 Read Tools ready to be checked through SLB cable.

10:30 Try to power up Read tools, realize that there is a problem. Decide to run through the CIS instead of directly from the collector.

10:40 Read tries to lower guns into water, weather too bad, aren't able to.

11:45 Read rigged through CIS, connection good but then when checking out whole thing together found short on line 7. Weather still too bad to run tools, trying to isolate problem.

12:00 Have eliminated cable, collector, head, each alone are fine. Weather still rough.

12:15 Problem located in AH63, start taking it apart

13:00 Informed by Read that while they need line 7, they dont need line 5. Discuss option of swapping lines 5 and 7 in AH63.

14:15 AH63 taken apart and put back together. Still short line 7. Line still good. Weather has calmed down to the point of being able to run VSP

14:45 Meeting with company man to discuss whether to cancel the VSP or not.

15:00 Trying to fix red-tagged PEH. Also re-checking line etc.

15:30 Decide to cancel VSP.

Run 1C CST-GR

15:30 Begin loading CST guns with Charge &, Igniters.

17:45 Begin Rig up CST on rig floor

18:00 Zero Taken

18:05 Guns armed, begin RIH

18:15 Compensator on, continue RIH

18:25 Entering Open Hole

19:20 Correlation Log

20:00 First Core sample taken at 2767m

31-Dec-98

00:15 Last core sample taken at 1556m, POOH

01:00 At Surface

01:45 Finish CST Rig-Down. 27 cores recovered, 2 lost, 1 misfire.

Logging Time Analysis

			Operating Time, hrs	Downtime, hrs
Run No.1A	AIT-DSI-PEX	Rig up	1.25	0
		Run	8.67	0
Run No.1B	MDT-GR	Rig up	2.50	0.5
		Run	10.5	0
	VSP	Rig up	8.0	8.0
Run No.1C	CST-GR	Rig up	2.5	0
		Run	7.75	0

Total Time for Wireline logging from 09:30 29th December to 01:45 31st December is 40.25hrs.

Amount of downtime recorded is 8.5hrs, i.e. 21.1% downtime.

Note that of the 8hrs lost attempting to rig up the READ VSP tool 2.5hrs can be attributed to delays caused by the high winds which prevented READ from getting their tool to the rig floor. The remaining 5.5hrs were spent trying to rig up the tool, of which 5hrs downtime was caused by the failure of the Schlumberger adapter. Therefore a total of 6.0hrs(14.9%) of downtime is attributable to Schlumberger with 2.5hrs caused by the weather.

Petrophysical Evaluation

Preliminary Quick-Look analysis confirms that the Balder and Forties Sandstone formations are water bearing. Porosities range from 30% up to 40% in the Balder Sandstone, and 25-30% in the Forties.

The pressure tests also confirmed a water gradient, with the points from all the sands starting with the Skade at the top to the Heimdal towards the base lying on the same gradient. A 1 gallon water sample was attempted at 2162m in the Balder. A total of 2litres of formation water was recovered,along with a thin scum of OBM. Preliminary analysis of the sample at the wellsite gave an NaCl equiv of 72,000mg/l, while a resistivity measurement gave an Rw of 0.122 Ohm-m at 65deg F.

Pretest summary:

Test No.	MDRT m	TVDRT m	TVDSS m	Mud Hyd. psia	Fm. Pres. psia	D-D Mob, mD/cp	Temp deg C	Comments
1	1246	1245.8		2238.7	1802.36	371.7	46.9	Limit drawdown 500psi
2	1673	1672.7		3016.9	2430.01	114.5	54.2	Limit drawdown 800psi
3	1824	1823.4		3283.1	2650.47	54.9	59.1	"
4	1984	1982.9		3566.6	2884.85	1026.4	62.9	"
5	2159	2157.0		3876.5	3140.82	1581.5	68.0	"
6	2165	2163.1		3865.4	3149.54	1818.9	69.2	"
7	2174	2172.0		3865.6	3162.79	2203.3	69.9	"
8	2195	2192.9		3895.0	3193.46	1298.4	70.5	"
9	2298	2295.7		4091.3	3345.94	194.6	72.1	"
10	2324	2321.6		4131.3	3383.74	359.6	73.9	"
11	2430	2427.4		4328.9	3537.94	359.4	76.4	"
12	2560	2556.7		4568.5	3729.38	109.4	79.3	"

Wireline Formation Tops

The following are provisional wireline formation top picks:

Formation	Prognosed MD RT, m	Prognosed TVD SS, m	Actual MD RT, m	Actual TVD SS, m	high/low +/- m
Utsira Sst	*685*	*660*	695	672	-12
Base Utsira	*950*	*925*	906	883	+42
Skade	*1130*	*1105*	1239	1215.8	-110.8
Grid Sst	*1565*	*1540*	1560	1536.7	+3.3
Balder Cond.	*2131*	*2106*	2120	2095.3	+10.7
Balder Sst	*2160*	*2135*	2156	2131.2	+3.8
Base Balder Sst	*2195*	*2170*	2198	2172.9	-2.9
Sele(Pal. Cond)	*2211*	*2186*	2212	2186.9	-0.9
Forties Sst	*2265*	*2240*	2267	2241.7	-1.7
Lista Cond.?	*?*	*?*	2354	2328.6	-
Heimdal Sst	*2310*	*2285*	2410 ?	2384.5 ?	-99.5
Ekofisk	*2710*	*2685*	2751	2722.3	-37.7
Cretaceous	*2760*	*2735*	2788	2758.5	-23.5
Drillers TD	*2810*	*2785*	2793	2763.2	-
Wireline TD			2799.7	2769.6	-

Data Transmission and Dispatch

Field copies of the first log run were faxed to the Amoco Stavanger office and PDS files of the first run were also sent to the Amoco office. Due to difficulties with the fax getting through the transmittal of the PDS files was very useful, enabling good copies of the logs to be printed at the Amoco office. However for future reference the 1:500 scale logs in PDS format would have been more convenient. The PDS files and LIS data was transferred from the Schlumberger computer to a ZIP drive which enabled these large files to be sent to the Amoco office soon after the first run was completed. This was a significant improvement on using floppy disks which can only hold 1.4 MB of data.

One set of field paper copies of all logs plus the digital tapes were hand carried from the rig at the completion of the logging by the Amoco petrophysicist.

Recommendations

Overall the logging operations went reasonably well with no major tool failures and good quality data was acquired in a timely manner with only minor problems with the repeatability of the DSI in parts. However this did mean that the log had to be stopped and an interval repeated which caused delays in the final presentation of the data (The log had to be spliced and played back which takes almost as long as the original pass when the DSI is involved.) The use of the PEX tool saves a significant amount of rig time by cutting out the second run of the nuclear tools.

The cancellation of the VSP due to the failure of the adapter from the Schlumberger wireline to the READ tools was a cause for concern. This could have been avoided if READ had been on the rig sooner to check their tools. Also, the use of a separate contractor other than the wireline contractor to carry out a straightforward zero-offset VSP should be reconsidered in view of the additional mobilisation of personnel and equipment which is necessary.

A further point to note is the excessive amount of time taken to rig up the MDT, which might have been avoided if the specialist MDT technician had been on the rig in time to be involved in the operation. During the MDT run the large diameter probe which had been run to obtain the fluid sample would not set properly and the normal probe had to be used, which became plugged while taking the sample. Also while taking the sample the 1 gallon chamber could not be opened in a controlled manner (Throttling) which may have caused the plugging of the probe.

Wellsite Geologists
Ray Edmunds, Iain Greig

5. CORING AND SIDEWALL CORES

5.1. CORE SUMMARY

Coring was planned in the 8 1/2" hole section for the primary target Balder Sandstone Member, 25m below the top of the Balder Formation or on a drilling break, whichever was shallower, with the intention to core the entire Balder Sandstone, regardless of shows. A further core was to be cut in secondary target Hermod (Forties) Formation, regardless of shows.

Coring of the Balder began upon the basis of LWD correlation with offsets and prognosed depths. Two 18m cores were cut in this section successfully coring the entire main Balder Sandstone Member, including overlying and underlying shales. Drilling continued until the Forties Sandstone where the final core was cut. All three cores were cut with excellent penetration rates of 20 to 40m/hr with recoveries of 100%, 98% and 100% respectively.

Baker Hughes Inteq was selected as coring contractor. The cores were cut in 8 1/2" hole and were of standard 4 inches diameter. Core barrels were aluminium. Despite 27m barrels, the amount of core cut was limited to 18m to minimise damage due to compaction of the unconsolidated sandstones.

Table 5.1 Core Summary

Core No	Interval cut	Cut metres	Interval Recovered	Recovery metres	Recovery %	Formations
1	2140 - 2158	18	2140 - 2158	18	100	Balder Sandstone
2	2158 - 2176	18	2158 - 2175.7	17.57	98.33	Balder Sandstone
3	2278 - 2297.7	19.7	2278 - 2297.7	19.7	100	Hermod (Forties) Sandstone
	TOTAL	**55.7**		**55.27**	**99.23**	

Core summary intervals are drillers depths, that is measured core depths. Cores were subsequently tied to wireline depth by core gamma ray log.

5.2. CORE ANALYSIS PROGRAMME

5.2.1. Tracer

Tritium tracer was added to the mud, for invasion identification in cores and fluid samples, from the top of the Balder Sandstone section and for the remainder of the 8 1/2" hole section. During coring mud samples were taken every 3m for monitoring of tritium content.

5.2.2. Wellsite handling and core plugging

Oilphase supplied and monitored tritium tracer concentration and cut wellsite core plugs. Mud samples, cores and wellsite core plugs were sent to Oilphase in Stavanger for onshore core analysis.

Special wellsite handling was done because of the unconsolidated nature of the core, including lay down cradles and resin injection to ensure preservation. After being measured up and cut up into one meter lengths, the core was placed in special drainage racks to allow mud to drain, to enable unconsolidated core to be resinated.

Where sufficiently consolidated, 1.5" diameter vertical and horizontal core plugs, were cut every meter, irrespective of lithology, using Marcol mineral oil, wrapped in seran wrap and aluminium foil and preserved in wax using a wax bath. Wellsite core plugs were taken to ensure plugs in as pristine a state as possible, minimising deteriation and filtrate diffusion, for possible quicklook poroperm, water saturation, tritium content, special core analysis and geochemical analysis.

The bulk of the Balder sandstone, core 1 and 2, and the top of core 3, Hermod (Forties) sandstone, proved too unconsolidated for wellsite core plugs to be taken and these intervals were preserved by resin injection between core and inner barrel.

Core was resinated over the following intervals:

Core 1 : 2150 - 2158 m MD
Core 2 : 2158 - 2167 m MD
Core 3 : 2278 - 2280 m MD

Wellsite core plugs were cut as per Table 5.2

After wellsite plugging and resination, the one meter lengths were sealed with end caps for shipment to shore.

5.2.3. Core analysis and processing of cores

Core analysis and processing of cores was as follows:

<u>Spectral gamma ray</u>

<u>Seal peels</u> : Six seal peels were taken at following intervals and preserved in wax:

1. 2152.75 m
2. 2161.70 m
3. 2172.00 m
4. 2279.80 m
5. 2288.00 m
6. 2294.00 m

Core plugging and cleaning: Horizontal plugs were taken every 0.25m and vertical every 1 meter in sandstones and siltstones. Wellsite core plugs were incorporated so as not to repeat depths. All plugs were 1.5" diameter. Resinated intervals of core were slabbed prior to plugging.

Consolidated plug samples were cut in brine and cleaned by solvent soxhlet extraction using toluene and methanol.

Unconsolidated cores were frozen and plugs taken using liquid nitrogen as lubricant. Whilst frozen they were installed in core holders and allowed to thaw at a low confining pressure before increasing the pressure to test pressure. They were then cleaned by flooding with toluene and methanol, dried by flooding with gas, and dried again after flushing with acetone.

Core analysis: Porosity, permeability, grain density and lithology description.

Because of the unconsolidated nature of the rock, permeability and porosity analysis was conducted at variable pressures :

Balder sandstone: 20 55 103 166 207 bar

Hermod (Forties) sandstone: 20 55 103 173 207 bar

Slabbing and mounting of cores:

A cut for BPAmoco (Operator) stored at Oilphase

Flat B viewing cut stored at Oilphase

D cut for NPD

(No C cut because core was unconsolidated and would have fallen to pieces if attempted).

Photography: Direct light core photographs of slabbed core were taken, together with standard 0.5m resolution digital core photographs in 5m strings and presented on cd rom.

Core plug trims: Where possible, ends were sliced of all sandstones and siltstones from horizontal plugs.

Core to storage. Operator's core, plugs and trims are stored with Oilphase.

For details and results of all core analysis and studies refer to the individual reports produced.

5.3. OTHER ANALYSIS FROM CORES

Petrological thin sections: 17 thin sections were prepared by Oilphase from core plug trims or from core chips where plugs not taken. Thin sections were vacuum impregnated with blue resin dye in the pore space, stained for potassium feldspar, and a combined alizarin red S and potassium ferricyanide stain for carbonate. A cover glass was applied. Table 5.3 lists the thin sections.

Sedimentology and Petrology: A full sedimentological core description together with petrology from 17 thin sections and report was done by Baker Atlas Geoscience.

A copy of the Sedimentological Core Description can be found in Attachment 8.2

Geophysical Vp/Vs (GEM) plugs: From the wellsite plugs, preserved in wax, 34 plugs were sent to BPAmoco Research Centre in Tulsa Oklahoma for porosity, permeability, grain density, mineralogy, and vp/vs ratio measurements.

Full results can be found in 15/3-6 GEM Analysis Report.

Geochemistry plugs Six vertical 1.5" diameter plugs were cut using brine for liquid extraction geochemical analysis by GeolabNor.

Balder : 2150.34, 2151.19, 2159.13, 2162.05, 2165.09 m MD

Hermod(Forties) : 2279.47 m MD

A seventh vertical plug from the Hermod (Forties), 2285.0 m MD, cut at the wellsite using marcol, was also used.

A summary of the results of geochemical analysis are in section 6.

Table 5.2 Summary of Wellsite Core Plugging

CORE No.1
Horizontal 1.5" plugs

Plug No.	Depth	Plug No.	Depth
1	2140.20	7	2146.18
2	2141.03	8	2147.03
3	2142.20	9	2148.14
4	2143.16	10	2149.05
5	2144.17	11	2150.20
6	2145.03		

Vertical 1.5" plugs

Plug No.	Depth	Plug No.	Depth
1	2140.0	9	2148.0
2	2141.0	10	2149.0
3	2142.0	11	2150.0
4	2143.0	12	2153.0
5	2144.0	13	2154.0
6	2145.0	14	2155.0
7	2146.0	15	2156.0
8	2147.0	16	2157.0

CORE No.2
Horizontal 1.5" plugs

Plug No.	Depth	Plug No.	Depth
12	2167.18	16	2172.19
13	2168.03	17	2173.18
14	2170.16	18	2174.17
15	2171.16	19	2175.07

Vertical 1.5" plugs

Plug No.	Depth	Plug No.	Depth
17	2167.0	21	2172.0
18	2168.0	22	2173.0
19	2170.0	23	2174.0
20	2171.0	24	2175.0

CORE No.3
Horizontal 1.5" plugs

Plug No.	Depth	Plug No.	Depth
20	2280.10	29	2289.15
21	2281.05	30	2290.16
22	2282.10	31	2291.15
23	2283.06	32	2292.23
24	2284.22	33	2293.15
25	2285.06	34	2294.23
26	2286.21	35	2295.14
27	2287.15	36	2296.16
28	2288.15	37	2297.14

Vertical 1.5" plugs

Plug No.	Depth	Plug No.	Depth
25	2278.0	35	2289.0
26	2280.0	36	2290.0
27	2281.0	37	2291.0
28	2282.0	38	2292.0
29	2283.0	39	2293.0
30	2284.0	40	2294.0
31	2285.0	41	2295.0

32	2286.0	42	2296.0
33	2287.0	43	2297.0
34	2288.0		

Table 5.3 Petrological Thin Sections

Balder Core 1

1. 2141.68 olive green turbidites
2. 2151.76 med grained debrite (Plug 68) **F**
3. 2152-53 one plug from this mud/hc interval **F**

Balder Core 2

4. 2162.41 med grd debrite faint bedding (Plug 98) **F**
5. 2167.50 med grained debrite (Plug 116)
6. 2172.48 med grained debrite (Plug 129)
7. 2173.85 olive green turbidites

Hermod (Forties) Core 3

8. 2280.69 cg-vcg sst (Plug 10)
9. 2281.25 med grained mid turbidite
10. 2283.82 mg-cg sst includes fault plane
11. 2285.47 med grained mid debrite (Plug 21)
12. 2290.59 fine grained upper turbidite
13. 2290.75 med grained mid turbidite (Plug 40)
14. 2290.85 mg-cg base turbidite
15. 2294.03 upper debrite (Plug 51)
16. 2294.77 mid debrite (Plug 54)
17. 2295.40 med grained base debrite

F = Frozen plug trims

5.4. SIDEWALL CORING

In the 8 1/2" hole section, percussion sidewall cores were cut in one for biostratigraphical analysis from shales. In all 30 cores were attempted, with 27 good, 2 lost and 1 missfire.

Table 5.4 are wellsite descriptions of CST plugs from Run 1c in 8 ½" hole.

Table 5.4 CST Core Description, Run 1c, 8 1/2" hole

AMOCO NORWAY OIL Co.

WELL: **15/3-6 (Pinnsvin)**

RUN No.: **1C** **30 ATTEMPTED, 27 RECOVERED, 1 MISSFIRE, 2 LOST**

Depth based on log: AIT-DSI-PEX — DATE: 30-31st 1998

Geologist: Ray Edmunds — BULLET TYPE: COMBO, 8gm charges

Core No.	Depth m	Rec in	Lithology	Shows	Ring Size in
1	2767,0	3/4	ARG LST/MARL: lt gy, sl hd, blk-flky, crpxln, Mdst, mod arg, v hygroturgid, swlg & grdg to Marl, no vis por.	No fluor, no show, dull wh fluor from OBM stn.	2 1/8
2	2760,0	1/2	ARG LST/MARL: highly fractured core, med lt gy-lt olv gy, sl hd, flky-blky, crpxln Mdst, w/ tr med dk gy cly/arg strks, tr blk carb spks, no vis por.	No fluor, no show, OBM fluor a/a.	2 1/4
3	2752,5	1	ARG LST/MARL: lt gy-lt olv gy, sl hd, blky-flky, crpxln Mdst, mod arg, v hygrot v sft & stky in water, w/ tr wh calcite vns, no vis por.	No fluor, no show, OBM fluor a/a.	2 1/8
4	2727,0	1/2	ARG LST: fractured core, v lt-lt gy, grdg to lt gn gy/yell gy, sl hd-hd, ang-flky, crpxln Mdst, sl hygroturgid, sl arg, tr thin blk carb/org lams, no vis por.	A/A	2 1/8
5	2698,0	1/2	CALC CLST: med dk gy-dk gy-olv blk, v frm-sl hd, blky, sbfiss, v calc, sl micro-mica, tr thin pyr vns & dism pyr, v sl microcarb.	A/A	2 1/4
6	2643,5	1	CLST: dk gn gy, v fr, blky-sl splntry, sbfiss, v sl calc, mod hygroturgid, waxy tex, sl icrocarb.	A/A	2 3/8
7	2628,5	1 1/2	CLST: dk gy, v frm, blky, sbfiss, non calc, v sl micromica.	No show, OBM fluor in part A/A	2 3/8
8	2549,0	3/4	CLST: dk gn gy-gn blk, v frm, blky-sbplty, sbfiss, waxy tex, non calc, tr dk brn-blk org lams, tr dism pyr, w/ SST lens: v lt gy-lt olv gy, frm-sl fri, vf-occ silt size, sbang, mod w srtd, w/ tr lith grns, carb spks, fr vis por.	No nat fluor, no show, patchy, dull wh OBM fluor only.	2 3/8
9	2537,0	1 1/2	CLST: med dk gy-med blu gy, frm, blky, sbfiss, non calc, sl hygrot, sl micmica & sl microcarb, w/ v thin SST lens: vlt gy, frm-fri, vf-silt size, w srtd, tr lith grns, carb spks, pr vis por.	A/A	2 1/8
10	2522,5	1	CLST: gy blu gn, v frm, splntry, fiss, waxy tex, shaly, non calc, sl hygrot, tr thin blk org lams, v sl microica.	No show a/a	2 3/8
11	2454,0	1	CLST/SHALE: gn blk-gy gn, v frm, blky-splntry, fiss, non calc, waxy tex, brit, non calc, sl tr blk carb lams, hygrofiss-sl hygroturgid.	No show a/a	2 3/8
12	2434,0	1	CLST: dk gn gy-gy gn, v frm, blky-splntry, sbfiss-fiss, non calc, waxy tex, brit, sl carb spks, v sl hygroturgid	No show a/a	2 3/8
13	2412,0	1 1/4	CLST: gn gy, frm, blky, non calc, sbfiss, a/a, w/ SST: lt-v lt gy, fri, vf-occ f, w srtd, sbang, no vis cmt, tr gn glauc, sl tr pyr, carb spks, fr vis por.	No nat fluor, no show a/a.	2 1/4
14	2401,0	0	LOST		2 1/8

Core No.	Depth m	Rec in	Lithology	Shows	Ring Size in
15	2391,0	1 1/4	SLTY CLST: med dk gy, frm, blky-crmbly, non calc, v slty, grdg to Sltst, micro-mica, tr blk coal/lig frags.	No show a/a.	2 1/4
16	2377,5	0	MISSFIRE		2 3/8
17	2354,0	3/4	CLST: dk gy-olv blk, frm, blky, sbfiss, non calc, mod hygrot, v sl micromica	No show a/a.	2 3/8
18	2336,0	1	CLST: med dk gy, fr, blky, sbfiss, non calc, micromica, carb spks, w/ v thin slty/sdy lam.		2 1/8
19	2320,0	0	LOST		2 3/8
20	2314,5	1 1/4	CLST: med dk gy, frm, blky, sbfiss, non calc, w/ silt lam & abnt mica flks, tr carb spks.	No show a/a.	2 3/8
21	2266,5	1 1/2	CLST: med dk gy, frm, blky-sbplty, sbfiss, non calc, mod micromica, w/ layer of olv gy CLST: pale yell brn mottl, tr carb spks, biot mica - tuffaceous?	No show a/a.	2 3/8
22	2264,0	1 1/4	CLST: dk gy-olv blk, frm, blky-sbplty, sbfiss, waxy tex, microlam med gy & blk, v sl tr carb spks	No show.	2 3/8
23	2253,0	1	CLST: med dk gy, frm, blky, sbfiss, microlaminated med gy, dk gy & blk, varved appearance, non calc, micromica.	No show.	2 3/8
24	2238,5	3/4	CLST: med dk gy, frm, blky, sbfiss, non calc.	No show.	2 3/8
25	2211,5	3/4	CLST: med dk gy, v frm, blky, sbfiss, non calc, sl micromica, v sl microcarb.	No show.	2 3/8
26	2181,5	3/4	CLST: med-med dkgy, v frm, blky, sbfiss, non calc.	No show.	2 3/8
27	2035,0	1 1/4	CLST: med dk gy-olv gy, frm, blky, sbfiss, non calc, tr carb debris.	No show.	2 3/8
28	1967,0	1	CLST: dk gn gy-gn blk, v frm, splntry-sbplty, sbfiss-fiss, non calc, waxy tex, brit tr carb spks, micromica.	No show.	2 3/8
29	1860,0	2	CLST: gn blk-olv blk, frm, sbplty-blky, sbfiss, non calc, gd tr glauc.	No show.	2 1/4
30	1556,0	1 1/4	CLST: olv blk-dk gy, frm, blky, sbfiss, non calc, rr tr forams, tr glauc, v sl slty, sl micromica.	No show.	2 3/8

6. GEOCHEMISTRY SUMMARY

Determination of water phase contamination by the oil based mud was enabled by the addition of tritium tracer to the oil based mud during drilling. Determination of contamination by the oil phase of the mud was enabled by gas chromatograph "fingerprints".

6.1. GEOCHEMISTRY OF CUTTINGS SAMPLES

A washed and dried set of cuttings was prepared at the wellsite for geochemical analysis, together with 50m composite cuttings samples in tins. In addition an unwashed cuttings set was prepared onshore.

The well did not discover any commercial hydrocarbon accumulations, nor did it penetrate the source rock, (Jurassic Draupne Formation). On this basis, no geochemical analysis of cuttings was conducted.

6.2. GEOCHEMISTRY OF CORE PLUG SAMPLES

Six vertical 1.5" diameter plugs were cut from the cores, in the sandstone reservoirs, using brine, for liquid extraction analysis by GeolabNor, Trondheim.

Table 6.1 Amount of extractable organic matter (EOM) from core plug samples.

Plug Sample Depth m MD	EOM (mg /g rock)	Formation	Core No
2150.34	0.8	Balder Sandstone Member	1
2151.19	0.1	Balder Sandstone Member	1
2159.13	8.4	Balder Sandstone Member	2
2162.05	15.6	Balder Sandstone Member	2
2165.09	1.3	Balder Sandstone Member	2
2279.47	0.6	Hermod(Forties) Formation	3

The analysed sandstones were all contaminated with oil based mud, as can be seen from the gas chromatograms in figures 6.1 to 6.6, which made the interpretation of the geochemical analyses difficult. A gas chromatogram of the clean mud is shown in figure 6.7.

The geochemical analysis of the plugs may suggest that traces of residual hydrocarbons are seen in the uppermost part of the Balder Sandstone Member in samples at 2150.34 and 2151.19 meters. According to the core-GR, the top of the Balder sandstone was encountered at 2149.8 meters suggesting that at least a 1.5 meter thick zone with residual hydrocarbons could be present in the well.

Geochemical data suggest that the core plugs taken at 2150.34 and 2151.19 meters, figures 6.1 and 6.2, are slightly enriched in the heavier C-components (C20-C24) compared to the drilling mud. The same trend is seen using a multivariable statistical analysis, principal components, figure 6.8. Notably, the first sample is more enriched in the heavier C-components than the second.

The possible presence of residual hydrocarbons in the uppermost meter or so of the Balder Sandstone Member suggest that either the hydrocarbons were generated insitu from organic material deposited between the sandstone grains, or which is probably more likely, that hydrocarbons actually migrated into the sandstones in geological time but presently only traces of these are left. The latter possibility may suggest that the 15/3-6 well was dry because of low seal efficiency due to sandstone/siltstone stringers through the seal and up to the overlying sandstones in Grid Formation, and that the uppermost meter or so represent a migration fairway.

6.3. GEOCHEMISTRY OF MDT WATER SAMPLE 2162.0 m MD

A 12-ion analysis was made by Oilphase of the MDT water sample at 2162.0m MD, from the Balder Sandstone Member.

Analysis of tritium content of the sample showed an activity level of 0.42 Bq/ml. Tritium content of the mud was 200 Bq/ml, suggesting contamination of the sample by the water phase of the oil based mud in the order of 0.2%, virtually zero.

Table 6.2 MDT Water Sample Chemistry at 2162.0m MD, Balder Sandstone Member

CATIONS	mg/l	ANIONS	mg/l
Sodium	25100	Chloride	44600
Potassium	195	Bicarbonate	165
Calcium	2535	Sulphate	45
Magnesium	801		
Strontium	508		
Barium	142		
Iron	not detected		
OTHER PROPERTIES			
ph : 6.7 @ 20 deg C			
density : 1.051 g/cc @ 15 deg C			
total suspended solids : 64 mg/l			
total dissolved solids : 74091 mg/l			
measured resistivity : 0.1091 ohmm @ 20 deg C (82500 ppm NaCl equivalent)			

Analysis Name : [62477] 5 OV62477A,2,1.

Multichrom

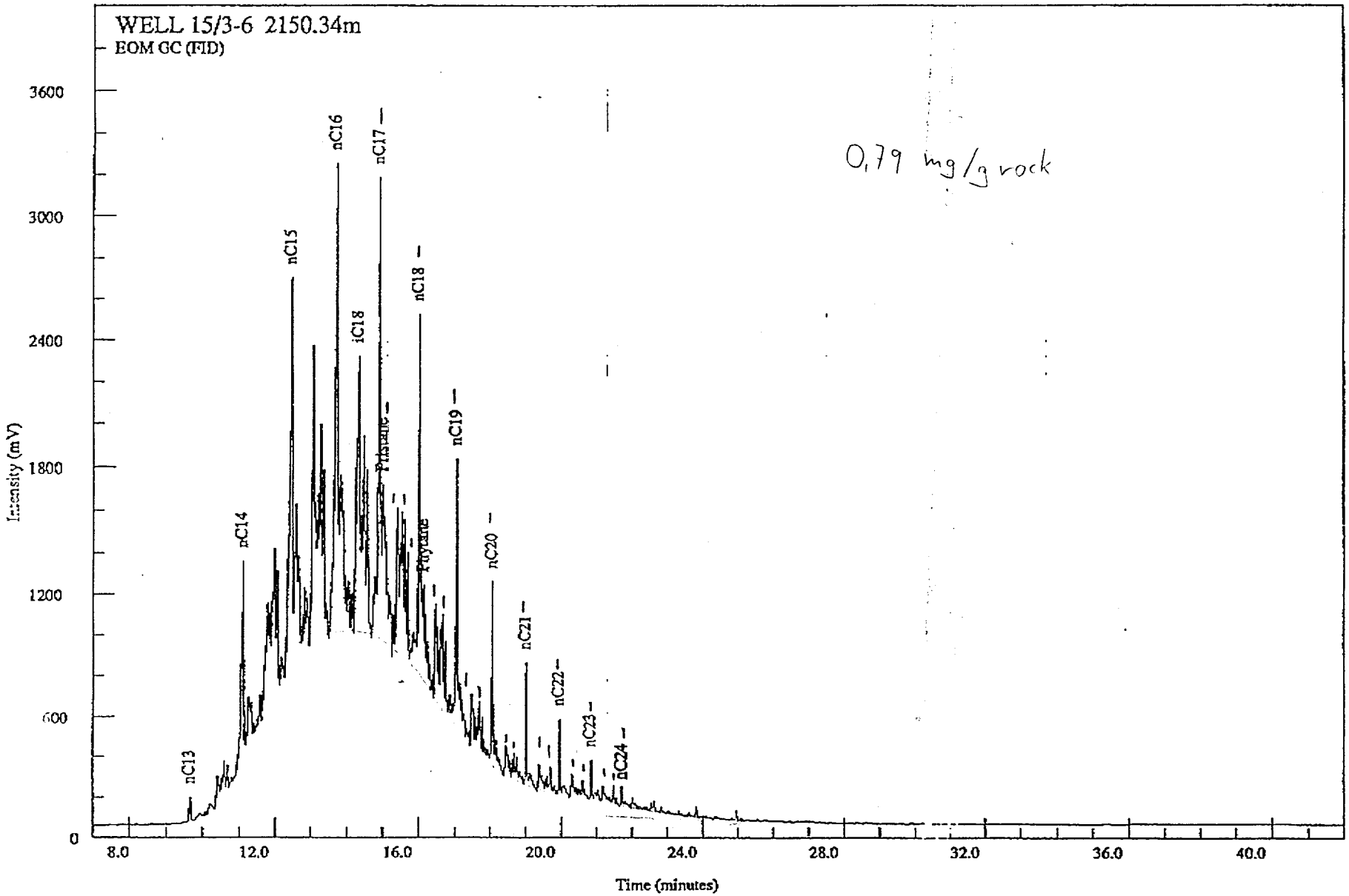


Figure 6.1

Analysis Name : [62477] 5 OV62477A,3,1.

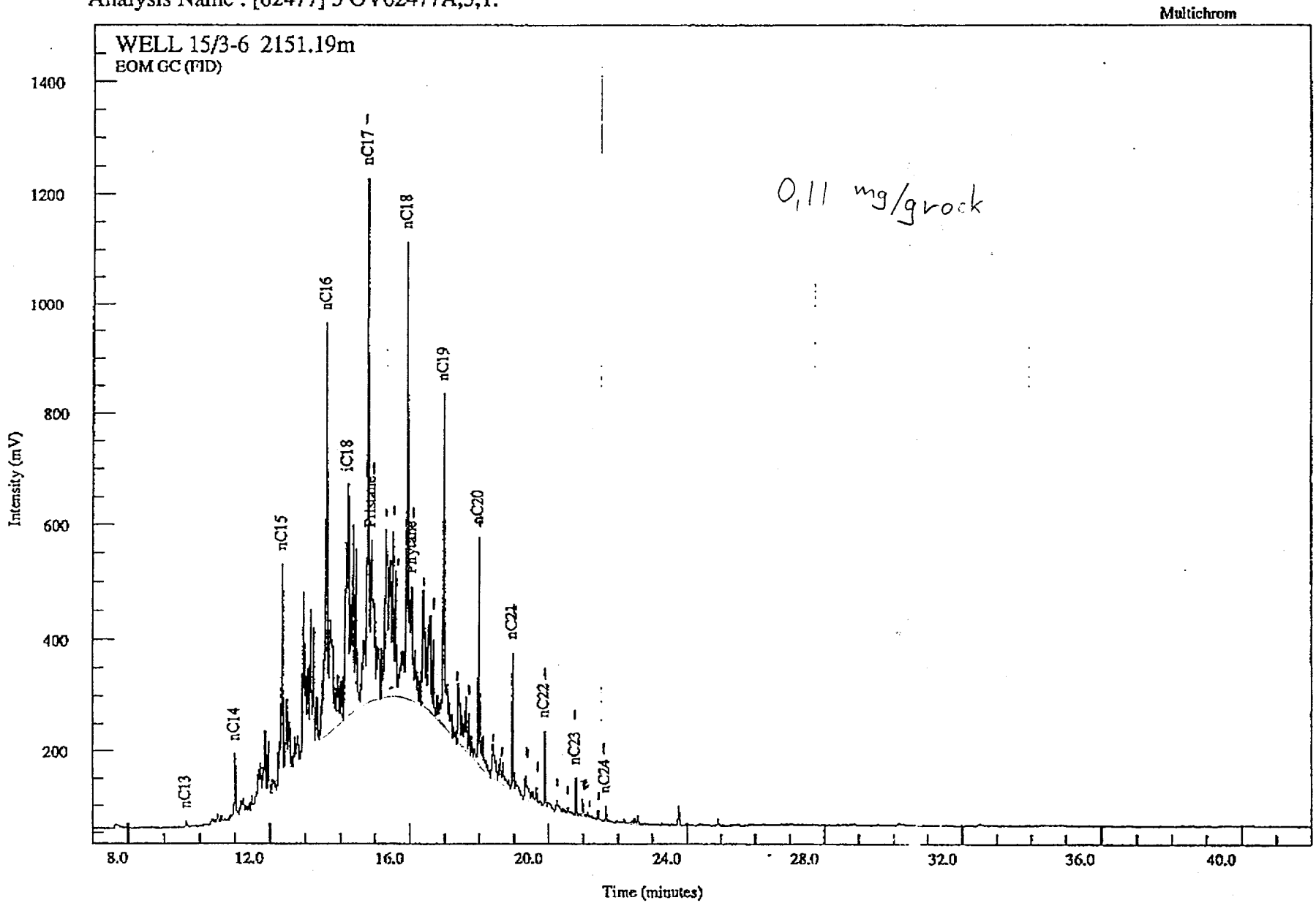


Figure 6.2

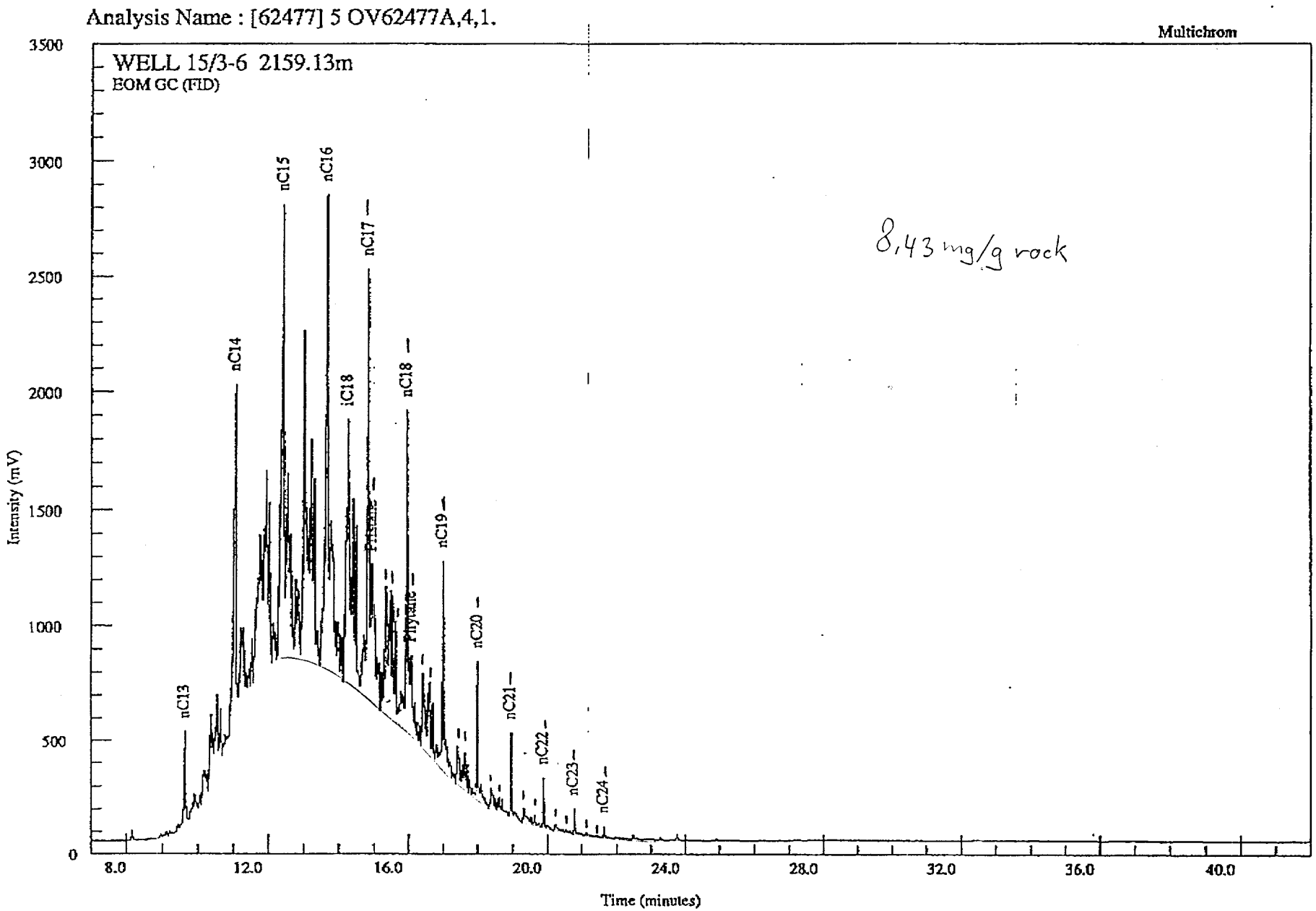

Analysis Name : [62477] 5 OV62477A,4,1.
Multichrom
WELL 15/3-6 2159.13m
EOM GC (FID)
8,43 mg/g rock
nC13
nC14
nC15
nC16
iC18
nC17
Pristane
nC18
Phytane
nC19
nC20
nC21
nC22
nC23
nC24
Intensity (mV)
3500
3000
2500
2000
1500
1000
500
0
8.0
12.0
16.0
20.0
24.0
28.0
32.0
36.0
40.0
Time (minutes)

Figure 6.3

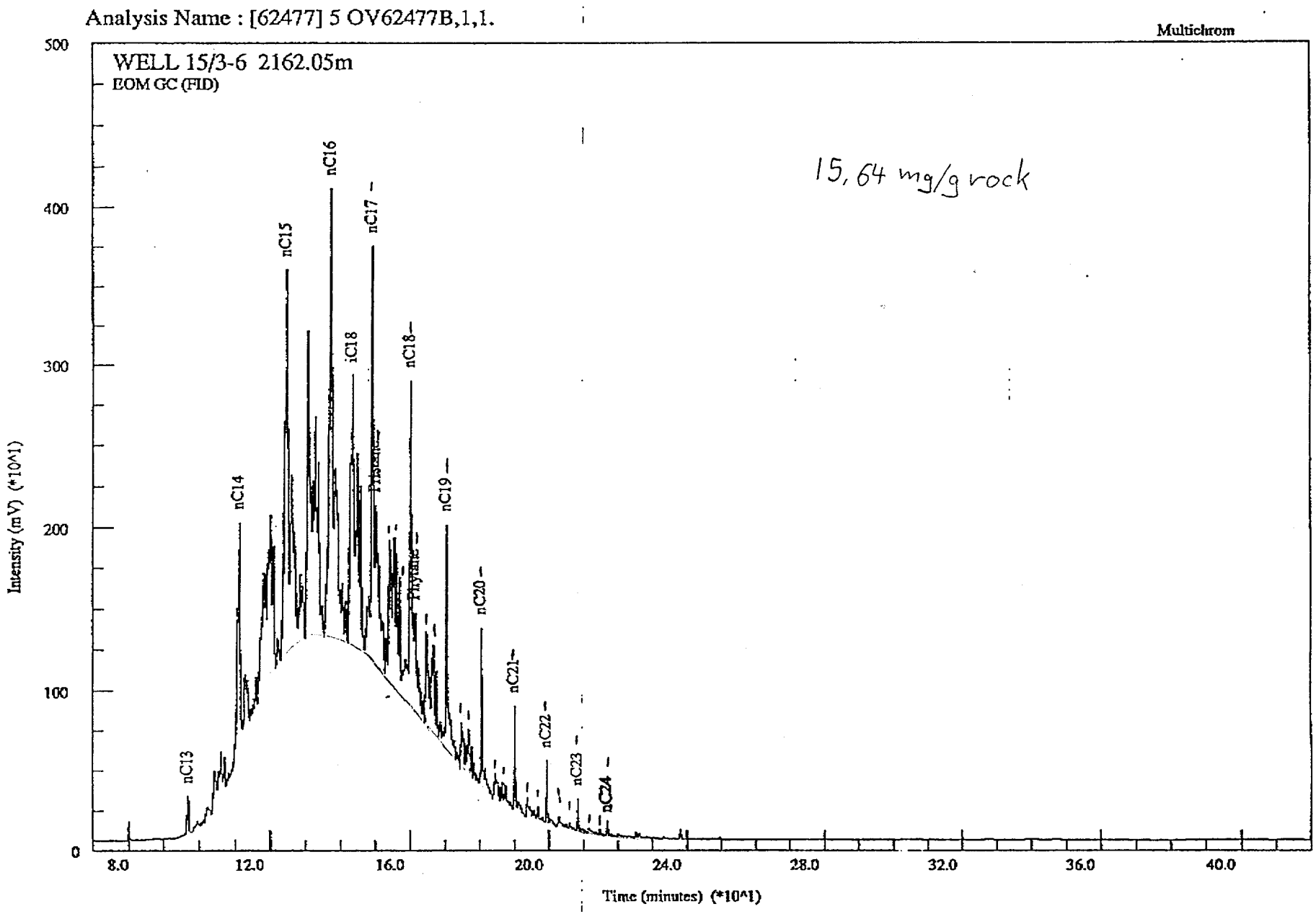

Analysis Name : [62477] 5 OV62477B,1,1.
Multichrom
WELL 15/3-6 2162.05m
EOM GC (FID)
15,64 mg/g rock
nC13
nC14
nC15
nC16
iC18
nC17
Pristane
nC18
Phytane
nC19
nC20
nC21
nC22
nC23
nC24
Intensity (mV) (*10^1)
Time (minutes) (*10^1)
0
100
200
300
400
500
8.0
12.0
16.0
20.0
24.0
28.0
32.0
36.0
40.0

Figure 6.4

Analysis Name : [62477] 5 OV62477A,6,1.

Multichrom

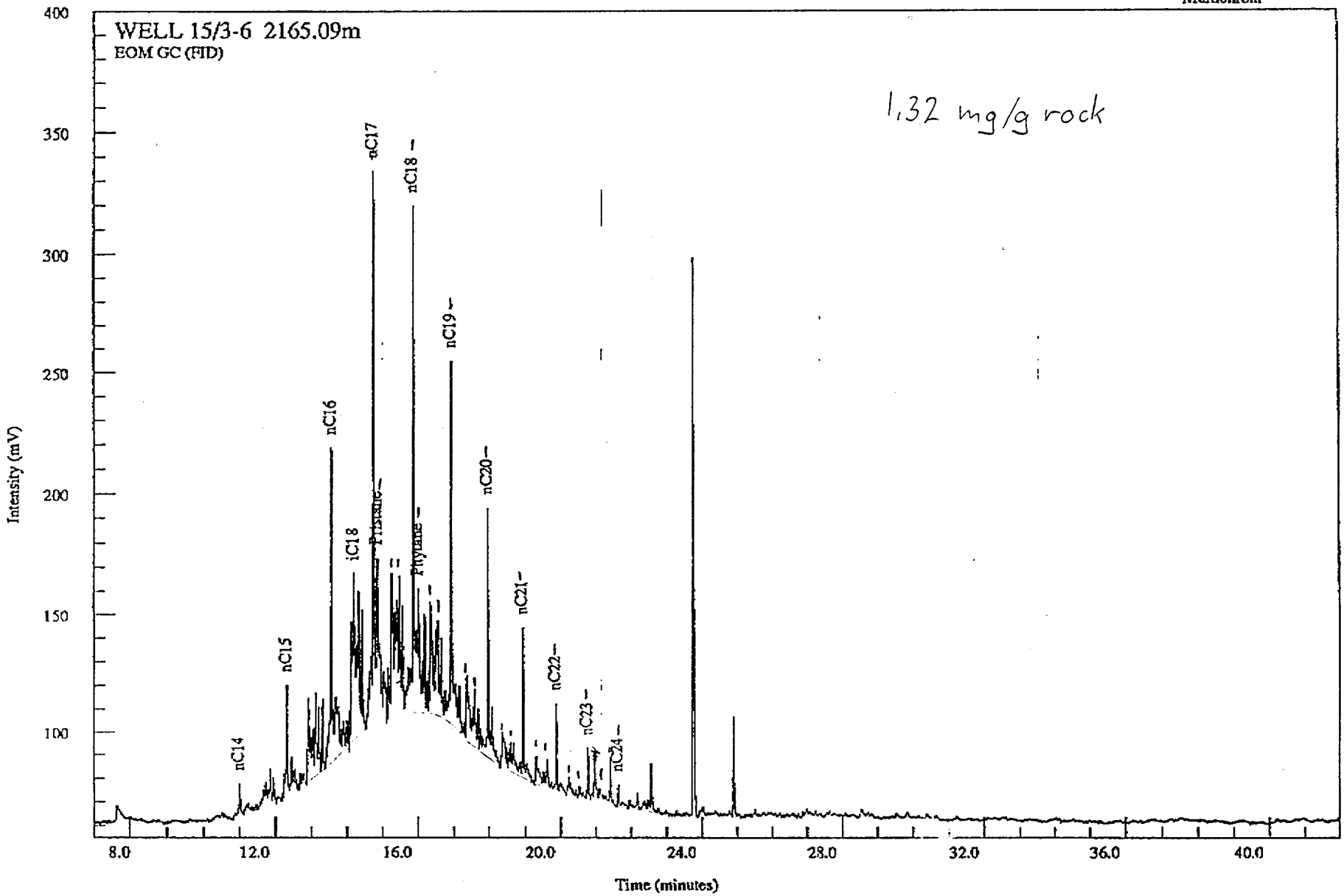


Figure 6.5

Analysis Name : [62477] 5 OV62477A,7,1.

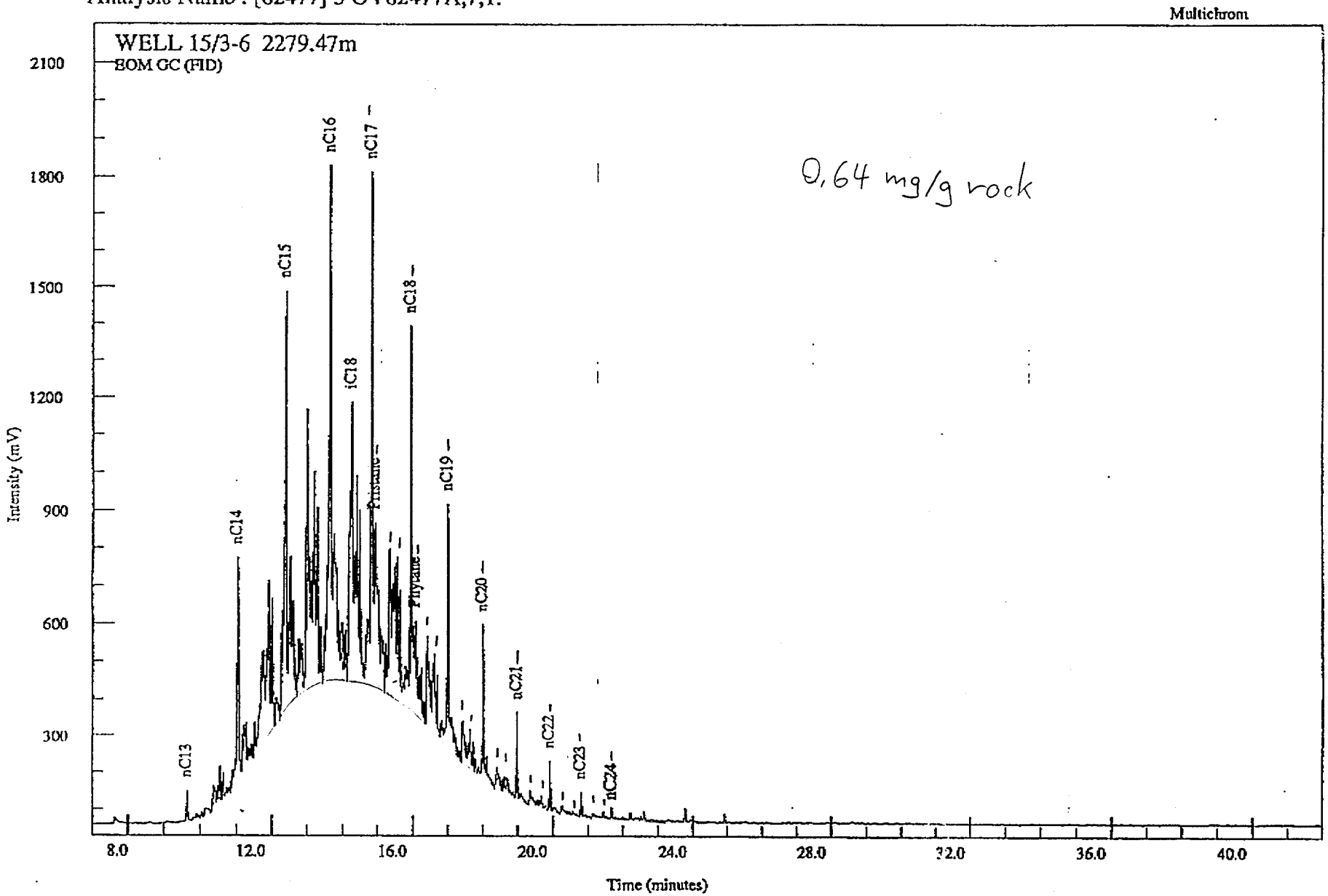


Figure 6.6

Analysis Name : [62477] 5 OV62477C,1,1.

Multichrom

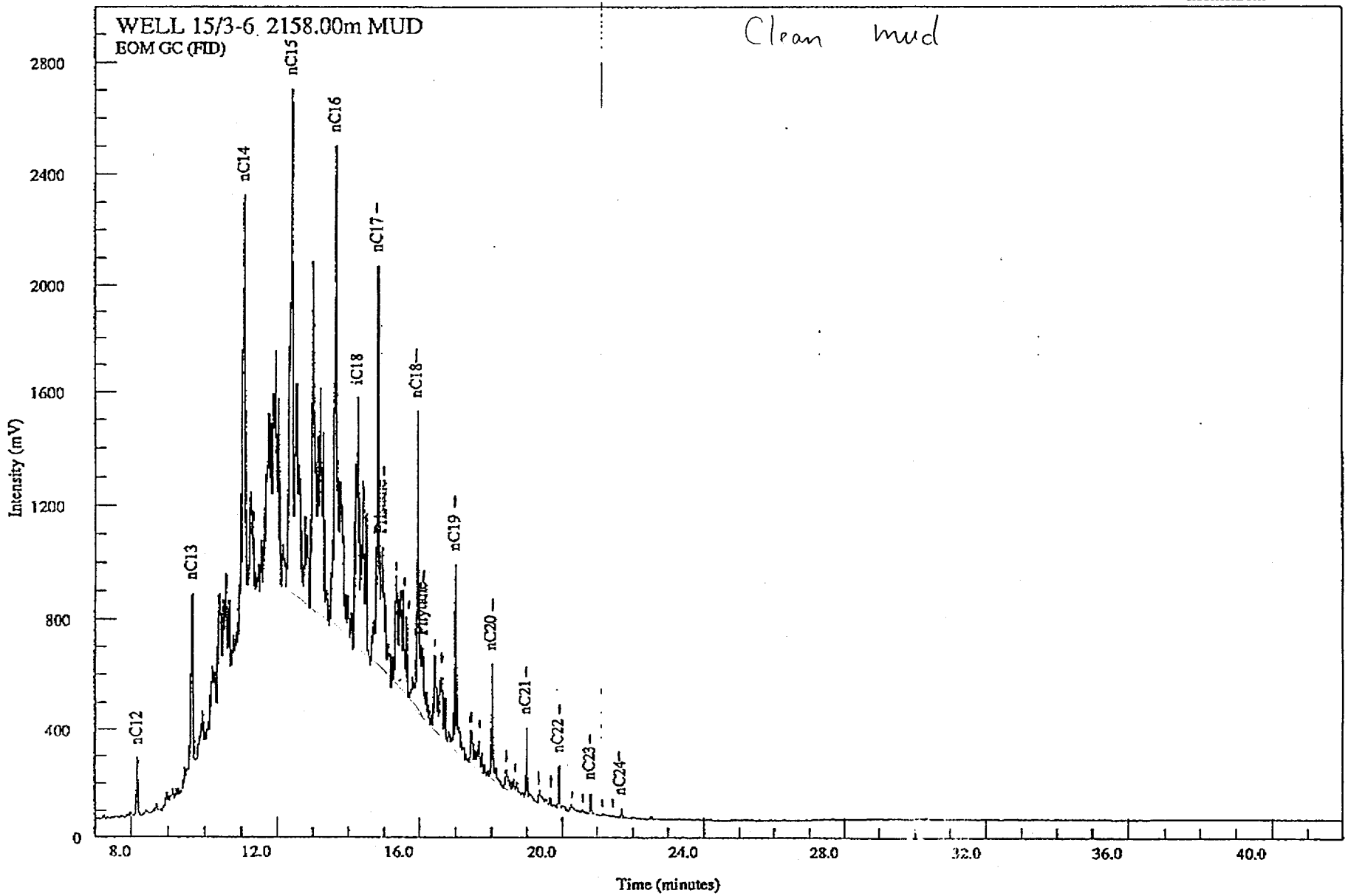


Figure 6.7

last one

Dataset: pinnsvin, Class: 1, Biplot 1 vs 2,Date 6/5/1999

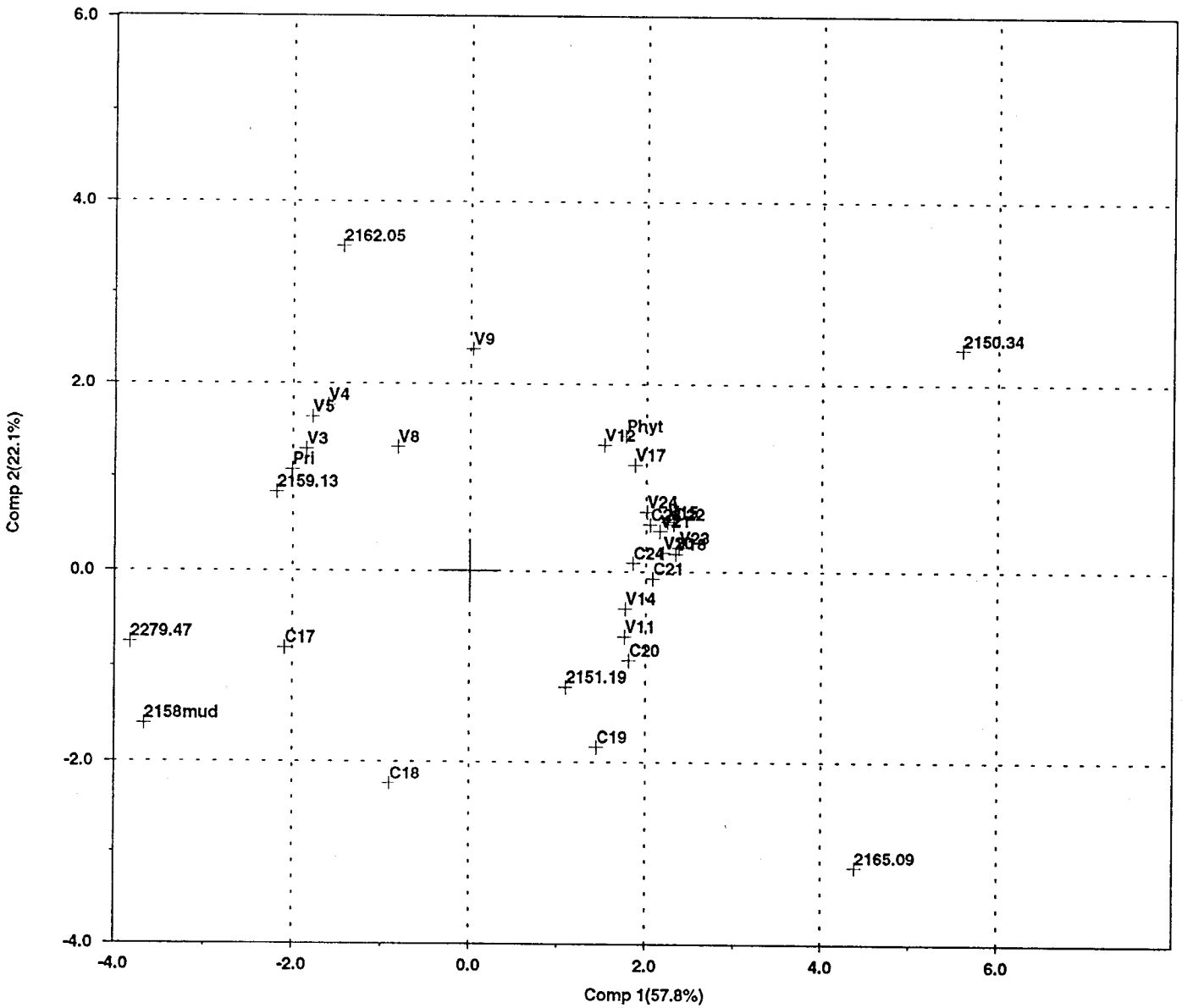


Figure 6.8

7. GEOPRESSURE AND TEMPERATURE

7.1. PORE PRESSURE

A total of 13 MDT tests were performed between 1246 and 2560 m MD. The results from these tests showed an equivalent pore pressure of 8.58 to 8.62 ppg and verified the pore pressure to be normal throughout the well, as expected. See Table 4-5 MDT Pressure Data Summary and figure 4.1 MDT Pressure Plot.

Following figure 7.1 plots predicted geopressures updated with actual MDT and LOT pressure measurements.

7.2. TEMPERATURE

Expected temperature gradient together with actual temperature are plotted figure 7.2 The expected temperature gradient was derived from static temperatures from offset wells. None of the temperature measurements for 15/3-6 are static, and the temperature profile for the well remains as anticipated from offset wells.

PINNSVIN 15/3-6 - Predicted Pressure comp. w/ Actual Measurements

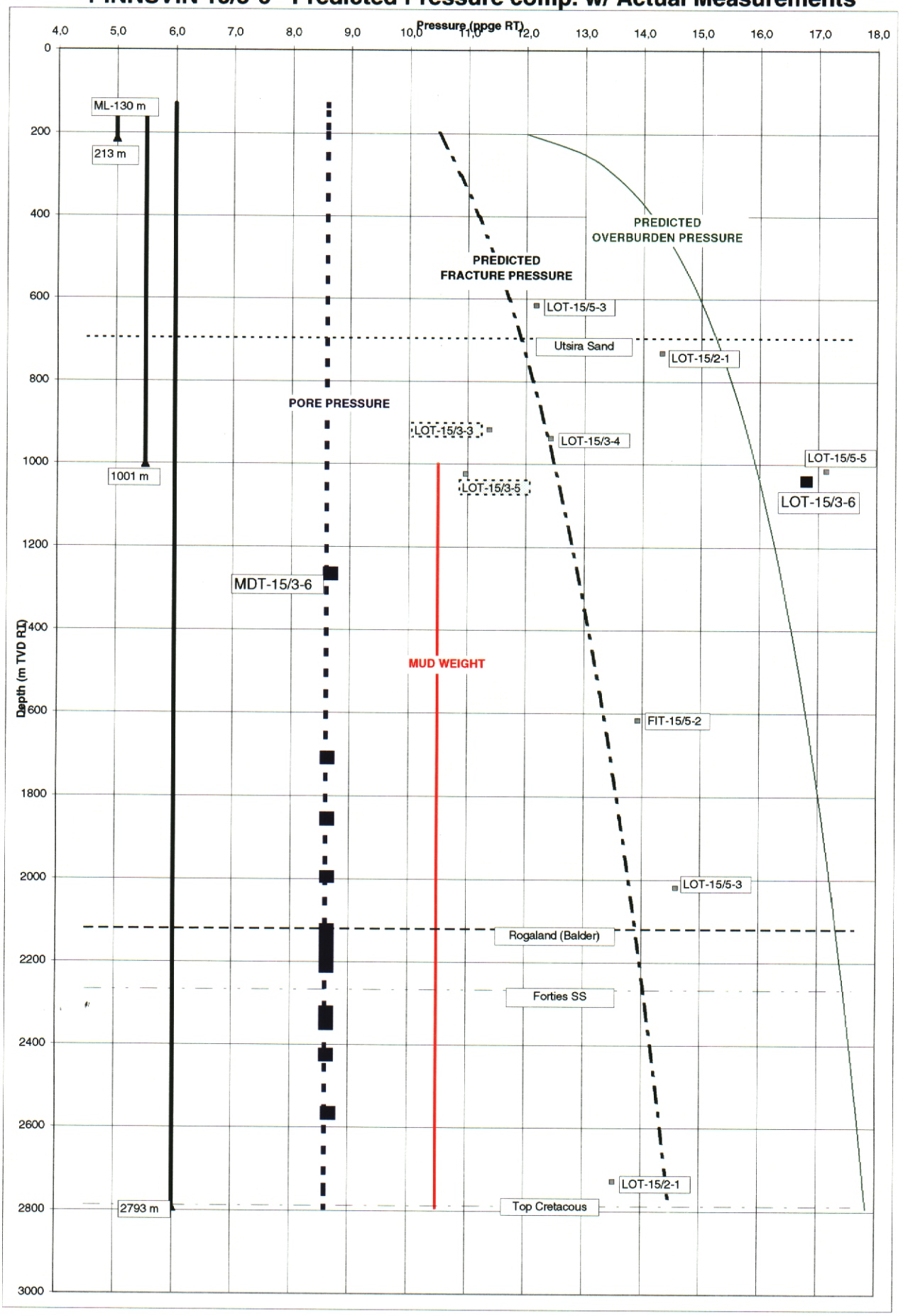


Figure 7.1

15/3-6 Temperature Profile

None of the actual 15/3-6 temperature measurements are static. Due to the single measurement it is not possible to extrapolate to a static bottom hole temperature. Expected temperature profile derived from maximum static temperatures from offset wells.

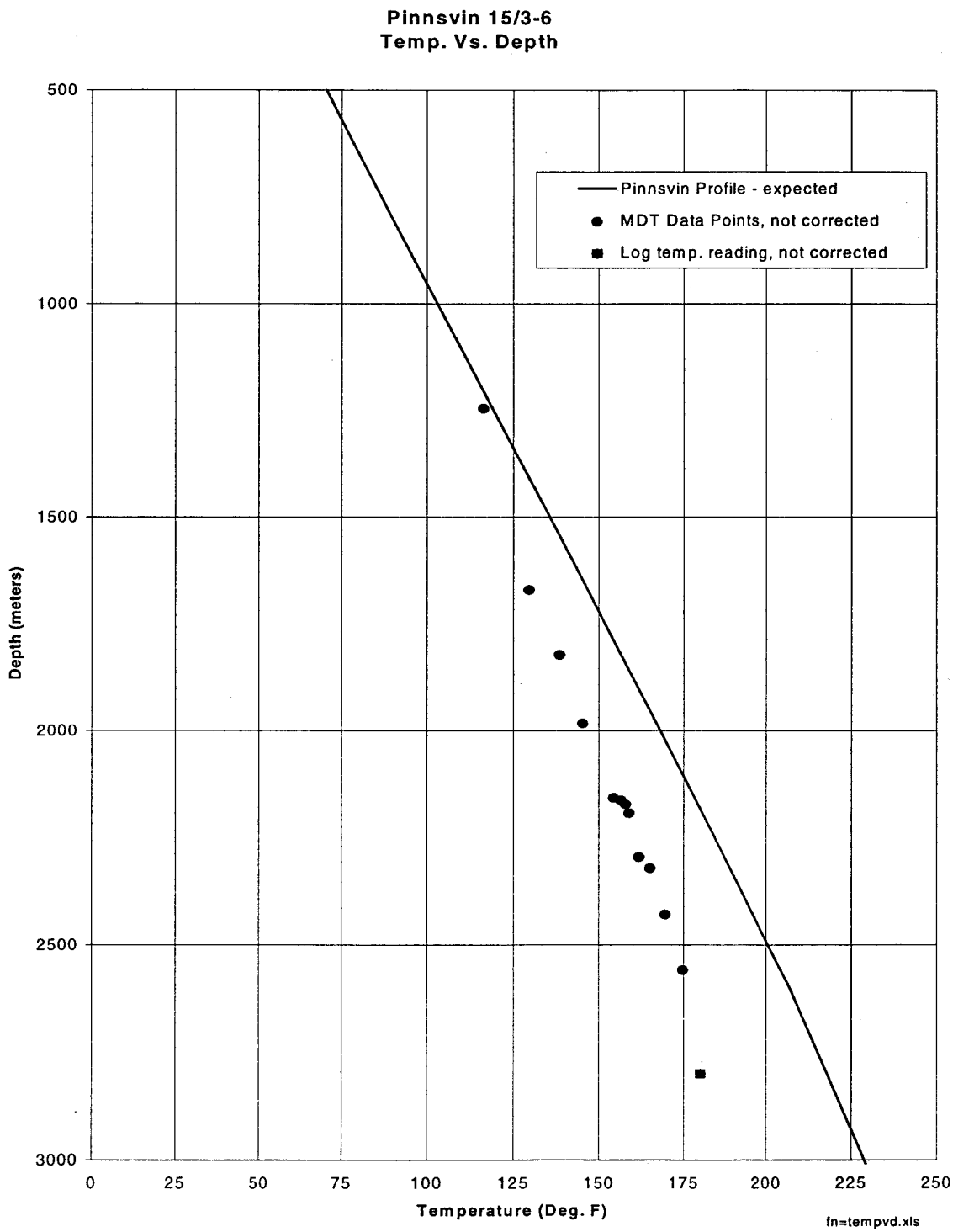


Figure 7.2

AMOCO NORWAY OIL COMPANY
Well Site Sample Description Sheet

Slot No.: -	Well No.: 15/3-6 (Pinnsvin)	K.B. Elevation: 23.0m
Water Depth:105m	Sheet: of: Date: 24th December 1998	Geologist: Edmunds/Greig

DEPTH, m	LITHOLOGICAL DESCRIPTION	SHOWS/COMMENTS
	Drilled 17 1/2" hole to 1015m, Set 13 3/8" casing @ 1001.2m. Drilled 12 1/4" hole to 1018m, performed LOT to 16.5ppg. Drill ahead 8 1/2" hole from	
1020	100% CLST: olv gy-occ lt olv gy, rr gn gy, sft, stky, hygroturgid, sl-mod calc, v slty, w/ tr vf qtz, mod micromica, sl microcarb, tr glauc spks.	
1030	100% CLST: pred olv gy, sft, stky hygroturgid, sl-occ mod calc, micromica, gen slty, sl microcarb, tr glauc spks, sl tr forams. Tr SLTST: dk gy, mod hd, blky, w cmtd, w/ vf qtz.	
1040	100% CLST: olv gy as above.	
1050	100% CLST: olv gy, bcmg sft-occ frm, blky & subfiss i/p, sl-mod calc, mod micromica, less slty, sl glauc spks & blk carb spks.	
1060	100% CLST: olv gy, sft-frm, blky-crmbly, slty, sl-mod calc a/a.	
1070	100% CLST: a/a.	
1080	100% CLST: a/a, v slty, grdg to Slty Clst, sl-mod calc, mod micac, sl tr glauc & carb spks,	
1090	100% CLST: a/a w/ minor tr brn gy Clst.	
1100	100% CLST a/a	
1110	100% CLST: a/a w/ loc abnt glauc pels assoc w/ more slty Clst, grdg to SLTST, tr shell frags, minor tr dk red brn CLST, frm, blky, non calc.	
1120	100% CLST: a/a olv gy. Tr SLTST: dk gn gy-olv gy, frm, crmbly, sl calc, v glauc, sdy, grdg to Slty Sst.	
1130	100% CLST: a/a, bcmg dk olv gy-olv blk i/p, v slty & loc glauc.	
1140	100% CLST: a/a	
1150	100% CLST: med-dk olv gy, bcmg less calc & less slty.	
1160	100% CLST: olv gy, bcmg incr frm, less slty, less calc. LST: lt olv gy-lt gy, frm-sl hd, blky, crpxln MDST, sl-mod arg.	
1170	100% CLST: a/a	

Slot No.: -	Well No.: 15/3-6	K.B. Elevation: 23.0m
Water Depth:105m	Sheet: of: Date: 24th December 1998	Geologist: Edmunds/Greig

DEPTH, m	LITHOLOGICAL DESCRIPTION	SHOWS/COMMENTS
1180	100% CLST: olv gy, locally silty, blocky-sub fissile, non calc. occasional glauc. occasional shell debris and carbonaceous flecks.	
1190	100% CLYST: olv gy, silty in parts, firm, blocky-sub fissile, slightly calcareous, occasional glauconite.	
1200	100% CLYST: olv gy, firm, blocky, sub fissile, slightly calc, locally rare carbonaceous flecks,	
1210	100% CLYST: olv gy, firm, blocky-tab, sub fissile, slightly calcareous, occasionally micromicaceous,with rare glauconite and carbonaceous flecks.	
1220	100% CLYST: dk gy, firm, blocky-sub fissile, slightly calc, rare glauconite.	
1230	100% CLST: a/a slightly calcareous.	
1240	40% CLYST: a/a also hygrturgid, with much shell debris. 60% SAND: lse qtz, fn-crse, clr-transluc, sub rd, sub spher. poor srtd. TR Lmst.	
1250	100% CLYST: dk gy, firm, blocky-tabular, sub fissile, slightly calc, occ carb flecks, hygroturgid.	
1260	80% SST: lse, clr, trnsl qtz, f-med, subrnd, subspher, mod srtd. 20% CLST: a/a, silty, hygroturgid.	
1270	100% CLST: dk gy, frm, blky-tab, subfiss, calc, micromica, glauc, tr pyr, carb	
1280	100% CLST: dk gy, frm, blky, sl calc, tr mica, glauc.	
1290	100% CLST: dk gy, frm, occ sft-frm, sl calc, rr glauc, loc micromica, tr pyr, tr scattered carb flecks.	
1300	100% CLST: dk gy, a/a, dk gy brn, sft-frm, blky, hygroturgid, tr glauc, sl calc.	
1310	100% CLST: dk gy, frm, blky, occ subfiss, sl calc, loc abnt glauc,micromica, tr	
1320	100% CLST: dk gy, frm, rr sft-frm, blky, tab, subfiss, sl-mod calc, rr shell occ glauc, micromica.	
1330	100% CLST: a/a, dk gy TR LST: lt gy brn, frm-hd, blky, crpxln, sl arg.	
1340	90% CLST: dk gy, frm, blky, subfiss, also lt gy, sft, hygroturgid, sl calc, tr micromica. 10% LST: as above.	
1350	90% CLST: dk gy, frm, blky,subfiss, sl-mod calc, micromica, rr glauc, tr carb 10% LST: lt gy, brn, frm-hd, blky, microxln, sl arg	
1360	100% CLST: dk gy, frm, blky, subfiss, a/a, also lt gy, sft-frm, blky, mod calc.	

Slot No.: -	Well No.: 15/3-6	K.B. Elevation: 23.0m
Water Depth:105m	Sheet: of: Date: 24th December 1998	Geologist: Edmunds/Greig

DEPTH, m	LITHOLOGICAL DESCRIPTION	SHOWS/COMMENTS
1370	100% CLST: dk gy, frm, blky, subfiss, sl-mod calc, loc micromica.	
1380	LOST SAMPLE	
1390	LOST SAMPLE	
1400	100% CLST: med-dk gy, frm, rr sft-frm, blky, subfiss, sl-mod calc, hygroturgid loc micromica, rr glauc.	
1410	100% CLST: med dk gy, blky, occ sub fiss, gen firm, occ. sft/fm, locally rare pyr, Tr Lmstn. lt brn, blky, hd, microxln.	
1420	100% CLST: dk med gy, blky-sub fiss, gen fm, sli calc, tr glauc. and micromic.	
1430	100% CLST: dk med gy, fm, also sft/fm hygroturgid. Tr SAND: v fn grn silty, poorly cmtd, friable.	
1440	LOST SAMPLE	
1450	100% CLST: dk gy, blocky, firm, occ sub fissile, sli calcareous.	
1460	MISSED SAMPLE	
1470	90% CLST: med gy, blocky, sft/firm, slightly calcareous. 10% LST: lt gy, blocky, hard,microxlln.	
1480	MISSED SAMPLE	
1490	80% CLST: dk gry, blocky, firm, slightly calc, micromicaceous. 20% LST: lt gy, lt gy brn, fm-hd, blocky, microxlln, slightly argill. and sandy	
1500	MISSED SAMPLE	
1510	100% CLST: dk gy, blocky, firm, occ sub fiss, locally lt gy, silty sli calc. Tr LST: med gy, blocky, hard, microxlln.	
1520	MISSED SAMPLE	
1530	100% CLST: dk gy, olv gy, firm, blocky- sub fissile, locally v. carbonaceous. Tr LST: lt gy wht, hard, microxlln, slightly argillaceous.	
1540	MISSED SAMPLE	
1550	100% CLST: olv gy, sft-firm, dk gy, firm, blocky, sub fissile, occasional silty non calcareous.	
1560	MISSED SAMPLE	

Slot No.: -	Well No.: 15/3-6	K.B. Elevation: 23.0m
Water Depth:105m	Sheet: of: Date: 24th December 1998	Geologist: Edmunds/Greig

DEPTH, m	LITHOLOGICAL DESCRIPTION	SHOWS/COMMENTS
1570	80% CLST: dk gy, olv gy, firm, blocky, non calc, micromic in parts. 20% SST: v fn- fn grn, poorly cmtd, fri, sub rdd, sub spher, mod srtd.	Samples to 1770m not representative. sand passing thru shaker screens and loggers sieves.
1580	MISSED SAMPLE	
1590	80% CLST: dk gy, olv gy, blocky-sub fissile, firm, 20% SST: fn-med grn clear-transluc qutz, poorly cmtd, fri, sub rdd, sub spher	
1600	MISSED SAMPLE	
1610	80% CLST: olv gy, dk gy, occ brn gy, gen fm, blocky-sub fiss, in parts 20% SST: v fn-fn grn, clear-transluc qutz, poorly cmtd, also lse crse qtx grns.	
1620	MISSED SAMPLE	
1630	90% CLST: dk gy, olv gy, blocky-sub fiss, non calc, 10% SST: v fn grn qutz, clear, transluc, poorly cmtd, friable	
1640	MISSED SAMPLE	
1650	70% CLST: dk gy, olv gy, firm, blocky-tab, non calc, 30% SST: v fn grn, a/a, also crse grained with rare glauc, poorly sorted.	
1660	MISSED SAMPLE	
1670	70% CLST: dk gy, olv gry, fm, blocky-tab, non calc, 30% SST: v fn- fn grn, poorly cmtd, also lse crse qutz, with rare glauc, poor	
1680	MISSED SAMPLE (logger locating fresh base oil to wash samples)	
1690	MISSED SAMPLE	
1700	MISSED SAMPLE	
1710	100% SST: med grn lse qutz, clear, transluc, sub ang, sub spher, mod srtd.	
1720	MISSED SAMPLE	
1730	50% CLST: olv gy, dk gy, blocky, tab, non calc. 50% SST: v fn grn, poorly cmtd, friable, also lse crse clear transluc qutz,	
1740	MISSED SAMPLE	
1750	50% CLST: olv gy, dk gy, firm, blocky, tab, non calc, hygroturgid, also locally 50% SST: gen med grn, lse qutz, sub rd, sub spher, rare glauc, also fn fri sstn.	
1760	MISSED SAMPLE	

Slot No.: -	Well No.: 15/3-6	K.B. Elevation: 23.0m
Water Depth:105m	Sheet: of: Date: 24th December 1998	Geologist: Edmunds/Greig

DEPTH, m	LITHOLOGICAL DESCRIPTION	SHOWS/COMMENTS
1770	50% SAND: med grn, lse clear, transluc, qutz, sub rdd, sub spher, well srtd. 50% CLST: olv gy, dk gy, sft/firm, blocky, non calcareous.	
1780	MISSED SAMPLE	
1790	100% SAND: v fn-fn grn, clear transluc qutz, mod srtd.	
1800	MISSED SAMPLE	
1810	100% SST: fn- med grn, poorly cmtd, clear, transluc qutz, sub rounded, sub mod well sorted with occasional glauconite.	
1820	MISSED SAMPLE	
1830	100% SAND: v fn-fn grn, lse clear qutz, mod srtd.	
1840	MISSED SAMPLE	
1850	100% SAND: med grn lse qutz, clear, transluc, sub ang-sub rdd, sub spherical mod well sorted.	
1860	MISSED SAMPLE	
1870	100% CLST: med dk gy, olv gy, blocky -tabular, sub fissile, non calc, soft-firm hygroturgid in places.	
1880	MISSED SAMPLE	
1890	100% CLST: med gy, sft-firm, bloocky-tabular, non calc, hygroturgid. Tr LST: lt orange brn, blocky, hard, microxlln	
1900	MISSED SAMPLE	
1910	100% CLST:med dk-dk gy, frm, blky-sbplty, sbfiss, non calc, homog, tr dsky TR LST: lt olv gy-lt gy, sl hd, blky, micxln.	
1920	LOST	
1930	LOST	
1940	100% CLST: med dk-dk gy, frm, blky-sbplty, sbfiss-fiss, non calc, shaly, w/ tr gy-dk gn gy Clst. abnt vf SD on shakers	
1950	LOST	
1960	100% CLST: med dk-dk gy, a/a, minor dk blu gy, w/ tr dism pyr. TR LST: lt olv gy, yell gy, sl hd, micxln.	

Slot No.: -	Well No.: 15/3-6	K.B. Elevation: 23.0m
Water Depth:105m	Sheet: of: Date: 24th December 1998	Geologist: Edmunds/Greig

DEPTH, m	LITHOLOGICAL DESCRIPTION	SHOWS/COMMENTS
1970	Missed Sample	
1980	CLST: 50% a/a SD:50% lse. clr, v fn grn, sub rdd, occ sub ang, mod srtd, tr lithic grns, no vis cmt.	
1990	Missed Sample	
2000	CLST: 30% a/a med dk gy. SAND: 70% lse, v fn grn occ med grn,	
2010	Missed Sample	
2020	CLST: 80% med-dk gry, firm, sub plty, sub blky, sub fiss-fiss, non calc, sli SD: 20% a/a	
2030	Missed Sample	
2040	CLST: 100% med-dk gy a/a, also dk grn gry, grn blk, tr dk brn gry.	
2050	Missed Sample	
2060	CLST: 100% pred dk brn gy,fm, blky, sub fiss non calc, also med -dk gy, loc dk gry-blk, tr glauc. Tr LST: fm-hd, blky,microxlln.	
2070	Missed Sample	
2080	CLST: 100% gy brn, dk brn gy, a/afirm, sub plty, LST: Tr. lt gy, lt yell gy, fm-hd, blky.	
2090	Missed Sample	
2100	CLST: 100% gy brn-brn gy, a/a also occ gry blu grn, and gy to dk gry glauc clst LST: tr. lt yell gry to lt gy, blky- crmbly. fm-hd.	
2110	CLST: 90% med blu gry-blu grn a/a Tuff: tr. v lt gy blky firm.	
2120	CLST: 100% gen med dk gy, also blu gy, gy brn, locally micromic, tuffaceous	
2130	CLST: 100% med dk-dk gy, also gy brn, blu gy, a/a with tr argill lst and firm xlln lmstn, also sli tr speckld tuffaceous clst.	
2140	CLST: 90% med dk gy, med dk blu gy, with sli tr argill lmst, SST. 10% off wht, lt gy, v fn -fn grn, sub ang, clr qutz, also ground up, no show.	
2140 **2158**	**-2158 Core run #1** **- 2177 Core run # 2**	

Slot No.: -	Well No.: 15/3-6 (Pinnsvin)	K.B. Elevation: 23.0m
Water Depth:105m	Sheet: of: Date: 24th December 1998	Geologist: Edmunds/Greig

DEPTH, m	LITHOLOGICAL DESCRIPTION	SHOWS/COMMENTS
2179	CLST: 100% med dk gy, olv gy, blocky-tab, occ sub fiss,fm-med hd, non calc. Tr Tuff: gy, spkld, blocky, fm.	
2182	CLST: 100% lt, dk gy, olv gy, blocky-tab, rarely platy, occ silty partings, non Tr Tuff: a/a Tr LST: lt brn, blocky, microxlln.	
2185	CLST: 100% med dk gy,,, rare gy brn, blocky, sub fiss,occ plty, non calc, tr pyr, rare carb flecks.	
2188	Missed Sample	
2191	CLST: 80% Med gy, olv gy, blocky, sub fiss, non calc. SST: 20% fn grn, off wht, with rock flour, no vis por	
2194	CLST: 80% med dk gy, firm, blky, tab, occ plty, silty, rare carb flecks. SST: 20% fn grn, off wht, much rock flour, sli calc, no vis por.	
2197	CLST: 90% med gy, rare dk gy, blky, firm, non calc. Tuff: 10% lt steel gy, blky, speckled. Tr LST: lt brn, blky, hd, microxlln.	
2200	CLST:90% dk med gyblky. fm, sli calc, rare pyr. Tuff: 10% a/a	
2203	CLST: 90% med dk gy, blky, fm, sli calc, occ pyr. TUFF: 10% lt gy blu gry steely, fm, blky, speckled. Tr LS: a/a	
2206	CLST: 90% med-dk gy, fm, blky, sli calc, occ pyr and carb flecks. TUFF: 10% a/a	
2209	CLST: 100% lt med gry, blocky-tab gen firm, sli calc, occ pyr and carb flecks. Tr Tuff a/a	
2212	CLST: 100% med gy, occ gy brn, blky-tab, occ plty, firm, occ carb flecks,rare	
2215	Missed Sample	
2218	CLST: 100% lt med gy, blky-tab,rare sub fiss, fm-sli hd, scattered carb flecks, pyr patches. Tr Tuff steel gy, blugy, blocky, firm,	
2221	CLST:100% med dk gy, v fm, blky, sub plty, sub fiss, micromic, tr olv grn grn, tuffaceous, Tr Tuff: lt-med gy, blky, fm, crmbly.	
2224	CLST: 100% gry, incr olv gy, blky, non calc, firm. TUFF: TR olv gy, olv brn, sli hard, poss phosphat nodules. Tr LST.	
2227	Missed Sample	
2230	CLST: 100% A/a, LST: pale yell brfn, firm, blky,	

Slot No.: -	Well No.: 15/3-6	K.B. Elevation: 23.0m
Water Depth:105m	Sheet: of: Date: 24th December 1998	Geologist: Edmunds/Greig

DEPTH, m	LITHOLOGICAL DESCRIPTION	SHOWS/COMMENTS
2233	CLST:100% med-dk gy, firm, blky, tr olv gy, Tr LST: pale yell brn firm-hd, blky.	
2236	CLST: 100% med dk gy, firm, blky, micromic, sli tuffaceous, Tr Dolomitic LST pale yell brn, firm, blky,	
2239	CLST: med dk gr, tr olv gy, gen a/a tr micromic, carb specks, tr med gy tuff clst	
2242	CLST: 100% med dk gy, occ olv gy, firm-hd, LST: tr, lt olv gy, fm-hd, blky, microxlln,	
2245	CLST: 100% med dk gy-dk gy, firm, blky, sub fiss, non calc, micromic, Tr LST olv gy, hd, blky.	
2248	CLST:100% a/a also olv gy, med dk gy-grnblk	
2251	CLST: 100% a/a tr tuffmed lv gy Tr LST dolomitic pale yell brn.	
2254	CLST:100% a/a Tr SST: v fn grn, off wht	
2257	CLST:100% a/a med dk gy, dk olv gy, Tr SST: v fn grn, ground up by bit, also clr sb ang qutz.	
2260	CLST: 90% med dk gy, olv gy, blky, firm, to sub fiss, non calc, SST: 10% lse v fn grn, clr, well srtd qutz, sub ang-sub rdd,	
2263	CLST: 80% a/a med-dk gy SST: 20% v fn grn, ground up to rock flour, mod- well srtd, tr glauc, no vis por	
2266	CLST: 100% a/a SST TR: v fn grn, ground to rock flour, pred qutz,clr, tr glauc and carb specks	
2269	Missed Sample	
2272	CLST: 40% a/a tr lt gry grn, blu grn, SST: 60% v lt gy, v fn-fn grn, tr med grn, sub rdd qutz, no vis por,	
2275	CLST: 50% med dk gy, a/a v fm. blky, fiss, non calc, tr glauc and carb flecks, SST: 50% lt gy-lt gy, rock flour, v fn-fn grn qutz, tr glauc, also carb specks.	
2278	CLST: 40% med gry a/a, also olv gy, brn gy, non calc, SST: 60% v lt gy rock flour, a/a, tr glauc, tr v fn-med grn qutz.	
2278	**-2297m Core # 3**	
2299	Missed Sample	
2302	Missed Sample	
2305	Missed Sample	

Slot No.: -	Well No.: 15/3-6	K.B. Elevation: 23.0m
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DEPTH, m	LITHOLOGICAL DESCRIPTION	SHOWS/COMMENTS
2308	CLST:40% pred med-med dk gy, occ dk blu gy, dk grn gy, v fm, blky, sub fiss, SST: 60% lse v fn -fn grn, locally rock flour, tr lithic grns, tr carb mat.	
2311	Missed Sample	
2314	CLST: 50% med-med dk gy a/a, occ dk blu gy, v fm, blky, SST: 50% rock flour, lt gy-v lt gy, v fn-fn grn, mod srtd, also lt med gry silty ss.	
2317	Missed Sample	
2320	SST: 70% predom lse v fn -fn grn, also rock flour, , tr glauc, CLST: 30% med med dk gy, blky, sub fiss, firm sli silty, also occ blky-splntry.	
2323	Missed Sample	
2326	CLST: 20% med- occ med dk gy, tr blu gy, a/a SST: 80% lse. predom, fn grn, occ v fn grn, tr glauc, and carb frags,	
2329	Missed Sample	
2332	CLST: 60% med-med dk gy, a/a tr blu gy, grn gy. SST:40% lse fn-med occ crse grn, poor srt, sub ang sub rd, sb spher, Tr LST.	
2335	Missed Sample	
2338	CLST: 90% med dk gy, occ dk gy, firm blky, sub fiss, micromic, carb mat ips SST: 5% lse fn-med grn, clr sub rdd, a/a	
2341	Missed Sample	
2344	CLST: 100% a/a med dk gy LST: tr, pale yell brn, fm, blky,	
2347	Missed Sample	
2350	CLST:100% med dk-dk gy, firm, blky, sub fiss, non calc, microcarb and	
2353	Missed Sample	
2356	CLST: 100% a/a Tr LST: gy-yell gy, hd, blky, microxlln, slightly argillaceous.	
2359	Missed Sample	
2362	CLST:95% med dk gy-dk gy, incr dk blu gy, tr dk grn gy, fm, blky, sb fissn non LST: 5% pale yell brn, ly gy-yell gy, fm-hd, blky, sli arg,	
2365	Missed Sample	

Slot No.: -	Well No.: 15/3-6	K.B. Elevation: 23.0m
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DEPTH, m	LITHOLOGICAL DESCRIPTION	SHOWS/COMMENTS
2368	CLST:100% med dk gy, inc dk grn gy, minor olv gy, fm, blky, sub fiss, in parts fiss, shaly, rare dissem pyr.	
2371	Missed Sample	
2374	CLST: 100% med dk gy, occ dk grn gy, a/a loc glauc, firm, commonly fiss,	
2377	Missed Sample	
2380	Missed Sample	
2383	CLST: 95% med dk gy, loc,,,dk grn gy, a/a with increasing silt content. CLST: 5% med gy, firm crmbly, non calc, com carb streaks, micromic.	
2386	Missed Sample	
2389	Missed Sample	
2392	CLST:90% dk grn gy, med dk gy, shaly SST: 10% v fn grn, lse, clr, well srtd, some rock flour, tr carb specks. Tr LST	
2395	Missed Sample	
2398	Missed Sample	
2401	Missed Sample	
2404	CLST:60 % med dkgy, dk grn gy, firm, blky, sub fiss, non calc, microcarb. SST: 40% v fn-fn, clr, subang, mod srtd, tr carb flecks, LST: tr lt yell gry,	
2407	Missed Sample	
2410	Missed Sample	
2413	Missed Sample	
2416	Missed Sample	
2419	CLST:60% predom dk gy, a/a SST:40% predom rock flour, occ fri, silty, v fn grn.	
2422	Missed Sample	
2425	Missed Sample	

Slot No.: -	Well No.: 15/3-6	K.B. Elevation: 23.0m
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DEPTH, m	LITHOLOGICAL DESCRIPTION	SHOWS/COMMENTS
2428	CLST:100% pred dk grn gy, firm, blky, non calc, sli micromic, sli microcarb, tr med gy-lt gy clst.	
2431	Missed Sample	
2434	Missed Sample	
2437	CLST:80% dk gy-med dk gy, SST:20% lse, fn grn, tr rock flour, LST: tr, pale yell brn, fm, blky,	
2440	Missed Sample	
2443	Missed Sample	
2446	CLST: 90% pred dk grn gy a/a, tr med dk gy, fm, blky, SST:10% a/a gen ground up to rock flour.	
2449	Missed Sample	
2452	CLST: 60% dk grn gy, fm-v fm, blky, splntry, fiss, shaly in parts. SST: 40% gen lt gy fri rock flour, v fn grn well srtd.	
2455	Missed Sample	
2458	CLST:50% dk grn gy, med dk gy, gen a/a, shaly, in parts tr carb strks. SST:50% lt gy, some rock flour, a/a v fn clr qutz, tr carb specks.	
2461	Missed Sample	
2464	Missed Sample	
2467	CLST:50% a/a SST: 50% a/a	
2470	Missed Sample	
2473	Missed Sample	
2476	CLST:90% dk grn gy, incr med dk gy, fm, blky, non calc,sub fiss, occ blk carb SST: 10% lt gy rock flour, v fn -fn grn qutz, non calc.	
2479	Missed Sample	
2482	Missed Sample	
2485	CLST:100% dk grn gy, med blu gry, fm, blky, sub fiss, non calc, carb strks SST; Tr. lt gy, rock flour and silt size qutz.	

Slot No.: -	Well No.: 15/3-6	K.B. Elevation: 23.0m
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DEPTH, m	LITHOLOGICAL DESCRIPTION	SHOWS/COMMENTS
2488	Missed Sample	
2491	Missed Sample	
2494	CLST:90% dk grn gy,med gy, fm, blky, sub fiss-fiss, loc splntry, silty, carb SST:10% lt gry rock flour v fn -silt size qutz.	
2497	Missed Sample	
2500	Missed Sample	
2503	CLST: 100%dk grn gy, occ gy, fm blky, splntry, sub fiss-fiss, loc glauc, sli	
2506	Missed Sample	
2509	Missed Sample	
2512	CLST:100% dk grn gy-grn gry, a/a med brn gy, LST: tr, v lt gy, yell gy, fm, blky, crmbly	
2515	Missed Sample	
2518	Missed Sample	
2521	Missed Sample	
2524	Missed Sample	
2527	Missed Sample	
2530	CLST: 90% grn gy-dk grn gy. occ gy blu, fm, blky, sub fiss,non calc SST: tr lt-med gy, rock flour, v fn-fn grn clr qutz.	
2533	Missed Sample	
2536	CLST: 80% gry grn-dk grn gy, med dk gy, a/a SST:20% lt-med gry, rock flour, fn-v fn grn qutz.	
2539	Missed Sample	
2542	CLST: 90% a/a tr gy blu grn SST: 10% rock flour, a/a v fn grn qutz, Tr LST. lt gy, blky, hd, amorph, argill.	
2545	Missed Sample	

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DEPTH, m	LITHOLOGICAL DESCRIPTION	SHOWS/COMMENTS
2548	CLST: 80% dk grn gy, tr gy blu firm blky, sub fiss-fiss,occ sub plty, micromic SST:20% lt gy rock flour, v fn -fn grn, silty qutz, tr lithic frags,	
2551	Missed Sample	
2554	CLST: 80% dk grn gy, occ med dk gy, a/a SST: 20% lt gy, rock flour, v fn grn silty qutz, a/a	
2557	Missed Sample	
2560	CLST: 40% dk grn gy, blky, occ splntry, fiss ips, SST: 60% lt gy rock flour, gen v fn grn, carb strks, gen sub rdd grns.	
2563	Missed Sample	
2566	Missed Sample	
2569	Missed Sample	
2572	CLST: 30% lt grn gry, rare gry grn, blkt-tab.occ fiss, SST: 70% lt gy, mainly rock fllour, fn-med grn, occ carb, silty, no vos por.	
2575	Missed Sample	
2578	CLST:20% lt gry, lt grn gy, blky-tab, rare fiss, fm, SST:70% lt gy.off wht, occ fn grn qutz, mainly rock flour, rare lithic frags, silty.	
2581	Missed Sample	
2584	CLST:20% lt gy, lt grn gy, blky, fm-mod hd, SST: 80% lt gy, off wht, occ fn grn, clr qutz, mainly rock flour, rare lithic frags.	
2587	Missed Sample	
2590	CLST:20% lt-med gry, occ grn gry, fm, blky-tab.rare silty partings, occ carb SST:80% fn med grn clr transluc qutz, subang subrdd, sub spher,mod srt, rare	
2593	Missed Sample	
2595	Missed Sample	
2598	Missed Sample	
2602	SST:100% fn med grn clr transluc qutz, sub rdd sub spher, poor srtd, tr rock CLST: tr. gry grn, fm-mod hd, blky-tab.	
2605	Missed Sample	

Slot No.: -	Well No.: 15/3-6	K.B. Elevation: 23.0m
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DEPTH, m	LITHOLOGICAL DESCRIPTION	SHOWS/COMMENTS
2608	CLST: 20% med gry,grn gy, tab-sub fiss, fm-mod hd, occ carb flecks. SST:80%med gy, off wht, clr transluc qutz, occ rock flour, poor cmt, fri, poor	
2611	Missed Sample	
2614	CLST:70%med dk gy, blky-tab, sub fiss, fm, occ carb flecks. SST:30% fn med grn qutz a/a, also med gry a/a	
2617	Missed Sample	
2620	Missed Sample	
2623	Missed Sample	
2626	Missed Sample	
2629	Missed Sample	
2632	CLST:30% med gy, gy grn, blky-sub fiss, fm-mod hd ,rare steel gy tuff, occ pyr. SST:70%lt gy off wht also clr transluc qutz, fn-med grn, much rock flour, poor	
2635	CLST:80%med gy, grn gry, blky-tab, occ sub fiss, silty in parts, rare pyr, non SST: 20%fn med rare crse grn, in parts rock flour, poor srtd, fri.	
2638	CLST:70% med gy,blky-tab, occ fiss and splntry, fm-mod hd. SST:30% lt gy off wht, also clr-transluc, v fn-fn grn, poor srt, in parts rock flour.	
2641	CLST:20% med gy, gry grn, gen blky.tab,occ carb flecks rare pyr dustings. SST: 80% fn grn with some rock flour a/a.	
2644	Missed Sample	
2647	Missed Sample	
2650	CLST:20%med gry, occ grn gy, fm, blky, occ carb flecks. SST:80% fn grn a/a some rock flour, poor to mod cmt, fri,	
2653	CLST:20% a/a SST:80%lt gy off wht, also clr transluc qutz,fn med grn poor srt, fri,	
2656	CLST:10% med gy, blky-tab, sub fiss, firm SST: 90% fn grn a/a, slightly calc cmt, weak fri.	
2659	CLST:30% lt med gy, fm blky, sli calc. SST:70%lt gy off wht, gen fn grn, mod srtd, sli calc cmt, weak fri	
2662	Missed Sample	
2665	Missed Sample	

Slot No.: -	Well No.: 15/3-6	K.B. Elevation: 23.0m
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DEPTH, m	LITHOLOGICAL DESCRIPTION	SHOWS/COMMENTS
2668	CLST:60% lt-med gy, fm blky, sli calc SST:40% a/a	
2671	Missed Sample	
2674	CLST:80% lt med gy, blky-plty,fm calc, grades to marl (v. homogenous) SST:20% lt gy, off wht, also clr-transluc, fn grn poor cmt fri, some rock flour.	
2677	Missed Sample	
2680	CLST: 80% lt-med gy, blky, locally v. calc. SST:20% a/a	
2683	CLST:20% lt med gy, occ grn gy, blky, fm, calc, SST:80% v fn-fn grn, occ rock flour subang, sub rdd, poor-mod srt, sli calc cmt.	
2686	CLST:90% lt med gy, blky, tab, calc, fm, marly SST:10% a/a	
2689	Missed Sample	
2692	Missed Sample	
2695	Missed Sample	
2698	Missed Sample	
2701	Missed Sample	
2704	CLST: 60% lt gy, off wht, sft-fm, blky, hygroturgid, v calc, marly SST:40% lt gy off wht, also clr transluc, fn grn, poor cmtd, fri, some rock flour.	
2707	CLST:60% lt gy, off wht, blky, sft-fm,v calc, hygroturgid SST:40% a/a	
2710	CLST:70% lt gy, off wht a/a SST:30% fn grn,lt gy, off wht, clr transluc, mod srt, poor cmt, fri, no vis por.	
2713	CLST:100% lt gy med gy rare brn gy, tab-blky, sft-fm, v. calc, marly	
2716	CLST:100%lt gy off wht, rare gy brn, blky-tab gen sft, v calc, marly	
2719	CLST:90% a/a LST:10% lt gy, blky-tab, fm hd, microxlln, argill.	
2722	CLST:40% lt med gy, blky, v calc, marly LST: 60% lt gy, off wht, blky.fm-hd, microxlln, sli argill	
2725	CLST:10% a/a LST: 90% a/a	

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DEPTH, m	LITHOLOGICAL DESCRIPTION	SHOWS/COMMENTS
2728	CLST: 10% lt med gy, fm blky calc. LST: 90% lt gy off wht blky fm-hd.	
2731	Missed Sample	
2734	CLST:10% med gy, fm blky, tr pyr, calc. LST:60% a/a. SST:30% lt gy off wht clr transluc qutz, fn grn also rock flour	
2737	CLST:30% lt med gy, blky, tab, calc, tr pyr. LST:70% lt gy off wht, blky, tab, microxlln, sli argill	
2740	CLST:20% a/a LST:80% a/a. SST: tr	
2743	CLST:30% med gy,red brn, sft-fm,blky, tab,v calc. LST:70% lt med gy, fm, blky, amorph,sli argill.	
2746	CLST:30% med gy,gry grn,red brn, fm, blky, v calc, LST:70% a/a	
2749	CLST:30% med gy, dk gy, red brn, blky, tab fm, v calc. LST: 60% a/a. SST: 10% lt gy clr, transluc qutz, fn grn, sli calc.	
2752	CLST/MARL:100% med lt gy, fm blky, locally grades to olv gy , w tr red marly	
2755	CLST/MARL:med lt gy, olv gy, fm , blky, v calc, grades to argill lmstn	
2758	MARLY LST: med lt gy, lt olv gy, sft-fm, blky-crmbly.	
2761	Marly LST: lt olv gy, grn gy, occ pink gy, fm, blky,	
2764	MARLY CLST/ARGILL LST:lt olv gy, occ grn gy, loc carb strks.	
2767	MARLY LST: lt olv gy, tr gy grn, a/a	
2770	MARLY LST: lt olv gy grn gy, fm loc sft, blky.	
2773	ARG LST: lt gy grn gy, sft fm grading to chalky lmstn.	
2776	MARLY LST:med gy, occ olv gy, a/a	
2779	MARLY CLST: dk grn gy, fm, blky, marly, occ dk gy grn, carb flecks Tr LST:v lt gy chlky, fm, crpxlln.	
2782	CALC CLST:a/a dk grn gy, Tr Marly LST: v lt gy, fm, blky, crmbly, crypxlln	
2785	CALC CLST:dk grn gy, tr dk rd brn, fm blky, v calc, crmbly, TR Chalky LST: off wht, v lt gy, fm blky crypxlln	

Slot No.: -	Well No.: 15/3-6	K.B. Elevation: 23.0m
Water Depth:105m	Sheet: of: Date: 24th December 1998	Geologist: Edmunds/Greig

		SHOWS/COMMENTS
2788	MARLY CLST: med lt-lt gy, fm, blky, occ lt olv gy, crmbly, amorph, Tr: v lt gy, off wht, chalk, fm, blky.	
2791	CHALK:50% v lt gy, off wht, fm-hd, blky, crypxlln, MARLY CLST: 50% med lt gy, a/a	
2793	CHALK:50% v lt gy, off wht, a/a MARLY CLST: 50%, lt-med gy, tr pale rd brn, fm, blky.	
	TD OF WELL 2793 m MD	

Baker Atlas Geoscience

Project BAG-99-515

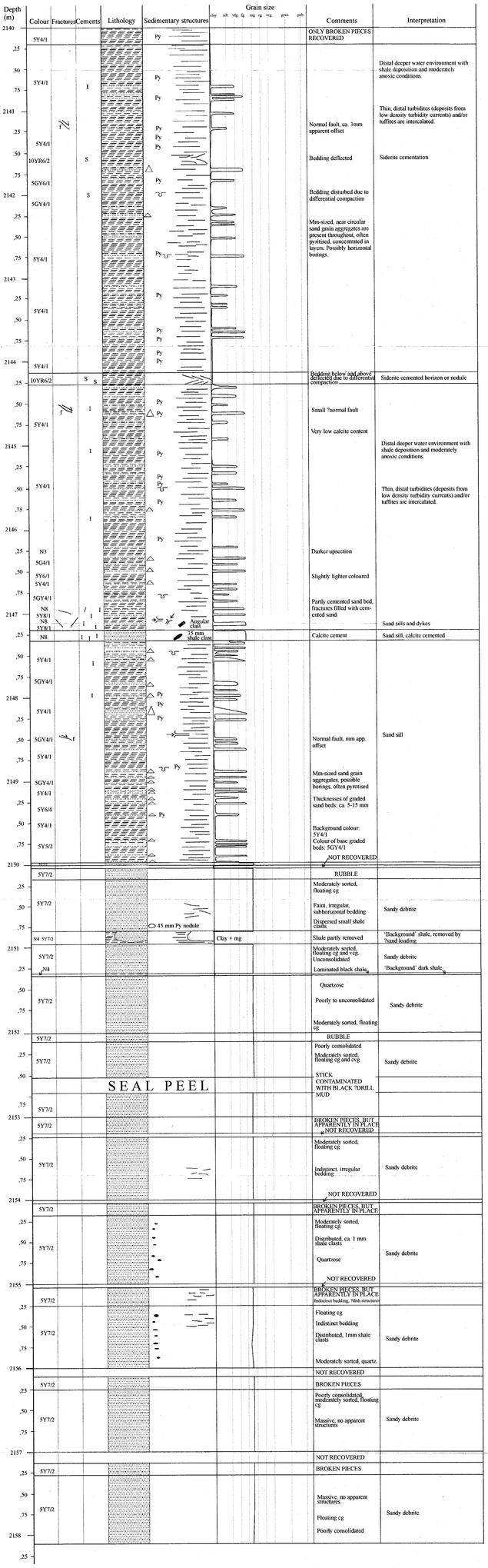
Attachment 8.2

BP AMOCO

Well 15/3-6

Enclosure 3: Core 1

Geological Core Log, scale 1:20



Legend

LITHOLOGY

- Shale
- Sand/sandstone
- Silt/siltstone
- Sandstone with carbonaceous debris
- Sandstone with abundant larger grains

TECTONIC STRUCTURES

- Fracture/fracture swarm
- Minor fault/ fault (> 10 mm displacement)

SEDIMENTARY STRUCTURES

- Parallel bedding/lamination
- Irregular/discontinuous bedding and lamination
- Loading structures
- Carbonaceous debris
- Slump folding
- Sand dyke
- Sand sill
- Convolute laminae
- Current ripple cross-lamination
- Dish structures
- Scour
- Deflected bedding (around nodular cement)
- Dewatering pipe
- Flame structures
- General mottling
- Lenticular bedding
- General cross-bedding

CEMENTS AND QUALIFIERS

- Dolomite cement
- Calcite cement
- Siderite
- Shale clasts
- Fining-upward trend
- Pyrite

COMMENTS IN CAPITAL LETTERS REFER TO THE CONDITION OF THE CORE.

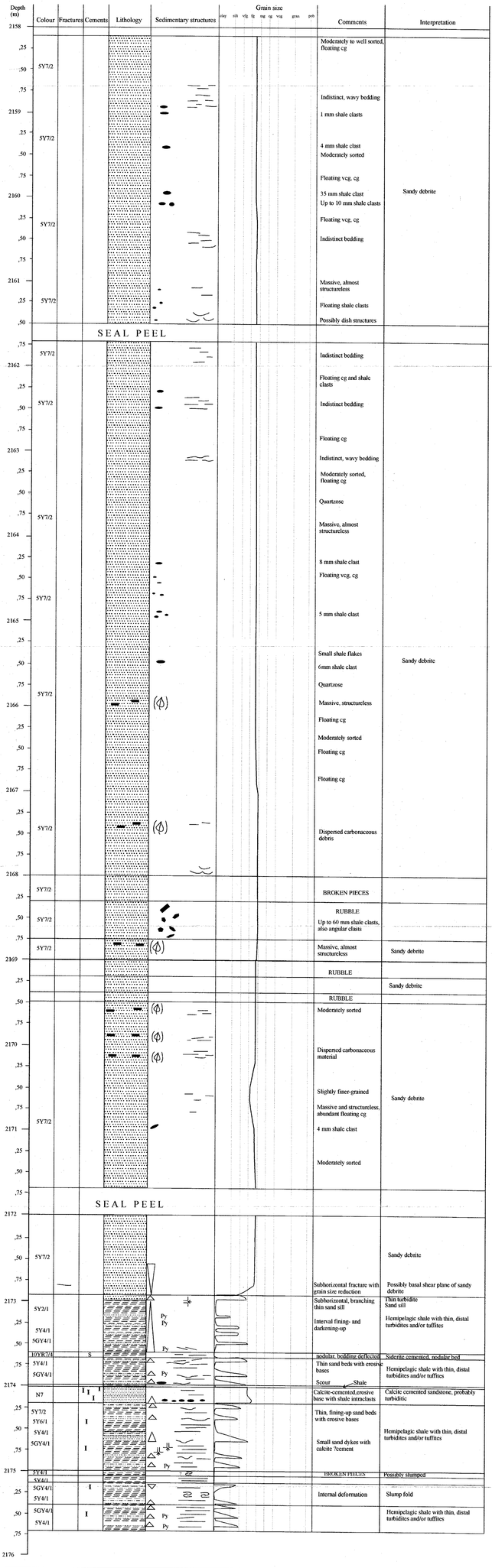
1.33 VOL 2

BP AMOCO

Well 15/3-6

Enclosure 2: Core 2

Geological Core Log, scale 1:20



Legend

LITHOLOGY

- Shale
- Sand/sandstone
- Silt/siltstone
- Sandstone with carbonaceous debris
- Sandstone with abundant larger grains

TECTONIC STRUCTURES

- Fracture/fracture swarm
- Minor fault/ fault (> 10 mm displacement)

SEDIMENTARY STRUCTURES

- Parallel bedding/lamination
- Irregular/discontinuous bedding and lamination
- Loading structures
- Carbonaceous debris
- Slump folding
- Sand dyke
- Sand sill
- Convolute laminae
- Current ripple cross-lamination
- Dish structures
- Scour
- Deflected bedding (around nodular cement)
- Dewatering pipe
- Flame structures
- General mottling
- Lenticular bedding
- General cross-bedding

CEMENTS AND QUALIFIERS

- Dolomite cement
- Calcite cement
- S — Siderite
- Shale clasts
- Fining-upward trend
- Py — Pyrite

COMMENTS IN CAPITAL LETTERS REFER TO THE CONDITION OF THE CORE.

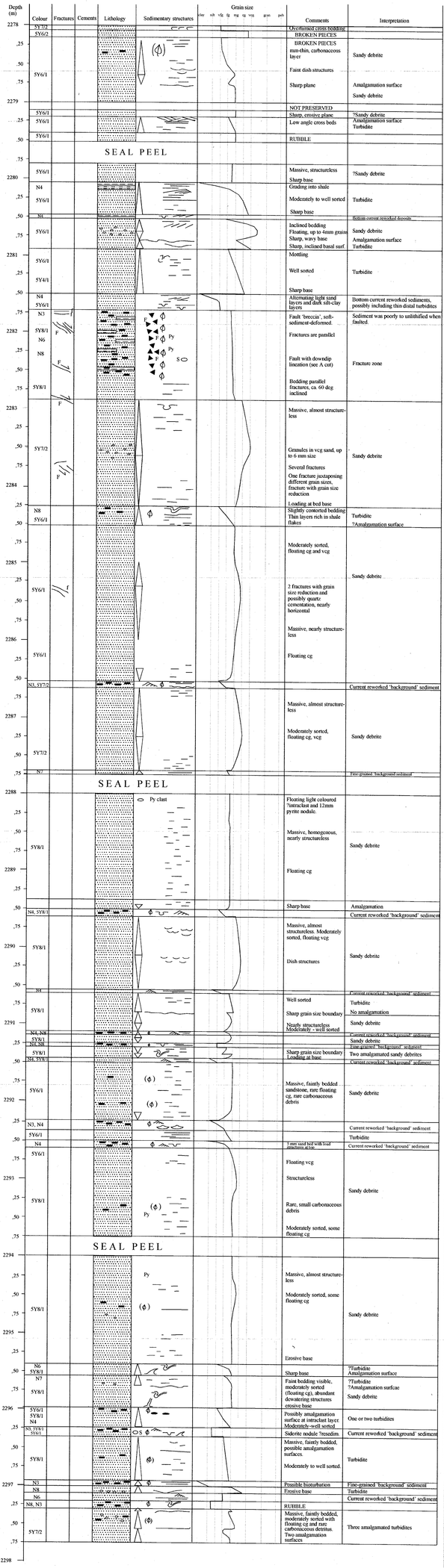
W38 VOL 2
BP RESEARCH AND LIBRARY

BP AMOCO

Well 15/3-6

Enclosure 1: Core 3

Geological Core Log, scale 1:20



Legend

LITHOLOGY

- Shale
- Sand/sandstone
- Silt/siltstone
- Sandstone with carbonaceous debris
- Sandstone with abundant larger grains

TECTONIC STRUCTURES

- Fracture/fracture swarm
- Minor fault/ fault (> 10 mm displacement)

SEDIMENTARY STRUCTURES

- Parallel bedding/lamination
- Irregular/discontinuous bedding and lamination
- Loading structures
- Carbonaceous debris
- Slump folding
- Sand dyke
- Sand sill
- Convolute laminae
- Current ripple cross-lamination
- Dish structures
- Scour
- Deflected bedding (around nodular cement)
- Dewatering pipe
- Flame structures
- General mottling
- Lenticular bedding
- General cross-bedding

CEMENTS AND QUALIFIERS

- Dolomite cement
- Calcite cement
- Siderite
- Shale clasts
- Fining-upward trend
- Pyrite

COMMENTS IN CAPITAL LETTERS REFER TO THE CONDITION OF THE CORE.

Attachment 8.5

Quick Shaley Analysis

Mincom

Well: N15_3-6

COMPANY: AMOCO

LOCATION: South Viking Graben

LATITUDE: 58 DEG 46' 23.3" N

LONGITUDE: 01 Deg 45' 15.0" E

X COORDINATE: 427951.20

Y COORDINATE: 6515614.40

HORIZONTAL UNITS: METRES

DATE PLOTTED: 17-Jun-1999

DATUM FOR ELEVATION: Mean Sea Level

SURFACE ELEVATION: 105.00

MEASUREMENT REF.: Drill Floor

ELEVATION MEAS. REF.: 23.00

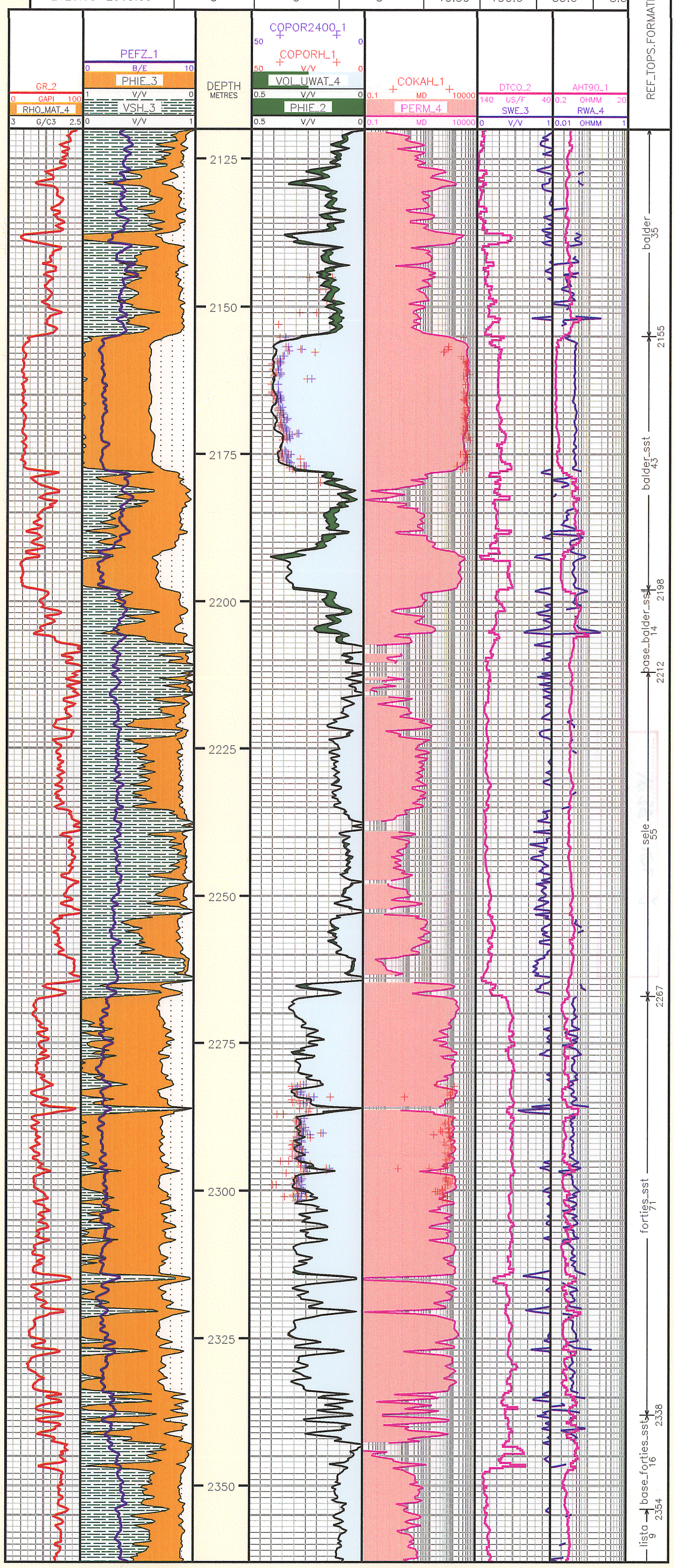
DRILLED DEPTH: 2793.00

VERTICAL UNITS: METRES

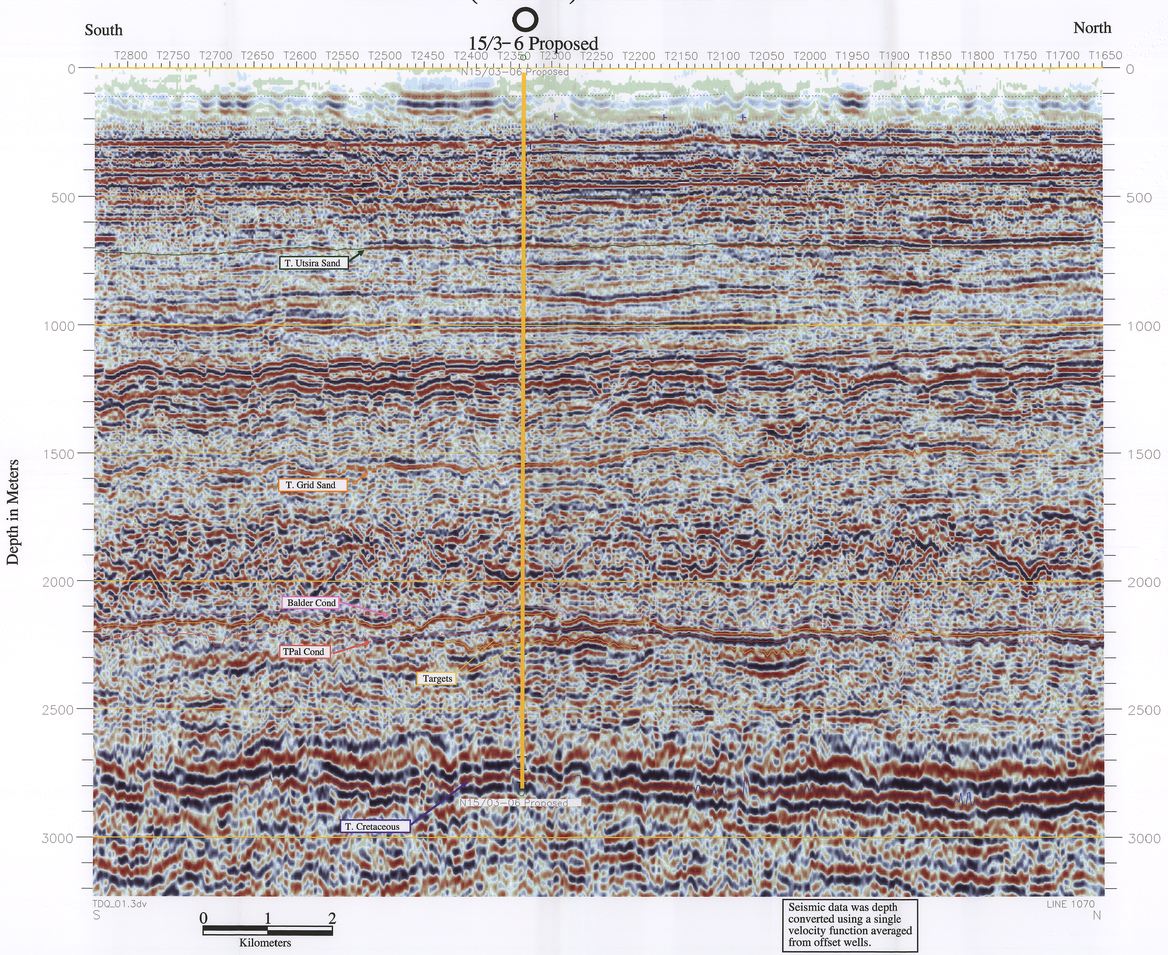
DATE LOGGED: 29-Dec-1998

VERTICAL SCALE: 1:500

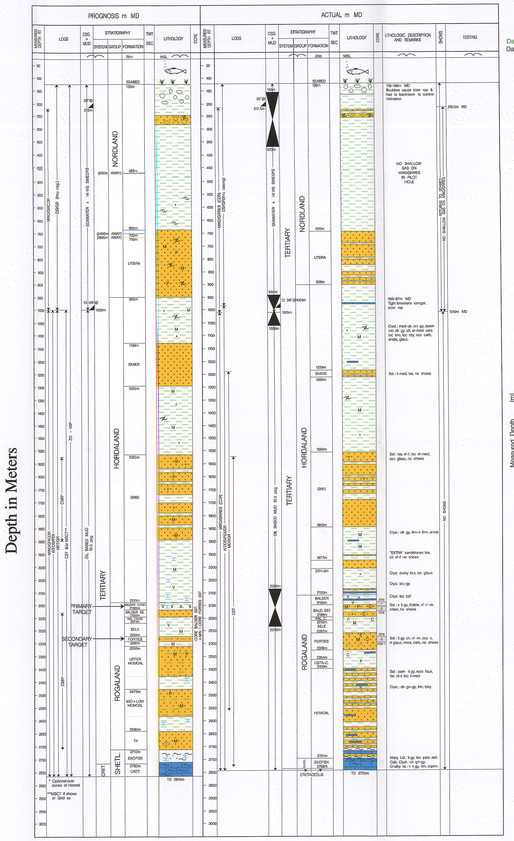
DEPTH (METRES)	RM	RMC	RMF	DFD	BHT	SHT	BIT S
2120.00-2363.00	- @ -	- @ -	- @ -	10.50	190.0	35.6	8.5

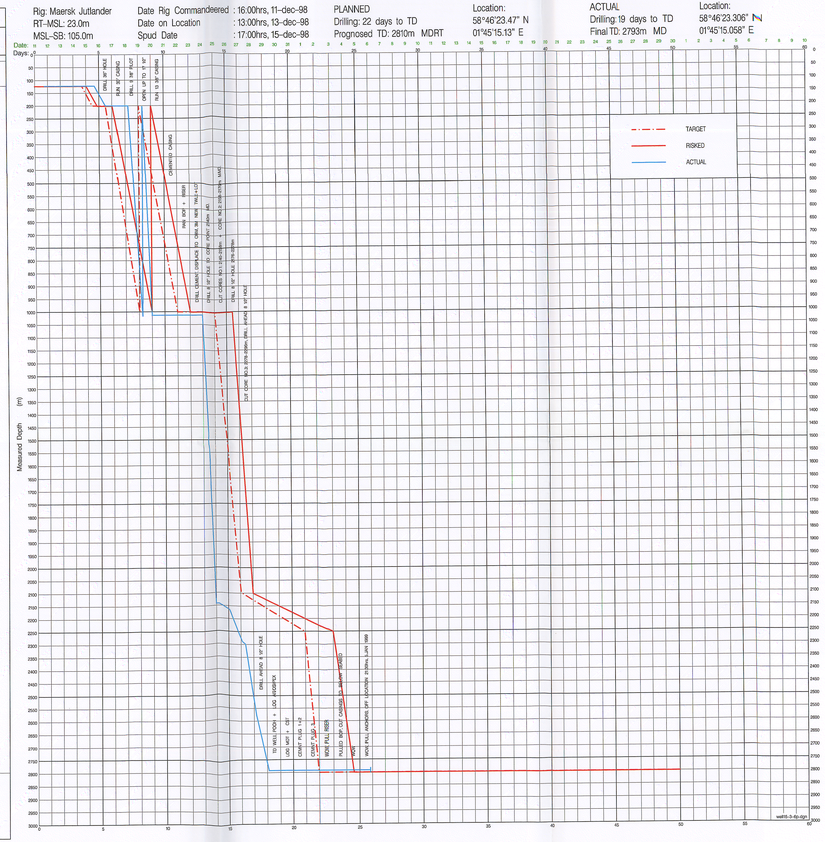


Pinnsvin (15/3-6) Drill Line Inline 1070



Seismic data was depth converted using a single velocity function averaged from offset wells.





RECORDS MANAGEMENT AND LIBRARY
W/3 VOL. 2

COMPOSITE WELL LOG - 1/500

WELL : 15/5-5

OPERATOR	STATOIL	LATITUDE DEG MIN SEC	57 14 59.00 N
FIELD	GULLFAKS	LONGITUDE DEG MIN SEC	02 14 00.00 E
WELL	15/5-5	DATE SPUDDED	15-MAY-1986
LOCATION	BLOCK 15/5	DATE COMPLETED	27-JUN-1986
		TOTAL DEPTH (TD)	3110 M
		TVD	3110 M
		KELLY BUSHING ELEV.	43.0 M
		WATER DEPTH	217.0 M
		DATE ON PRODUCTION	01-JUL-1986
		PRODUCTION FORMATION	TARBERT
		PRODUCTION INTERVAL	2980 - 3000 M
		PRODUCTION TEST	1
		OIL RATE	1000 STB/D
		GAS RATE	0.000 MSCF/D
		WATER RATE	0.000 STB/D
		OIL GRAVITY	37.0 API
		GAS GRAVITY	0.000
		WATER CUT	0.0 %
		GOR	0.000 SCF/STB
		FLOW PRESSURE	0.000 BAR
		FLOW TEMPERATURE	0.000 DEGC
		CHOKE SIZE	0.000 MM
		PRODUCTION METHOD	NATURAL FLOW
		PRODUCTION PERIOD	0.000 HRS

CASING & LINER DATA							

MUD DATA			

CORE DATA			

| CORE DEPTHS