IKU
SINTEF-GRUPPEN

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Final report

SOURCE ROCK EVALUATION OF 34/7-5

1. Screening Report

CLIENT/ OPPDRAGSGIVER
Saga Petroleum a.s.

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SUMMARY/ SAMMENDRAG

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Geochemical screening
C1-C5+ hydrocarbons
Lithology and total organic carbon

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SUMMARY

Tertiary

Utsira Formation (970-1100m)

The Utsira formation is mainly arenaceous in nature and the presence of probable biogenic methane suggests that the section is thermally immature.

Hordaland Group (1100-1669m)

The Hordaland group contains argillaceous rocks of fair to very good organic richness, although the predominance of methane in the C_1-C_5+ hydrocarbons suggests that these rocks are thermally immature.

Rogaland Group (1669-1907m)

The Rogaland group contains argillaceous rocks of fair to poor organic richness. These rocks are probably thermally immature.

Cretaceous

Shetland Group (1907-2488m)

The Shetland group contains argillaceous rocks of fair organic richness and more arenaceous horizons are present below 2226. The C_1-C_5+ hydrocarbon data suggest that the Shetland group has a low thermal maturity at present and minor amounts of non-indigenous hydrocarbons may be present towards the base of this group.

Cromer Knoll Group (2488-2502m)

The Cromer Knoll group is an arenaceous unit in which migrated, non-indigenous hydrocarbons may be present.

Jurassic

Brent Group (2502-2624m)

The Brent group represents a sequence of argillaceous and arenaceous horizons. The argillaceous horizons are of fair to good organic richness, but the likely presence of migrated hydrocarbons makes it difficult to state anything about the thermal maturity of these rocks. These argillaceous rocks may represent good hydrocarbon source rocks if more deeply buried.

Dunlin Group (2624-2892m)

The Dunlin group contains a sequence of claystones of fair to very good organic richness, and poorly cemented sandstones. The C_1-C_5+ hydrocarbon data suggest that the argillaceous rocks may be moderately mature. These rocks could be good hydrocarbon source rocks with increased burial.

Statfjord Formation (2892-3010.5m)

The Statfjord formation represents an arenaceous sequence of no significant hydrocarbon generation potential.

Triassic

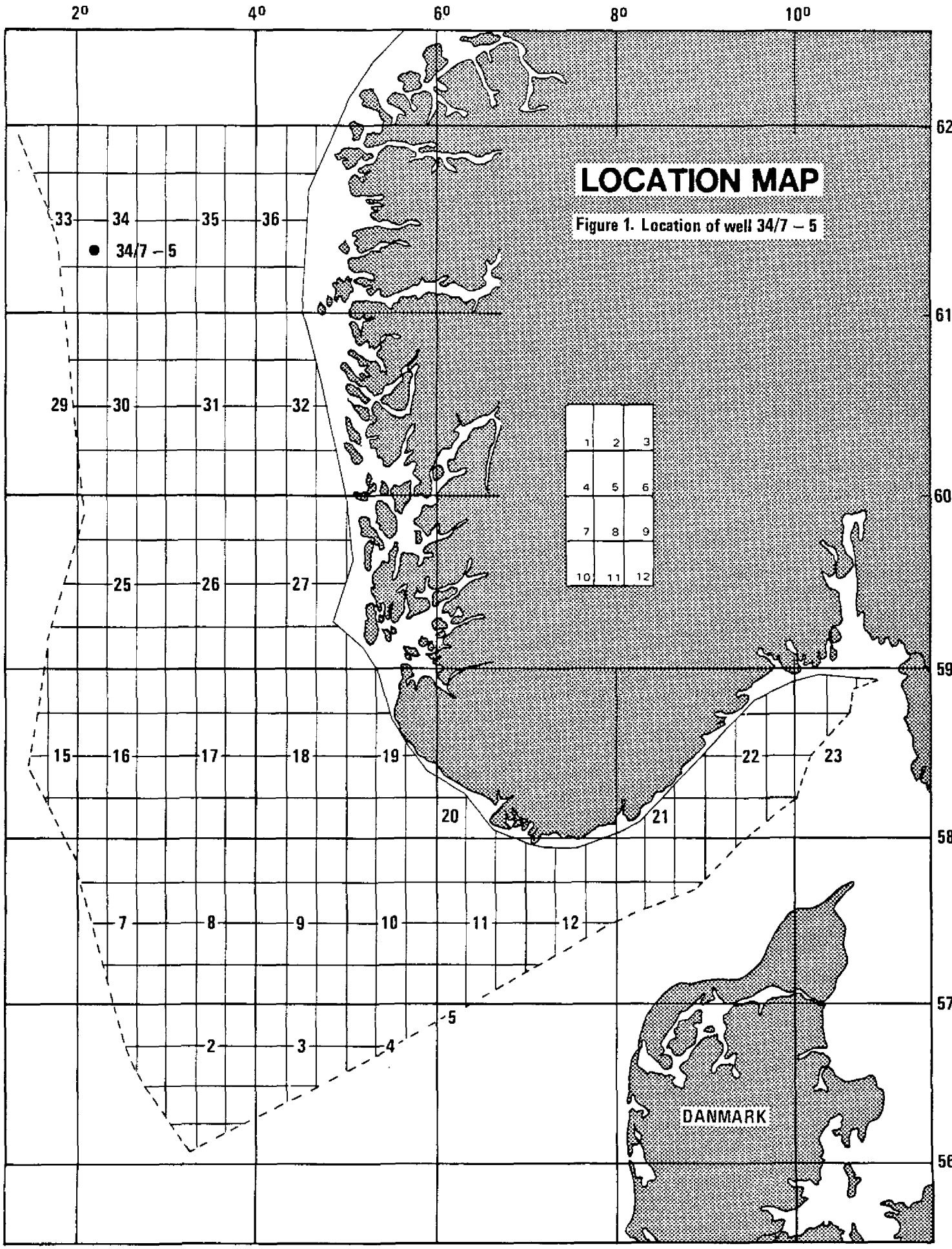
Lunde Formation (3010.5-3146m)

The Lunde formation contains sandstones and varicoloured claystones of poor organic richness. This formation is unlikely to have a significant hydrocarbon source potential.

1. INTRODUCTION

A total of two hundred and ninety cuttings samples were shipped from well 34/7-5 (Figure 1) by Saga Petroleum A/S. As instructed by Saga Petroleum A/S, every third sample from the Tertiary section and every second sample from the Cretaceous, Jurassic and Triassic sections was selected for organic geochemical screening analysis. These analyses include light hydrocarbon analysis (headspace and occluded gas), lithological description and total organic carbon (TOC) determination. A total of one hundred samples was analysed, and the results of these analyses are presented in this report.

The data are discussed with reference to lithostratigraphic tops provided by Saga Petroleum A/S. These tops are listed in table 1.


2°
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6°
8°
10°
62°
61°
60°
59°
58°
57°
56°
LOCATION MAP
Figure 1. Location of well 34/7 – 5
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34/7 – 5
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DANMARK

Table 1

Lithostratigraphic Tops for well 34/7-5

NORDLAND GROUP: Utsira Formation		970 m
HORDALAND GROUP		1100 m
ROGALAND GROUP		1669 m
SHETLAND GROUP		1907 m
CROMER KNOLL GROUP		2488 m
BRENT GROUP		2502 m
DUBLIN GROUP		2624 m
	Statfjord Formation	2892 m
	Lunde Formation	3010.5 m
TOTAL DEPTH (T.D.)		3146 m

2. DISCUSSION OF RESULTS

The geochemical screening results will be discussed in relation to the lithostratigraphic tops provided by Saga Petroleum A/S.

Utsira Formation (970 - 1100 m)

The light hydrocarbons (Table 2) recovered from four cuttings samples are dominated by methane. Trace amounts of C_2 and C_3 hydrocarbons are usually present in the samples. Most of the methane occurs in the headspace gas fraction. The high methane content of the gas suggests a biogenic origin.

The three cuttings samples at 990 - 1000 m, 1020 - 1030 m and 1050 - 1060 m consist of a mixture of poorly-sorted sand and shell fragments (Table 3). Trace amounts of an olive grey claystone are present in the lower two samples. The remaining cutting sample at 1080 - 1090 m has a predominant light olive grey, glauconitic claystone lithology in which spicules were observed. This lithology was determined as having a total organic carbon (TOC) content of 1.22 wt % which is normally indicative of good organic richness.

The Utsira formation contains rocks of low thermal maturity, as suggested by the presence of biogenic methane, and of a predominantly arenaceous nature. There is a change to a more argillaceous lithology towards the base of the formation.

Hordaland Group (1100 - 1669 m)

With the exception of the two cuttings intervals at 1620 - 1630 m and 1650 - 1660 m, the light hydrocarbons recovered from the cuttings samples are represented mainly by methane, with trace amounts of C_2, C_3 and iC_4 compounds. Generally, the concentration of the gaseous compounds is poor, although a richer zone occurs between 1140m and 1210m. As was noted in the Utsira formation, the majority of the C_1, C_2 and C_3 components are concentrated in the headspace gas fraction and probably represent biogenic products. The remaining two intervals at 1620 - 1630 m and 1650 - 1660 m contain significant concentrations of C_2, C_3, C_4 and C_5+ components which may indicate the presence of thermogenic products.

Generally, in the 1650 - 1660 m samples, the C_1 - C_4 compounds are concentrated in the headspace gas fraction while the C_5+ compounds are more evenly divided between the headspace and cuttings gas. In the 1620 - 1630 m interval, C_5+ compounds dominate the cuttings gas fraction.

Between 1120m and 1240m, a light olive grey claystone of good to very good organic richness is the dominant lithology. Between 1260m and 1600m, the dominant lithology is a darker, olive grey claystone of fair organic richness, changing to dark olive grey or olive grey - olive black claystone of fair to good organic richness below 1620m.

The Tertiary Hordaland group contains argillaceous rocks of fair to very good organic richness. The predominance of probably biogenic methane in most of the cuttings samples suggests a low thermal maturity.

Rogaland Group (1669 - 1907 m)

The light hydrocarbons of the cuttings samples taken from this group are dominated by methane, although gas wetness values of between 3.38% and 8.14% indicate the presence of C_2 - C_4 compounds, and C_5+ compounds are present down to 1839m. Below 1839m, there is a decrease in the concentrations of light hydrocarbons present and C_3+ compounds are absent. As has been observed previously, the headspace gas fraction generally contains the greater proportion of the C_1 - C_4 compounds, although this does not always hold true for the C_5+ compounds. The gaseous compounds in the Rogaland group are probably of mixed biogenic/thermogenic origin.

The cutting samples from the Rogaland group are predominantly composed of an olive grey claystone lithology of poor to fair organic richness. A moderate brown claystone lithology is secondary to minor between 1680m and 1810m. No lithology was recorded for the sample at 1857 - 1866 m, which consisted entirely of casing cement. The claystones in this group show a decrease in organic richness with increasing depth, varying from 0.90 wt % at 1680 - 1690 m, to 0.34 wt % at 1902 - 1911 m. The Rogaland group is mainly argillaceous and has poor to fair

organic richness. The light hydrocarbon data suggest that the rocks are thermally immature.

Shetland Group (1904 - 2488 m)

The light hydrocarbons recovered from the cutting samples of the Shetland group may be distinguished from those examined in the overlying section by the presence of significant amounts of C_2+ compounds. This is reflected by gas wetness values of between 6.67% and 19.93% above 2253m. Higher gas wetness values of between 26.44% and 45.36% are found below 2253m. The sample interval at 2208 - 2217 m deviates from this, but the higher gas wetness of 31.82% may partially reflect the low gas content of the sample. With the exception of the interval between 1920 m and 1965 m, which generally contains low concentrations of light hydrocarbons, the sampled intervals have a good to excellent richness of light hydrocarbons reaching a maximum of 192,547 µl/kg at 2046 - 2055 m.

The greater part of the light hydrocarbon compounds occur in the headspace gas fraction, although methane is depleted to a greater extent than the other compounds in the cuttings gas fraction as indicated by very high gas wetnesses of up to 81.45 % in the cuttings gas. iC_4/nC_4 ratios for the samples vary from reliable values of about 0.73 at 1974 - 1983 m to 0.35 at 2293 - 2307 m, with an average value of 0.49. Generally, the iC_4/nC_4 ratios are slightly lower in value below about 2226m. The abundance of methane and low amounts of C_2+ components indicate that the light hydrocarbons in the Shetland group probably represent immature thermogenic products. A marked increase in gas wetness values and an increase in the content of C_5+ compounds below about 2262m may be due to the presence of minor amounts of non-indigenous material.

The dominant lithology throughout most of the Shetland group is a medium grey claystone of fair organic richness. Below 2226m, a fine to medium grey sand occurs as a secondary cuttings lithology and between 2334m and 2361 m, sand accounts for the majority of the cuttings lithology. The occurance of sand in the cuttings samples correlates with a slight decrease in iC_4/nC_4 ratio values and an increase in gas wetness values. This would support the suggestion that minor amounts of non-

indigenous hydrocarbons may be present in the lower part of the Shetland group.

The Shetland group is a predominantly argillaceous unit with occasional arenaceous horizons which tend to occur below 2226m. An abundance of methane suggests that the rocks are not thermally mature, although the presence of migrated hydrocarbons in the more arenaceous section is suggested. The argillaceous rocks are unlikely to be significant source rocks at this time.

Cromer Knoll group (2488 - 2502 m)

The Cromer Knoll group is represented by one cuttings sample. Methane is the most abundant light hydrocarbon, but the C_2^+ hydrocarbon compounds account for a major part of the total light hydrocarbon content. A gas wetness of 62.33% is comparable to the values observed at the base of the Shetland group. The greater part of the light hydrocarbons occurs in the headspace gas fraction, although a gas wetness value of 86.51 % in the cuttings gas fraction indicates that methane is particularly concentrated in the headspace gas relative to the C_2^+ compounds. The high concentrations of hydrocarbons and a low iC_4/nC_4 ratio of 0.38 may suggest the presence of thermogenically - derived hydrocarbons which are not indigenous to this section.

A fine to medium grained sand is the dominant cuttings lithology in the sample and would suggest that the light hydrocarbon compounds are not of indigenous origin. Minor amounts of a medium grey claystone of fair organic richness and a white chalk/limestone lithology are also present.

The Cromer Knoll group is predominantly arenaceous and has no appreciable oil or gas generation potential. The presence of non-indigenous hydrocarbons is suggested.

Brent group (2502 - 2624 m)

The samples from the Brent group may be distinguished from those of the Cromer Knoll group by a marked reduction in the concentration of the C_1-C_4 hydrocarbon compounds and an increase in the concentration of the C_5+ compounds. The liquid hydrocarbons in the Brent group have high gas wetness values varying from 80.03% at 2559 - 2568 m to 90.31% at 2592 - 2604 m. The basal sample in the Brent group is marked by a rapid decrease in gas wetness to a value of 59.24% and an increase in the abundance of the C_1 - C_3 compounds present. In the samples above 2604m, the C_5+ compounds represent the most abundant component, accounting for over half of the light hydrocarbons present. These data suggest that the rocks of the Brent group may contain migrated liquid hydrocarbons.

Two lithologies are present in varying proportions in the cuttings samples. A medium grey to dark grey claystone of fair to good organic richness is the predominant lithology in most of the samples from the Brent group. The other lithology is a light coloured, poorly sorted sand, which is the predominant lithology between 2541m and 2568m, and is secondary to minor in the remaining samples. The cuttings sample at 2613 - 2622 m contains a small amount of coal, which could account for the increased C_1 - C_3 concentration in this sample.

The Brent group is predominantly argillaceous, but also contains more arenaceous horizons. The presence of migrated, possibly non-indigenous hydrocarbons is suggested.

Dunlin Group (2624-2892m)

The Dunlin group is characterised by a marked reduction in the concentration of C_5+ compounds and gas wetness values relative to the overlying Brent group. Gas wetness values in the Dunlin group vary from 33.43% at 2721-2730m to 74.04% at 2865-2874m. Generally, methane is the most abundant component in the samples, and there is a marked decrease in the concentration of all components below 2829m. There is also an increase in the iC_4/nC_4 ratio of the samples from the Dunlin group and values vary from 0.38 at 2631-2640m to 0.77 at 2811-2820m. The data suggest that the light hydrocarbon compounds may represent indigenous products.

Above 2658m, a medium grey to medium dark grey claystone lithology of fair to good organic richness is the dominant cuttings lithology and a dark grey to medium dark grey claystone of good to very good organic richness is secondary. Between 2667m and 2712m, the dark grey to medium dark grey claystone becomes the dominant cuttings lithology. Minor amounts of the medium grey claystone, limestone and a sand/sandstone lithology are also present. Between 2721m and 2748m, the sand/sandstone lithology is the dominant cuttings lithology. Below 2757m, a dark grey or dark olive grey claystone of good organic richness is generally the dominant lithology. Minor amounts of limestone, sandstone and the previously described claystones are also present. The organic richness of the claystone lithologies below 2757m appears to decrease with increasing depth.

The Dublin group represents a mixed argillaceous/arenaceous group with minor carbonate. The claystones may have fair hydrocarbon generation potential, but do no appear to have attained optimum thermal maturity in this well.

Statfjord Formation (2892-3010.5m)

The C_1-C_5+ hydrocarbon concentrations are generally lower than those described from the Dunlin group, and there is a decrease in the concentrations of the C_2+ compounds which is reflected in lower gas wetnesses of between 46.61% and 21.93%. iC_4/nC_4 ratios are of poor reliability due to the low concentrations of these compounds present. The light hydrocarbon concentrations in the Statfjord formation are generally poor.

A light grey or clear, poorly sorted sand is the dominant lithology in the cuttings samples from the Statfjord formation. Minor amounts of a medium grey claystone of poor organic richness are also present in the samples.

The Statfjord formation is a predominantly arenaceous formation and probably has negligable hydrocarbon generation potential.

Lunde Formation (3010.5-3146m (TD)

The samples from the Lunde formation have a very poor concentration of light hydrocarbon compounds, and in the samples below 3027m, only the C_1-C_3 compounds are present. The light hydrocarbons appear to be preferentially concentrated in the headspace gas fraction.

The cuttings samples contain a light grey or clear sand lithology which is dominant above 3090m, and a varicoloured claystone lithology of fair to very poor organic richness which is dominant below 3099m.

The Lunde formation consists of a sequence of sandstones and varicoloured claystones of no significant hydrocarbon source potential.

3. CONCLUSIONS

Tertiary

Utsira Formation (970-1100m)

The Utsira formation is mainly arenaceous in nature and the presence of probable biogenic methane suggests that the section is thermally immature.

Hordaland Group (1100-1669m)

The Hordaland group contains argillaceous rocks of fair to very good organic richness, although the predominance of methane in the C_1-C_5+ hydrocarbons suggests that these rocks are thermally immature.

Rogaland Group (1669-1907m)

The Rogaland group contains argillaceous rocks of fair to poor organic richness. These rocks are probably thermally immature.

Cretaceous

Shetland Group (1907-2488m)

The Shetland group contains argillaceous rocks of fair organic richness and more arenacous horizons are present below 2226. The C_1-C_5+ hydrocarbon data suggest that the Shetland group has a low thermal maturity at present and minor amounts of non-indigenous hydrocarbons may be present towards the base of this group.

Cromer Knoll Group (2488-2502m)

The Cromer Knoll group is an arenaceous unit in which migrated, non-indigenous hydrocarbons may be present.

Jurassic

Brent Group (2502-2624m)

The Brent group represents a sequence of argillaceous and arenaceous horizons. The argillaceous horizons are of fair to good organic richness, but the likely presence of migrated hydrocarbons makes it difficult to state anything about the thermal maturity of these rocks. These argillaceous rocks may represent good hydrocarbon source rocks if more deeply buried.

Dunlin Group (2624-2892m)

The Dunlin group contains a sequence of claystones of fair to very good organic richness, and poorly cemented sandstones. The C_1-C_5+ hydrocarbon data suggest that the argillaceous rocks may be moderately mature. These rocks could be good hydrocarbon source rocks with increased burial.

Statfjord Formation (2892-3010.5m)

The Statfjord formation represents an arenaceous sequence of no significant hydrocarbon generation potential.

Triassic

Lunde Formation (3010.5-3146m)

The Lunde formation contains sandstones and varicoloured claystones of poor organic richness. This formation is unlikely to have a significant hydrocarbon source potential.

EXPERIMENTAL METHODS AND DESCRIPTION OF INTERPRETATION LEVELS

Gas analyses

A septum was attached to the can, a sample of the headspace gas was taken and analysed for C_1, C_2, C_3, i-C_4, nC_4 and C_5+ (conditions: see below).

The can was opened, headspace volume, water volume and sample weight were measured. The canned samples were washed with temperated water on 4, 2 and 0.125 mm sieves to remove drilling mud and thereafter dried at 35°C.

For occluded gas analysis an aliquot of the 2-4 mm fraction of each sample before drying was crushed in water using an airtight ball mill. The evolved gas was analysed as described for headspace gas.

GC conditions:

C_1-C_5+ analysis

This analysis was performed on Carlo Erba Fractovap 2150 and 2350 gas chromatographs equipped with 2m x 1/8" stainless steel columns filled with Porapack Q on Chromosorb using nitrogen as carrier gas. The oven temperature was 150°C. After elution of n-butane the column was back-flushed and C_5+ was recorded. A standard gas containing methane, ethane, propane, n-butane, n-pentane and n-hexane was used for quantitation.

Lithological descriptions

Lithological examinations are normally carried out using a binocular microscope (maximum 50x magnification). Colour descriptions are in accordance with "Rock Colour Chart" published in 1979 by the Geology Society of America. Boulder, Colorado. The clients have a choice of three different levels of description from a simple identification of the lithologies to a full examination of the sample. Handpicking of the cuttings for organic geochemical analyses is based on these descriptions.

Total Organic Carbon

Bulk samples were crushed in a mortar. Aliquots of the samples were then weighed into Leco crucibles and treated three times with hot 10% HCl to remove carbonate, and washed 4 times with distilled water to remove traces of HCl. The crucibles were then placed on a hot plate and dried for 24 hours. The total organic carbon (TOC) content of the dried samples was determined using a Leco CR12 carbon analyser.

Project no.: 22.1771.00
Well ident.: 34/7-5
DATE : 28 - 3 - 85.

TABLE 2a

CONCENTRATION (ul Gas / kg dry Rock) OF C1 - C5+ HYDROCARBONS IN HEADSPACE

IKU no.	DEPTH m	C1	C2	C3	iC4	nC4	C5+	SUM C1-C4	SUM C2-C4	WET-NESS (%)	iC4/nC4
B 9628	1000	583						583		0.00	******
B 9631	1030	22483						22483		0.00	******
B 9633	1050	3795						3795		0.00	******
B 9637	1090	26490						26490		0.00	******
B 9640	1120	4970						4970		0.00	******
B 9643	1150	78717	37					78755	37	0.05	******
B 9646	1180	20505						20505		0.00	******
B 9649	1210	26700	18					26718	18	0.07	******
B 9652	1240	6285						6285		0.00	******
B 9655	1270	5467						5467		0.00	******
B 9658	1300	783						783		0.00	******
B 9661	1330	6571						6571		0.00	******
B 9664	1360	1581						1581		0.00	******
B 9667	1390	136						136		0.00	******
B 9670	1420	1280						1280		0.00	******
B 9673	1450	1441						1441		0.00	******
B 9676	1480	2785	25					2809	25	0.87	******
B 9679	1510	1666	20		10			1696	30	1.74	******
B 9682	1540	593	14					607	14	2.36	******
B 9685	1570	864	23					887	23	2.54	******
B 9688	1600	1838	42		41			1922	84	4.35	******
B 9691	1630	10127	431	96		357	409	11011	884	8.03	0.00
B 9694	1660	17249	334	48		170	328	17800	551	3.10	0.00
B 9697	1690	13170	255	35		189	1095	13650	480	3.51	0.00

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TABLE 2a

CONCENTRATION (ul Gas / kg dry Rock) OF C1 - C5+ HYDROCARBONS IN HEADSPACE

IKU no.	DEPTH m	C1	C2	C3	iC4	nC4	C5+	SUM C1-C4	SUM C2-C4	WET-NESS (%)	iC4/nC4
B 9700	1720	21197	471	61		348	1739	22077	880	3.99	0.00
B 9703	1750	15874	391	50		224	885	16539	665	4.02	0.00
B 9706	1780	7931	174	21		67	163	8192	261	3.19	0.00
B 9709	1810	5179	133	21		43	45	5375	197	3.66	0.00
C 0023	1839	10069	268	49	128		209	10515	446	4.24	******
C 0026	1866	1144	41					1185	41	3.49	******
C 0029	1893	3809	221	144				4173	365	8.74	******
C 0031	1911	5198	295	137	88			5718	520	9.09	******
C 0033	1929	4033	219	105	43	36		4436	403	9.09	1.19
C 0035	1947	371	27	23	9	12		442	71	16.11	0.80
C 0037	1965	8966	583	425	137	195		10307	1340	13.00	0.70
C 0039	1983	28364	1340	633	124	168		30629	2264	7.39	0.73
C 0041	2001	18239	766	334	61	79	30	19480	1240	6.37	0.76
C 0043	2019	26312	1320	606	99	131	24	28469	2156	7.57	0.76
C 0045	2037	27252	2408	1640	198	328		31825	4573	14.37	0.60
C 0047	2055	163892	13753	9998	1502	2504		191649	27757	14.48	0.60
C 0049	2073	60508	5413	5010	839	1509		73279	12772	17.43	0.56
C 0051	2081	127609	11855	8793	1136	2026		151419	23810	15.72	0.56
C 0053	2109	66847	7499	6110	821	1412		82690	15843	19.16	0.58
C 0055	2127	36022	3420	3418	561	995		44415	8394	18.90	0.56
C 0057	2145	82170	9513	6992	882	1685	247	101243	19073	18.84	0.52
C 0059	2163	58987	5503	4191	620	1247	229	70549	11562	16.39	0.50
C 0061	2181	68570	5870	3883	563	1103	242	79989	11419	14.28	0.51
C 0063	2199	96389	8769	6886	1105	2374	662	115522	19133	16.56	0.47

TABLE 2a

CONCENTRATION (ul Gas / kg dry Rock) OF C1 - C5+ HYDROCARBONS IN HEADSPACE

IKU no.	DEPTH m	C1	C2	C3	iC4	nC4	C5+	SUM C1-C4	SUM C2-C4	WET-NESS (%)	iC4/nC4
C 0065	2217	1265	122	105				1492	227	15.24	******
C 0067	2235	17509	1513	1245	222	455	233	20944	3435	16.40	0.49
C 0069	2253	31422	3016	2756	534	1180	923	38908	7486	19.24	0.45
C 0071	2271	38930	6681	10499	3506	6778	8685	66394	27464	41.37	0.52
C 0073	2289	26266	4924	6813	1601	3350	3320	42954	16688	38.85	0.48
C 0075	2307	12905	3456	4028	649	1749	1436	22788	9882	43.37	0.37
C 0077	2325	52877	11867	11301	1718	3558	3078	81322	28445	34.98	0.48
C 0079	2343	27833	4712	3139	367	712	394	36763	8931	24.29	0.51
C 0081	2361	15872	2857	2487	324	568	340	22108	6236	28.21	0.57
C 0083	2379	22468	4274	3516	492	994	634	31744	9276	29.22	0.50
C 0085	2397	47673	9094	5390	546	1018	401	63721	16048	25.18	0.54
C 0087	2415	91389	19690	12395	1256	2490	1124	127219	35830	28.16	0.50
C 0089	2433	56516	16453	11848	1182	2402	1053	88402	31885	36.07	0.49
C 0091	2451	64721	17622	15207	1888	4090	2186	103528	38808	37.48	0.46
C 0093	2469	56202	11626	9507	1117	2834	2065	81286	25084	30.86	0.39
C 0095	2487	168140	43491	34143	3452	9731	7470	258956	90816	35.07	0.35
C 0097	2505	96186	48779	64956	11276	28037	30452	249234	153048	61.41	0.40
C 0099	2523	1194	701	974	173	492	1355	3534	2340	66.21	0.35
C 0101	2550	731	678	1917	682	1990	5283	5997	5267	87.82	0.34
C 0103	2568	846	610	1598	581	1666	4540	5301	4455	84.04	0.35
C 0105	2595	2338	1126	3295	1317	3648	9349	11724	9386	80.05	0.36
C 0107	2604	651	664	2828	1151	3216	10232	8510	7859	92.34	0.36
C 0109	2622	27860	11594	9060	1338	3101	5575	52953	25093	47.39	0.43
C 0111	2640	16729	8771	7263	766	1764	861	35293	18564	52.60	0.43

TABLE 2a

CONCENTRATION (ul Gas / kg dry Rock) OF C1 - C5+ HYDROCARBONS IN HEADSPACE

IKU no.	DEPTH m	C1	C2	C3	iC4	nC4	C5+	SUM C1-C4	SUM C2-C4	WET-NESS (%)	iC4 ----- nC4
C 0113	2658	70772	23187	15118	1541	3097	1288	113716	42944	37.76	0.50
C 0115	2676	154328	45829	27791	2656	5136	733	235741	81413	34.53	0.52
C 0117	2694	81500	25072	14947	1529	2771	686	125820	44320	35.22	0.55
C 0177	2712	49589	17098	11031	1240	2233	1728	81191	31602	38.92	0.56
C 0179	2730	42973	9865	5607	609	958		60011	17038	28.39	0.64
C 0181	2748	48345	15961	10534	1320	1972	866	78132	29787	38.12	0.67
C 0183	2766	19660	8096	5446	730	1050	653	34981	15321	43.80	0.70
C 0185	2784	37885	13273	7613		1508	3199	60279	22394	37.15	0.00
C 0187	2802	16540	5205	2956	381	483	897	25565	9025	35.30	0.79
C 0189	2820	24121	9678	6735	1242	1334	1297	43110	18989	44.05	0.93
C 0191	2838	6247	1622	874	139	168	254	9051	2804	30.98	0.82
C 0193	2856	7762	2293	1398	262	313		12027	4265	35.46	0.84
C 0195	2874	893	409	356	64	99		1822	928	50.97	0.64
C 0197	2892	3067	735	529	84	133		4548	1481	32.57	0.63
C 0199	2910	4898	605	255				5758	860	14.94	******
C 0201	2928	742	229	109	19			1100	357	32.50	******
C 0203	2946	551	111	83				745	194	26.06	******
C 0205	2964	697	96	63				855	158	18.50	******
C 0207	2982	1188	219	98	16	24		1544	357	23.10	0.64
C 0209	3000	1098	222	104				1424	326	22.91	******
C 0211	3018	385	75	83				544	158	29.14	******
C 0213	3036	378	46	34				459	80	17.48	******
C 0215	3054	884	71	54				1009	125	12.36	******
C 0217	3072	304	15					319	15	4.59	******

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TABLE 2a

CONCENTRATION (ul Gas / kg dry Rock) OF C1 - C5+ HYDROCARBONS IN HEADSPACE

IKU no.	DEPTH m	C1	C2	C3	iC4	nC4	C5+	SUM C1-C4	SUM C2-C4	WET-NESS (%)	iC4 ----- nC4
C 0219	3090	288	20	20				328	40	12.13	******
C 0221	3108	448	24	21				493	45	9.05	******
C 0223	3126	496	18					514	18	3.59	******
C 0225	3144	419	37	34				490	71	14.44	******

TABLE 2b

CONCENTRATION (ul Gas / kg dry Rock) OF C1 - C5+ HYDROCARBONS IN OCLUDED

IKU no.	DEPTH m	C1	C2	C3	iC4	nC4	C5+	SUM C1-C4	SUM C2-C4	WET-NESS (%)	iC4/nC4
B 9628	1000	569	13					582	13	2.19	******
B 9631	1030	829						829		0.00	******
B 9633	1050	198	15	19				232	34	14.57	******
B 9637	1090	708	48					756	48	6.40	******
B 9640	1120	384	14					399	14	3.61	******
B 9643	1150	548	15	4				567	18	3.23	******
B 9646	1180	280	15	18				313	33	10.60	******
B 9649	1210	373	18	5				395	23	5.78	******
B 9652	1240	144	11					155	11	7.09	******
B 9655	1270	115	8					123	8	6.86	******
B 9658	1300	82	7					89	7	7.81	******
B 9661	1330	140	8					148	8	5.08	******
B 9664	1360	79						79		0.00	******
B 9667	1390	66						66		0.00	******
B 9670	1420	48						48		0.00	******
B 9673	1450	51						51		0.00	******
B 9676	1480	77						77		0.00	******
B 9679	1510	38						38		0.00	******
B 9682	1540	72						72		0.00	******
B 9685	1570	79						79		0.00	******
B 9688	1600	63						63		0.00	******
B 9691	1630	94	15	18	125	55	803	307	213	69.33	2.26
B 9694	1660	128	9				273	136	9	6.28	******
B 9697	1690	137	7				646	144	7	5.03	******

TABLE 2b

CONCENTRATION (ul Gas / kg dry Rock) OF C1 - C5+ HYDROCARBONS IN OCLUDED

IKU no.	DEPTH m	C1	C2	C3	iC4	nC4	C5+	SUM C1-C4	SUM C2-C4	WET-NESS (%)	iC4/nC4
B 9700	1720	313	21		36		4281	370	57	15.38	******
B 9703	1750	146	12		13		701	171	25	14.85	******
B 9706	1780	125	8		12		402	146	21	14.09	******
B 9709	1810	89	7					96	7	7.81	******
C 0023	1839	195						195		0.00	******
C 0026	1866	39						39		0.00	******
C 0029	1893	309						309		0.00	******
C 0031	1911	223	13					236	13	5.57	******
C 0035	1947	129	10					138	10	6.93	******
C 0037	1965	367	28					395	28	7.14	******
C 0039	1983	263	22	25				310	47	15.22	******
C 0041	2001	300	33	51				384	84	21.79	******
C 0043	2019	379	31	98	42	117		666	287	43.16	0.36
C 0045	2037	279	26	69	30	83		486	208	42.69	0.36
C 0047	2055	620	75	113		89		897	277	30.91	0.00
C 0049	2073	463	47	69		92		672	208	31.01	0.00
C 0051	2081	476	78	240	56	193	180	1043	567	54.36	0.29
C 0053	2109	368	50	156		136	181	710	343	48.24	0.00
C 0055	2127	381	55	173	61	164	81	832	452	54.29	0.37
C 0057	2145	448	90	363	102	310	260	1313	865	65.87	0.33
C 0059	2163	187	33	117	25	103		466	279	59.91	0.24
C 0061	2181	368	57	149				574	206	35.94	******
C 0063	2199	382	59	177			281	618	236	38.17	******
C 0065	2217	339	68	201	52	200	366	861	521	60.56	0.26

TABLE 2b

CONCENTRATION (ul Gas / kg dry Rock) OF C1 - C5+ HYDROCARBONS IN OCLUDED

IKU no.	DEPTH m	C1	C2	C3	iC4	nC4	C5+	SUM C1-C4	SUM C2-C4	WET-NESS (%)	iC4/nC4
C 0067	2235	179	31	123		130	238	462	283	61.23	0.00
C 0069	2253	365	50	166	40	167	521	789	423	53.69	0.24
C 0071	2271	462	104	431	178	575	3777	1752	1289	73.61	0.31
C 0073	2289	521	86	332	76	350	1963	1365	844	61.84	0.22
C 0075	2307	393	113	497	113	436	1144	1552	1159	74.66	0.26
C 0077	2325	651	225	862	172	687	1363	2597	1946	74.95	0.25
C 0079	2343	425	218	712	105	407	518	1867	1442	77.21	0.26
C 0081	2361	531	180	718	126	461	776	2015	1484	73.66	0.27
C 0083	2379	236	126	480	97	331	643	1270	1034	81.45	0.29
C 0085	2397	358	249	640	56	272	439	1574	1217	77.29	0.21
C 0087	2415	654	254	709	99	374		2090	1436	68.70	0.27
C 0089	2433	485	128	387	47	208		1255	771	61.40	0.23
C 0091	2451	564	138	502		325		1529	965	63.11	0.00
C 0093	2469	669	207	674	76	401	1400	2026	1357	66.98	0.19
C 0095	2487	562	196	605	82	443	653	1887	1325	70.23	0.18
C 0097	2505	1288	751	3280	732	3500	18753	9551	8263	86.51	0.21
C 0099	2523	386	349	1803	360	1595	9593	4493	4107	91.40	0.23
C 0101	2550	648	96	559	211	1095	7172	2609	1961	75.16	0.19
C 0103	2568	855	136	741	243	1243	8434	3219	2364	73.43	0.20
C 0105	2595	324	168	725	235	1205	8233	2657	2333	87.79	0.19
C 0107	2604	381	68	529	201	966	8756	2145	1764	82.26	0.21
C 0109	2622	1118	4149	8495	820	3562	7384	18144	17026	93.84	0.23
C 0111	2640	298	278	1177	194	786	1673	2733	2435	89.10	0.25
C 0113	2658	1755	1418	4580	705	2615	7173	11072	9318	84.15	0.27

TABLE 2b

CONCENTRATION (ul Gas / kg dry Rock) OF C1 - C5+ HYDROCARBONS IN OCLUDED

IKU no.	DEPTH m	C1	C2	C3	iC4	nC4	C5+	SUM C1-C4	SUM C2-C4	WET-NESS (%)	iC4/nC4
C 0115	2676	2317	1754	5799	799	2892	6650	13562	11245	82.91	0.28
C 0117	2694	2045	1326	3513	521	1648	2397	9053	7008	77.41	0.32
C 0177	2712	966	1213	3348	445	1384	1631	7356	6390	86.87	0.32
C 0179	2730	1733	1072	2704	428	1210	1251	7148	5414	75.75	0.35
C 0181	2748	1412	1004	2489	298	882	1355	6085	4673	76.79	0.34
C 0183	2766	698	638	2270	415	1102	1973	5123	4425	86.37	0.38
C 0185	2784	793	697	1846	359	848	2602	4543	3750	82.55	0.42
C 0187	2802	1065	1067	3010	565	1075	4062	6782	5717	84.30	0.53
C 0189	2820	1108	467	1836	397	784	2639	4592	3484	75.87	0.51
C 0191	2838	475	543	1584	341	794	1908	3738	3263	87.29	0.43
C 0193	2856	470	410	1237	273	651	2198	3041	2571	84.54	0.42
C 0195	2874	314	297	1252	270	695	2118	2828	2514	88.91	0.39
C 0197	2892	309	211	723	139	342	449	1724	1415	82.09	0.41
C 0199	2910	572	216	300	53	107	213	1248	676	54.17	0.49
C 0201	2928	487	130	344	74	168	299	1203	716	59.51	0.44
C 0203	2946	293	37	163		68	167	561	268	47.81	0.00
C 0205	2964	426	160	243	44	86	128	959	533	55.59	0.51
C 0207	2982	328	92	168	10		95	598	270	45.15	******
C 0209	3000	254	57	117		38	93	466	212	45.50	0.00
C 0211	3018	163	39	182	33	100	229	517	354	68.42	0.33
C 0213	3036	236	23	39				297	62	20.78	******
C 0215	3054	240	22	35				297	56	19.04	******
C 0217	3072	305	26	41				371	67	17.93	******
C 0219	3090	151	11	27				189	38	20.27	******

TABLE 2b

CONCENTRATION (ul Gas / kg dry Rock) OF C1 - C5+ HYDROCARBONS IN OCLUDED

IKU no.	DEPTH m	C1	C2	C3	iC4	nC4	C5+	SUM C1-C4	SUM C2-C4	WET-NESS (%)	iC4/nC4
C 0221	3108	89	6	15				110	21	19.09	******
C 0223	3126	139	10	24				173	34	19.62	******
C 0225	3144	146	15	60				221	76	34.22	******

TABLE 2c

CONCENTRATION (ul Gas / kg dry Rock) OF C1 - C5+ HYDROCARBONS SUMMATION

IKU no.	DEPTH m	C1	C2	C3	iC4	nC4	C5+	SUM C1-C4	SUM C2-C4	WET-NESS (%)	iC4 / nC4
B 9628	1000	1152	13					1165	13	1.09	******
B 9631	1030	23312						23312		0.00	******
B 9633	1050	3993	15	19				4026	34	0.84	******
B 9637	1090	27198	48					27246	48	0.18	******
B 9640	1120	5354	14					5368	14	0.27	******
B 9643	1150	79266	52	4				79321	55	0.07	******
B 9646	1180	20784	15	18				20817	33	0.16	******
B 9649	1210	27073	36	5				27114	41	0.15	******
B 9652	1240	6428	11					6439	11	0.17	******
B 9655	1270	5582	8					5590	8	0.15	******
B 9658	1300	865	7					872	7	0.80	******
B 9661	1330	6711	8					6719	8	0.11	******
B 9664	1360	1660						1660		0.00	******
B 9667	1390	201						201		0.00	******
B 9670	1420	1328						1328		0.00	******
B 9673	1450	1492						1492		0.00	******
B 9676	1480	2862	25					2886	25	0.85	******
B 9679	1510	1705	20		10			1734	30	1.70	******
B 9682	1540	665	14					679	14	2.11	******
B 9685	1570	944	23					966	23	2.33	******
B 9688	1600	1901	42		41			1985	84	4.21	******
B 9691	1630	10221	446	115	125	412	1211	11318	1097	9.69	0.30
B 9694	1660	17377	343	48		170	602	17936	560	3.12	0.00
B 9697	1690	13307	262	35		189	1740	13794	487	3.53	0.00

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TABLE 2c

CONCENTRATION (ul Gas / kg dry Rock) OF C1 - C5+ HYDROCARBONS SUMMATION

IKU no.	DEPTH m	C1	C2	C3	iC4	nC4	C5+	SUM C1-C4	SUM C2-C4	WET-NESS (%)	iC4/nC4
B 9700	1720	21510	492	61	36	348	6020	22447	937	4.17	0.10
B 9703	1750	16020	403	50	13	224	1586	16710	690	4.13	0.06
B 9706	1780	8057	182	21	12	67	566	8338	282	3.38	0.18
B 9709	1810	5267	140	21		43	45	5471	204	3.73	0.00
C 0023	1839	10265	268	49	128		209	10710	446	4.16	******
C 0026	1866	1183	41					1224	41	3.38	******
C 0029	1893	4118	221	144				4483	365	8.14	******
C 0031	1911	5421	308	137	88			5954	533	8.95	******
C 0033	1929	4033	219	105	43	36		4436	403	9.09	1.19
C 0035	1947	499	37	23	9	12		580	81	13.92	0.80
C 0037	1965	9333	611	425	137	195		10702	1369	12.79	0.70
C 0039	1983	28627	1362	658	124	168		30938	2311	7.47	0.73
C 0041	2001	18539	799	385	61	79	30	19863	1324	6.67	0.76
C 0043	2019	26691	1351	703	141	248	24	29135	2444	8.39	0.57
C 0045	2037	27531	2434	1709	228	411		32312	4781	14.80	0.55
C 0047	2055	164512	13828	10111	1502	2594		192547	28035	14.56	0.58
C 0049	2073	60971	5461	5079	839	1601		73951	12980	17.55	0.52
C 0051	2081	128085	11933	9033	1192	2219	180	152462	24377	15.99	0.54
C 0053	2109	67214	7549	6266	821	1549	181	83400	16186	19.41	0.53
C 0055	2127	36402	3475	3590	622	1159	81	45248	8846	19.55	0.54
C 0057	2145	82618	9603	7355	984	1995	507	102556	19938	19.44	0.49
C 0059	2163	59173	5536	4309	645	1350	229	71014	11841	16.67	0.48
C 0061	2181	68938	5928	4032	563	1103	242	80564	11626	14.43	0.51
C 0063	2199	96771	8828	7062	1105	2374	942	116140	19369	16.68	0.47

TABLE 2c

CONCENTRATION (ul Gas / kg dry Rock) OF C1 - C5+ HYDROCARBONS SUMMATION

IKU no.	DEPTH m	C1	C2	C3	iC4	nC4	C5+	SUM C1-C4	SUM C2-C4	WET-NESS (%)	iC4/nC4
C 0065	2217	1604	190	307	52	200	366	2353	749	31.82	0.26
C 0067	2235	17688	1543	1368	222	585	472	21406	3718	17.37	0.38
C 0069	2253	31787	3066	2922	574	1347	1444	39696	7910	19.93	0.43
C 0071	2271	39392	6785	10930	3685	7354	12462	68146	28754	42.19	0.50
C 0073	2289	26787	5010	7145	1677	3700	5283	44319	17532	39.56	0.45
C 0075	2307	13299	3568	4525	762	2185	2580	24340	11041	45.36	0.35
C 0077	2325	53528	12092	12164	1890	4245	4441	83918	30391	36.21	0.45
C 0079	2343	28258	4930	3851	472	1119	912	38631	10372	26.85	0.42
C 0081	2361	16403	3036	3204	450	1029	1117	24123	7720	32.00	0.44
C 0083	2379	22704	4400	3996	589	1325	1277	33014	10310	31.23	0.45
C 0085	2397	48031	9343	6030	602	1289	840	65295	17264	26.44	0.47
C 0087	2415	92043	19943	13103	1356	2864	1124	129309	37266	28.82	0.47
C 0089	2433	57001	16581	12235	1229	2611	1053	89657	32656	36.42	0.47
C 0091	2451	65285	17761	15710	1888	4414	2186	105058	39773	37.86	0.43
C 0093	2469	56871	11832	10181	1193	3235	3465	83312	26441	31.74	0.37
C 0095	2487	168701	43686	34748	3533	10174	8123	260843	92142	35.32	0.35
C 0097	2505	97474	49530	68236	12008	31536	49205	258785	161311	62.33	0.38
C 0099	2523	1580	1049	2778	533	2087	10948	8027	6447	80.31	0.26
C 0101	2550	1379	774	2475	893	3085	12456	8606	7227	83.98	0.29
C 0103	2568	1701	746	2339	824	2910	12974	8520	6819	80.03	0.28
C 0105	2595	2663	1294	4020	1552	4854	17582	14382	11719	81.48	0.32
C 0107	2604	1032	732	3356	1352	4182	18988	10655	9623	90.31	0.32
C 0109	2622	28978	15742	17555	2157	6664	12960	71097	42119	59.24	0.32
C 0111	2640	17027	9048	8440	960	2551	2533	38026	20998	55.22	0.38

TABLE 2c

CONCENTRATION (ul Gas / kg dry Rock) OF C1 - C5+ HYDROCARBONS SUMMATION

IKU no.	DEPTH m	C1	C2	C3	iC4	nC4	C5+	SUM C1-C4	SUM C2-C4	WET-NESS (%)	iC4/nC4
C 0113	2658	72526	24605	19698	2246	5712	8461	124788	52262	41.88	0.39
C 0115	2676	156646	47583	33590	3455	8028	7383	249303	92657	37.17	0.43
C 0117	2694	83546	26398	18460	2050	4420	3082	134873	51328	38.06	0.46
C 0177	2712	50555	18311	14379	1686	3616	3359	88547	37992	42.91	0.47
C 0179	2730	44706	10937	8311	1037	2168	1251	67159	22453	33.43	0.48
C 0181	2748	49758	16965	13023	1618	2854	2221	84218	34460	40.92	0.57
C 0183	2766	20359	8733	7716	1145	2152	2626	40104	19745	49.24	0.53
C 0185	2784	38678	13970	9459	359	2356	5801	64822	26144	40.33	0.15
C 0187	2802	17605	6272	5965	946	1558	4959	32346	14741	45.57	0.61
C 0189	2820	25230	10146	8571	1639	2117	3936	47703	22473	47.11	0.77
C 0191	2838	6722	2166	2458	480	962	2162	12788	6066	47.44	0.50
C 0193	2856	8232	2703	2635	535	963	2198	15068	6836	45.37	0.56
C 0195	2874	1207	706	1608	334	794	2118	4650	3443	74.04	0.42
C 0197	2892	3376	946	1252	223	475	449	6272	2897	46.18	0.47
C 0199	2910	5470	822	555	53	107	213	7006	1536	21.93	0.49
C 0201	2928	1229	359	453	93	168	299	2302	1073	46.61	0.55
C 0203	2946	843	149	246		68	167	1306	462	35.41	0.00
C 0205	2964	1123	255	306	44	86	128	1814	691	38.10	0.51
C 0207	2982	1515	310	266	26	24	95	2142	627	29.25	1.06
C 0209	3000	1352	279	222		38	93	1890	538	28.48	0.00
C 0211	3018	549	114	265	33	100	229	1061	512	48.28	0.33
C 0213	3036	614	69	73				756	142	18.78	******
C 0215	3054	1124	92	89				1305	181	13.88	******
C 0217	3072	609	40	41				690	81	11.77	******

TABLE 2c

CONCENTRATION (ul Gas / kg dry Rock) OF C1 - C5+ HYDROCARBONS SUMMATION

IKU no.	DEPTH m	C1	C2	C3	iC4	nC4	C5+	SUM C1-C4	SUM C2-C4	WET-NESS (%)	iC4/nC4
C 0219	3090	439	31	47				517	78	15.11	******
C 0221	3108	537	30	36				603	66	10.88	******
C 0223	3126	635	28	24				687	52	7.63	******
C 0225	3144	564	52	94				711	146	20.60	******

IKU

Lithology and Total Organic Carbon measurements

TABLE NO.: 3
WELL NO.: 34/7-5

Sample	Depth (m)	TOC	Lithology
M-9628	990-1000		60% Shell fragments 40% Sand, clear-light grey, very fine-very coarse grained, with some crystalline rock fragments Sm.am. Foraminifera
B-9631	1020-30		90% Sand, as above 10% Shell fragments Sm.am. Claystone (olive grey-greenish grey); Pyrite; Lignite
B-9634	1050-60		80% Sand, as above 20% Glauconite, dark green Sm.am. Claystone (olive grey-greenish grey); Pyrite; Lignite
B-9637	1080-90	1.29	*80% Claystone, light olive grey, glauconitic, slightly micromicaceous, containing spicules, non calcareous 20% Glauconite Sm.am. Lignite; Clay (white)
B-9640	1110-20	2.22	*100% Claystone, light olive grey, as above Sm.am. Glauconite
B-9643	1140-50	2.21	*100% Claystone, light olive grey, slightly micromicaceous, occ. glauconitic, containing spicules, non calcareous Sm.am. Glauconite
B-9646	1170-80	2.08	*100% Claystone, light olive grey, as above Sm.am. Glauconite

Lithology and Total Organic Carbon measurements

TABLE NO.: 3
WELL NO.: 34/7-5

Sample	Depth (m)	TOC	Lithology
B-9649	1200-10	1.88	*100% Claystone, light olive grey, as above Trace of Glauconite
B-9652	1230-40	1.60	*60% Claystone, light olive grey, as above, occ. very light olive grey
		1.40	*40% Claystone, olive grey, slightly micromicaceous, slowly disintegrates in 10% Hcl Sm.am. Glauconite
B-9655	1260-70	0.80	*80% Claystone, olive grey, as above
		1.39	*20% Claystone, light olive grey, as above Sm.am. Sand; Pyrite; Glauconite
B-9658	1290-1300	0.98	*50% Claystone, olive grey, as above
		1.66	*50% Claystone, light olive grey, as above Sm.am. Sand; Glauconite
B-9661	1320-30	0.87	*100% Claystone, olive grey, as above Sm.am. Claystone (light olive grey)
B-9664	1350-60	0.78	*100% Claystone, olive grey, as above Sm.am. Claystone (light olive grey)
B-9667	1380-90	0.84	*100% Claystone, olive grey, as above Sm.am. Claystone (light olive grey); Siderite
B-9670	1410-20	0.72	*100% Claystone, olive grey, as above Sm.am. Claystone (light olive grey)

Lithology and Total Organic Carbon measurements

TABLE NO.: 3
WELL NO.: 34/7-5

Sample	Depth (m)	TOC	Lithology
B-9673	1440-50	0.79	*100% Claystone, olive grey, as above
B-9676	1470-80	0.81	*100% Claystone, olive grey, as above
B-9679	1500-10	0.83	*100% Claystone, olive grey, as above Sm.am. Claystone (light olive grey)
B-9682	1530-40	0.60	*100% Claystone, olive grey, as above
B-9685	1560-70	0.63	*100% Claystone, olive grey, as above
B-9688	1590-1600	0.79	*100% Claystone, olive grey, as above
B-9691	1620-30	0.76 0.70	*50% Claystone, olive grey, as above *50% Claystone, dark olive grey, slightly micromicaceous, calcareous, slightly ?tuffaceous Sm.am. Claystone (light brown grey) Claystone (bluish grey, ?tuffaceous)
B-9694	1650-60	1.28	*100% Claystone, varicoloured, (light) olive grey-olive black-brownish grey-moderate brown, slightly micromicaceous, partly calcareous, partly ?tuffaceous
B-9697	1680-90	0.90	*60% Claystone, olive grey-dark olive grey, slightly micromicaceous, partly mottled (?tuffaceous) 40% Claystone, moderate brown, slightly calcareous

Lithology and Total Organic Carbon measurements

TABLE NO.: 3
WELL NO.: 34/7-5

Sample	Depth (m)	TOC	Lithology
B-9700	1710-20	0.65	*80% Claystone, olive grey, dark dark olive grey, slightly micromicaceous, partly mottled (?tuffaceous) 20% Claystone, moderate brown Sm.am. Claystone (light olive grey)
B-9703	1740-50	0.82	*100% Claystone, (light) olive grey-olive grey, slightly micromicaceous, non calcareous, occ. ?tuffaceous Sm.am. Claystone (moderate brown), olive black
B-9706	1770-80	0.74	*100% Claystone, light olive grey-olive grey, as above Sm.am. Claystone (moderate brown, olive black)
B-9709	1800-10	0.54	*100% Claystone, light olive grey-olive grey, greenish grey, slightly micromicaceous, non calcareous Sm.am. Claystone (moderate brown, olive black)
C-23	1850-39	0.41	*100% Claystone, light olive grey-olive grey, greenish grey, as above Sm.am. Sand
C-26	1857-66		100% Casing cement Sm.am. Claystone (light olive grey-olive grey)
C-29	1884-93	0.48	*80% Claystone, olive grey, slightly silty, slightly micromicaceous, non calcareous 20% Sand, light grey-clear, very fine-very coarse grained

Lithology and Total Organic Carbon measurements

TABLE NO.: 3
WELL NO.: 34/7-5

Sample	Depth (m)	TOC	Lithology
C-31	1902-11	0.34	*100% Claystone, olive grey, as above Sm.am Claystone (medium grey); Glauconite; Sand
C-33	1920-29	0.54	*100% Claystone, medium grey-slightly micromicaceous, slightly calcareous-calcareous Sm.am. Claystone (olive grey); Sand; Glauconite; Limestone
C-35	1938-47	0.49	*100% Claystone, medium grey, as above Sm.am. Claystone (olive grey); Limestone; Sand
C-37	1956-65	0.71	*100% Claystone, medium grey, as above Sm.am. Limestone (white, off white); Claystone (olive grey); Glauconite; Pyrite; Sand
C-39	1974-83	0.41	*100% Claystone, medium grey, as above Sm.am. Claystone (olive grey); Limestone (white, off white); Sand; Pyrite; Glauconite
C-41	1992-200	0.44	*100% Claystone, medium grey, (occ. slightly brownish) Sm.am. Sand; Glauconite; Forams; Shell fragments; Pyrite
C-43	2010-19	0.42	*100% Claystone, medium grey, as above Sm.am. Claystone (olive grey); Limestone; Sand; Forams; Glauconite
C-45	2028-37	0.59	*100% Claystone, medium grey, as above Sm.am. Sand; Forams; Claystone (olive grey); Pyrite; Mud-additive

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Lithology and Total Organic Carbon measurements

TABLE NO.: 3
WELL NO.: 34/7-5

Sample	Depth (m)	TOC	Lithology
C-47	2046-55	0.67	*100% Claystone, medium grey, as above Sm.am. Sand; Limestone; Glauconite; Pyrite; ?Casing cement; Mud additives
C-49	2064-73	0.65	*100% Claystone, medium grey, as above Sm.am. Limestone; Glauconite; Pyrite; ?Casing cement
C-51	2082-91	0.61	*100% Claystone, medium grey, as above Sm.am. Limestone; Pyrite; Glauconite; Forams
C-53	2100-2109	0.90	*100% Claystone, medium grey, as above Sm.am. Glauconite; Pyrite; Forams
C-55	2118-27	0.72	*100% Claystone, medium grey, as above Sm.am. Glauconite; Limestone (pink); Sand; Pyrite (Lumping of fragments due to poor washing)
C-57	2136-45	0.62	*100% Claystone, medium grey, as above Sm.am. Glauconite; Pyrite; Siderite
C-59	2159-63	0.62	*100% Claystone, medium grey, as above; Sm.am. Siderite; Claystone (reddish brown); Glauconite; Pyrite; Mud additives
C-61	2172-81	0.53	*100% Claystone, medium grey, as above Sm.am. Sandstone, fine to very fine, well cemented; Glauconite; Claystone (reddish brown); Pyrite

Lithology and Total Organic Carbon measurements

TABLE NO.: 3
WELL NO.: 34/7-5

Sample	Depth (m)	TOC	Lithology
C-63	2190-99	0.67	*90% Claystone, medium grey, as above 10% Limestone, light olive to light brownish grey Sm.am. Sand; Glauconite; Pyrite; Claystone (reddish brown)
C-65	2208-2217	0.64	*100% Claystone, medium grey, as above Sm.am. Sandstone (white to light grey); Chalk (white to pinkish white); Siderite; Pyrite
C-67	2226-35	0.52	*70% Claystone, medium grey, occ. medium olive grey 30% Sand, fine to medium, white to light brown, occ. reddish brown Sm.am. Pyrite; Coal (fragments); Siderite; Glauconite
C-69	2214-53	0.57	*70% Claystone, medium grey, as above 30% Sand, as above Sm.am. Glauconite; Pyrite
C-71	2262-71	0.50	*60% Claystone, medium grey, as above 40% Sand, as above Sm.am. Pyrite; Glauconite; Siderite
C-73	2280-89	0.61	*90% Claystone, medium grey, as above 10% Sand, as above Sm.am. Pyrite; Glauconite; Chalk (white)
C-75	2298-2307	0.67	*80% Claystone, medium grey, as above 20% Sand, as above Sm.am. Chalk; Pyrite; Glauconite. (Drilling mud deposits on fragments)

Lithology and Total Organic Carbon measurements

TABLE NO.: 3
WELL NO.: 34/7-5

Sample	Depth (m)	TOC	Lithology
C-77	2316-25	0.68	*80% Claystone, medium grey, occ. medium olive grey, as above 20% Sand, as above Sm.am. Limestone; Pyrite; Siderite
C-79	2334-43	0.68	80% Sand, fine to medium, white to light brown *20% Claystone, medium grey, as above Sm.am. Glauconite; Pyrite
C-81	2352-61	0.66	90% Sand, medium subangular to subrounded, white to light brown, occ. reddish brown *10% Claystone, medium grey, medium olive grey, as above Sm.am. Claystone (dark reddish grey); Pyrite; Limestone, Coal
C-83	2370-79	0.66	*90% Claystone, medium grey, occ. medium olive grey, as above 10% Sand, as above Sm.am. Claystone (reddish brown); Chalk; Limestone; Glauconite
C-85	2388-97	0.73	*60% Claystone, medium grey, as above 40% Sand, as above Sm.am. Pyrite (Some drilling mud deposits on fragments)
C-87	2406-15	0.82	*70% Claystone, medium grey, as above, occ.with some lamination 30% Sandstone, very fine to fine, white, well cemented, with some glauconite fragments Sm.am. Pyrite; sideritic Limestone (medium brownish grey); Claystone (medium dark grey)

Lithology and Total Organic Carbon measurements

TABLE NO.: 3
WELL NO.: 34/7-5

Sample	Depth (m)	TOC	Lithology
C-89	2424-33	0.59	*70% Claystone, medium grey, as above 20% Sand, very fine to medium well cemented 10% Limestone, medium grey Sm.am. Pyrite Some mud contamination
C-91	2442-51	0.86	*50% Claystone, medium dark grey
		0.69	*30% Claystone, medium grey, as above 20% Sand, as above Sm.am. Chalk; Pyrite
C-93	2460-69	0.64	*100% Claystone, medium grey, occ. medium olive grey Sm.am. Siderite (light brown); Claystone (reddish brown); Claystone (reddish brown); Sandstone (fine to very fine, with Glauconite grains)
C-95	2478-87	0.65	*90% Claystone, medium grey, as above 10% Sand, white to light brown, fine to medium Sm.am. Siderite; Pyrite; Claystone (reddish brown); Glauconite
C-97	2496-2505		80% Sand, fine to medium, mainly white, occ. light brown, angular to subangular
		0.94	*10% Claystone, medium grey, as above 10% Chalk/Limestone, white Sm.am. Claystone, reddish brown; Pyrite; Claystone, greenish white

Lithology and Total Organic Carbon measurements

TABLE NO.: 3
WELL NO.: 34/7-5

Sample	Depth (m)	TOC	Lithology
C-99	2523-32	0.62	*90% Claystone, medium grey, grading to medium dark grey 10% Sand, as above Sm.am. Glauconite, pyritic; Claystone (reddish brown)
C-101	2541-50	0.80	*90% Sand, light grey-clear fine-very coarse grained *20% Claystone, medium grey-medium dark grey, slightly micromicaceous, non calcareous-calcareous
C-103	2559-68	0.95	80% Sand, as above *20% Claystone, medium grey-medium dark grey, as above Sm.am. Claystone (moderate brown)
C-105	2586-95	1.00	*80% Claystone, medium grey-medium dark grey, as above 20% Sand, as above Sm.am. Claystone (dark grey) (moderate brown); Kaolinite
C-107	2595-2604	1.09	*80% Claystone, medium grey-medium dark grey, as above 20% Sand, as above Sm.am. Claystone (dark grey) (moderate brown); Kaolinite
C-109	2613-22	0.89	*70% Claystone, medium grey-medium dark grey, as above 10% Coal, brownish black-black 10% Sand Sm.am. Claystone (dark grey); Kaolinite

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Lithology and Total Organic Carbon measurements

TABLE NO.: 3
WELL NO.: 34/7-5

Sample	Depth (m)	TOC	Lithology
C-111	2631-40	0.83	*90% Claystone, medium grey-medium dark grey, as above
		2.14	*10% Claystone, dark grey, micromicaceous
			Sm.am. Sand; Pyrite
C-113	2649-58	0.91	*60% Claystone, medium grey-medium dark grey, as above
		2.27	*40% Claystone, dark grey, as above
			Sm.am. Sand; Pyrite
C-115	2667-76	1.95	*50% Claystone, dark grey-medium dark grey, as above
		1.26	*30% Claystone, medium grey-medium dark grey, as above
			20% Limestone, light-medium grey
			Sm.am. Sand; Pyrite
C-117	2685-94	1.73	*70% Claystone, dark grey-medium dark grey, as above
			20% Limestone, as above
			10% Claystone, medium grey-medium dark grey, as above
			Sm.am. Sand; Pyrite; Claystone (moderate brown)
C-177	2703-12	2.12	*50% Claystone, dark grey-medium dark grey, as above
			30% Sand/Sandstone, light grey-clear, very fine-coarse grained
		1.31	*20% Claystone, medium grey-medium dark grey, as above
			Sm.am. Limestone; Pyrite

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Lithology and Total Organic Carbon measurements

TABLE NO.: 3
WELL NO.: 34/7-5

Sample	Depth (m)	TOC	Lithology
C-179	2721-30		50% Sand/Sandstone, as above
		1.39	*40% Claystone, dark grey, as above
		1.15	*10% Claystone, medium grey-medium dark grey, as above
			Sm.am. Limestone
C-181	2739-48		70% Sand/Sandstone, as above
		1.54	*30% Claystone, dark grey, as above
			Sm.am. Limestone; Claystone (medium grey)
C-183	2757-60	1.41	*100% Claystone, dark grey, occ. greyish black, silty, micromicaceous
			Sm.am. Claystone (medium grey); Limestone; Paint; Pipe dope
C-185	2775-84	1.62	*90% Claystone, (dark) olive grey-dark grey, silty, slightly micromicaceous-micromicaceous
			10% Contaminants (Paint; Fibre; Pipe dope)
			Sm.am. Limestone
C-187	2793-2802	1.86	*80% Claystone, (dark) olive grey-dark grey, as above
			10% Sand/Sandstone, clear-light grey, very fine-fine grained
			10% Contaminants, as above
C-189	2811-20	1.92	*80% Claystone, (dark) olive grey-dark grey, as above
			20% Limestone, light grey-brownish grey
			Sm.am. Sand; Contaminants

Lithology and Total Organic Carbon measurements

TABLE NO.: 3
WELL NO.: 34/7-5

Sample	Depth (m)	TOC	Lithology
C-191	2829-38	1.18	*100% Claystone, dark olive grey-dark grey, as above Sm.am. Limestone; Sand; Pyrite
C-193	2847-56	1.60	*70% Claystone, dark olive grey-dark grey, as above
		0.96	*30% Claystone, medium grey-medium dark grey Sm.am. Claystone (medium grey); Limestone
C-195	2865-74	0.91	*70% Claystone, medium grey-medium dark grey, silty, slightly micromicaceous 30% Sand/Sandstone, clear-light grey, very fine-medium grained Sm.am. Mica (?additive)
C-197	2883-92	1.44	*90% Claystone, dark grey-dark olive grey, silty, slightly micromicaceous
		0.87	*10% Claystone, medium grey-medium dark grey Sm.am. Dolomite; Limestone; Sand; Paint; Pipe dope
C-199	2901-2910		100% Sand, clear-light grey, fine-very coarse grained Sm.am. Claystone (medium-dark grey, brownish grey) Trace of Coal
C-201	2919-2928		100% Sand, as above Sm.am. Claystone (medium-dark grey, brownish grey) Trace of Coal

Lithology and Total Organic Carbon measurements

TABLE NO.: 3
WELL NO.: 34/7-5

Sample	Depth (m)	TOC	Lithology
C-203	2937-46		100% Sand, as above Sm.am. Claystone (dark brownish grey-medium grey)
C-205	2955-64		100% Sand, as above Sm.am. Claystone (medium-dark grey, brownish grey) Trace of Coal
C-207	2973-82	0.38	90% Sand, as above *10% Claystone, medium grey, dark brownish grey, silty
C-209	2991-3000		100% Sand, as above Sm.am. Claystone (light grey-dark grey, dark brownish grey)
C-211	3009-18	0.67	90% Sand, as above *10% Claystone, varicoloured, medium-dark grey, brownish grey-olive brown-moderate brown, partly mottled, var. micromicaceous, var. silty
C-213	3027-36	0.32	50% Sand, as above *50% Claystone, varicoloured, moderate-olive brown, medium-dark grey-greenish grey, var. micromicaceous, var. silty
C-215	3045-54	0.26	60% Sand, as above 40% Claystone, varicoloured, as above
C-217	3063-72	0.23	70% Sand, as above *30% Claystone, varicoloured, as above

Lithology and Total Organic Carbon measurements

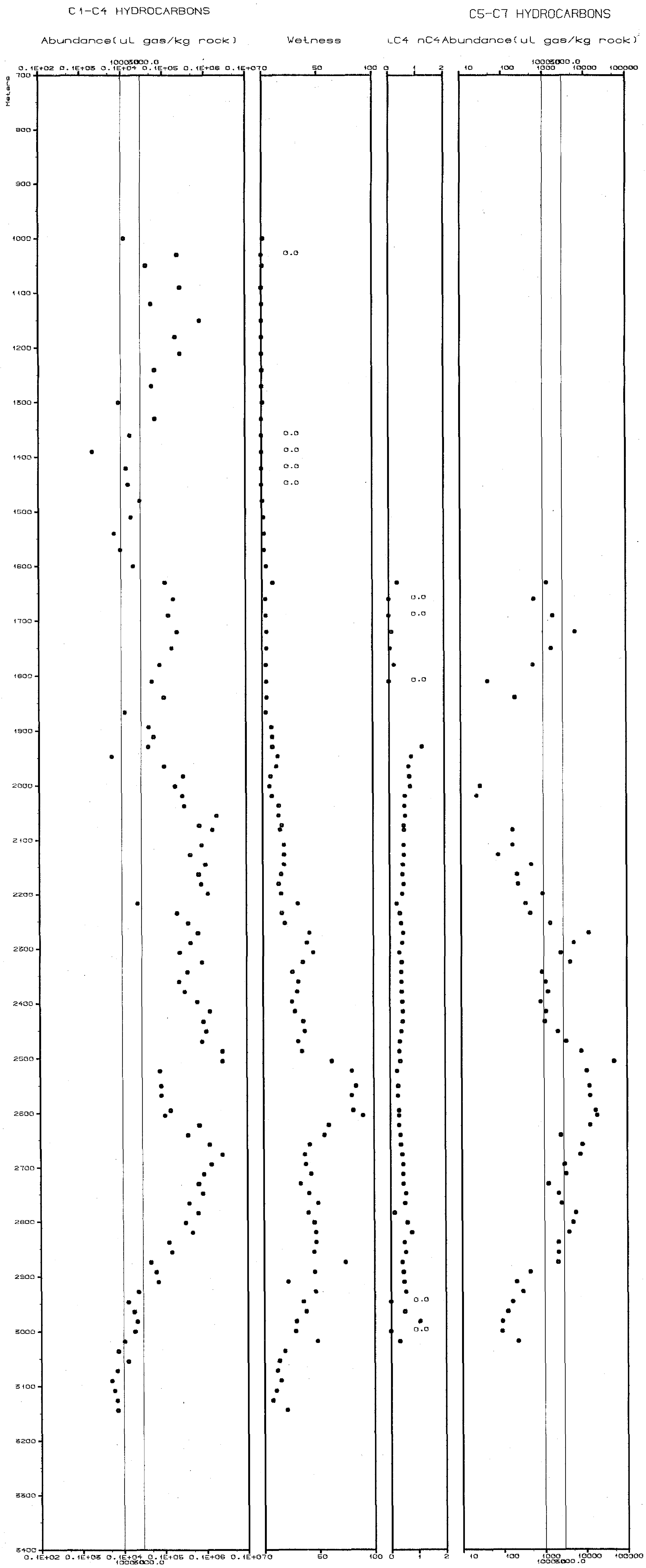
TABLE NO.: 3
WELL NO.: 34/7-5

Sample	Depth (m)	TOC	Lithology
C-219	3081-90		60% Sand, as above
		0.05	*40% Claystone, varicoloured, as above
C-221	3099-3108	0.01	*90% Claystone, varicoloured, moderate-dark brown, olive brown-olive grey-brownish grey-medium grey, varicoloured
			10% Sand/Sandstone, clear-light grey, moderate brown, very fine-coarse grained
			Sm.am. Limestone
C-223	3117-26	0.08	*100% Claystone, varicoloured, as above
			Sm.am. Limestone; Paint
C-225	3135-44	0.06	*90% Claystone, varicoloured, as above
			10% Sand, as above
			Sm.am. Limestone; Paint

IKU SINTEF-GRUPPEN

C_1 - C_7 HYDROCARBONS

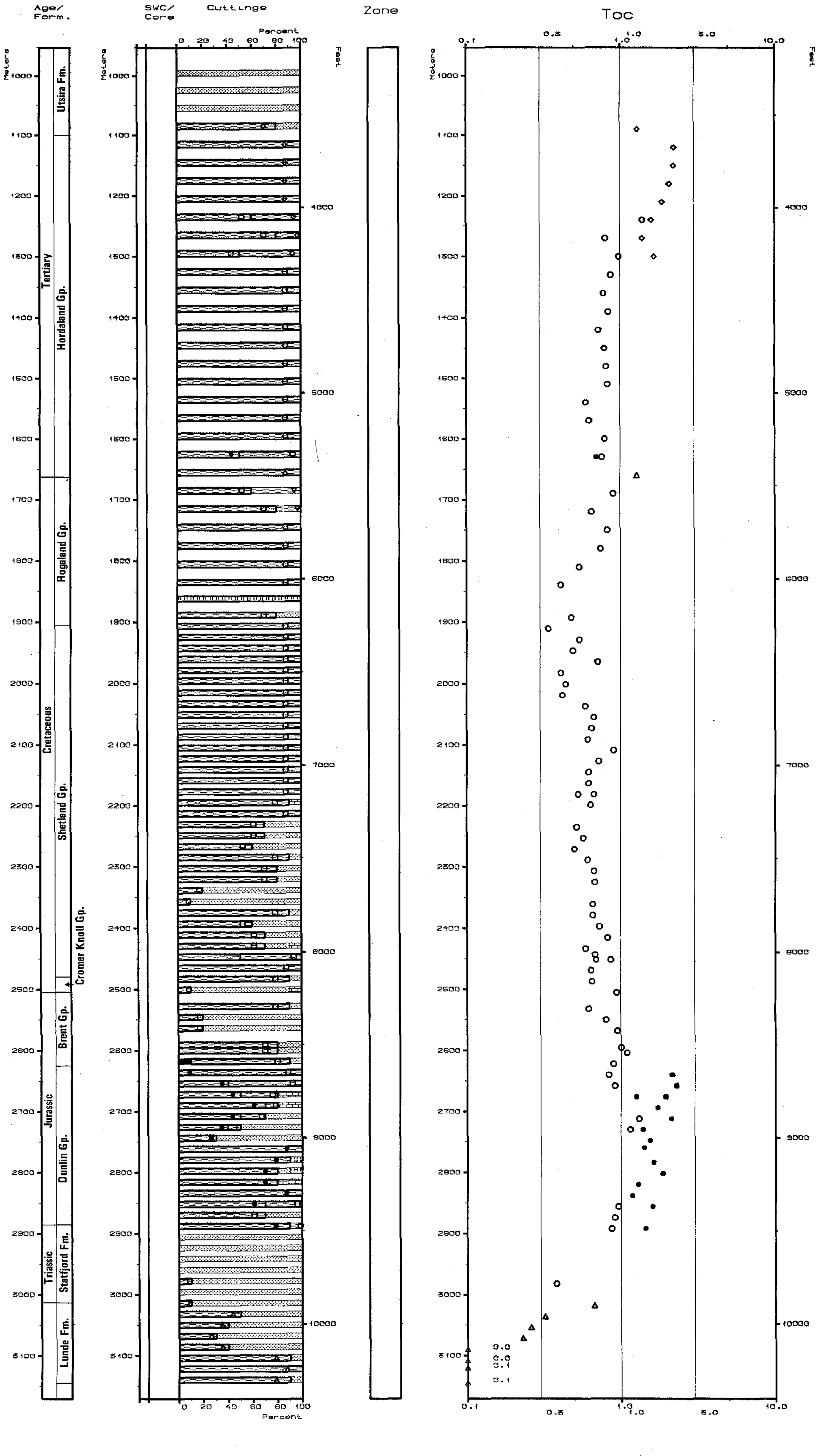
34/7-5



IKU
SINTEF-GRUPPEN

TOC AND LITHOLOGY

WELL 34/7-5



A Coal
B Claystone/Mudstone
C Claystone/Mudstone, dark coloured
D Claystone/Mudstone, medium coloured
E Claystone/Mudstone, light coloured
F Claystone/Mudstone, red-brown coloured
G Claystone/Mudstone, varicoloured
H Marl
I Siltstone
J Sandstone
K Limestone
L Dolomite
M Siderite
N Evaporites
O Tuff

● Claystone/Mudstone, dark coloured
○ Claystone/Mudstone, medium coloured
◇ Claystone/Mudstone, light coloured
▽ Claystone/Mudstone, red-brown coloured
△ Claystone/Mudstone, varicoloured
× Siltstone
✱ Sandstone
□ Carbonates
+ Coal
▫ Marl
⊕ Bulk
↗ Sidewall core/core