6.3 Mud report.

36" hole, 30" csg.:

The 36" hole was drilled from 189 m to 313 m using seawater with returns to the sea bed. High viscous pills were circulated around as necassary to clean the hole. At 313 m the hole was displaced with 63 m3 high viscous mud and a wiper trip made. Prior to run the 30" casing the hole was displaced with 119 m3 high viscous mud of 1.20 r.d.

Materials used in this section: Baryte, Bentonite, Caustic Soda, Soda Ash and Lime.

26" hole, 20" csg.:

The riser was run and the 17-1/2" pilot hole was drilled to 515 m using a bentonite-seawater system. At T.D. the mud was conditioned and a wiper trip was made prior to logging. The hole was opened to 26", using underreamer down to 506 m where the mud was conditioned and the riser pulled. A 26" bit was run in the hole to 480 m. The hole was reamed to 506 m and opened from 17-1/2" down to 515 m. The hole was displaced with 1.14 r.d. mud prior to run the 20" casing.

Materials used in this section: Baryte, Bentonite, Caustic Soda, Soda Ash and CMC EHV.

17-1/2" hole, 13-3/8" csg.:

The 17-1/2" hole section was drilled to 1724 m using a bentonite/lignosulfonate/seawater system. Severe problems were encontered with gumbo type clays during the interval from about 800 m to 1400 m. The shakers and flowline were packed off several times, mud was lot due to screen blinding and new mud had to be built, using bentonite and chemicals to maintain reasonable mud parameters.

The mud weight was increased to 1.18 r.d. at 1430 m wich helped to ease the shale problems. At 1724 m the mudweight was increased to 1.26 r.d. prior to logging and to 1.30 r.d. prior to running the 13-3/8" casing. The 13-3/8" casing was cemented without returns and new mud volume had to be built.

Materials used in this section: Baryte, Bentonite, Caustic Soda, CMC EHV, CMC LV and Soda Ash.

12-1/4" hole, 9-5/8" csg.:

The 12-1/4" hole was drilled to 3116 m using the same system as for the 17-1/2" hole section. The 13-3/8" casing was drilled out using 1.30 r.d. mud. At 1888 m the mudweight was increased to 1.36 r.d. and at 3116 m to 1.53 r.d. due to increased pore pressure prior to running the 9-5/8" casing. The logs over this section were run without hole problems. The mud properties were maintained within specifications throughout the interval and the solids kept within the optimum range by means of dilution and use of the solids control equipment on board.

Materials used in this section: Baryte, Bentonite, Spersene, XP-20, Caustic Soda, Soda Ash, CMC LV, CMC EHV, Magcolube, Al. Stearate and Lime.

8-3/8" hole:

The 8-3/8" hole was drilled with the existing mud system. The 9-5/8" casing was drilled out using 1.59 r.d. mud. Later on the mudweight was increased gradually to 1.89 r.d. at 3850 m and to 1.93 r.d. at 3977 m due to increase in pore pressure. The logs throughout this interval were run without experiencing hole problems. The mud properties were maintained within the required parameters, and the only problem was mud aeration in the latter part of the hole section. This was brought under control by chemical treatment.
A leak in the riser occured at T.D. and 12.7 m3 mud was lost and a lost circulation material pill was circulated round.

Materials used in this section:
Baryte, Bentonite, Spersene, XP-20, Caustic Soda, Lime, Soda Ash, CMC LV, Resinex, Magcolube, Magconol, AL. Stearate, Mica Fine and Nut Plug Fine.

DRESSER

TABLE B-5: **DAILY MUD PROPERTIES**

Well : Norsk Hydro, 7120/12-2

PAGE 1

1981 DATE	Meters DEPTH	R.D. WT.	VIS SEC.	CORR. 115°F Pascals PV	YP	GELS 0	10	pH BECK ☒ STRIP ☐	FLUID LOSS 100 PSI API	500 PSI 300 °F HT-HP	CL ☒ CACL ☐ NACL ☐	ALKALINITY PF	PM	MF	CA ppm	RETORT % OIL	% SOL	% WATER	V.G. METER READING @ 115° 600 R.P.M.	300 R.P.M.	200 R.P.M.	100 R.P.M.	6 R.P.M.	3 R.P.M.	lb/Bbl CEC		$ TOTAL MUD COST
April																											
14	RKB	1.04	130																								3959-80
15	202	1.04	130																								
16	228	1.04	130																								
17	241	1.04	130																								
18	284	1.04	130																								7957-20
19	313	1.20	170	3	43														89	86							8682-10
20	313	1.04	120																								13370-70
21	413	1.08	50	6	24	16	18	9.6																			22209-30
22	515	1.12	85	8	39	18	21	9.7											94	86	72	66	48	47			28992-30
23	506	1.12	66	6	31	15	8	10.3											74	68	53	47	31	28			35815-66
24	515	1.14	74	7	31	16	19	10.1											79	72	57	50	33	30			42027-27
25	515	1.12	60+					10.5																			48387-27
26	515	1.12	60	8	13	11	12	10.5	21										42	34	31	28	23	22			48387-27
27	515	1.12	55	11	12	10	12	10.5	22		20000								47	36	34	30	26	24			51205-03
28	515	1.12	51	11	12	10	12	10.5	22		20000								47	36	34	30	26	24			51205-03
29	515	1.12	51	11	12	10	12	10.5	22		20000								47	36	34	30	26	24			51205-03
30	515	1.12	51	11	12	10	12	10.5	22		20000								47	36	34	30	26	24			51205-03
May 1	515	1.12	51	11	12	10	12	10.5	22		20000								47	36	34	30	26	24			51205-03
2	515	1.12	51	11	12	10	12	10.5	22		20000								47	36	34	30	26	24			51908-33
3	701	1.12	61	11	14	12	15	10.1	19		26000								52	41	38	33	26	25			56524-94
4	930	1.12	62	11	17	14	14	9.8	20		14000								58	47	42	38	28	27			64294-91
5	1169	1.12	60	10	20	18	19	9.8	22		14000								61	51	37	33	25	25			68863-33
6	1341	1.14	60	9	10	14	18	9.5	22		13000								39	30	28	24	17	17			74621-98
7	1429	1.15	57	10	13	17	20	9.8	18		13000								47	37	35	31	22	22			82703-07
8	1532	1.18	60	13	21	24	28	9.4	14.8		16000	0.1	0.8	0.4	120		12	88	68	55	47	39	34	29	30		91727-14
9	1625	1.19	46	9	18	19	21	9.2	17.4		16000	TR	0.4	0.4	240		13	87	54	45	42	35	26	24	22.5		98371-04
10	1625	1.18	65	12	20	21	23	9.2	18.2		16000	TR	0.3	0.4	240		13	87	64	52	36	32	26	24	25		99479-04

DATE SPUD: DATE T.D.: COST:

TABLE B-5: **DAILY MUD PROPERTIES** CONT'D

Well: Norsk Hydro, 7120/12-2

PAGE 2

1981 DATE	Meters DEPTH	WT.	VIS SEC.	CORR. 115°F Pascals PV	YP	GELS 0	GELS 10	pH BECK ☒ STRIP ☐	FLUID LOSS 100 PSI API	FLUID LOSS 500 PSI 300 °F HT-HP	CL ☒ CACL ☐ NACL ☐	ALKALINITY PF	PM	MF	CA ppm	RETORT % OIL	% SOL	% WATER	V.G. METER READING @ 115° 600 R.P.M.	300 R.P.M.	200 R.P.M.	100 R.P.M.	6 R.P.M.	3 R.P.M.	Bbl CEC		TOTAL MUD COST
May																											
11	1724	1.19	62	13	26	26	27	10.8	16.4		16000	0.6	1.3	1.1	80		13	87	62	52	47	42	33	32	25		103739-14
12	1724	1.26	63	10	27	26	28	10.0	17.6		16000	0.4	1.0	0.9	120		14	86	74	64	59	53	47	45	25		108309-64
13	1724	1.30	54	12	18	17	29	9.2	17.8		16000	0.2	0.5	0.5	200		14	86	60	48	43	38	28	27	25		111864-14
14	1724	1.30	75			RUNNING CASING																					117265-14
15	1710		FABRICATING NEW VOLUMES																								122715-14
16	1710	1.30	42																								124288-94
17	1729	1.30	43	10	6	5	28	11.9		24.0	12000	1.6	5.0	2.3	TR		15	85	32	22	16	11	4	3	22.5		132851-06
18	1835	1.30	43	12	6.5	5	29	11.6	5.2	18.2	12000	0.8	3.8	1.7	TR	TR	15	85	37	25	18	12	5	4	25		140240-56
19	1888	1.36	46	16	8	9	36	10.9	4.8	17.6	12000	0.6	3.0	1.4	120	TR	87	83	48	32	24	17	7	6	25		151558-06
20	1908	1.36	44	15	5	4	19	11.0	4.6	17.6	11000	0.9	3.3	1.7	160	TR	15	85	40	25	18	12	4	3	22.5		152590-56
21	1978	1.36	41	14	5	3	16	11.2	4.6	17.8	11000	1.3	3.2	2.5	TR	TR	15	85	38	24	18	12	3	3	25		158897-01
22	2003	1.36	49	18	7.2	5	21	11.4	4.2	14.8	11000	1.1	2.8	2.3	TR	TR	16	84	51	33	25	17	6	5	25		160005-01
23	2032	1.36	48	16	9	7	21	11.3	5.0	16.2	11000	1.1	2.9	2.2	TR	TR	15	85	51	35	27	21	6	5	25		162327-51
24	2050	1.36	67	19	11	9	23	11.0	5.0	16.2	11000	.9	3.1	2.1	140	TR	15	85	61	42	36	26	8	7	25		163060-53
25	2128	1.36	47	16	14	10	17	11.2	4.8	13.2	13000	1.2	3.1	2.6	140	TR	15	85	62	46	41	33	24	21	27.5		165739-23
26	2165	1.36	48	14	10	8	15	10.9	4.8	13.4	13000	1.1	2.6	2.5	180	TR	15	85	49	35	29	22	11	10	22.5		167855-18
27	2179	1.36	48	14	10	9	16	11.0	4.8	15.4	13000	1.3	3.1	2.9	180	TR	15	85	48	34	28	20	8	8	22.5		168516-58
28	2247	1.36	48	14	10	6	25	11.1	5.2	17.4	13000	1.2	2.4	2.4	200	TR	15	85	48	34	28	21	7	6	22.5		170149-08
29	2311	1.36	49	18	10	4	22	10.7	4.8	16.2	13000	1.0	2.4	2.2	180	TR	15	85	56	38	31	22	5	4	26.0		173228-15
30	2354	1.36	48	18	9	4	16	10.3	4.6	16.4	13000	.9	2.0	1.8	160	TR	15	85	54	36	28	18	5	4	24		174116-88
31	2366	1.36	50	18	8	5	24	9.8	5.4	-	13000	.8	1.9	1.9	160	TR	15	85	52	34	27	19	4	3	22		174116-88
June 1	2366	1.36	50	18	10	6	32	9.8	5.4	-	13000	.8	1.9	1.9	160	TR	15	85	46	28	22	16	5	4	22		174116-88
2	2366	1.36	58	15	9	6	30	9.3	6.3	17.4	13000	.8	1.7	1.8	160	TR	15	85	49	34	28	20	6	5	22		174116-88
3	2368	1.36	54	17	9	4	20	11.3	7.2	14.0	13000	1.0	2.0	1.7	120	TR	15	85	54	36	28	20	6	5	23		174847-43
4	2429	1.36	48	16	8	7	26	11.0	8.2	15.6	13000	1.0	1.9	1.7	200	TR	15	85	48	32	25	16	7	5	24		179549-43
5	2516	1.36	46	14	5	6	31	11.2	8.4	14.8	13000	0.8	5.0	1.5	200	TR	16	84	39	25	20	14	6	4	21		181086-18
6	2606	1.36	45	14	5	7	34	11.2	8.4	14.2	13000	0.7	4.6	1.5	280	TR	15	85	38	24	19	13	4	3	25		183123-68

DATE SPUD: DATE T.D.: COST:

DRESSER

TABLE B-5: DAILY MUD PROPERTIES CONT'D

Well : Norsk Hydro 7120/12-2

PAGE 3

1981 DATE	Meters DEPTH	R.D. WT.	VIS SEC.	CORR. 115°F PV	YP	GELS (Pascals) 0	10	pH BECK ☒ STRIP ☐	FLUID LOSS 100 PSI API	500 PSI 250°F HT-HP	CL ☒ CACL ☐ NACL ☐	ALKALINITY PF	PM	MF	CA ppm	RETORT % OIL	% SOL	% WATER	V.G. METER READING @ 115° 600 R.P.M.	300 R.P.M.	200 R.P.M.	100 R.P.M.	6 R.P.M.	3 R.P.M.	lb/Bbl CEC		$ TOTAL MUD COST
June																											
7	2640	1.36	46	14	5	3	17	11.2	7.4	17.8	12500	0.7	2.9	1.5	200	TR	16	84	38	24	17	10	4	3	25		184380-38
8	2678	1.36	46	14	5	4	21	11.0	7.6	18.4	12000	0.5	3.2	1.3	320	TR	16	84	38	24	18	11	4	3	25		186953-88
9	2701	1.36	46	14	5	4	19	11.2	7.6	18.6	12500	0.5	3.8	1.5	200	TR	17	83	38	24	18	11	3	2	25		187034-68
10	2709	1.36	46	15	5	4	18	11.1	7.0	17.4	12000	0.5	3.6	1.5	240	TR	17	83	40	25	19	12	4	3	25		187034-68
11	2777	1.36	48	13	4	4	18	10.7	7.4	18.4	12000	0.4	2.8	1.2	240	TR	17	83	34	21	16	10	3	2	27		187681-28
12	2853	1.36	46	13	4	3	15	11.3	6.6	18.0	13000	0.8	3.6	2.0	160	TR	17	83	35	22	16	10	3	2	27.5		191214-88
13	2929	1.36	50	14	4	3	16	11.2	5.6	17.6	12000	0.7	3.4	210	160	TR	17	83	37	23	17	11	3	2	27.5		191954-13
14	2966	1.36	52	15	4	3	19	11.1	6.8	18.6	12000	0.7	3.1	2.3	100	TR	17	83	39	24	18	11	3	2	27.5		192075-33
15	2985	1.40	48	15	4	3	19	11.3	7.2	18.8	14000	0.7	3.2	2.3	120	TR	18	82	39	24	18	12	3	2	27.5		195197-83
16	3066	1.40	51	16	5	3	24	11.2	6.8	18.0	13000	0.7	3.3	2.4	120	TR	18	82	43	27	21	14	3	2	32		195899-83
17	3117	1.44	49	16	5	3	17	11.1	7.0	18.2	14000	0.7	3.1	2.0	120	TR	20	80	41	25	19	12	3	2	30		201218-33
18	3117	1.51	49	17	6	3	19	11.3	6.6	16.8	14500	4.1	2.9	2.7	100	TR	20	80	46	29	22	13	3	2	30		209693-93
19	3117	1.53	68	20	6	4	18	11.3	7.0	18.8	15000	1.0	2.4	3.0	180	TR	22	78	52	32	24	15	3	3	27.5		209693-93
20	3117	1.53	60	21	7	3	13	11.1	7.8	19.2	15000	1.0	2.6	3.0	180	TR	23	77	62	38	29	18	4	3	27.5		212200-93
21	3117	1.53	60	21	7	3	13	11.1	7.8	19.2	15000	1.0	2.6	3.0	180	TR	23	77	62	38	29	18	4	3	27.5		212311-63
22	3117	1.53	62	20	6	3	12	11.2	7.4	18.2	15000	1.1	2.6	3.1	180	TR	22	78	53	33	25	16	3	3	27.5		212459-23
23	3117	1.53	62	20	6	3	12	11.2	7.4	18.2	15000	1.1	2.6	3.1	180	TR	22	78	53	33	25	16	3	3	27.5		212000-63
24	3117	1.54	55	20	6	3	12	11.3	7.2	16.4	15000	1.1	1.4	3.1	160	TR	22	78	52	32	24	16	4	3	27.5		213259-68
25	3126	1.59	53	19	5	6	20	11.3	6.8	15.6	15000	1.7	3.8	4.3	100	TR	24	76	48	29	22	14	4	3	25.0		223360-68
26	3170	1.59	48	17	3	3	14	11.3	8.0	17.6	14000	1.2	3.3	2.8	100	TR	25	75	41	24	18	12	3	3	27.5		228527-98
27	3246	1.59	54	17	6	4	16	11.1	7.6	17.4	14500	1.2	3.1	2.7	140	TR	27	73	46	29	23	15	4	3	27.5		230288-28
28	3296	1.59	52	19	5	3	12	11.1	7.8	16.2	14000	1.3	3.1	3.2	120	TR	24	76	47	28	21	13	3	3	27.5		236088-03
29	3344	1.59	52	18	6	3	14	11.2	6.0	15.6	15000	1.3	1.5	3.0	100	TR	25	75	47	29	22	14	3	3	25.0		237638-49
30	3379	1.59	50	17	6	3	13	11.0	5.4	15.0	15000	1.1	2.6	3.2	130	TR	24	76	46	29	23	15	4	3	25.0		243231-09
July 1	3398	1.59	53	17	5	3	12	10.3	5.6	15.2	15000	.4	2.3	2.7	100	TR	23	77	44	27	21	14	3	3	25.0		245778-21
2	2439	1.59	50	17	6	3	13	11.0	5.2	15.0	15000	1.2	2.8	3.4	130	TR	23	77	46	29	22	15	3	3	25.0		252041-14
3	3532	1.59	49	20	6	3	18	10.7	4.6	15.6	15000	1.2	2.0	2.4	120	TR	23	77	53	33	26	16	3	2	25		260559-30

DATE SPUD: DATE T.D.: COST:

TABLE B-5: DAILY MUD PROPERTIES CONT'D

DRESSER

Well : Norsk Hydro 7120/12-2

PAGE 4

1981 DATE	Meters DEPTH	R.D. WT.	VIS SEC.	CORR. 115°F PV	YP	GELS Pascals 0	10	pH BECK ☒ STRIP ☐	FLUID LOSS 100 PSI API	500 PSI 300 °F HT-HP	CL ☒ CACL ☐ NACL ☐	ALKALINITY PF	PM	MF	CA ppm	RETORT % OIL	% SOL	% WATER	V.G. METER READING @ 115° 600 R.P.M.	300 R.P.M.	200 R.P.M.	100 R.P.M.	6 R.P.M.	3 R.P.M.	lb/Bbl CEC		$ TOTAL MUD COST
July 4	3595	1.59	53	16	9	4	20	10.7	3.8	14.0	15000	1.2	2.6	2.8	100	TR	23	77	50	34	28	20	4	3	25		268554-40
5	3667	1.59	53	14	11	4	22	10.8	3.0	14.2	16000	1.2	2.5	2.6	80	TR	23	77	50	36	30	24	7	6	25		278923-26
6	3673	1.65	52	17	7	4	18	11.3	3.0	13.0	17000	2.3	3.9	4.0	80	TR	25	75	48	31	27	20	4	3	22		287014-26
7	3095	1.70	54	18	4	4	15	11.4	2.6	11.4	16500	2.4	4.2	4.2	80	TR	26	74	43	25	18	10	3	3	22		290725-26
8	3744	1.80	71	18	12	9	25	11.1	2.6	12.8	16000	2.2	3.0	3.8	100	TR	30	70	61	43	32	26	10	8	22.5		310436.46
9	3814	1.87	58	20	8.5	7	23	11.2	2.2	11.6	17000	2.2	2.6	4.4	100	TR	32	68	57	37	29	21	6	4	20		322371-51
10	3816	1.87	54	20	8.5	8	22	11.2	2.0	11.2	17000	2.4	2.7	4.2	100	TR	32	68	57	37	30	21	5	4	22		324755-31
11	3838	1.87	57	18	9.5	10	23	11.0	2.4	13.4	17000	2.8	3.8	3.5	100	TR	31	69	57	39	32	25	6	5	20		327513-76
12	3884	1.89	54	18	8.5	5	20	11.2	3.0	13.6	16000	1.4	3.4	3.0	80	TR	32	68	53	35	28	21	7	5	20		338579-56
13	3900	1.89	56	20	10	6	22	11.1	2.6	12.6	16000	2.5	3.0	4.7	100	TR	32	68	60	40	32	21	5	4	21		343556-66
14	3916	1.89	54	22	9	6	22	10.8	2.8	11.8	16000	1.7	2.6	3.1	80	TR	32	68	62	40	32	22	4	3	22		349857-61
15	3923	1.89	55	21	10	6	23	11.0	2.8	11.8	16000	1.6	2.5	3.2	80	TR	32	68	62	41	31	22	5	4	22		355385-56
16	3934	1.89	54	22	9	6	21	10.8	2.6	12.6	16000	1.4	2.4	2.7	120	TR	32	68	62	40	31	23	5	4	22		359708-06
17	3988	1.93	56	23	11	6	24	10.9	2.0	10.8	16000	1.7	2.0	5.0	80	TR	34	66	68	50	38	27	9	5	22.5		368732-58
18	3999	1.93	55	26	10	6	21	11.3	2.4	12.0	17000	1.5	2.8	32	120	TR	33	67	72	46	36	21	7	4	21		373371-96
19	4024	1.93	54	25	9.5	5	21	11.4	2.6	12.4	14000	1.6	3.6	32	40	TR	33	67	69	44	33	22	6	9	22		318091-71
20	4064	1.93	54	25	9	6	25	11.1	2.6	12.2	14000	1.6	3.0	3.8	60	TR	34	66	68	43	33	26	8	5	22		337337-26
21	4085	1.93	55	26	11	7	25	10.8	3.0	12.0	15000	1.4	3.0	3.6	80	TR	34	66	44	48	44	39	10	7	24		389168-21
22	4103	1.93	54	25	11	6	21	10.8	3.0	12.2	16000	1.5	3.0	3.5	100	TR	33	61	72	47	38	27	11	7	22		345123-01
23	4124	1.93	54	26	16	7	20	10.8	2.8	11.8	16000	1.6	2.9	3.7	80	TR	34	66	70	46	38	26	11	6	23		346609-01
24	4142	1.93	54	24	10	6	18	11.0	3.0	12.0	15000	1.8	3.1	4.0	60	TR	33	61	68	44	36	29	11	7	21		399211-51
25	4176	1.93	53	23	12	4	14	11.0	3.2	12.0	15000	2.2	3.3	4.0	40	TR	33	67	70	47	40	32	12	8	21		406116-01
26	4216	1.93	55	23	9.5	5	18	10.4	3.4	12.2	16000	2.1	3.9	4.0	40	TR	33	67	65	47	32	23	10	5	22		409193-01
27	4263	1.93	52	23	10.5	6	17	11.1	3.6	13.8	14000	2.2	4.1	4.4	80	TR	34	67	67	44	37	26	10	5	24		414769-01
28	4302	1.93	54	24	11	6	19	11.2	8.4	13.2	15000	2.5	4.3	4.8	40	TR	33	67	70	46	39	28	11	6	21		419452-01
29	4308	1.93	52	23	10	5	18	11.0	3.2	13.2	14000	2.1	5.8	4.1	60	TR	33	67	66	43	34	25	3	5	22		420357-51
30	4351	1.93	55	24	11.5	6	19	11.0	3.0	11.8	14000	1.9	3.8	4.3	30	TR	33	65	71	47	38	26	11	6	21		424262-31
31	4413	1.93	54	27	14	9	31	10.9	4.2	12.4	15000	2.8	3.4	3.8	80	TR	35	65	82	55	47	33	11	9	23		426988-61

DATE SPUD: DATE T.D.: COST:

DRESSER

TABLE B-5: **DAILY MUD PROPERTIES** CONT'D.

Well : Norsk Hydro, 7120/12-2 PAGE 5

1981	Meters		VIS	CORR. 115°F	Pascals	GELS		pH	FLUID LOSS		CL ☒ CACL ☐ NACL ☐	ALKALINITY			CA	RETORT			V.G. METER READING @ 115°						lb/ Bbl		$ TOTAL
DATE	DEPTH	WT.	SEC.	PV	YP	0	10	BECK ☒ STRIP ☐	100 PSI API	500 PSI 300 °F HT-HP		PF	PM	MF	ppm	% OIL	% SOL	% WATER	600 R.P.M.	300 R.P.M.	200 R.P.M.	100 R.P.M.	6 R.P.M.	3 R.P.M.	CEC		MUD COST
01/8	4420	1.93	54	26	12	8	29	11.0	4.0	12.2	15000	2.6	3.6	4.0	80	TR	35	65	76	50	43	29	10	8	23		430849-11
02	4434	1.93	54	20	10.5	6	24	11.1	3.8	11.0	15500	3.6	4.8	6.0	80	TR	35	65	61	41	33	23	5	4	23		441667-21
03	4457	1.93	47	20	9.5	8	24	11.3	4.2	13.2	15000	4.0	5.4	6.4	80	TR	35	65	60	40	32	22	5	4	25		456986-31
04	4476	1.93	46	19	7.5	6	17	10.6	3.8	11.0	13000	3.3	4.0	5.4	100	TR	34	66	63	34	27	20	5	4	25		467374-81
05	4507	1.93	48	22	9.5	7	23	11.2	4.4	11.8	11000	3.1	3.8	4.3	60	TR	35	65	63	41	34	23	4	4	25		480118-96
06	4513	1.93	49	22	10	8	23	11.1	4.0	12.0	11000	3.2	3.9	4.3	60	TR	85	65	64	42	35	24	5	4	25		483465-56
07	4537	1.93	47	22	8.5	6	21	11.1	3.8	11.8	11000	3.7	5.0	4.9	240	TR	34	66	61	39	31	21	4	3	25		495127-26
08	4549	1.93	49	21	7.5	6	20	10.8	3.0	10.5	11000	1.9	4.8	3.9	320	TR	34	66	57	36	29	19	4	3	25		505178-46
09	4579	1.93	49	23	11	8	23	10.8	2.6	9.6	10000	3.4	4.9	4.0	240	TR	34	66	68	45	37	26	5	4	26		518727-16
10	4617	1.93	47	21	7.5	5	19	11.2	2.8	9.8	11000	3.7	5.0	6.1	140	TR	35	65	57	36	29	19	4	3	26		528631-06
11	4645	1.93	44	22	6.5	4	21	11.4	2.8	11.4	11000	4.4	6.4	5.0	280	TR	35	65	55	33	24	20	4	2	23		541159-86
12	4674	1.93	46	22	3.5	3	14	12.0	3.8	15.6	11000	4.9	6.1	5.7	200	TR	35	65	51	29	21	16	3	2	20		560701-06
13	4674	1.93	46	23	3	3	8	11.5	2.8	13.4	9500	2.8	6.1	3.6	160	TR	33	67	52	29	20	15	3	3	21		567386-95
14	4674	1.93	47	24	3	3	9	11.7	2.6	13.8	9000	2.8	6.1	3.6	160	TR	33	67	53	29	20	15	3	3	20		569741-45
15	4674	1.93	52	18	2	3	7	11.5	3.2	14.2	8000	3.4	3.6	55	640	TR	33	67	40	22	14	8	2	2	20		577166-75
16	4674	1.93	53	20	3	2	5	11.3	3.4	13.8	7500	3.1	3.3	4.9	400	TR	33	67	45	25	17	10	2	2	20		580523-43
17	4676	1.93	53	21	4	2	5	10.2	3.0	14.2	8000	2.0	2.9	4.6	360	TR	32	68	50	29	19	11	2	2	22.5		587596-63
18	4675	1.93	53	21	4	2	5	10.7	3.0	14.0	8000	1.9	2.8	4.3	360	TR	32	68	50	29	19	11	2	2	22.5		593074-83
19	4680	1.93	55	22	3	2	5	10.2	2.8	9.2	8000	1.4	2.0	4.0	320	TR	33	67	50	28	18	10	2	2	22.5		596179-27
20	4680	1.93	65	22	3	2	5	10.2	2.8	9.2	8000	1.4	2.0	4.0	320	TR	33	67	50	28	18	10	2	2	22.5		598118-27
21	4680	1.93	65	22	3	2	5	10.2	2.8	9.2	8000	1.4	2.0	4.0	320	TR	33	67	50	28	18	10	2	2	22.5		597867-40
22	4680	1.93	68	22	3	2	5	10.3	2.8	9.2	8000	1.4	2.0	4.0	320	TR	33	67	50	28	18	10	2	2	22.5		593358-20
23	4680	1.93	65	22	3	2	5	10.3	2.8	9.2	8000	1.4	2.0	4.0	320	TR	33	67	50	28	18	10	2	2	22.5		600158-70
24	4680	1.93	66	22	4	3	12	10.7	2.8	9.2	8000	2.0	2.2	4.3	360	TR	33	67	33	31	20	12	3	3	22.5		601348-70
25	4680	1.93	68	22	4	3	10	10.6	2.8	9.2	8000	2.0	2.2	4.3	360	TR	33	67	53	31	20	12	3	3	22.5		601348-70
	TESTING PROCEDURE AND PLUG AND ABANDONMENT																										
26	4680	1.29	43	14	2	4	11	9.2	8.8	13.2	11000	0.4	0.6	1.1	200	TR	10	90	30	16	12	8	3	3	17.5		601888-52
27	4680	1.26	43	14	2	4	11	9.2	8.8	-	11000	0.4	0.6	1.1	200	TR	10	90	30	16	12	8	3	3	17.5		604116-92

DATE SPUD: DATE T.D.: COST:

DRESSER

TABLE B-5: **DAILY MUD PROPERTIES** CONT'D

Well : Norsk Hydro, 7120/12-2

PAGE 6

1981 DATE	Meters DEPTH	R.D. WT.	VIS SEC.	CORR. 115°F PV	Pascals YP	GELS 0	GELS 10	pH BECK ☒ STRIP ☐	FLUID LOSS 100 PSI API	FLUID LOSS 500 PSI 300 °F HT-HP	CL ☒ CACL ☐ NACL ☐	ALKALINITY PF	ALKALINITY PM	ALKALINITY MF	CA ppm	RETORT % OIL	RETORT % SOL	RETORT % WATER	V.G. METER READING @ 115° 600 R.P.M.	300 R.P.M.	200 R.P.M.	100 R.P.M.	6 R.P.M.	3 R.P.M.	lb/Bbl CEC		$ TOTAL MUD COST
28/8	4680	1.26	51	13	6	5	13	9.0	10.2	16.2	11000	0.3	0.6	1.0	240	TR	11	89	38	25	20	16	7	4	14		604116-92
29	3055	1.26	48	12	5	4	11	9.1	9.8	15.6	10000	0.35	0.6	1.0	200	TR	11	89	34	22	18	14	4	3	16		605231-12
30	3055	1.26	48	12	5	4	12	9.0	9.6	15.6	10000	0.35	0.6	1.0	200	TR	11	89	34	22	18	14	5	3	16		605231-12
31	3055	1.27	46	12	4	3	10	9.8	6.2	11.4	11000	0.4	0.5	1.0	160	TR	11	89	32	20	16	15	3	3	16		607814-57
01/9	2006	1.27	47	11	5	4	11	10.8	8.2	-	11000	0.45	0.8	0.7	120	TR	12	88	32	21	17	16	4	3	18		607916-57
02	2006	1.27	44	12	4	3	9	10.8	6.4	-	11000	0.4	0.8	0.7	200	TR	12	88	32	20	17	15	4	3	18		607916-57
03	2006	1.27	46	11	4	3	8	10.6	7.2	-	11000	0.4	0.75	0.8	160	TR	11	89	30	19	16	15	3	3	18		608698-02
04	2006	1.27	46	11	5	3	10	10.8	7.4	-	11000	0.4	0.8	1.0	200	TR	11	89	32	21	17	16	4	3	18		609113-52
05	2006	1.27	51	12	6	4	12	10.8	8.2	-	11000	0.4	0.8	1.0	200	TR	12	88	36	24	20	18	6	4	18		609113-52
06	2006	1.26	44	10	4	3	8	10.9	7.4	-	10000	0.5	1.4	0.9	120	1	11	88	28	18	16	14	3	2	17		609499-12
07	1989	1.26	43	10	4	3	9	10.7	8.0	-	11000	0.45	1.2	0.9	120	1	11	88	28	18	16	14	3	2	17		609499-12

DATE SPUD:

DATE T.D.:

COST:

RFT RESULTS

Well: **7120/12-2**

RUN 1

NO	DEPTH (MRKB)	H.P. (PSI)	F.P. (DSI)	PERM.
1/1	1888.5	3587	3085	Very good
2/1	1893.5	3596	3087	—»—
3/1	1903	2615	3090	—»—
4/1	1909.5	3626	3091	—»—
5/1	1920	3648	3096	—»—
6/1	1928	3662	3099	Good
7/1	1936	3676	3101	—»—
8/1	1943.5	3690	3102	Excellent
9/1	1947.5	3698	3102	—»—
10/1	1954.4	3712	3103	—»—
11/1	1960.5	3722	3109	Fair
12/1	1967	3735	3107	Good
13/1	1972	3745	3110	Fair
14/1	1978	3758	3111	Good
15/1	1982	3762	3112	Very good
16/1	1987.5	3775	3121	—»—
17/1	1991	3780	3126	Excellent
18/1	2002	3800	3144	Fair
19/1	2014.5	3823	3160	Good
20/1	2034.5	3861	3193	Fair
21/1	2074.5	3936	3251	Very good
22/1	2090.5	3967	3276	Good
23/1	2112	4007	3307	Very good
24/1	2148.5	4073	3362	»
25/1	1978	Took 2¾ gal sample and recorered: 1500 ccm gas (0.66 grav) and traces of condensate.		
26/1	1943.5	Took 1 gal sample and recorered: 46.91 l gas. (0.660 grav) 1.86 ccm condensate (61° API) GOR: 141603 scf/bbl.		

RUN 2

NO	DEPTH (MRKB)	H.P. (PSI)	F.P. (DSI)	PERM.
1/2	2165	4705	3386	Very good
2/2	2198	4781	3443	Fair
3/2	2219.5	4827	3473	»
4/2	2265	4927	3541	»
5/2	2292.5	4986	3583	—»—
6/2	2309.5	5022	3618	Very low
7/2	2362.5	–	–	Tight
8/2	2363.5	–	–	Tight
9/2	2514.5	5470	4233	Very low
10/2	2556.6	5559	4185	Fair
11/2	2561	5570	4174	—»—
12/2	2563.5	5575	4174	Good
13/2	2567	5582	4175	—»—
14/2	2569	5586	4176	Fair
15/2	2810	6109	4639	—»—
16/2	2943	6395	6034	—»—
17/2	2977	6472	6072	—»—
18/2	3004	6523	6256	Very low

RUN 3

NO	DEPTH (MRKB)	H.P. (PSI)	F.P. (DSI)	PERM
1/3	3555.3	9494	–	Tight
2/3	3666	9785	9542	Very low
3/3	3696.5	9880	9255	Fair
4/3	3699	9878	9257	—»—
5/3	3717	9932	9728	Very low
6/3	3720	9941	9665	—»—
7/3	3726	9964	9794	—»—
8/3	3757	10036	9974	Seal failure?
9/3	3766.5	10066	9426	Fair
10/3	3775.5	10090	9781	Very low
11/3	3783	10110	9586	—»—
12/3	3800	10148	9886	Fair
13/3	3805.5	10168	9525	—»—
14/3	3813	10199	10008	Seal failure?
15/3	3823.5	10215	9614	Fair
16/3	3844	10266	9519	low
17/3	3859.4	10303	9503	Very low
18/3	3696.5	Took segregated sample and recorered only minor amounts of mudfiltrate.		

RUN 4

NO	DEPTH (MRKB)	H.P. (PSI)	F.P. (DSI)	PERM
1/4	3141	8395	–	Tight
2/4	3202	8575	7612	Very low
3/4	3240	8672		Tight
4/4	3272	8740	7254	Very low
5/4	3281.5	8769	7140	—»—

RUN 5

NO	DEPTH (MRKB)	
1/5	3780.7	Attempted sample and recorered only
2/5	3766.5	minor amounts of mudfiltrate.

DST RESULTS

DST 1

Perforated interval: 2562 - 2568 m. Choke size: 1/2".

Flow rates:
- 14.75 mm scf/d gas. grav.: 0.62
- 158.0 bbl/d condensate. grav 55.92° API.

GOR: 93350 sct/bbl.

DST 2

Perforated interval: 1985 - 1991 m. choke size: 172/64"

Flow rate: 1008 bbl/d water.

DST 3

Perforated interval: 1944 - 1950. Choke size: 60/64"

Flow rates:
- 26.77 mm scf/d gas. grav: 0.626
- 330.5 bbl/d condensate. grav: 64.4° API

GOR: 81000 scf/bbl.

Checked: B.To

Date: 18.3.82

3.2 Production Test Summary

On August 25th. the BOP was pulled and the upper and lower pipe rams changed to 3-1/2" before rerunning and testing the stack. The well was perforated from 2562 m to 2568 m on August 28th and the test string was run in the hole. (Fig. B-5). When testing the sub sea test tree after landing same, the ball valve was found leaking. Hence, the test tree was pulled, replaced and rerun.

The test string was tested to 290 bar against the APR-N valve before the well was opened for flow. The test was carried out as follows: 10 min initial flow, 1 hrs initial shut in, 6-3/4 hrs main flow and 6-1/4 hrs main shut in.

The well was then killed, the test string pulled and the perforations squeezed off through a squeeze packer at 2550 m.

On September 1st. the well was perforated at 2010 m, a squeeze packer set at 2006 m and an annulus squeeze cement job was performed in order to improve the cement bond over the interval of test no. 2 and 3. A subsequently run CBL log showed that an acceptable bond over the interval had been achieved.

The well was then perforated from 1985 m to 1991 m for test no. 2. The test string was run and tested to 220 bar against the APR-N valve prior to opening the well for flow. The test was successfully carried out as follows: 4 hrs flow and 3 hrs shut in.

The well was killed, the test string pulled and the perforations were squeezed off through a squeeze packer set at 1980 m.

On September 4th the well was perforated from 1944 m to 1950 m for test no. 3. The test string was run and tested to 220 bar against the APR-N valve prior to opening the well for flow. The test was successfully carried out as follows: 5 min. initial flow, 1 hrs. initial shut in, 8 hrs main flow, 14 hrs main shut in, 15 hrs three stage flow and 6 hrs final shut in.

The well was killed, the test string pulled and the perforations were squeezed off through a squeeze packer set at 1939 m on September 7th. This concluded the production test programme.

2 PRODUCTION TESTS

2.1 Summary and results

3 Production tests were conducted in the following intervals (mRKB) to evaluate the productivity and to obtain fluid samples.

Test no. 1	2562 - 2568	(Gas test)
Test no. 2	1985 - 1991	(Water test)
Test no. 3	1944 - 1950	(Gas test)

The test operations are summarized in chapter 2.3 and the recorded bottomhole-pressure vs. time is plotted in figs. 2.4-1 to 2.4-4.

Summarized test results are:

Test no.	1	2	3			
Gas rate (MMSCF/D)	14.75	-	23.665	9.3	17.53	26.77
Condensate rate (bbl/D)	158.0	-	365.0	101.6	148.5	330.5
Water rate (bbl/D)	-	1008	-	-	-	-
GOR avg (SCF/bbl)	93350	-	64150	91500	118050	81000
WHP (Psia)	2444	30	1770	2517	2250	1436
Choke size (1/64")	32	172	48	24	36	60
Condensate gravity (°API)	55.92	-	64.4	64.4	64.4	64.4
Gas gravity (Air = 1)	0.62	-	0.626	0.626	0.626	0.626
B.S. & W. (%)	Nil	Nil	Nil	Nil	Nil	Nil
Sep. press. (psig)	495	-	535	930	880	390
Sep. temp. (°F)	57	-	38	97	64	56

Table 2.1-1

2.2 Fluid data

Reservoir and well characteristics:

Producing zone	1944 - 1950 mRKB
Static pressure	3117 psig
Bottom hole temperature	151° F

Sampling conditions

Choke	48/64"
Wellhead pressure	1768 psig
Separator pressure	535 psig
Separator temperature	37° F
Gas rate (separator)	23.665 mmSCF/d
Compressibility factor	0.842
Gas gravity (air = 1)	0.626
Liquid rate (separator)	463.3 bbls/d

COMPOSITION OF RESERVOIR FLUID

COMPONENT	RECOMBINED RESERVOIR FLUID (MOLE PERCENT)	MOL WEIGHT
Nitrogen	1.52	
Carbon dioxide	0.84	
Hydrogen sulphide	0.00	
Methane	89.59	
Ethane	3.59	
Propane	1.63	
I-Butane	0.38	
N-Butane	0.60	
I-Pentane	0.26	
N-Pentane	0.22	
Hexanes	0.30	
Heptanes	0.37	
Octanes	0.32	
Nonanes	0.16	
Decanes	0.09	
Undecanes	0.05	
Dodecanes plus	0.08	193
T O T A L	100.00	

SOURCE ROCK ANALYSES OF WELL 7120/12-2

CLIENT/ OPPDRAGSGIVER

Norsk Hydro A/S

RESPONSIBLE SCIENTIST/ PROSJEKTANSVARLIG

Malvin Bjorøy

AUTHORS/ FORFATTERE

Bjorøy, M., Knarud, R., Vigran, J.O. and Berg, T.

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18.12.81	0-353	100	

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CONTINENTAL SHELF INSTITUTE

Håkon Magnussons gt. 1B — N-7000 Trondheim — Norway — Telephone (075) 15660 — Telex 55548

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CONTINENTAL SHELF INSTITUTE

Håkon Magnussons gt. 1B — N-7000 Trondheim — Telephone (075) 15 660 — Telex 55548

REPORT TITLE/ TITTEL

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18.12.81	0-353	100	

SUMMARY/ SAMMENDRAG

Canned samples from the interval 1485-4575 m were analysed and the following interpretation given:

Zone A; 1485-1650 m: Immature, good potential as a source rock for gas.

Zone B; 1650-1875 m: Immature, rich potential as a source rock for oil and gas.

Zone C; 1875-2450 m: Moderate mature, turbodrilling affecting results. Good potential as a source rock for gas and paraffinic oil below 2100 m. Indications of free HC between 1950 and 2100 m, approximately.

Zone D; 2450-2715 m: Moderate mature. Sandstone. Indications of free HC between 2450-2600 m.

Zone E; 2715-2910 m: Moderate mature, rich potential as a source rock for gas.

KEY WORDS/ STIKKORD

Summary continued:

Zone F; 2910-3105 m: Moderate mature, good potential as a source rock for gas.

Zone G,H,J and K; 3105-3960 m: Moderate mature increasing to oil window maturity.

Zone L; 3960-4065 m: Oil window maturity.

Zone M; 4065-4485 m: Oil window maturity. Turbodrilling have affected the results. Possibly free HC in upper part.

Zone N; 4485-4575 m: Oil window maturity, fair potential as a source rock for gas.

EXPERIMENTAL AND DESCRIPTION OF INTERPRETATION LEVELS

Headspace Gas Analysis

One ml. of the headspace gas from each of the cans was analysed gas chromatographically for light hydrocarbons. The results are shown in Table 1a. The canned samples were washed with temperated water on 4, 2, 1 and 0.125 mm sieves to remove drilling mud and thereafter dried at 35^{o}C.

Total Organic Carbon (TOC)

Picked cuttings of the various lithologies in each sample was crushed in a centrifugal mill. Aliquots of the samples were then weighed into Leco crucibles and treated with hot 2N HCl to remove carbonate and washed twice with distilled water to remove traces of HCl. The crucibles were then placed in a vacuum oven at 50^{o}C and evacuated to 20 mm Hg for 12 hrs. The samples were then analysed on a Leco E C 12 carbon analyser, to determine the total organic carbon (TOC).

Extractable Organic Matter (EOM)

From the TOC results samples were selected for extraction. Of the selected samples, approximately 100 gm of each was extracted in a flow through system (Radke et al,, 1978, Anal. Chem. 49, 663-665) for 10 min. using dichloromethane (DCM) as solvent. The DCM used as solvent was distilled in an all glass apparatus to remove contaminants.

Activated copper fillings were used to remove any free sulphur from the samples.

After extraction, the solvent was removed on a Buchi Rotavapor and transferred to a 50 ml flask. The rest of the solvent was then removed and the amount of extractable organic matter (EOM) determined.

Chromatographic Separation

The extractable organic matter (EOM) was separated into saturated fraction, aromatic fraction and non hydrocarbon fraction using a MPLC system with hexane as eluant (Radke et al., Anal. Chem., 1980). The various fractions were evaporated on a Buchi Rotavapor and transferred to glassvials and dried in a stream of nitrogen. The various results are given in Table III-VI.

Gas Chromatographic Analyses

The saturated and aromatic hydrocarbon fractions were each diluted with n-hexane and analysed on a HP 5730 A gas chromatograph, fitted with a 25 m OV101 glass capillary column and an automatic injection system. Hydrogen (0.7 ml/min.) was used as carrier gas and the injection was performed in the split mode (1:20).

Vitrinite Reflectance

Samples, taken at various intervals, were sent for vitrinite reflectance measurements to Geoconsultants, Newcastle-upon-Tyne. The samples were mounted in Bakelite resin blocks; care being taken during the setting of the plastic to avoid temperatures in excess of 100^{o}C. The samples were then ground, initially on a diamond lap followed by two grades of corundum paper. All grinding and subsequent polishing stages in the preparation were carried out using isopropyl alcohol as lubricant, since water leads to the swelling and disintegration of the clay fraction of the samples.

Polishing of the samples was performed on Selvyt cloths using three grades of alumina, 5/20, 3/50 and Gamma, followed by careful cleaning of the surface.

Reflectance determinations were carried out on a Leitz M.P.V. microphotometer under oil immersion, R.I. 1.516 at a wavelength of 546 nm. The field measured was varied to suit the size of the organic particle, but was usually of the order of 2 micron diameter.

The surface of the polished block was searched by the operator for suitable areas of vitrinitic material in the sediment. The reflectance of the organic particle was determined relative to optical glass standards of known reflectance. Where possible, a minimum of twenty individual particles of vitrinite was measured, although in many cases this number could not be achieved.

The samples were also analysed in UV light, and the colour of the fluorescing material determined. Below, a scale comparing the vitrinite reflectance measurements and the fluorescence measurements are given.

VITRINITE REFLECTANCE R.AVER. 546 nm 1516	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90	1.00	1.10
% CARBON CONTENT DAF.	57	62	70	73	76	79	80.5	82.5	84	85.5

LIPTINITE FLUOR nm	725	750	790	820	840		860	890	940	
EXC. 400 nm BAR. 530 nm colour	G	G/Y	Y	Y/O	L.O	M.O.		D.O.	O/R	R
zone	1	2	3	4	5	6		7	8	9

NOTE: Liptinite NM = Numberical measurements of overall spore colour and not peak fluorescence wavelength.

Relationship between liptinite fluorescence colour, vitrinite reflectance and carbon content is variable with depositional environment and catagenic history. The above is only a guide. Liptinite will often appear to process to deep orange colour and then fade rather than develop O/R red shade. Termination of fluorescence is also variable.

Processing of Samples and Evaluation of Visual Kerogen

Crushed rock samples were treated with hydrochloric and hydrofluoric acids to remove the minerals. A series of microscopic slides contain strew mounts of the residue:

T-slide represents the total acid insoluble residue.
N-slide represents a screened residue (15 μ mesh).
O-slide contains palynodebris remaining after flotation ($ZnBr_2$) to remove heavy minerals.
X-slides contain oxidized residues, (oxidizing may be required to remove sapropel which embeds palynomorphs, or where high coalification prevents the identification of the various groups).

T and/or O slides are necessary to evaluate kerogen composition/-palynofacies which is closely related to sample lithology.

Screened or oxidized residues are normally required to concentrate the larger fragments, and to study palynomorphs (pollen, spores and dinoflagellates) and cuticles for paleodating and colour evaluation.

So far visual evaluation of kerogen has been undertaken from residues mounted in glycerine jelly, and studied by Leitz Dialux in normal light (halogene) using x10 and x63 objectives. By x63 magnification it is possible to distinguish single particles of diameters about 2 and, if required, to make a more refined classification of the screened residues (particles >15μ).

The colour evaluation is based on colour tones of spores and pollen (preferably) with supporting evidence from colour tones of other types of kerogen (woody material, cuticles and sapropel). These colours are dependant upon the maturity, but are also influenced by the paleoenvironment (lithology of the rock, oxidation and decay processes). The colours and the estimated colour index of an individual sample may therefore differ from those of the neighbouring samples. The techniques in visual kerogen studies are adopted from Staplin (1969) and Burgess (1974).

In interpretation of the maturity from the estimated colour indices we follow a general scheme that is calibrated against vitrinite reflectance values (R_o).

Ro	0.45	0.6	0.9	1.0	1.3
colour index	2-	2	2+	3-	3
Maturity intervals	Moderate mature	Mature (oil window)			Condensate window

Rock-Eval Pyrolysis

100 mg crushed sample was put into a platinum crucible whose bottom and cover are made of sintered steel and analysed on a Rock-Eval pyrolyser.

Pyrolysis-GC

Instrumentation: CDS Pyroprobe 120 interfaced to a Varian 3700 GC
Pyrolysis conditions: 600°C in nitrogen for 5 sec.
GC conditions:
Column: 30m OV-1 glass capillary.
Carrier gas: Nitrogen with inlet pressure 3 psi; 0.7 ml/min.
Oven program: 38°C/1 min.; to 260 at 4°C/min.
Split: 1:20.
Kerogen concentrates for visual kerogen examination were used for pyrolysis gas chromatography.

RESULTS AND DISCUSSION

Light Hydrocarbons

Head space gas analysis was performed on canned samples from 1485 m to 4575 m. Based on the results from these analyses together with the lithological examination, the analysed section of the well is divided into fourteen different zones.

A: 1485-1680 m
B: 1680-1875 m
C: 1875-2440 m
D: 2440-2715 m
E: 2715-2910 m
F: 2910-3105 m
G: 3105-3315 m
H: 3315-3405 m
I: 3405-3510 m
J: 3510-3705 m
K: 3705-3960 m
L: 3960-4065 m
M: 4065-4485 m
N: 4485-4575 m

Zone A; 1500-1680 m: Only a few samples from this zone were analysed. The analysed samples are mainly found to contain claystone while one sample 1575-90 m has a mixture of claystone and sandstone. All the analysed samples in this zone have a good abundance of C_1-C_4 hydrocarbons and a poor abundance of C_5+ hydrocarbons. This, together with the low wetness of the gas and the high $iC_4/n\ C_4$ ratio indicates that the samples are immature, and the gas encountered is mainly biogenic gas. The sample from 1575-90 m, which contained some sandstone shows a higher abundance of C_1-C_4 hydrocarbons than the other samples in the zone, indicating that this sandstone lense contains migrated biogenic gas.

Zone B; 1680-1875 m: This zone consists of claystone as zone A, but all the light hydrocarbon data is significantly different to that for zone A. Both the abundance of C_1-C_4 and C_5+ hydrocarbons are significantly higher than zone A (good and fair respectively), while the wetness of the gas shows an increase and the $iC_4/n\ C_4$ ratio shows a decrease. This indicates that the claystone in this zone is richer in organic matter than zone A and with a type of kerogen which is capable of producing hydrocarbons at this low maturity.

Zone C; 1875-2440 m: Only a few samples from this zone were analysed, and these consist of variable lithologies; mainly sandstone and claystone together with some coal. A large part of the zone is turbodrilled and this very often affects the light hydrocarbon results due to the high temperatures produced during drilling. The levels are extremely variable throughout the zone probably due to the turbodrilling.

Zone D; 2445-2715 m: This zone consists of sandstone with an increasing amount of claystone and siltstone towards the base of the zone. The light hydrocarbon data is again found to be very variable, especially the C_1-C_4 results, while the C_5+ are relatively uniform. The abundance of C_1-C_4 hydrocarbons is good throughout the zone with a relatively high iC_4/nC_4 ratio indicating immaturity. The abundance of C_5+ hydrocarbons is poor throughout the zone.

Zone E; 2715-2910 m: Another zone which is almost completely turbodrilled, and has therefore affected the light hydrocarbon results. The abundance of C_1-C_4 hydrocarbons is lower than in Zone D.

Zone F; 2910-3105 m: This zone consists mainly of claystone, with some turbodrilled material around 2950 m. The abundance of both C_1-C_4 and C_5+ hydrocarbons are significantly higher than in zone E while the wetness of the gas is still low. This together with the relatively high iC_4/nC_4 ratio indicate that the samples are immature.

Zone G; 3105-3315 m: This zone consists mainly of sandstone with variable amount of claystone. The abundance of C_1-C_4 hydrocarbons is significantly lower than in zone F, and the abundance of C_5+ hydrocarbons is higher. This, together with the significantly higher wetness of gas in this zone indicate that the zone might contain small amounts of migrated heavy hydrocarbons.

Zone H; 3315-3405 m: The percentage of claystone in this zone is variable, but on the whole higher than in zone G. The abundance of C_1-C_4 hydrocarbons is approximately the same as in zone G while the abundance of C_5+ hydrocarbons is variable. The most significant difference from zone G is found in the wetness of the gas and in the iC_4/nC_4 ratios. The percentage wetness is very high, indicating high maturity. The iC_4/nC_4 ratio is also significantly higher than in zone G. Such an increase in iC_4/nC_4 ratio could indicate bacteriological activity. Presently the true stratigraphy is not known.

Zone I; 3405-3510 m: Again a zone which has been turbodrilled and the abundance of C_1-C_4 and C_5+ shows a decrease compared with zone H. The wetness of the gas also shows a decrease at the top of the zone compared with zone H then increases with increasing depth. The iC_4/nC_4 ratio drops significantly compared to zone H.

Zone J; 3510-3705 m: This zone is also turbodrilled, but is distinct from zone I because of the large differences in the light hydrocarbon data. The abundance of both C_1-C_4 and C_5+ hydrocarbons show a general increase with increasing depth, and the wetness of the gas is significantly higher than in zone I, almost similar to zone H.

Zone K; 3705-3960 m: The upper 60 m of this zone is also turbodrilled while the rest of the zone consists mainly of claystone down to 3915 m, then chert down to 3960 m. Because of this, the zone might have been divided into two, but due to only minor variations in the light hydrocarbon data, it was decided to keep it as one zone. The abundance of C_1-C_4 hydrocarbons varies slightly throughout the zone, but is generally found to be slightly higher than zone J. The abundance of C_5+ hydrocarbons is slightly higher at the top of the zone compared with zone J, while the lower part of the zone has a similar abundance to zone J. The greatest difference between zone J and K is found in the wetness of the gas which shows a general decrease with increasing depth.

Zone L; 3960-4065 m: This zone consists mainly of sandstone. The upper samples of this zone shows a significant increase in the abundance of light hydrocarbons compared with the lowermost samples in zone K, but the wetness of the gas is low. This indicates that this part of the zone contains migrated dry gas.

Zone M; 4065-4485 m: The upper part of this zone consists of claystone, and most of the samples from 4100 m down to 4450 m contains turbodrilled material. The abundance of light hydrocarbons decreases significantly in this zone compared with zone L. This might be due to turbodrilling.

Zone N; 4485-4575 m: This zone consists mainly of claystone and chert. It is distinct from zone M, because of the increase in the wetness of the gas found at the top of zone N. This decreases rapidly towards the base of the zone.

Total Organic Carbon (TOC)

Where shales/claystones constitute more than 10% of a sample, they were analysed. Occasionally shales/claystones of different colours were picked and analysed separately. Similarly siltstones, where prominent, were picked and analysed separately. Limestones and shaly or silty sandstone were also picked and analysed where they comprised greater than 10% of a sample. Clean sands and sandstones were not analysed.

Zone A: The claystones in this zone are mainly grey-green and are found to have a uniform TOC value of 1.2% throughout the zone. Two samples, 1485-1500 m and 1620-1635 m contain a mixture of grey-green and dark grey claystone. The dark grey claystone is found to have a significantly higher TOC value and is classified as having a rich abundance of organic carbon.

Zone B: Zone B consists mainly of dark grey claystones which show increasing TOC values with increasing depth. The whole zone is found to have a rich abundance of organic carbon.

Zone C: Only a few samples of this zone were organic geochemically analysed, and of these a large number of them consisted of turbo-drilled material. This material was not analysed, while small percentages of dark claystone found in the samples were analysed and found to have a rich abundance of organic carbon. Later analyses indicate that these samples are most probably cavings. A few samples also contain some grey-green claystone which is found to have a good abundance of organic carbon.

Zone D: This zone consists mainly of sandstone which was not analysed for organic carbon, together with small percentages of claystone and siltstone. Where these exceeded 10% they were analysed, and the siltstone is found to have a good abundance of organic carbon.

Zone E: Only the upper part of this zone which consisted of grey-brownish to grey claystones were analysed for organic carbon, and found to have a rich abundance. The lower part was affected by turbodrilling and not analysed.

Zone F: The lithology is similar to the upper part of zone E while the abundance of organic carbon is significantly lower. The decrease in the abundance of organic carbon with increasing depth is also seen in the analysed samples in zone E and the results found for zone F therefore fit the general pattern for the grey, brownish grey claystone in these two zones.

Zone G: This zone consists of a mixture of sandstone and greenish-grey to grey claystone. The claystone in the upper three samples has TOC values close to 1% while the samples below 3135 m have TOC values around 0.3%.

Zone H: The claystones are mostly grey in this zone and the TOC values of the claystone are low; 0.15-0.2% showing a slight increase with increasing depth.

Zone I: The cuttings from zone I are affected by the turbodrilling; they consist almost entirely of sandstones with variable TOC values (0.2-0.7%).

Zone J: The lithologies in this zone are similar to the zone above, and have similar TOC values.

Zone K: This zone consists mostly of grey claystones with variable TOC values, probably due to turbodrilling. The samples generally have a fair abundance of organic carbon.

Zone L: This zone consist of some claystone but mainly limestone and silicified limestone. The latter is found to be barren while the claystone has approximately 0,3% organic carbon. The siltstone found in some of the samples has rather high abundances of organic carbon (0.5-1.5%).

Zone M: This zone consists mostly of light grey to dark grey claystone with a fair abundance of organic carbon, with generally uniform values (0.4-0.5%) throughout the zone, and a 'mudstone' looking cokey due to turbodrilling. The mudstones is found to have TOC values of 1-1.9% throughout the upper 270 m of the zone with a distinct decrease from approximately 4370 m. The lowermost samples with this lithology have TOC values of 0.2-0.8%.

Zone N: This zone consists mainly of grey to dark grey claystone with variable TOC values (0.3-0.8%). A few samples contain some limestone with relatively high TOC values (0.5-0.8%).

Extraction and Chromatographic Separation

Zone A: Two samples, 1485-1500 m and 1665-80 m, from this zone were extracted and found to have a fair abundance of extractable hydrocarbons. The organic carbon-normalized results show, however, a poor extractability of extractable hydrocarbon. This discrepancy is probably due to the low maturity so that the organic matter in the sample has not reached the maturity level for producing significant amounts of hydrocarbons. The gas chromatograms of saturated hydrocarbon fractions of the two samples vary significantly. The sample from 1485-1500 m shows a large input of high molecular weight n-alkanes together with steranes and triterpanes. The CPI is high for these samples indicating low maturity. At this low maturity only the geochemical fossils will be extracted from the sample. This chromatogram therefore indicates that there has been a significant input of higher plant lipids etc. The sample from 1665-1680 m has a large isoprenoid component and medium molecular weight hydrocarbons rather than high molecular weight n-alkanes are dominant. This suggests that this sample contains organic matter of marine origin.

Zone B: Four samples from this zone were extracted. The abundance of extractable hydrocarbons increases with increasing depth, from a good abundance for the sample from 1710-25 m to a rich abundance for the two lowermost samples. A slight decrease in abundance is found for the sample from 1845-60 m. A similar trend is found for the organic carbon-normalized values. However extractability values were low which suggests that these samples are of low maturity.

The gas chromatograms of the saturated hydrocarbon fractions of the four samples are similar with a large abundance of isoprenoids and approximately equal amounts of medium weight and heavy n-alkanes. The abundance of steranes and triterpanes was also high. The hydrocarbons present are mostly geochemical fossils at this low maturity level, and the results indicate a mixed input of terrestrial and marine organic matter.

Zone C: Nine samples; four cutting samples and five core samples from this zone were analysed. The cutting samples from 1980-95 m and the four uppermost core samples have a rich abundance of extractable hydrocarbons. There is a significant difference in the abundance of extractable hydrocarbons between the core sample from 2041.2 m and 2044.2 m. The latter has a significantly lower abundance of extractable hydrocarbons, while the abundance of extractable organic matter vary slightly. The three analysed cutting samples from the lower part of the zone show a decreasing abundance of extractable hydrocarbons with increasing depth. The organic carbon normalised values show similar trends to those of the extractable hydrocarbons.

The gas chromatograms of the saturated hydrocarbon fractions vary in the different samples. The gas chromatograms of the saturated hydrocarbons of the cuttings sample from 1980-95 m exhibits a large abundance of medium molecular weight hydrocarbons typical for a condensate or possibly a diesel, if this was used as a mud additive. There is also a small amount of high molecular weight n-alkanes with a high CPI value and a significant amount of steranes/triterpanes, typical for an immature sample of terrestrial material. The gas chromatography results indicate that the analysed sample is contaminated with either a migrated condensate, or diesel from the drilling mud. The gas chromatograms of the saturated hydrocarbon fractions of the two core samples from 1983 and 1983.2 m exhibit unimodal front-biased n-alkane distributions typical of mature hydrocarbon distributions. The gas chromatograms of the saturated hydrocarbon fractions of the next three core samples 2026.8, 3041.2 and 3044.2 m are all different from those encountered higher up in the well with a large abundance of high molecular weight n-alkanes, typical of terrestrial material. Sample 2041.2 m is slightly different from the two others in that pristane is quite prominent in this sample. Otherwise only minor differences are found in the general pattern. The gas chromatograms of the saturated hydrocarbon fractions of the three remaining, cutting samples from the lower part of this zone are different from those already discussed. All three have a bimodal distribution with maxima at nC_{16} and nC_{27} with a high CPI value for the C_{23}-C_{32} hydrocarbons. In two of the samples the pristane/nC_{17} ratio is slightly above 1.0 while in the third it is slightly below 1.0. The bimodal pattern would indicate an input from well mature hydrocarbons, possibly of marine origin together with an input of hydrocarbons from moderate mature terrestrial material.

Zone D: Four samples from this zone were analysed. The sample 2445-60 m is found to have a poor abundance of extractable hydrocarbons while the samples from 2610-25, 2625-40 and 2685-2700 m have good abundance. The organic carbon normalised results are in good agreement with this. The gas chromatograms of the saturated hydrocarbon fractions vary slightly. The main variation is found in the abundance of the high molecular weight n-alkanes which is found to be quite significant in the sample from 2445-60 m but are only minor constituents for the three other samples. This would indicate that the input from terrestric material is far less in the samples from 2610-25 m, 2625-40 m and 2685-2700 m while it is quite significant in the sample from 2445-60 m.

Zone E: Two samples from this zone were extracted and found to have a good/rich abundance of extractable hydrocarbons in good agreement with the extractability found by normalizing the results to organic carbon. The gas chromatograms of the saturated hydrocarbon fractions show bimodal distributions with maxima at nC_{15} and nC_{25} indicating an input of hydrocarbons both from terrestrial and marine material.

Zone F: Two samples from this zone were extracted and both found to have a good abundance of extractable hydrocarbons. The gas chromatograms of the saturated fraction of the sample from 2925-40 m is similar to those from zone E. The gas chromatogram of the saturated fraction of the sample from 2970-85 m has a more prominent content of high molecular weight n-alkanes with low CPI, typical for mature hydrocarbons of terrestrial origin.

Zones G, H, I, J and K: No samples from these zones were extracted.

Zone L: One sample, 4005-4020 m was extracted and found to have a good abundance of extractable hydrocarbons. The gas chromatogram of the saturated hydrocarbon fraction shows a smooth unimodal n-alkane pattern with a maximum at nC_{17}, typical for mature hydrocarbons.

Zone M: Six samples, including four cuttings samples from this zone were extracted and all found to have a good abundance of extractable hydrocarbons. The gas chromatograms of the saturated hydrocarbon fractions show only minor variations. All the samples have a smooth unimodal n-alkane distribution, typical for well mature hydrocarbons. The sample from 4125 m shows a larger input of high molecular weight n-alkanes than the other samples, indicating a larger input of terrestrial material.

Zone N: No samples from this zone were analysed.

Examination in Reflected Light

K-7762, 1485-1500 m: Shale and Siltstone, Ro=0,45(6)

The sample shows a of light bitumen staining with some wisps. It has a low to moderate phytoclast content. There are some reworked and inertinite particles with subordinate vitrinite wisps. UV light shows no fluorescence and the exinite content is nil.

K-7774, 1665-80 m: Shale, Ro=0,42(22)

The sample has an overall moderate bitumen staining. It has a moderate content of inertinite. Particles which are reworked are dominant with a good content of vitrinite particles and wisps. UV light shows yellow/orange and light orange fluorescence from spores and a moderate exinite content.

K-7777, 1710-25 m: Shale and Carbonate, Ro=0,44(22)

The sample has an overall heavy bitumen staining. It has a low content of vitrinite particles and wisps with a trace only of inertinite and reworked particles. UV light shows yellow/orange fluorescence from spores and a moderate to rich exinite content.

K-7780, 1755-70 m: Shale, Ro=0,42(22)

The sample has an overall heavy bitumen staining. It has a low to moderate content of vitrinite particles and wisps. There is a trace only of inertinite. UV light shows yellow and yellow/orange fluorescence from spores and hydrocarbon specks and a low to moderate exinite content.

K-7784, 1815-30 m: Shale, Ro=0,43(21)

The sample has an overall heavy bitumen staining. It has a moderate content of vitrinite wisps and particles with subordinate inertinite and reworked particles. UV light shows yellow/orange fluorescence from spores and a low to moderate exinite content.

K-7786, 1845-60 m: Shale and Siltstone, Ro=0,44(22)

The sample has an overall heavy bitumen staining. It has a moderate phytoclast content containing vitrinite particles and wisps with about an equal proportion of reworked and inertinite particles. UV light shows yellow/orange and light orange fluorescence from spores and a trace only of exinite.

K-8793, 1983.0 m: Coal and Shale, Ro=0,39(21)

The sample is vitrinitic with resin wisps and spores and contains a little inertinite in the coal. It has abundant phytoclasts in the shale. UV light shows light orange fluorescence from spores and a moderate exinite content.

K-8794, 1993.0 m: Coal and Shale, Ro=0,44(25)

The sample is vitrinitic with resin globules and with a trace only of inertinite in the coal. The shale has plentiful inertinite and vitrinite particles. UV light shows light to mid orange fluorescence from spores and algae and has a rich exinite content.

K-7797, 1980-95 m: Shale, Ro=0,47(16)

The sample has a few bitumen wisps and light staining with a moderate phytoclast content. It contains vitrinite wisps with subordinate inertinite and reworked particles. UV light shows light orange fluorescence from spores and hydrocarbon specks and a low exinite content.

K-8795, 2026.8 m: Coal and Shale, Ro=0,57(20)

The sample consists of coal which is wholly vitrinitic and shale with a few vitrinite wisps, stringers and particles. There are no other macerals. UV light shows light and mid orange fluorescence from spores and a moderate to rich exinite content.

K-8796, 2041.2 m: Coal and Shale, Ro=0,44(17)

The sample consists of coal where vitrinite is dominant, together with resin bands and globules and a little inertinite. There are plentiful vitrinite wisps and particles in the shale. UV light shows light and mid-orange fluorescence from spores and cuticles and a moderate exinite content.

K-8797, 2044.2 m: Carbargillite, Ro=0,83(21)

The sample consists of a mass of inertinite fragments in heavy bitumen stained matrix with a few vitrinite wisps. UV light shows deep orange fluorescence from spores and a moderate exinite content.

K-7809, 2160-75 m: Shale, Ro=0,44(20)

The sample consists of a variable bitumen staining with a moderate content of inertinite and reworked particles with about an equal proportion of vitrinite particles and wispy particles. UV light shows yellow/orange fluorescence from spores and hydrocarbon specks and a moderate exinite content.

K-7834, 2265 m: Shale, Ro=0,51(10)

The sample contains bitumen wisps and light staining. It has a moderate phytoclast content and reworked and inertinite particles with a trace of vitrinite wisps. UV light shows light to deep orange fluorescence from spores in a few cuttings and a low exinite content.

K-7837, 2310 m: Shale, Siltstone and Sandstone, Ro=0,45(8)

The sample contains light bitumen staining and wisps. It has a low to moderate phytoclast content and reworked and inertinite particles with subordinate vitrinite wisps. UV light shows light orange fluorescence from spores and a low to moderate exinite content.

K-7847, 2446-60 m: Shale, Siltstone and Carbonate, Ro=0,50(21)

The sample has a few bitumen stained cuttings and a low content of inertinite and reworked particles with a trace only of vitrinite particles and wisps. UV light shows yellow/orange fluorescence from hydrocarbon specks and spores and a moderate exinite content.

K-7921, 2610-25 m: Shale and Carbonate, Ro=0,45(21)

The sample has a variable bitumen staining and a moderate content of inertinite and reworked particles with subordinate vitrinite particles and wisps. UV light shows yellow/orange fluorescence from spores and hydrocarbon specks and a moderate exinite content.

K-7922, 2625-40 m: Shale, Ro=0,45(20)

The sample has a moderate bitumen staining and wisps. It has a moderate content of vitrinite wisps and particles with subordinate inertinite and reworked particles. UV light shows light orange fluorescence from spores and a moderate exinite content.

K-7926, 2685-2700 m: Mixed Shale Lithologies, Ro=0,47(21)

The sample contains bitumen wisps. It has a moderate content of phytoclasts but mostly vitrinite wisps and particles with subordinate inertinite and reworked material. UV light shows yellow/orange and light orange fluorescence from spores and a moderate exinite content.

K-7928, 2715-30 m: Shale, Ro=0,45(20)

The sample has a variable strong bitumen staining. It has a low to moderate content of inertinite and reworked particles with a trace only of vitrinite as wispy particles. UV light shows yellow/orange and light orange fluorescence from spores and a moderate exinite content.

K-7931, 2760-75 m: Shale, Ro=0,48(21)

The sample has a heavy bitumen staining with a low to moderate content of inertinite and reworked particles with about an equal proportion of vitrinite wispy particles. UV light shows yellow/orange and light orange fluorescence from spores and a moderate exinite content.

K-7942, 2925-40 m: Shale, Ro=0,44(23)

The sample has a variable strong bitumen staining and wisps. It has a low to moderate content of inertinite and reworked particles with plentiful vitrinite wisps and particles. UV light shows light and mid orange fluorescence from spores and a low exinite content.

K-7945, 2970-85 m: Shale and Sandstone traces, Ro=0,59(21)

The sample contains bitumen wisps and light staining. It has a low to moderate content of inertinite and reworked particles with subordinate vitrinite wispy particles. UV light shows mid orange fluorescence from spores and a low exinite content.

K-7971, 3030-45 m: Siltstone, Calcareous Shale, Ro=0,55(11)

The sample has a moderate bitumen staining and a few wisps. It has a moderate phytoclast content. Reworked and inertinite particles are dominant. There are some vitrinite wispy particles present. UV light shows mid orange fluorescence from spores and a moderate exinite content.

K-7975, 3090-105 m: Shale and Calcareous Shale, Ro=0,57(6)

The sample shows light bitumen staining and some wisps. It has a low to moderate phytoclast content. Reworked and inertinite particles dominate over vitrinite wisps. UV light shows light orange fluorescence from spores and a moderate exinite content.

K-8005, 3405-20 m: Shale, Ro=0,54(2) and 1,04(1)

The sample contains a few bitumen wisps. It has a very low content of inertinite and reworked particles. Only a couple of possible vitrinite particles are located which give possible true values. UV light shows light to mid orange fluorescence from spores and hydrocarbon specks and a low to moderate exinite content.

K-8013, 3525-40 m: Shale, Ro=0,57(3)

The sample contains some bitumen wisps. It has a low organic content with almost wholly inertinite and reworked particles. Only three vitrinite wisps were located. UV light shows mid orange fluorescence from spores and a low exinite content.

K-8019, 3615-30 m: Shale, Ro=0,59(7)

The sample contains bitumen wisps. It has a very low phytoclast content and a few particles of inertinite and reworked material. There are only a handful of poor vitrinite particles. UV light shows mid to deep orange fluorescence from spores and a moderate exinite content.

K-8025, 3705-20 m: Shale, Ro=0,55(7) and 0,91(1)

The sample contains bitumen wisps and a trace only of phytoclasts. It has a few inertinite particles and a handful of poor vitrinite wispy particles. UV light shows light orange fluorescence from spores and a low exinite content.

K-8030, 3780-95 m: Shale, Ro=0,57(5)

The sample contains bitumen wisps and a very low content of phytoclast. It has only a handful of vitrinite specks. Inertinite and reworked particles are dominant. UV light shows light and mid orange fluorescence from spores and a low exinite content.

K-8061, 3825-40 m: Shale, Ro=0,37(1) and 0,68(4)

The sample contains bitumen wisps with a trace only of phytoclasts. It has a few inertinite and reworked particles and only a handful of poor vitrinite specks. UV light shows mid orange fluorescence from spores and a low exinite content.

K-8067, 3915-30 m: Shale, Ro=0,69(7)

The sample contains bitumen wisps with a very low content of phytoclast. It has some inertinite and reworked particles with a trace of vitrinite particles. UV light shows orange to red fluorescence from spores and a low to moderate exinite content.

K-8072, 3990-4005 m: Siltstone, Ro=0,67(20)

The sample contains bitumen wisps and staining. It has a low to moderate content of gnarled and corroded inertinite and reworked particles with subordinate vitrinite wispy particles. UV light shows mid to deep orange fluorescence from spores and a low exinite content.

K-8073, 4005-20 m: Shale and Siltstone, Ro=0,36(1) and 0,71(6)

The sample has a variable strong bitumen staining and wisps. It has a low to moderate content of gnarled inertinite and reworked particles with a trace only of poor vitrinite particles of variable Ro values. UV light shows mid orange fluorescence from spores and a low exinite content.

K-8076, 4050-65 m: Siltstone and Shale

The sample has an overall moderate bitumen staining and wisps. There is a trace only of phytoclasts and a few inertinite and reworked particles. No vitrinite is located. UV light shows mid to deep orange fluorescence from spores and hydrocarbon wisps and a low exinite content.

K-8392, 4095-110 m: Shale and Siltstone, Ro=0,61(3) and 1,00(2)

The sample has strong bitumen staining and wisps with a trace only of phytoclasts. It has a few particles of inertinite and reworked material and a handful of doubtful vitrinite particles. UV light shows mid orange fluorescence from spores and hydrocarbon specks and a low to moderate exinite content.

K-8392, 4095-110 m: Turbo-drilled

The sample contains no true sediment. UV light shows no fluorescence and the exinite content is nil.

K-8798, 4121.05 m: Shale and Siltstone, Ro=0,81(12)

The sample contains bitumen wisps and a moderate staining. The vitrinite and inertinite particles have high Ro values. The lowest Ro vitrinite particles measured are possibly wholly reworked. UV light shows deep orange fluorescence from spores and a low exinite content.

K-8799, 4124 m: Shale and Sandstone, Ro=0,84(6)

The sample has a light bitumen staining and plentiful phytoclasts. Reworked and inertinite particles are dominant. There is a trace only of vitrinite wisps. UV light shows mid orange fluorescence from carbonate and the exinite content is nil.

K-8396, 4155-70 m: Turbo drilled

The sample contains no true sediment. UV light shows no fluorescence and the exinite content is nil.

K-8396, 4155-70 m: Shale, Ro=0,65(16) and 1,00(2)

The sample contains bitumen wisps. It has a variable phytoclast content, generally lcw overall. There are some inertinite and reworked particles present with a trace only of vitrinite wispy particles. UV light shows mid orange fluorescence from spore specks and a low exinite content.

K-8401, 4230-45 m: Turbo drilled

The sample contains no true sediment. UV light shows no fluorescence and the exinite content is nil.

K-8401, 4230-45 m: Shale, Ro=0,29(1)

The sample contains bitumen wisps but is otherwise virtually barren. There are a few phytoclasts and only one poor vitrinite wisp is located. UV light shows mid to deep orange fluorescence from spores and a low to moderate exinite content.

K-8408, 4335-50 m: Turbo drilled

The sample contains no true sediment. UV light shows no fluorescence and the exinite content is nil.

K-8408, 4335-50 m: Shale, Ro=0,45(1), 0,68(7) and 1,07(1)

The sample contains bitumen wisps and has a very low phytoclast content. There are a few particles of inertinite and reworked material with a trace only of vitrinite particles of variable Ro values. UV light shows mid orange fluorescence from spores and a low to moderate exinite content.

K-8639, 4380 m: Turbo drilled

The sample consists of only a couple of shale cuttings containing bitumen wisps and it has no phytoclasts. UV light shows no fluorescence and the exinite content is nil.

K-8641, 4395-410 m: Turbo drilled

The sample contains no true sediment. UV light shows no fluorescence and the exinite content is nil.

K-8646, 4470-85 m: Turbo drilled

Only three true shale cuttings are located in this sample. It contains bitumen wisps with a trace only of inertinite and reworked particles. One speck of possible vitrinite is located. UV light shows no fluorescence and the exinite content is nil.

K-8647, 4500 m: Shale, Ro=0,73(6)

The sample shows a strong bitumen staining and wisps. There is a trace only of vitrinite and inertinite particles which are possibly reworked. UV light shows mid orange fluorescence from spores and a low exinite content.

K-8649, 4515-30 m: Shale and Siltstone, Ro=0,57(6) and 0,95(2)

The sample contains bitumen wisps and has a very low organic content. It has inertinite and reworked particles with only a handful of vitrinite particles and wispy particles. UV light shows deep orange fluorescence from spores and a low exinite content.

INVESTIGATIONS IN TRANSMITTED LIGHT

Disperse Organic Matter (Visual Kerogen)

The analysis of the sedimentary organic matter in this well, on request from Norsk Hydro, has been based on picked lithologies from ditch cuttings. The results from 33 cutting samples were supplied by analyses of 6 core samples.

We distinguish the following main intervals on the basis of composition and preservation of the organic matter.

1680-1725 m and 1770-1860 m: Dominantly cuticles and woody material. Large sapropelised cuticular fragments were observed especially in the upper part and fusinite and inertinite were frequent in the lower part of the interval. Cysts and pollen of late Jurassic affinity indicate immature to moderate mature deposits.

1983-2041.2 m: Coal fragments of mostly pure woody nature.

2044.2-2175 m, 2265-2460 m and 2625-2730 m: Dominantly cuticular and woody material with 10-20% of amorphous material. The presence in some samples of Jurassic palynomorphs indicate contamination in an interval of Triassic age. The maturity is near the top of the oil window.

2775-2985 m: Consist of residues of variable composition, due to fluctuations in marine influence of the Triassic rocks. Caved material from higher levels were occasionally observed. Top of the oil window.

4020 m and below: The sidewall cores suggest marine Permian deposits. Mostly very small residues consisting of dominantly amorphous, finely disperse matter. From 4350 m and below there is abundant caved material. The opacity of the material required chemical oxidation. The results obtained from this are therefore arbitrary.

Sample 1500 m:

The organic residue consists mainly of amorphous material as aggregates with embedded pyrite framboids and particles of wood (vitrinite). Well preserved cysts allow a correlation to Early Cretaceous.

Colour index: 2 is too high as maturation index.

Samples 1680-1725 m and 1770-1860 m:

The organic residues consists dominantly of terrestrial material (cuticles and woody matter) that is strongly sapropelised. True amorphous material which was estimated at about 10% is difficult to distinguish since the material is coherent as aggregates embedding palynomorphs, cysts and pollen of Late Jurassic affinity.

The upper part of the interval seems richer in large cuticular fragments, while there is more fusinite/inertinite in the lower interval.

Colour index: 2-/2 or 2 to 2/2+. The colour index in the lower part 2/2+ is probably too high as a maturation index and we tentatively propose a maturity level close to 2 for the entire interval.

Samples 1983-2041.2 m:

The short interval, covered by cored material, is rich in coal fragments, mostly vitrinite. Cuticles and pollen/spores are subordinate.

Colour index: 2/2+ (sample 2026.8 m) seems somewhat low. Due to the opacity of the coal and the low content of exinite, a colour estimate was not attempted for the other samples.

Samples 2044.2 m and 2265 m:

Sapropelised cuticles and woody material together with true amorphous material are contained in aggregates. The structured material is poor or poor to fairly well preserved.
Colour index: 2/2+ or 2+

Samples 2310-2730 m:

Terrestrial material, cuticles and woody matter, from aggregates of variable density. Pollen, spores and small cysts revealed by chemical oxidation are of Triassic affinity. The preservation is variable and generally poor due to pyrite framboids.

The colour index: 2/2+, 2+, 2+/3-; variable within the interval. The lower readings represent Jurassic caved material, the highest readings may be due to weathering.

At this level, along with the Jurassic palynomorphs; we also consider the light coloured woody material to be caved material.

Samples 2775-2985 m:

The amorphous matter, although usually not dominant represents 25-35% of the organic matter. Cuticular fragments (30-45%), are important together with occasionally rich assemblages of pollen and spores of undoubted Triassic nature. The degree of preservation is variable.

The colour index: 2/2+ or 2+

Samples 4020-4110 m:

The content of amorphous material is relatively high, but the organic residues are small and after screening (15μ) are dominated by dark coaly fragments. Due to the high coalification the distinction between inertinite and vitrinite is difficult.

Colour index: 3-/3

Samples 4121.05-4350 (?4530 m):

The residues are very small, most of them being dominated by amorphous material. After oxidation which removes the sapropel, most residues were rich in dark coaly matter, both vitrinite/inertinite and fusinite/semifusinite. Palynomorphs of Permian affinity were found occasionally and seem poorly preserved as a consequence of a carbonate lithology and abundance of pyrite.

The colour index: 3-, 3-/3, 3+ is variable and is probably influenced by the lithology.

ROCK-EVAL PYROLYSES

Zone A: Two samples from this zone were pyrolysed. The sample from 1485-1500 m has a low hydrogen index typical for a kerogen type III. The oxygen index is also found to be low for this sample which is found to have a fair petroleum potential. The sample from 1665-80 m has a far higher hydrogen index and probably consists of a mixture of kerogen type II and III. This sample which is immature has a good petroleum potential.

Zones B, C, D and E: A total of nineteen samples from these zones were pyrolysed and all are considered to be immature. The hydrogen indices vary from 200 to 400 for these samples while the oxygen indices vary from 12-38. The results indicate a mixture of kerogen type II and type III in the various analysed samples, but with a large percentage of kerogen type II in most of the samples. Almost all the analysed samples have a rich petroleum potential. The production indices of the two core samples from 1983 m and 1993 m indicate that these samples contain some migrated hydrocarbons.

Zone F: Two samples from this zone were pyrolysed and both were immature, kerogen type III.

Zone G,H, J and K: No samples from these zones were pyrolysed.

Zones L and M: Seven samples from these zones were pyrolysed and all of mature kerogen type III. The petroleum potential is poor for all these samples while the high production index indicates free hydrocarbons in the samples.

CONCLUSION

The maturity of the analysed sequence from well 7120/12-2 is mainly based on vitrinite reflectance, spore fluorescence, spore coloration and T_{max} values from Rock-Eval pyrolysis. The richness of the samples is based on TOC and Rock-Eval pyrolysis with additional evidence being supplied from the abundance of light hydrocarbons, and C_{15}^{+} extractable hydrocarbons. Source rock quality is based mainly on Rock-Eval pyrolysis and on visual kerogen examination.

Zone A, 1485-1680 m: Every second sample only was analysed. These were mainly grey-green claystones with a small amount of sandstone at 1600 m. Mostly diagenetic methane is present in the light hydrocarbons. All the samples have a good abundance of organic carbon. Rock-Eval of the two analysed samples show a distinct variation with far higher hydrogen index in the sample from 1665-1680 m compared with the sample from 1485-1500 m. This is in disagreement with the visual kerogen examinations which shows the sample from 1485-1500 m to contain more than 50% amorphous material while the sample from 1665-1680 m consists almost entirely of terrestrial material. Some of the terrestrial material is cuticular which would give a high hydrogen index. The zone is immature with a good potential as a source rock for gas.

Zone B, 1680-1875 m: The zone consists almost entirely of dark grey claystone with a rich abundance of organic carbon. The abundance of light hydrocarbons is good to rich, but rather dry. This is probably due to the low maturity. The abundance of extractable hydrocarbons is good increasing to rich in the lower half of the zone. The Rock-Eval pyrolysis shows the samples in the zone to have a relatively high hydrogen index. Pure kerogen type II should however, have a hydrogen index of 400-500 at this maturity level while kerogen type I should be at 700 m or higher. The visual kerogen examination shows that the samples contain almost entirely terrestrial material with a large input of cuticules. The gas chromatograms of the saturated hydrocarbon fractions show a large input of high molecular weight n-alkanes. Based on this it is believed that the kerogen in this zone consists of a mixture of kerogen type I and III. The zone is immature with a rich potential as a source rock for heavy paraffinic oil and gas.

Zone C, 1875-2410 m: Parts of this zone were cored and some of the samples are badly affected by turbodrilling. This has severely affected the results and the interpretation is therefore tentative. The TOC analyses show the claystone in the samples to have a rich abundance of organic carbon. The gas chromatograms of the extracted hydrocarbon from the core samples from 1983 m and 1993.2 m show these to contain migrated hydrocarbons, possibly condensate. Similarly for the cutting sample 1980-95 m. The core samples from 2026.8 m, 2041.2 m and 2044.2 m are typical for immature coal samples. The hydrogen index was high for all the analysed samples from the zone, while the visual kerogen examination indicate that the samples contain mostly terrestrial material. Down to approximately 2042 m this is all woody material, and in the rest of the zone there is a significant proportion of cuticules. The vitrinite reflectance measurements on the core samples shows that most are immature, while one sample, 2044.2 m, has an oil window maturity. The results we think are reliable. This coal sample does, however, contain a large percentage of inertinite and we have therefore decided not to include this result in the maturity evaluation. The zone has a good potential as a source rock for gas plus heavy paraffinic oil below 2100 m. There are indications of migrated hydrocarbons (condensate) between 1950 m and 2100 m approximately .

Zone D, 2445-2715 m: The zone consists mainly of sandstones with a larger amount of siltstone towards the base. Fluorescence of hydrocarbons in UV light indicate some migrated hydrocarbons between approximately 2450 m and 2600 m. The zone is moderate mature.

Zone E, 2715-2910 m: Almost the entire zone is turbodrilled and the results are affected. The brown-grey claystone in upper part of the zone has a rich abundance of organic carbon and a rich abundance of extractable hydrocarbon with a relatively large amount of high molecular weight n-alkanes. The Rock-Eval results show a lower hydrogen index than for the samples above, although the visual kerogen examination does not indicate any great variation. The zone is found to be moderate mature with a rich potential as a source rock for gas and possibly some heavy paraffinic oil. The lower part of the zone was not analysed.

Zone F, 2910-3105 m: Most of the samples in this zone consist of brown-grey claystones with a good abundance of organic carbon. Extraction of the samples show that they have a good abundance of extractable hydrocarbons with a large proportion of high molecular weight n-alkanes. The Rock-Eval results show that the samples have a low hydrogen index typical for kerogen type III while the visual kerogen examination indicate that these samples contain a good proportion of amorphous material. The zone is moderate mature with a good potential as a source rock for gas.

Zones G, H, I, J and K, 3105-3960 m: Only screening analyses have been undertaken on these zones which is partly turbodrilled. The abundance of organic carbon is poor in the analysed samples and there is no indication of free hydrocarbons in the samples. The upper part is moderate mature increasing to mature/oil window maturity for the lower part.

Zone L, 3960-4065 m: This zone consists of a mixture of sandstones and claystones. The claystones have a fair abundance of organic carbon. The light hydrocarbon data, together with the occurrence of fluorescence from hydrocarbons in UV light indicate migrated hydrocarbons in the sandstones in the zone. This is in good agreement with the gas chromatogram of the saturated hydrocarbon fraction and the production index. The Rock-Eval shows the sample in the zone to be of kerogen type III while the visual kerogen examination indicates that the sample contains approximately 50% amorphous material. The zone has an oil window maturity.

Zone M, 4065-4485 m: Almost the entire zone is turbodrilled. Grey claystones have a fair abundance of organic carbon while cokey mudstone has a good abundance. The Rock-Eval shows the zone to contain kerogen type III while most of the samples analysed in transmitted light contain a large proportion of amorphous material. The analyses might be strongly affected by the turbodrilling and interpretation is therefore difficult. The zone has an oil window maturity, with a fair and good potential as source rocks for hydrocarbons for the two lithologies respectively.

Zone N, 4485-4575 m: The zone consists of claystone and chert. The claystone has a fair abundance of organic carbon. Rock-Eval pyrolyses shows the samples to contain kerogen type III in contrast to the visual kerogen examination which shows the sample to contain mainly amorphous material. The zone is found to have an oil window maturity with a fair potential as a source rock for gas.

TABLE I a.

[illegible] OF C1 – C7 HYDROCARBONS IN HEADSPACE.

IKU No.	DEPTH (m)	C1	C2	C3	iC4	nC4	C5+	SUM C1–C4	SUM C2–C4	WET-NESS (%)	iC4 / nC4
K7762	1500	11334	239	101	16	20	77	11710	376	3.21	.80
K7765	1545	6113	102	56	15	16	44	6302	189	3.00	.94
K7768	1590	19529	436	258	54	50	83	20327	798	3.93	1.08
K7771	1635	3633	147	115	31	36	87	3962	329	8.30	.86
K7774	1680	39437	1809	1306	221	262	250	43035	3598	8.36	.84
K7776	1710	62066	2894	2097	327	432	498	67816	5750	8.48	.76
K7777	1725	66217	3132	2074	287	381	358	72091	5874	8.15	.75
K7778	1740	37357	1912	1379	190	293	295	41131	3774	9.18	.65
K7779	1755	61960	3337	2564	394	667	876	68922	6962	10.10	.59
K7780	1770	74185	4569	4198	703	1376	1757	85031	10846	12.76	.51
K7781	1785	131417	8173	7075	1035	2061	2052	149761	18344	12.25	.50
K7782	1800	98214	6567	6163	829	1978	2263	113751	15537	13.66	.42
K7783	1815	26845	3447	3453	479	1033	965	35257	8412	23.86	.46
K7784	1830	49292	15343	6422	788	1535	1290	73380	24088	32.83	.51
K7785	1845	56051	13710	4752	575	1064	1167	76152	20101	26.40	.54
K7786	1860	55396	14187	4099	506	792	1010	74980	19584	26.12	.64
K7787	1875	40206	2675	1991	256	424	736	45552	5346	11.74	.60
K7788	1890	9534	930	898	169	310	577	11841	2307	19.48	.55
K7789	1905	7598	797	710	101	206	353	9412	1814	19.27	.49
K7792	1950	5713	463	620	249	402	988	7447	1734	23.28	.62
K7797	1995	8454	699	564	74	152	248	9943	1489	14.98	.49
K7800	2040	21472	1508	1028	168	289	537	24465	2993	12.23	.58
K7803	2085	56957	12242	1723	254	193	100	71369	14412	20.19	1.32
K7806	2130	O P E N		L I D.							
K7809	2175	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	4.29	1.19

IKU

TABLE 1 a.

CONCENTRATION (ul Gas / kg Rock) OF C1 - C7 HYDROCARBONS IN HEADSPAC

IKU No.	DEPTH (m)	C1	C2	C3	iC4	nC4	C5+	SUM C1-C4	SUM C2-C4	WET-NESS (%)	iC4 / nC4
K7812	2220	2828	70	42	6	10	23	2956	128	4.33	.6
K7834	2265	11971	1526	827	108	232	528	14664	2693	18.36	.4
K7837	2310	4580	341	213	29	46	55	5209	629	12.08	.6
K7840	2355	1520	95	68	9	37	111	1729	209	12.09	.2
K7843	2400	13530	502	289	52	87	158	14460	930	6.43	.6
K7846	2445	4671	419	490	194	279	661	6053	1382	22.83	.7
K7847	2460	4391	401	444	151	198	379	5585	1194	21.38	.7
K7848	2475	14145	440	277	74	106	246	15042	897	5.96	.7
K7849	2490	2947	206	194	72	104	372	3523	576	16.35	.6
K7850	2505	43	5	2	1	1	9	52	9	17.31	1.0
K7851	2520	4050	308	325	113	170	421	4966	916	18.45	.6
K7915	2535	6683	614	697	235	362	903	8591	1908	22.21	.6
K7916	2550	3847	478	514	155	207	492	5201	1354	26.03	.7
K7917	2565	11998	602	514	171	223	562	13508	1510	11.18	.7
K7918	2580	6305	434	361	126	167	358	7393	1088	14.72	.7
K7919	2595	1868	187	180	47	60	104	2342	474	20.24	.7
K7920	2610	2909	412	402	90	120	157	3933	1024	26.04	.7
K7921	2625	9698	499	481	120	167	159	10965	1267	11.55	.7
K7922	2640	7448	537	573	169	194	252	8921	1473	16.51	.8
K7923	2655	5304	1387	1337	357	475	588	8860	3556	40.14	.7
K7924	2670	2895	299	431	108	161	207	3894	999	25.65	.6
K7925	2685	7243	298	380	85	114	103	8120	877	10.80	.7
K7926	2700	7239	564	506	88	138	136	8535	1296	15.18	.6
K7927	2715	6307	353	250	39	69	81	7018	711	10.13	.5
K7928	2730	1825	171	124	18	36	31	2174	349	16.05	.5

TABLE I a.

CONCENTRATION (ul Gas / kg Rock) OF C1 - C7 HYDROCARBONS IN HEADSPACE

IKU No.	DEPTH (m)	C1	C2	C3	iC4	nC4	C5+	SUM C1-C4	SUM C2-C4	WET-NESS (%)	iC4 / nC4
K7929	2745	1044	101	79	13	22	23	1259	215	17.08	.5
K7930	2760	925	89	82	16	29	38	1141	216	18.93	.5
K7931	2775	1074	87	65	11	22	30	1259	185	14.69	.5
K7932	2790	106	10	8	1	3	3	128	22	17.19	.3
K7933	2805	930	56	40	6	15	17	1047	117	11.17	.4
K7934	2820	1200	82	50	7	19	26	1358	158	11.63	.3
K7935	2835	1680	117	68	8	26	53	1899	219	11.53	.3
K7936	2850	2482	176	188	36	84	136	2966	484	16.32	.4
K7937	2865	1378	115	93	14	36	58	1636	258	15.77	.3
K7938	2880	813	82	53	9	18	40	975	162	16.62	.5
K7939	2895	2484	210	143	17	59	110	2913	429	14.73	.2
K7940	2910	492	52	39	3	18	49	604	112	18.54	.1
K7941	2925	1535	155	106	16	33	59	1845	310	16.80	.4
K7942	2940	14767	787	634	108	152	118	16448	1681	10.22	.7
K7943	2955	25971	1549	1001	142	235	314	28898	2927	10.13	.6
K7944	2970	13487	1150	718	102	192	280	15649	2162	13.82	.5
K7945	2985	50229	2746	1346	134	246	296	54701	4472	8.18	.5
K7946	3000	9576	689	465	69	124	150	10923	1347	12.33	.5
K7947	3015	6689	669	393	50	97	127	7898	1209	15.31	.5
K7948	3030	5443	681	424	53	114	199	6715	1272	18.94	.4
K7971	3045	9748	1326	868	108	224	423	12274	2526	20.58	.4
K7972	3060	6090	650	377	47	91	149	7255	1165	16.06	.5
K7973	3075	4481	514	293	37	74	127	5399	918	17.00	.5
K7974	3090	3383	982	482	63	122	190	5032	1649	32.77	.5
K7975	3105	4499	1430	715	140	218	431	7002	2503	35.75	.6

Table 1a.

CONCENTRATION (ul Gas / kg Rock) OF C1 - C7 HYDROCARBONS IN HEADSPACE.

IKU No.	DEPTH (m)	C1	C2	C3	iC4	nC4	C5+	SUM C1-C4	SUM C2-C4	WET-NESS (%)	iC4 --- nC4
K7976	3120	O P E N		L I D .							
K7977	3135	430	204	124	43	61	217	862	432	50.12	.70
K7978	3150	454	97	86	47	58	256	742	288	38.81	.81
K7979	3165	O P E N		L I D .							
K7980	3180	401	144	127	69	95	574	836	435	52.03	.73
K7981	3195	351	123	85	24	38	181	621	270	43.48	.63
K7982	3210	427	129	80	28	34	89	698	271	38.83	.82
K7983	3225	277	114	67	21	24	50	503	226	44.93	.87
K7984	3240	840	286	119	28	32	67	1305	465	35.63	.87
K7985	3255	O P E N		L I D .							
K7986	3270	5594	588	270	73	97	382	6622	1028	15.52	.75
K7987	3285	3135	329	139	30	39	98	3672	537	14.62	.77
K7997	3300	521	136	56	14	25	108	752	231	30.72	.56
K7998	3315	201	156	96	32	50	200	535	334	62.43	.64
K7999	3330	422	318	272	142	185	475	1339	917	68.48	.77
K8000	3345	191	184	246	124	262	792	1007	816	81.03	.47
K8001	3360	286	215	978	932	1952	6559	4363	4077	93.44	.48
K8002	3375	183	201	399	209	371	775	1363	1180	86.57	.56
K8003	3390	270	359	713	287	489	935	2118	1848	87.25	.59
K8004	3405	180	331	521	150	280	422	1462	1282	87.69	.54
K8005	3420	124	90	134	39	88	250	475	351	73.89	.44
K8006	3435	206	57	100	26	66	165	455	249	54.73	.39
K8007	3450	153	42	71	20	57	243	343	190	55.39	.35
K8008	3465	69	18	30	8	25	102	150	81	54.00	.32
K8009	3480	160	48	86	22	65	201	381	221	58.01	.34

TABLE 1 a.

CONCENTRATION (ul Gas / kg Rock) OF C1 - C7 HYDROCARBONS IN HEADSPACE.

IKU No.	DEPTH (m)	C1	C2	C3	iC4	nC4	C5+	SUM C1-C4	SUM C2-C4	WET-NESS (%)	iC4 / nC4
K8010	3495	116	44	90	21	55	100	326	210	64.42	.38
K8011	3510	238	76	174	50	121	206	659	421	63.88	.41
K8012	3525	173	129	201	57	143	300	703	530	75.39	.40
K8013	3540	633	181	327	93	258	493	1492	859	57.57	.36
K8014	3555	1088	363	629	172	405	753	2657	1569	59.05	.42
K8015	3570	5	7	11	3	6	8	32	27	84.38	.50
K8016	3585	157	304	562	138	351	381	1512	1355	89.62	.39
K8017	3600	125	208	362	86	229	212	1010	885	87.62	.38
K8018	3615	322	361	746	147	397	580	1973	1651	83.68	.37
K8019	3630	333	441	977	205	540	674	2496	2163	86.66	.38
K8020	3645	331	471	975	189	461	451	2427	2096	86.36	.41
K8021	3660	563	581	1082	204	488	475	2918	2355	80.71	.42
K8022	3675	589	433	737	130	317	311	2206	1617	73.30	.41
K8023	3690	607	316	761	189	442	638	2315	1708	73.78	.43
K8024	3705	4131	1297	1707	403	883	1355	8421	4290	50.94	.46
K8025	3720	2199	1172	1488	285	626	936	5770	3571	61.89	.46
K8026	3735	2340	1276	1599	278	651	1004	6144	3804	61.91	.43
K8027	3750	1364	934	1270	205	541	877	4314	2950	68.38	.38
K8028	3765	1245	624	749	116	294	464	3028	1783	58.88	.39
K8029	3780	1843	926	1153	209	490	660	4621	2778	60.12	.43
K8030	3795	981	443	559	102	260	516	2345	1364	58.17	.39
K8031	3810	1340	445	407	61	160	516	2413	1073	44.47	.38
K8032	3825	1422	470	489	76	198	564	2655	1233	46.44	.38
K8061	3840	2070	806	909	142	353	473	4330	2260	52.19	.37
K8062	3855	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	754	7108	4045	56.75	.35

TABLE I a.

CONCENTRATION (ul Gas / kg Rock) OF C1 - C7 HYDROCARBONS IN HEADSPACE.

IKU No.	DEPTH (m)	C1	C2	C3	iC4	nC4	C5+	SUM C1-C4	SUM C2-C4	WET-NESS (%)	iC4 / nC4
K8063	3870	2559	823	966	191	509	783	5048	2489	49.31	.38
K8064	3885	3208	269	292	52	139	370	3960	752	18.99	.37
K8065	3900	2057	942	1190	231	642	1412	5062	3005	59.36	.36
K8066	3915	2703	1408	1134	291	413	960	5949	3246	54.56	.70
K8067	3930	2292	310	412	102	221	384	3337	1045	31.32	.46
K8068	3945	1195	478	509	146	357	1124	2685	1490	55.49	.41
K8069	3960	54420	1765	1218	348	531	1094	58282	3862	6.63	.66
K8070	3975	5650	381	277	66	118	318	6492	842	12.97	.56
K8071	3990	305	69	167	46	125	400	712	407	57.16	.37
K8072	4005	1363	523	377	100	196	388	2559	1196	46.74	.51
K8073	4020	2260	1208	1054	384	655	1622	5561	3301	59.36	.59
K8074	4035	6892	744	666	212	337	638	8851	1959	22.13	.63
K8075	4050	14218	1143	827	210	325	578	16723	2505	14.98	.65
K8076	4065	2480	284	227	54	98	175	3143	663	21.09	.55
K8077	4080	7334	922	797	169	358	628	9580	2246	23.44	.47
K8391	4095	2108	403	259	65	131	149	2966	858	28.93	.50
K8392	4110	O P E N		L I D .							
K8393	4125	1042	358	304	45	103	103	1852	810	43.74	.44
K8394	4140	688	217	198	35	90	102	1228	540	43.97	.39
K8395	4155	529	171	167	29	70	73	966	437	45.24	.41
K8396	4170	O P E N		L I D .							
K8397	4185	970	95	63	8	20	57	1156	186	16.09	.40
K8398	4200	492	170	88	13	32	45	745	253	33.96	.41
[illegible]	4215	468	[illegible]	212	34	81	81	1066	[illegible]	51.99	.42
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	28	[illegible]	[illegible]	[illegible]	[illegible]	45.11	.45

CONCENTRATION (ul Gas / kg Rock) OF C1 - C7 HYDROCARBONS IN HEADSPACE.

IKU No.	DEPTH (m)	C1	C2	C3	iC4	nC4	C5+	SUM C1-C4	SUM C2-C4	WET-NESS (%)	iC4 / nC4
K8401	4245	278	95	89	15	29	27	506	228	45.06	.52
K8402	4260	390	116	85	14	34	68	639	249	38.97	.41
K8403	4275	530	119	77	12	27	41	765	235	30.72	.44
K8404	4290	517	179	169	24	55	63	944	427	45.23	.44
K8405	4305	489	100	70	12	29	81	700	211	30.14	.41
K8406	4320	1078	359	270	38	88	97	1833	755	41.19	.43
K8407	4335	306	92	88	15	38	66	539	233	43.23	.39
K8408	4350	335	68	47	7	17	129	474	139	29.32	.41
K8638	4365	1093	256	402	70	165	202	1986	893	44.96	.42
K8639	4680	602	104	159	28	62	69	955	353	36.96	.45
K8640	4695	1903	243	395	62	131	135	2734	831	30.40	.47
K8641	4410	1167	146	279	52	135	277	1779	612	34.40	.39
K8642	4425	893	105	186	28	71	149	1283	390	30.40	.39
K8643	4440	2249	416	462	77	204	588	3408	1159	34.01	.38
K8644	4455	1978	319	438	74	194	363	3003	1025	34.13	.38
K8645	4470	4051	446	240	45	76	182	4858	807	16.61	.59
K8646	4485	1571	267	229	41	90	182	2198	627	28.53	.46
K8647	4500	911	430	370	65	149	181	1925	1014	52.68	.44
K8648	4515	614	318	409	79	198	301	1618	1004	62.05	.40
K8649	4530	1580	819	975	160	403	379	3937	2357	59.87	.40
K8650	4545	1055	102	175	35	86	146	1453	398	27.39	.41
K8651	4560	1064	86	85	22	43	118	1300	236	18.15	.51
K8652	4575	234	55	84	17	42	80	432	198	45.83	.40

IKU

LITHOLOGY AND TOTAL ORGANIC CARBON MEASUREMENTS

TABLE NO.: II

WELL NO.: 7120/12-2

Sample	Depth	TOC		Lithology
K 7762	1485-1500	4,61	15	Claystone, dark grey, carbonaceous
		1,25	80	Claystone, grey brownish grey, micaceous, occasionally grading to Siltstone
			2	Coal
			3	Limestone, light brownish grey
K 7765	1530-1545		5	Claystone, dark grey, micaceous
		1,28	70	Claystone, light grey, micaceous
			2	Sand
			1	Coal
			2	Limestone
K 7768	1575-1590	1,25	60	Claystone, grey
			5	Claystone, dark grey
			4	Limestone, light brownish grey, sideritic
			30	Sandstone,
			1	Coal
K 7771	1620-1635	1,20	55	Claystone, grey, greenish grey, light grey
		2,63	38	Claystone, (dark) grey, brownish grey, micaceous, silty
			3	Sandstone, white, light brownish, white
			1	Coal
			3	sideritic carbonate
K 7774	1665-1680	3,20	95	Claystone, dark brownish grey to grey, micaceous
			1	Sand
			2	sideritic carbonate

IKU

LITHOLOGY AND TOTAL ORGANIC CARBON MEASUREMENTS

TABLE NO.: II
WELL NO.: 7120/12-2

Sample	Depth	TOC		Lithology
K 7776	1695-1716	3,92	95	Claystone, (dark), brownish grey to grey, micaceous and silty
			3	Claystone, grey, slightly micaceous
			2	Coal
K 7777	1710-1725	4,50	98	Claystone (dark), brownish grey, micaceous and silty
			1	Claystone, grey, micaceous
			1	Sandstone, white
K 7778	1725-1740	4,72	70	Claystone, dark grey, brownish grey, micaceous and silty
			5	Claystone, grey, micaceous
			25	Cement
K 7779	1740-	4,93	75	Claystone, dark brownish grey, dark grey, micaceous and silty, slightly fissile
			25	Cement
K 7780	1755-1770	5,24	98	Claystone, dark brownish grey, micaceous and silty, fissile and sometimes laminated
			2	Cement, grey, brownish white
K 7781	1770-1785	5,64	100	Claystone, dark brownish grey, micaceous, silty, fissile, sometimes laminated and with occasional slickensides
			sm.am.	Cement, brownish white

032/B/jlh/2

IKU

LITHOLOGY AND TOTAL ORGANIC CARBON MEASUREMENTS

TABLE NO.: II

WELL NO.: 7120/12-2

Sample	Depth	TOC		Lithology
K 7782	1785-1800	5,49	100	Claystone, as above, occasionally grading to Siltstone
			sm.am.	Cement, brownish white
K 7883	1800-1815	6,63	100	Claystone, dark brownish grey, micaceous, fissile
			sm.am.	Cement, brownish white
K 7884	1815-1830	8,14	100	Claystone, as above
			sm.am.	Siltstone, light brownish grey
				Cement, brownish white to light grey
K 7885	1830-1845	9,30	100	Claystone, dark brownish grey, dark grey, micaceous, silty, fissile to sub-fissile, weakly laminated
			sm.am.	Cement, brownish white
				Fossile fragments
				Coal
K 7886	1845-1860	10,50	100	Claystone, as above
			sm.am.	Cement
K 7887	1860-1875	9,66	60	Claystone, as above
			40	Sandstone/Siltstone fine grained micaceous, light brownish white, light brownish grey, clayey
			sm.an.	Pyrite
K 7888	1875-1890	9,54	35	Claystone, as above
			60	Siltstone/Sandstone as above
			5	Cement

IKU

LITHOLOGY AND TOTAL ORGANIC CARBON MEASUREMENTS

TABLE NO.: II

WELL NO.: 7120/12-2

Sample	Depth	TOC		Lithology
K 7789	1890-1905	7,17	40	Claystone, as above
			10	Siltstone/Sandstone as above, light reddish brown or light brownish grey
			50	Cement
K 7792	1935-1950		5	Claystone, as above
			95	Sandstone, fine grained, micaceous, Calcite laminated, often grading to Siltstone, light brownish grey to light brownish white, containing some Glauconite and Claystone laminas, moderately hard
K 7797	1980-1995		80	Cement and deformed Claystone material due to the coring procedure
		6,19	15	Claystone, dark brownish grey
			5	Coal, carbonate and micaceous
K 7800	2025-2040		83	Cement and deformed Claystone, as above
		5,55	12	Claystone, as above
			3	Siltstone, micaceous, grey
			2	very fine Sandstone, quartzitic
K 7803	2070-2085		10	Cement and deformed Claystone, as above
			20	fine Sandstone, quatzitic
			60	coarse to very coarse Sandstone, angular and unconsolidated
			4	Claystone, dark brownish grey
			2	very fine immature dark Sandstone and sideritic Carbonate
			4	Coal

IKU

LITHOLOGY AND TOTAL ORGANIC CARBON MEASUREMENTS

TABLE NO.: II

WELL NO.: 7120/12-2

Sample	Depth	TOC		Lithology
K 7809	2160-2175		40	Light quartzitic Sandstone
			25	very fine immature Sandstone
			15	Coal
		5,99	10	Claystone, dark
		1,95	10	Claystone, light grey-green, calcareous
				occasional Siderite
K 7812	2205-2220	2,36	94	Claystone, parallellaminated but slightly bioturbated
			2	Coal
			3	Sandstone, quartzitic
			1	Claystone, light grey-green
K 7834	2250-2265		55	Mudstone, light grey, deformed fragments due to turbodrill
			15	Mudstone, dark, deformed fragments due to turbodrill
			5	medium Sandstone
		5,86	12	Claystone, dark grey, silty
			3	micaceous Siltstone
			8	very fine Sandstone
			2	Coal
K 7837	2295-2310		40	Mudstone, light, turbodrill
			50	Mudstone, dark, turbodrill
		4,30	8	Claystone, dark grey, slightly micaceous
			2	traces of Coal, chloritic Claystone and Carbonate

IKU

LITHOLOGY AND TOTAL ORGANIC CARBON MEASUREMENTS

TABLE NO.: II
WELL NO.: 7120/12-2

Sample	Depth	TOC		Lithology
K 7840	2340-2355	1,64	88	Mudstone, transition light grey to dark grey material, turbodrill
			6	very fine quartzitic, light grey Sandstone
			sm.am.	Coal, Pyrite and Carbonate
			5	Claystone, dark grey, micaceous
K 7843	2385-2400		86	very fine-fine quartzitic Sandstone, oil incorporated from the drill mud
		5,05	10	Claystone, dark grey and micaceous, as above
			2	Claystone, light grey
K 7846	2430-2445		85	very fine, light grey Sandstone, quartzitic, slightly Carbonate cemented
		1,68	10	Claystone, dark grey
			4	Carbonate, grey
			1	Coal
K 7847	2445-2460		80	very fine Sandstone, as above
		2,72	12	Claystone, dark grey, almost as above, tending to be more silty
			8	Carbonate
				occasional Coal and Cement fragments
K 7848	2460-2475		88	very fine-fine Sandstone
			4	Claystone, dark grey, as above
			sm.am.	Coal, chloritic Claystone and Pyrite
			3	Carbonate
			2	Siltstone, grey

IKU

LITHOLOGY AND TOTAL ORGANIC CARBON MEASUREMENTS

TABLE NO.: II

WELL NO.: 7120/12-2

Sample	Depth	TOC		Lithology
K 7849	2475-2490	3,23	81	Sandstone, as above
			10	Claystone, dark grey, as above
			2	Coal
			1	Claystone, grey-green, waxy
			3	Siltstone, as above
K 7850	2490-2505	1,42	78	Sandstone, as above
			10	Claystone, dark grey, as above
			2	Claystone, grey-green, waxy
			4	Siltstone, light grey-grey
			7	Coal and Coal shale
			2	Carbonate
			1	Pyrite
K 7851	2505-2520		89	Sandstone, as above
			2	Claystone, dark grey, as above
			2	Siltstone, as above
			3	Claystone, light grey, micaceous occasional waxy Claystone, Coal and Carbonate
K 7915	2520-2535		95	Sandstone, hard, immature, containing grains of Quartz, Feldspar, micaceous. Calcite cemented, porosity in most cases seems to be moderate. Grain-size: very fine
			5	Siltstone, probably as laminae in Sandstone
K 7916	2535-2550	1,19	85	Sandstone, as above
			10	Siltstone, grey, as above
			5	Claystone, grey to dark grey, subfissile

032/B/jlh/7

IKU

LITHOLOGY AND TOTAL ORGANIC CARBON MEASUREMENTS

TABLE NO.: II

WELL NO.: 7120/12-2

Sample	Depth	TOC		Lithology
K 7917	2550-2565		90	Sandstone, fine grained, white to light grey, Calcite cemented, sometimes with a brown stain (hydrocarbon)
			5	Siltstone, grey, calcareous
			5	Claystone, grey to dark grey, waxy, luster, or brownish grey, silty, probably organic rich
K 7918	2565-2580		90	Sandstone, as above, rich in mica
			5	Siltstone, as above
			5	Claystone, as above
K 7919	2585-2595		90	Sandstone, as above, fine to very fine grained, often stained brown
			5	Siltstone, grey
			5	Claystone, grey, silty
			sm.am.	Limestone, pinkish or brownish white
K 7920	2595-2610		85	Sandstone, as above
		1,37	10	Siltstone, as above
			5	Claystone, as above
			sm.am.	Limestone, as above
K 7921	2610-2625		80	Sandstone, as above
		4,69	10	Siltstone, as above occasionally also green
		4,91	10	Claystone, grey, dark grey, brownish grey, occasionally silty (broken staining on Sandstones and Siltstones probably caused by hydrocarbons)

IKU

LITHOLOGY AND TOTAL ORGANIC CARBON MEASUREMENTS

TABLE NO.: II

WELL NO.: 7120/12-2

Sample	Depth	TOC		Lithology
K 7922	2625-2640		80	Sandstone, as above
		3,07	10	Siltstone, as above
		3,11	10	Claystone, light grey, light brownish grey, brownish grey, grey, dark brownish grey, occasionally silty
			sm.am.	Coal fragments
K 7923	2640-2655		70	Sandstone, as above, fine to medium grained
		1,54	15	Siltstone, as above
		2,91	15	Claystone, subfissile, silty and/or micaceous, as above
K 7924	2655-2670		50	Sandstone, as above
		0,76	25	Siltstone, as above
		2,24	25	Claystone, silty and micaceous, grey to brownish grey
			sm.am.	Coal (trace)
				Limestone, brownish grey
K 7925	2670-2685		20	Sandstone
		1,23	20	Siltstone, as above
		2,31	60	Claystone, grey brownish grey, silty, micaceous
			sm.am.	Coal, Limestone
K 7926	2685-2700		5	Sandstone, very fine to fine, mainly quartz grains, but also mica, Calcite cemented
		0,93	60	Siltstone, light grey, as above
		4,33	30	Claystone, grey, silty, as above, also some greenish
			5	Limestone, grey or brownish grey
			sm.am.	Coal

IKU

LITHOLOGY AND TOTAL ORGANIC CARBON MEASUREMENTS

TABLE NO.: II
WELL NO.: 7120/12-2

Sample	Depth	TOC		Lithology
K 7927	2700-2715		10	Sandstone, as above
		0,71	30	Siltstone, as above
		6,24	65	Claystone, grey, brownish grey, silty, observed with tiny coal flakes, or coal laminae, often micaceous
			5	Limestone, off.white, grey, brownish grey
			sm.am.	Fossil fragments
K 7928	2715-2730		50	Approximately 50% of the material, strongly affected by turbine drilling, indeterminate, Mudstone
		4,58	30	Claystone grey, brownish grey-green or greenish grey often micaceous and silty
		0,97	10	Siltstone, as above
			5	Limestone, as above
			5	Sandstone, as above
K 7929	2730-2745		50	Affected by turbo drilling, Mudstone
		2,68	30	Claystone, as above, often with fine lamination
			10	Siltstone, as above
			5	Sandstone, as above
			5	Limestone
			sm.am.	Coal, as fragments
K 7930	2745-2760		70	Strongly affected by turbine drilling, Mudstone
		1,83	20	Claystone, as above
			5	Siltstone, as above
			5	Sandstone, as above
			sm.am.	Limestone, as above

032/B/jlh/10

IKU

LITHOLOGY AND TOTAL ORGANIC CARBON MEASUREMENTS

TABLE NO.: II

WELL NO.: 7120/12-2

Sample	Depth	TOC		Lithology
K 7931	2760-2775		70	Strongly affected by turbo drilling, Mudstone
		2,68	20	Claystone, grey, brownish grey, micaceous, subfissile, probably also carbonaceous, greenish-grey, light grey, also observed; occasionally silty and sandy, with lamination
			5	Siltstone, lihgt grey, as above
			5	Sandstone, fine grained, as above
K 7932	2775-2790		90	Affected by turbine drilling, Mudstone
		2,26	10	Claystone, brownish grey, micaceous or grey, subfissile, micaceous
			sm.am.	Siltstone, as above
				Sandstone, as above
K 7933	2790-2805		95	Affected by turbine drilling, Mudstone
			5	Claystone, grey, brownish grey
			sm.am.	Siltstone, as above
K 7934	2805-2820		95	Affected by turbine drilling, Mudstone
			5	Claystone, grey, brownish grey
			sm.am.	Siltstone, as above
				Limestone, light grey, light grey
K 7935	2820-2835		95	Affected by turbine drilling, Mudstone
			3	Limestone, light grey, light greenish grey
			2	Claystone, grey, brownish grey
K 7936	2835-2850		95	Affected by turbine drilling, Mudstone
			4	Claystone, grey, brownish grey, micaceous
			1	Limestone, light green, light grey

IKU

LITHOLOGY AND TOTAL ORGANIC CARBON MEASUREMENTS

TABLE NO.: II
WELL NO.: 7120/12-2

Sample	Depth	TOC		Lithology
K 7937	2850-2865		95	Affected by turbine drilling, Mudstone
			4	Claystone, grey, brownish grey, micaceous, often silty
			1	Limestone, light greenish grey
K 7938	2865-2880		99	Affected by turbine drilling, Mudstone
			1	Claystone, grey, brownish grey, micaceous
K 7939	2880-2895		99	Affected by turbine drilling, Mudstone
			1	Claystone, grey, micaceous, subfissile
K 7940	2895-2910		95	Affected by turbine drilling, Mudstone
			4	Claystone, grey, brownish grey, micaceous, subfissile
			1	Limestone, light greenish grey
K 7941	2910-2925		95	Affected by turbine drilling, Mudstone
			5	Claystone, grey, greenish grey, brownish grey
			sm.am.	Limestone, as above
				Siltstone, light brownish grey
K 7942	2925-2940		10	Cement from casing
		1,63	88	Claystone, grey, brownish grey, greenish grey, micaceous, occasionally silty
			2	turbo drilled material, Mudstone
			sm.am.	very fine grained Sandstone

032/B/jlh/12

IKU

LITHOLOGY AND TOTAL ORGANIC CARBON MEASUREMENTS

TABLE NO.: II
WELL NO.: 7120/12-2

Sample	Depth	TOC		Lithology
K 7943	2940-2955	0,88	80	Claystone, grey, brownish grey, greenish grey, sometimes subfissile, micaceous, noncalcareous, sometimes the brownish grey Claystone has thin coal laminae
			5	Siltstone, brownish grey with lamination
			5	Sandstone, white to light brownish grey, fine grained
			10	Affected by turbine drilling, Mudstone
			sm.am.	Cement
K 7944	2955-2970		70	Affected by turbine drilling, Mudstone
		1,28	25	Claystone, as above, laminated, sometimes silty
			5	Sandstone, white, very fine to fine grained
			sm.am.	Siltstone, as above
				Coal (or coalified plant remains)
K 7945	2970-2985		40	Affected by turbine drilling, Mudstone
		1,37	55	Claystone, as above
			5	Sandstone, as above with small amounts of coalified plant remains
			sm.am.	Coal, black shiny

IKU

LITHOLOGY AND TOTAL ORGANIC CARBON MEASUREMENTS

TABLE NO.: II

WELL NO.: 7120/12-2

Sample	Depth	TOC		Lithology
K 7946	2985-3000	1,07	90	Claystone, grey, brownish grey, greenish grey, micaceous, laminated, sometimes silty
			5	Siltstone, brownish grey, micaceous
			5	Sandstone, white or brownish white
			sm.am.	turbine drilled material
				Cement
				Coal and coalified plant remains
K 7947	3000-3015	1,10	95	Claystone, as above, sometimes silty and sandy
			5	Siltstone, brownish grey
			sm.am.	Sandstone, as above
				Coal and coalified wood fragments
				some material affected by turbine drilling
K 7948	3015-3030	1,18	90	Claystone, as above, sometimes silty
			5	Siltstone, brownish grey, as above
			sm.am.	Sandstone, fine grained, white to grey
				Cement, from casing
K 7971	3030-3045	1,49	99	Claystone, grey, brownish grey, sometimes silty or sandy, with silt, sand or coal laminae, subfissile, micaceous
			1	Sandstone, white, observed to have been thin bands in Claystone
K 7972	3045-		10	Affected by turbine drilling, Mudstone
	3060	1,37	89	Claystone, grading to Siltstone, grey, brownish grey, greenish grey, laminated, micaceous
			1	Sandstone, white, off-white

032/B/jlh/14

IKU

LITHOLOGY AND TOTAL ORGANIC CARBON MEASUREMENTS

TABLE NO.: II

WELL NO.: 7120/12-2

Sample	Depth	TOC		Lithology
K 7973	3060-3075	1,16	95	Claystone, grey, brownish grey, greenish grey, as above, occasionally silty or sandy, subfissile
			5	Siltstone, greenish grey, brownish
K 7974	3075-3090		10	Affected by turbine drilling, Mudstone
		1,12	85	Claystone, as above, with slickensides, micaceous, and partly carbonaceous
			5	Siltstone, light brownish grey
			sm.am.	Pyrite
K 7975	3090-3105		5	Affected by turbine drilling, Mudstone
		1,0	85	Claystone, silty, micaceous, carbonaceous
			5	Siltstone, light brownish grey
			5	Sandstone, fine grained
K 7976	3105-3120	0,87	85	Claystone, as above
			5	Siltstone, as above
			10	casing Cement, brownish white
K 7977	3120-3135	0,82	50	Claystone, mainly grey but also brownish grey, as above, some greenish grey observed
			40	Sandstone, medium to coarse grained, white brownish white, containing organic material and glauconite, well cemented, calcite cement, quartz grains are angular to subangular, poorly sorted
			10	casing Cement, brownish white
			sm.am.	Pyrite

IKU

LITHOLOGY AND TOTAL ORGANIC CARBON MEASUREMENTS

TABLE NO.: II

WELL NO.: 7120/12-2

Sample	Depth	TOC		Lithology
K 7978	3135-3150	0,30	40	Claystone, greenish grey, grey, occasionally brownish grey
			55	Sandstone, as above, white, to light grey, but sometimes stained brown
			5	casing Cement
K 7979	3150-3165	0,40	40	Claystone, greenish grey, grey, subfissile
			60	Sandstone, as above
			sm.am.	Siltstone
				casing Cement
K 7980	3165-3180	0,30	40	Claystone, as above
			60	Sandstone, white, light greenish grey, light grey, often stained brown (hydrocarbons)
			sm.am.	casing Cement
K 7981	3180-3195	0,32	30	Claystone, as above
			70	Sandstone, as above, mainly fine grained, calcite and silica cemented
K 7982	3195-3210	0,26	30	Claystone, as above
			70	Sandstone, as above
K 7983	3210-3225	0,31	20	Claystone, as above
			80	Sandstone, as above
K 7984	3225-3240	0,28	20	Claystone, as above
			80	Sandstone, as above

IKU

LITHOLOGY AND TOTAL ORGANIC CARBON MEASUREMENTS

TABLE NO.: II

WELL NO.: 7120/12-2

Sample	Depth	TOC		Lithology
K 7985	3240-3255	0,31	20	Claystone, as above
			80	Sandstone, as above, some grains are light grey due to a higher content of clay minerals
			sm.am.	reddish brown or purple Claystone, silty casing Cement
K 7986	3255-3270	0,28	50	Claystone, greenish grey, as above
			50	Sandstone, Calcite cemented, as above
			sm.am.	reddish brown Siltstone and Claystone casing Cement, brownish grey
K 7987	3270-3285	0,29	50	Claystone, greenish grey, as above
			50	Sandstone, Calcite cemented, as above
			sm.am.	reddish brown Claystone casing Cement
K 7997	3285-3300	0,17	30	Claystone, grey
			70	Sandstone, white
K 7998	3300-3315	0,18	80	Claystone, grey, as above
			20	Sandstone, white, light grey
K 7999	3315-3330	0,20	50	Claystone, grey, partly green and light green
			50	Sandstone, as above
K 8000	3330-3345	0,23	80	Claystone, grey
			20	Sandstone, as above

IKU

LITHOLOGY AND TOTAL ORGANIC CARBON MEASUREMENTS

TABLE NO.: II
WELL NO.: 7120/12-2

Sample	Depth	TOC		Lithology
K 8001	3345-3360	0,25	20	Claystone, grey, with small zones which are green and brown
			75	Sandstone, as above
			5	Coal, probably additives
K 8002	3360-3375	0,34	40	Claystone, as above
			60	Sandstone, as above, with white Siltstone in addition
K 8003	3375-3390	0,31	90	Claystone, as above
			10	Sandstone, as above
K 8004	3390-3405	0,46	85	Claystone, as above, but grading to light grey and greenish grey
			5	Sandstone, as above
			10	Coal (?additives). Some of the cutting fragmetns have coating of hydrocarbon (?Oil from the drill mud)
K 8005	3405-3420	0,73	100	Mudstone, grey (turbodrill) with some light grey and green Claystones probably caved
K 8006	3420-3435	0,37	100	Mudstone, as above
K 8007	3435-3450	0,33	100	Mudstone, as above
K 8008	3450-3465	0,27	100	Mudstone, as above
K 8009	3465-3480	0.19	98	Mudstone, as above
			2	Coal (?additives)

032/B/jlh/18

IKU

LITHOLOGY AND TOTAL ORGANIC CARBON MEASUREMENTS

TABLE NO.: II

WELL NO.: 7120/12-2

Sample	Depth	TOC		Lithology
K 8010	3485-3495	0,23	100	Mudstone, as above occasional coal (?additives)
K 8011	3495-3510	0,36	100	Mudstone, grey, turbodrill, as above
K 8012	3510-3525	0,31	85	Mudstone, as above
		0,28	15	Claystone, not deformed, light grey-grey and green (?caved)
K 8013	3525-3540	0,63	100	Mudstone, as above
K 8014	3540 3555	0,68	85	Mudstone, as above
		0,40	15	Claystone, light grey to grey
K 8015	3555-3570	0,31	100	Mudstone, as above
K 8016	3570-3585	0,12	100	Mudstone, turbodrill
K 8017	3585-3600	0,02	85	Mudstone, as above
		0,30	15	Claystone, grey to light grey (?caved)
K 8018	3600-3615	0,17	100	Mudstone, as above
K 8019	3615-3630	0,57	100	Mudstone, as above
K 8020	3630-3645	0,09	75	Mudstone, as above
		0,35	25	Claystone, grey to light grey, not deformed material (?caved)

IKU

LITHOLOGY AND TOTAL ORGANIC CARBON MEASUREMENTS

TABLE NO.: II

WELL NO.: 7120/12-2

Sample	Depth	TOC		Lithology
K 8021	3645-3660	0,28	100	Mudstone, turbodrill, as above, but tending to be more brown-grey
K 8022	3660-3675	0,28	95	Mudstone, as above
			5	Sandstone, white
				occasional Coal (?additives)
K 8023	3675-3690	0,36	100	Claystone, light grey to grey, some fragments are greenish, relatively good lamination. The surface of the cutting fragments are often coated with hydrocarbons
			sm.am.	Sandstone and Coal (?the last as additives)
K 8024	3690-3705	0,42	100	Claystone, light grey to grey, often brownish
K 8025	3705-3720	0,40	100	Claystone, as above, hydrocarbon coating
K 8026	3720-3735	0,33	98	Claystone, as above, with some green fragments in addition
			2	Coal (?additives)
K 8061	3825-3840	0,36	85	Claystone, light grey and dark grey, partly deformed due to turbodrill
			15	Sand, as above
K 8062	3840-3855	0,62	100	Claystone/Mudstone, light grey to dark grey, largely deformed by turbo-drill

IKU

LITHOLOGY AND TOTAL ORGANIC CARBON MEASUREMENTS

TABLE NO.: II
WELL NO.: 7120/12-2

Sample	Depth	TOC		Lithology
K 8063	3855-3870	0,34	50	Claystone, grey to light grey occasionally green
			40	Mudstone, dark grey, deformed by turbodrill
			10	Sandstone, white
K 8064	3870-3885	0,86	95	Mudstone, mostly dark grey, but also 10 to 15% of light grey deformed material by turbodrill
			5	Sandstone, white
K 8065	3885-3900	0,37	85	Claystone, grey and light grey with some green fragments
			13	Sandstone, white
			2	Coal (?additives)
K 8066	3900-3915	0,81	90	Claystone, as above
			10	Limestone, white
K 8067	3915-3930	0,40	70	Claystone, as above
			30	Limestone and silicified Limestone
K 8068	3930-3945	0,53	20	Claystone, as above
		0,01	80	Limestone, strongly silicified, white grading to grey, bryozoans and brachiopods abundant
K 8069	3945-3960	0,02	95	Chert and silicified Limestone, white to bluish
			5	Claystone, as above
K 8070	3960-3975		95	Silica-cemented Sandstone, white and clear, grading to grey chert

032/B/jlh/21

IKU

LITHOLOGY AND TOTAL ORGANIC CARBON MEASUREMENTS

TABLE NO.: II

WELL NO.: 7120/12-2

Sample	Depth	TOC		Lithology
K 8071	3975-		85	Sand to Sandstone, white
	3990	0,35	15	Claystone, grey, as above
K 8072	3990-		35	Sandstone, white
	4005	1,08	35	Silt to Sandstone, clayey, brownish to dark grey, micaceous
			30	Claystone, as above
K 8073	4005-	1,55	70	sandy Siltstone, dark brown-grey, micaceous
	4020			
		0,45	30	Claystone, as above
K 8074	4020-	0,04	50	Limestone, white to light grey, partly dolomitized and silicified
	4035			
		0,91	30	Siltstone, as above, probably dolomitic
		0,36	20	Claystone, as above
K 8075	4035-	0,03	65	Limestone, silicified and dolomitized as above
	4050			
		0,52	30	Siltstone, as above
			5	Claystone, as above
K 8076	4050-	0,02	65	silty, silicified Limestone, white grading to grey
	4065			
		0,53	35	Siltstone, as above
K 8077	4065-	0,39	80	Siltstone, as above
	4080	0,21	20	silty, silicified Limestone, as above

032/B/jlh/22

IKU

LITHOLOGY AND TOTAL ORGANIC CARBON MEASUREMENTS

TABLE NO.: II

WELL NO.: 7120/12-2

Sample	Depth	TOC		Lithology
K 8391	4080-4095	0,44	98	Claystone, micromicaceous, light grey to dark grey, slighly silty, occasionally pyritized
			2	fragments of Chert, Carbonate and coarse grained Siltstone
K 8392	4095-4110	0,48	50	Claystone, as above
		1,44	50	Mudstone, cokey due to turbodrill
			sm.am.	Chert, micaceous Siltstone and Carbonate
K 8393	4110-4125	0,50	65	Claystone, as above
		1,40	33	Mudstone, as above
			2	traces of the same lighologies as above
K 8394	4125-4140	0,40	88	Claystone, as above
			10	Mudstone, as above
			1	waxy greenish Claystone
			1	traces of Chert and Siltstones
K 8395	4140-4155	0,39	40	Claystone, as above
		1,41	60	Mudstone, as above
K 8396	4155-4170	0,39	20	Claystone, as above
		1,55	77	Mudstone, as above
			3	Chert, Carbonate and micaceous Siltstone
K 8397	4170-4185	0,41	10	Claystone, as above
		1,41	90	Mudstone, as above

IKU

LITHOLOGY AND TOTAL ORGANIC CARBON MEASUREMENTS

TABLE NO.: II

WELL NO.: 7120/12-2

Sample	Depth	TOC		Lithology
K 8398	4185-4200	0,38	10	Claystone, as above
		1,36	88	Mudstone, as above
			2	traces of very fine Sandstone, coaly waxy Shale and silicified Carbonate
K 8399	4200-4215	0,38	10	Claystone, as above
		1,58	90	Mudstone, as above
K 8400	4215-4230	0,37	13	Claystone, as above
		1,28	86	Mudstone, as above
			1	Silicified Carbonate, micaceous Siltstone and very fine Sandstone
K 8401	4230-4245	0,34	10	Claystone, as above
		1,98	88	Mudstone, as above
			occ.	trace of the same accessorian lithologies as above
K 8402	4245-4260	0,47	10	Claystone, as above
		1,57	88	Mudstone, as above
			occ.	traces of the same lithologies as above
K 8403	4260-4275	0,41	10	Claystone, as above
		1,84	85	Mudstone, as above
			3	fine Sandstone and micaceous Siltstone
			2	silicified Carbonate and Coal (?additives)
K 8404	4275-4290		5	Claystone, as above
		1,53	90	Mudstone, as above (turbodrilled)
			5	Siltstone and very fine Sandstone, micaceous and variately cemented

032/B/jlh/24

IKU

LITHOLOGY AND TOTAL ORGANIC CARBON MEASUREMENTS

TABLE NO.: II
WELL NO.: 7120/12-2

Sample	Depth	TOC		Lithology
K 8405	4290-4305	0,37	13	Claystone, as above
		1,76	86	Mudstone, as above
			1	micaceous Siltstone and waxy Claystone
K 8406	4305-4320	0,44	70	Claystone, as above, mainly light grey to grey, micromicaceous and silty
		1,36	30	Mudstone, as above
			occ.	micaceous Siltstone
K 8407	4320-4335	0,39	48	Claystone, as above
		1,59	50	Mudstone, as above
			2	very fine Sandstone, and waxy, dark grey Shale
K 8408	4335-4350	0,42	15	Claystone, as above
		1,62	83	Mudstone, as above
			2	very fine Sandstone and micaceous Siltstone
K 8638	4350-4365	1,01	95	Mudstone, grey to dark grey, turbodrilled material
			5	Claystone, light grey to grey, not deformed by turbodrill
K 8639	4364-4380	0,90	96	Mudstone, as above
			2	Claystone, as above
			occ.	very fine Sandstone and waxy greenish Claystone
K 8640	4380-4395	0,62	95	Mudstone, as above
			5	Claystone and Siltstone, grey

IKU

LITHOLOGY AND TOTAL ORGANIC CARBON MEASUREMENTS

TABLE NO.: II
WELL NO.: 7120/12-2

Sample	Depth	TOC		Lithology
K 8641	4395-4410	0,59	95	Mudstone, as above
			5	Claystone, grey to light grey occasional Coal (?additives) and light Sandstone, fine
K 8642	4410-4425	0,30	80	Mudstone, as above
		0,29	18	Claystone, light grey to grey, some fragments with good lamination
			2	Sandstone, very fine and Siltstone, grey and micaceous
K 8643	4425-4440	0,23	75	Mudstone, as above
		0,30	20	Claystone, as above
			3	Additives
			2	waxy Claystone, greenish and micaceous Siltstone
K 8644	4440-4455		3	Mudstone, as above
		0,32	15	Claystone, as above
		0,72	75	silty and partly silicified Limestone, dark grey, ?dolomitized
			7	Siltstone, micaceous and very fine grained Sandstone occasionally various types of addditives
K 8645	4455-4470		3	Mudstone, as above
		0,34	25	Claystone, as above, occasionally waxy
		0,39	70	Limestone, as above, some of the fragments have white calcite fillings in micro cracks
			2	Siltstone and very fine Sandstone

IKU

LITHOLOGY AND TOTAL ORGANIC CARBON MEASUREMENTS

TABLE NO.: II

WELL NO.: 7120/12-2

Sample	Depth	TOC		Lithology
K 8646	4470-4485	0,53	50	Mudstone, influenced by turbodrill, as above
		0,32	40	various types of Claystones, grey to light grey, micaceous and partly waxy. Some fragments are also laminated
			5	Limestone, dark grey, as above
			5	Siltstone, and fine Sandstone, grey
K 8647	4485-4500		5	Mudstone, as above
		0,59	85	Claystone, grey to dark grey, as above
			5	Siltstone, grey, micaceous
			5	Sandstone, grey
			sm.am.	Limestone, and some additives
K 8648	4500-4515		2	Mudstone, as above
		0,32	88	Claystone, as above
			7	Siltstone, as above
			3	Sandstone, and silicified Limestone
			sm.am.	additives
K 8649	4515-4530		2	Mudstone, as above
		0,79	85	Claystone, mostly grey, occasionally waxy and laminated
			6	?additives of Coal
			4	Siltstone and Sandstone, very fine grained
			sm.am.	Limestone and Pyrite

IKU

LITHOLOGY AND TOTAL ORGANIC CARBON MEASUREMENTS

TABLE NO.: II

WELL NO.: 7120/12-2

Sample	Depth	TOC		Lithology
K 8650	4530-4545	0,34	20	Claystone, as above
		0,32	60	Chert/silicified Limestone, dark grey to bluish grey
			5	Mudstone, as above
		0,33	15	Siltstone, light grey, micro-micaceous, grading into Claystone
			sm.am.	Coal (?additives) and very fine Sandstone
K 8651	4545-4560		5	Claystone, as above
		0,18	50	Chert/silicified Limestone, as above
		0,88	40	silty Limestone, light grey
			3	Coal (?additives)
			2	Siltstone, micromicaceous
K 8652	4560-4575		8	Chert/silicified Limestone, as above
		0,52	90	Limestone, grey to light grey
			2	(additives of Coal and Siltstone)

TABLE: III

WEIGHT OF EOM AND CHROMATOGRAPHIC FRACTIONS

IKU-No	DEPTH (m)	Rock Extr. (g)	EOM (mg)	Sat. (mg)	Aro. (mg)	HC (mg)	Non HC (mg)	TOC (%)
K-7762	1500	17.8	7.8	1.2	2.2	3.4	4.4	9,6 2.0
K-7774	1680	30.3	32.8	2.5	2.9	5.4	27.4	4,7 3.8
K-7777	1725	32.0	42.6	6.0	2.3	8.3	34.3	5,3 4.9
K-7780	1770	30.4	60.3	9.4	12.0	21.4	38.9	12,0 5.4
K-7784	1830	31.7	98.7	15.2	20.5	35.8	62.9	13,3 8.5
K-7786	1860	33.5	114.8	11.0	19.3	30.4	84.4	8,3 10.9
K-7797	1995	7.6	22.9	7.0	5.3	12.2	10.7	25,1 6.4
K-7809	2175	4.5	16.7	1.6	2.2	3.7	13.0	11,4 7.2
K-7834	2265	3.2	4.5	1.7	.7	2.4	2.1	16,3 4.6
K-7837	2310	6.9	6.8	2.4	.8	3.2	3.6	12,5 3.7
K-7847	2460	8.8	9.4	.6	.6	1.2	8.2	7,6 1.8
K-7921	2625	13.5	23.2	2.9	5.5	8.4	14.8	15,2 4.1
K-7922	2640	6.3	7.1	1.9	1.4	3.4	3.7	20,0 2.7
K-7926	2700	8.9	12.4	2.0	1.9	4.0	8.4	14,5 3.1
K-7928	2730	9.4	24.5	3.2	3.2	6.5	18.0	16,9 4.1
K-7931	2775	7.3	13.6	3.2	2.6	5.9	7.7	29,9 2.7
K-7942	2940	16.9	12.7	3.1	2.2	5.3	7.4	14,9 2.1
K-7945	2985	15.0	7.4	3.4	1.4	4.8	2.6	8,8 1.7
K-8073	4020	17.7	11.7	3.2	2.4	5.6	6.1	21,1 1.5
K-8392	4110	7.7	3.9	.7	1.0	1.7	2.2	[illegible] 1.4
K-8396	4170	3.9	6.5	.5	.4	.8	5.7	13,7 1.5
K-8401	4245	3.7	8.3	1.0	.5	1.4	6.9	18,9 2.0
K-8408	4350	5.9	2.3	1.1	.7	1.8	.5	17,9 1.7

T A B L E : III

WEIGHT OF EOM AND CHROMATOGRAPHIC FRACTIONS

IKU-No	DEPTH (m)	Rock Extr. (g)	EOM (mg)	Sat. (mg)	Aro. (mg)	HC (mg)	Non HC (mg)	TOC (%)
K-8793	1983.0	10.5	190.3	20.4	24.8	45.2	145.1	9,557.1
K-8794	1993.2	10.3	245.9	44.3	49.8	94.0	151.9	14,065.0
K-8795	2026.8	10.8	61.3	9.4	13.4	22.8	38.5	6,134.6
K-8796	2041.2	10.6	220.6	69.0	43.2	112.2	108.4	1,464.4
K-8797	2044.2	10.3	180.0	2.5	2.1	4.6	175.4	1,433.0
K-8798	4121.05	10.5	4.9	2.4	1.3	3.7	1.2	16,02.2
K-8799	4124.0	10.5	6.1	1.6	1.6	3.1	3.0	9,23.2

TABLE: IV

CONCENTRATION OF EOM AND CHROMATOGRAPHIC FRACTIONS

(Weight ppm of rock)

IKU-No	DEPTH (m)	EOM	Sat.	Aro.	HC	Non HC
K-7762	1500	438	67	121	189	249
K-7774	1680	1083	83	95	178	904
K-7777	1725	1331	187	71	259	1072
K-7780	1770	1984	308	395	703	1281
K-7784	1830	3114	481	647	1128	1985
K-7786	1860	3427	330	577	906	2521
K-7797	1995	3013	916	695	1611	1403
K-7809	2175	3711	347	480	827	2884
K-7834	2265	1406	525	225	750	656
K-7837	2310	986	348	122	470	516
K-7847	2460	1068	68	68	136	932
K-7921	2625	1719	213	409	622	1096
K-7922	2640	1127	305	229	533	594
K-7926	2700	1393	229	216	445	948
K-7928	2730	2601	344	344	688	1913
K-7931	2775	1863	444	362	805	1058
K-7942	2940	752	185	128	313	439
K-7945	2985	493	224	96	320	173
K-8073	4020	660	183	135	318	342
K-8392	4110	508	94	125	219	289
K-8396	4170	1654	122	92	214	1440
K-8401	4245	2249	260	130	390	1859
K-8408	4350	391	184	122	306	85

IKU

T A B L E :   IV

CONCENTRATION OF EOM AND CHROMATOGRAPHIC FRACTIONS

(Weight ppm of rock)

IKU-No	DEPTH (m)	EOM	Sat.	Aro.	HC	Non HC
K-8793	1983.0	18124	1943	2362	4305	13819
K-8794	1993.2	23874	4296	4830	9126	14748
K-8795	2026.8	5676	867	1244	2111	3565
K-8796	2041.2	20811	6509	4079	10589	10223
K-8797	2044.2	17476	240	203	443	17033
K-8798	4121.05	467	229	126	354	112
K-8799	4124.0	581	149	149	297	284

TABLE: V

CONCENTRATION OF EOM AND CHROMATOGRAPHIC FRACTIONS

(mg/g TOC)

IKU-No	DEPTH (m)	EOM	Sat.	Aro.	HC	Non HC
K-7762	1500	21.7	3.3	6.0	9.3	12.3
K-7774	1680	28.6	2.2	2.5	4.7	23.9
K-7777	1725	27.2	3.8	1.5	5.3	21.9
K-7780	1770	36.6	5.7	7.3	13.0	23.6
K-7784	1830	36.5	5.6	7.6	13.2	23.2
K-7786	1860	31.4	3.0	5.3	8.3	23.1
K-7797	1995	46.8	14.2	10.8	25.0	21.8
K-7809	2175	51.3	4.8	6.6	11.4	39.9
K-7834	2265	30.2	11.3	4.8	16.1	14.1
K-7837	2310	26.4	9.3	3.3	12.6	13.8
K-7847	2460	60.3	3.9	3.9	7.7	52.6
K-7921	2625	41.6	5.2	9.9	15.1	26.5
K-7922	2640	41.4	11.2	8.4	19.6	21.8
K-7926	2700	44.9	7.4	7.0	14.4	30.6
K-7928	2730	62.7	8.3	8.3	16.6	46.1
K-7931	2775	69.0	16.4	13.4	29.8	39.2
K-7942	2940	36.2	8.9	6.1	15.0	21.1
K-7945	2985	29.9	13.6	5.8	19.4	10.5
K-8073	4020	44.0	12.2	9.0	21.2	22.8
K-8392	4110	35.8	6.6	8.8	15.4	20.4
K-8396	4170	108.8	8.0	6.0	14.1	94.8
K-8401	4245	111.4	12.9	6.4	19.3	92.0
K-8408	4350	23.7	11.1	7.4	18.6	5.2

IKU

T A B L E : V

CONCENTRATION OF EOM AND CHROMATOGRAPHIC FRACTIONS

(mg/g TOC)

IKU-No	DEPTH (m)	EOM	Sat.	Aro.	HC	Non HC
K-8793	1983.0	31.8	3.4	4.1	7.5	24.2
K-8794	1993.2	36.7	6.6	7.4	14.0	22.7
K-8795	2026.8	16.4	2.5	3.6	6.1	10.3
K-8796	2041.2	32.3	10.1	6.3	16.4	15.9
K-8797	2044.2	53.0	.7	.6	1.3	51.7
K-8798	4121.05	21.6	10.6	5.8	16.4	5.2
K-8799	4124.0	18.1	4.6	4.6	9.3	8.8

TABLE: VI

COMPOSITION IN % OF THE MATERIAL EXTRACTED FROM THE ROCK

IKU-No	DEPTH (m)	Sat / EOM	Aro / EOM	HC / EOM	Sat / Aro	Non HC / EOM	HC / Non HC
K-7762	1500	15.4	27.7	43.1	55.6	56.9	75.7
K-7774	1680	7.7	8.8	16.5	87.5	83.5	19.7
K-7777	1725	14.1	5.4	19.4	263.2	80.6	24.1
K-7780	1770	15.5	19.9	35.4	78.0	64.6	54.9
K-7784	1830	15.4	20.8	36.2	74.3	63.8	56.8
K-7786	1860	9.6	16.8	26.4	57.1	73.6	36.0
K-7797	1995	30.4	23.1	53.4	131.8	46.6	114.8
K-7809	2175	9.3	12.9	22.3	72.2	77.7	28.7
K-7834	2265	37.3	16.0	53.3	233.3	46.7	114.3
K-7837	2310	35.3	12.4	47.6	285.7	52.4	91.0
K-7847	2460	6.4	6.4	12.8	100.0	87.2	14.6
K-7921	2625	12.4	23.8	36.2	52.2	63.8	56.8
K-7922	2640	27.0	20.3	47.3	133.3	52.7	89.8
K-7926	2700	16.5	15.5	31.9	106.3	68.1	46.9
K-7928	2730	13.2	13.2	26.4	100.0	73.6	36.0
K-7931	2775	23.8	19.4	43.2	122.7	56.8	76.2
K-7942	2940	24.6	17.0	41.6	144.4	58.4	71.2
K-7945	2985	45.4	19.5	64.9	233.3	35.1	184.6
K-8073	4020	27.7	20.5	48.2	135.0	51.8	93.1
K-8392	4110	18.5	24.6	43.1	75.0	56.9	75.7
K-8396	4170	7.4	5.5	12.9	133.3	87.1	14.8
K-8401	4245	11.6	5.8	17.3	200.0	82.7	21.0
K-8408	4350	47.0	31.3	78.3	150.0	21.7	360.0

TABLE: VI

COMPOSITION IN % OF THE MATERIAL EXTRACTED FROM THE ROCK

IKU-No	DEPTH (m)	Sat / EOM	Aro / EOM	HC / EOM	Sat / Aro	Non HC / EOM	HC / Non HC
K-8793	1983.0	10.7	13.0	23.8	82.3	76.2	31.2
K-8794	1993.2	18.0	20.2	38.2	88.9	61.8	61.9
K-8795	2026.8	15.3	21.9	37.2	69.6	62.8	59.2
K-8796	2041.2	31.3	19.6	50.9	159.6	49.1	103.6
K-8797	2044.2	1.4	1.2	2.5	118.2	97.5	2.6
K-8798	4121.05	49.0	26.9	75.9	181.8	24.1	315.3
K-8799	4124.0	25.6	25.6	51.1	100.0	48.9	104.7

TABLE VII

TABULATION OF DATAS FROM THE GASCHROMATOGRAMS

IKU No.	DEPTH (m)	PRISTANE / n-C17	PRISTANE / PHYTANE	CPI
K7762	1500	.9	1.8	1.8
K7774	1680	3.2	3.4	1.9
K7777	1725	3.3	2.4	2.0
K7780	1770	2.9	1.9	1.9
K7784	1830	2.9	2.1	1.9
K7786	1860	2.5	2.1	1.6
K7797	1995	1.0	2.5	1.9
K7809	2175	1.9	2.8	1.6
K7834	2265	.8	2.2	1.7
K7837	2310	1.2	2.5	1.8
K7847	2460	1.1	2.1	1.4
K7921	2625	1.4	2.4	1.7
K7922	2640	1.0	2.2	1.3
K7926	2700	1.4	3.1	1.4
K7928	2730	1.6	2.2	1.4
K7931	2775	1.2	2.1	1.5
K7942	2940	1.1	2.2	1.6
K7945	2985	.7	2.6	1.3
K8073	4020	.4	2.2	1.2
K8392	4110	.4	.3	4.3
K8396	4170	.4	1.1	2.4
K8401	4245	.5	1.4	1.2
K8408	4350	.4	1.2	1.2

TABLE VII

IKU

TABULATION OF DATAS FROM THE GASCHROMATOGRAMS

IKU No.	DEPTH (m)	PRISTANE / n-C17	PRISTANE / PHYTANE	CPI
K8793	1983.0	.4	2.1	1.2
K8794	1993.2	.4	1.8	.9
K8795	2026.8	.9	4.6	1.3
K8796	2041.2	2.0	8.1	1.2
K8797	2044.2	1.1	3.9	1.6
K8798	4121.05	.4	1.8	1.2
K8799	4124.0	.3	1.8	1.1

IKU

VITRINITE REFLECTANCE MEASUREMENTS

Cu

TABLE NO.: VIII

WELL NO. 7120/12-2

Sample	Depth	Vitrinite reflectance	Fluorescence in UV light	Exinite content
K-7762	1500	0,45(6)	No fluorescence	
K-7774	1680	0,42(22)	Yellow/orange and light orange	Moderate
K-7777	1725	0,44(22)	Yellow/Orange	Moderate-Rich
K-7780	1770	0,42(22)	Yellow and yellow/orange	Low-Moderate
K-7784	1830	0,43(21)	Yellow/orange	Low-Moderate
K-7786	1860	0,44(22)	Yellow/orange and light orange	Trace
K-8793	1983.0	0,39(21)	Light orange	Moderate
K-8794	1993.2	0,44(25)	Light/mid orange spores and algae	Rich
K-7797	1995	0,47(16)	Light orange	Low
K-8796	2041.2	0,44(17)	Light and mid orange	Moderate
K-8797	2044.2	0,83(21)	Deep orange	Moderate
K-7809	2175	0,44(20)	Yellow/orange	Moderate
K-7834	2265	0,51(10)	Light-deep orange	Low
K-7837	2310	0,45(8)	Light orange	Low-Moderate
K-7847	2460	0,50(21)	Yellow/orange	Moderate
K-7921	2625	0,45(21)	Yellow/orange	Moderate
K-7922	2640	0,45(20)	Light orange	Moderate
K-7926	2700	0,47(21)	Yellow/orange and light orange	Moderate
K-7928	2730	0,45(20)	Yellow/orange and light orange	Moderate
K-7931	2775	0,48(21)	Yellow/orange and light orange	Moderate
K-7942	2940	0,44(23)	Light and mid orange	Low
K-7945	2985	0,59(21)	Mid orange	Low
K-7971	3045	0,55(11)	Mid orange	Moderate
K-7975	3105	0,57(6)	Light orange	Moderate
K-8005	3420	0,54(2)1,04(1)	Light and mid orange	Low-Moderate
K-8013	3540	0,57(3)	Mid orange	Low
K-8019	3630	0,59(7)	Mid-deep orange	Moderate
K-8025	3720	0,55(7)0,91(1)	Light orange	Low
K-8030	3795	0,57(5)	Light-mid orange	Low
K-8061	3840	0,37(1)0,68(4)	Mid orange	Low
K-8067	3930	0,69(7)	Orange/red	Low-Moderate
K-8072	4005	0,67(20)	Mid-deep orange	Low

032/M/jlh/1

IKU

VITRINITE REFLECTANCE MEASUREMENTS

TABLE NO.: VIII

WELL NO. 7120/12-2

Sample	Depth	Vitrinite reflectance	Fluorescence in UV light	Exinite content
K-8073	4020	0,36(1) 0,71(6)	Mid orange	Low
K-8076	4065	N.D.P.	Mid-deep orange	Low
K-8392 (Shale)	4110	0,61(3) 1,00(2)	Mid orange	Low-Moderate
K-8392 (coxy mudstone)	4110	N.D.P.		Nil
K-8798	4121.05	0,81(12)	Deep orange	Low
K-8799	4124.0	0,84(6)		Nil
K-8396 (coxy mudstone)	4170	N.D.P.		Nil
K-8396 (shale)	4170	0,65(16) 1,00(2)	Mid orange	Low
K-8401 (coxy mudstone)	4245	N.D.P.		
K-8401 (shale)		0,29(1)	Mid-deep orange	Low-Moderate
K-8408 (shale)	4350	0,45(1) 0,68(7) 1,07(1)	Mid orange	Low-Moderate
K-8408		N.D.P.		Nil
K-8639	4380	N.D.P.		Nil
K-8641	4410	N.D.P.		Nil
K-8646	4485	0,50(1)		Nil
K-8647	4500	0,73(6)	Mid crange	Low
K-8649	4530	0,57(6)0,95(2)	Deep orange	Low

032/M/jlh/2

IKU

VISUAL KEROGEN ANALYSIS

TABLE NO.: IX
WELL NO.: 7120/12-2

Sample	Depth	Composition of residue	Particle size	Preservation-palynomorphs	Thermal maturation index	Remarks
K-7762	1500	Am,Cy/W,Cut,P	F-M	good	2	Lower Cretaceous cysts (?Hauterive). Aggregates with pyrite framboids.
K-7774	1680	Cut,W,P/Am,Cy	F-M-L	poor-fair	2-/2 2	Indet. Late Jurassic cysts. Pollen, bisaccates and cuticles dominate after chemical oxidation of aggregates with pyrite framboids.
K-7777	1725	Cut,W,P/Am,Cy	F-M-L	poor-fair	2-/2 2	Saccate coniferous pollen abundant. Hyphae may be seen in the aggregates. Pyrite.
K-7780	1770	Cut,P,S,W/Am	F-M	poor	2/2+	Looser aggregates with pyrite framboids.

ABBREVATIONS

Am	amorphous	Cy	cysts, algae	W	woody material	F	fine
He	herbaceous	P	pollen grains	C	coal	M	medium
Cut	cuticles	S	spores	R!	reworked	L	large

032/N/jlh/1

IKU

VISUAL KEROGEN ANALYSIS

TABLE NO.: IX

WELL NO.: 7120/12-2

Sample	Depth	Composition of residue	Particle size	Preservation-palynomorphs	Thermal maturation index	Remarks
K-7784	1830	Cut,P,S,W/Am	F-M	poor	2/2+	Very dense opaque aggregates. More fusinite than above and spores are more common. Small particles stick and obscure.
K-7786	1860	Cut,W,P,S/Am	F-M	poor	2+	More disperse material (smaller particles) than above together with dense opaque aggregates rich in pyrite. Saccate conifers dominate over bisaccates.
K-8793	1983	W(Cut)				Coal, dominantly homogenous woody material (vitrinite). Traces of cuticular matter.
K-8794	1993	W(Cut)				As the core above.

ABBREVATIONS

Am	amorphous	Cy	cysts, algae	W	woody material	F	fine
He	herbaceous	P	pollen grains	C	coal	M	medium
Cut	cuticles	S	spores	R!	reworked	L	large

032/N/jlh/2

IKU

VISUAL KEROGEN ANALYSIS

TABLE NO.: IX

WELL NO.: 7120/12-2

Sample	Depth	Composition of residue	Particle size	Preservation-palynomorphs	Thermal maturation index	Remarks
K-7797	1995	W,Cut,P,S/?Am	F-M-L	poor		Aggregates less dense than in 1860. Strongly fragmented or brittle cuticles. Late Jurassic cysts observed.
K-8795	2026.8	W,Cut,P,S/?Am	F-M-L	fair to good	? 2-/2	Dominantly coaly matter, but more of structured material (semifusinite and cuticles). Particles often with an amorphous texture.
K-8796	2041.2	W(Cut)	F-M-L			Coal, homogenous woody material dominates.

ABBREVATIONS

Am	amorphous	Cy	cysts, algae	W	woody material	F	fine
He	herbaceous	P	pollen grains	C	coal	M	medium
Cut	cuticles	S	spores	R!	reworked	L	large

032/N/jlh/3

IKU

VISUAL KEROGEN ANALYSIS

TABLE NO.: IX

WELL NO.: 7120/12-2

Sample	Depth	Composition of residue	Particle size	Preservation-palynomorphs	Thermal maturation index	Remarks
K-8797	2044.2	W,Cut,S,P	F-M-L	good to poor	2+	Dark coaly matter, after chemical oxidation revealing woody (vitrinite, semifusinite) particles, cuticles and pollen spores.
K-7809	2175	Cut,W,P,S/Am	F-M-L	poor to fair	2+	Granuloperculatipollis and Chaomatosporites sp. A in between more light coloured ?caved aggregates.
K-7834	2265	Cut,W,P,S/Am	F-M-L	poor to fair	2+	Aggregates of mostly sapropelised cuticular and woody material (vitrinite).

ABBREVATIONS

Am	amorphous	Cy	cysts, algae	W	woody material	F	fine
He	herbaceous	P	pollen grains	C	coal	M	medium
Cut	cuticles	S	spores	R!	reworked	L	large

032/N/jlh/4

IKU

VISUAL KEROGEN ANALYSIS

TABLE NO.: IX
WELL NO.: 7120/12-2

Sample	Depth	Composition of residue	Particle size	Preservation-palynomorphs	Thermal maturation index	Remarks
K-7837	2310	W,Cut,P,S/Am	F-M-L	poor to fair	2+/3-	Aggregates of sapropel/sapropelised material, mostly vitrinite particles. Pyrite framboids abundant. C.mes. and Kyotomisp. mixed in one sample. Etched vitrinite fragments suggest presence of some carbonate.
K-7847	2460	*Cut,W,P,S/Am	F-M-L		2+	*Screened residue.
K-7921	2625	Cut,W,P,S,W/Am	F-M-L	poor	2/2+ 2+	Aggregates of sapropelised cuticular matter. Cerebropollenites macroverrucosus bisaccates and small simple spores.

ABBREVATIONS

Am	amorphous	Cy	cysts, algae	W	woody material	F	fine
He	herbaceous	P	pollen grains	C	coal	M	medium
Cut	cuticles	S	spores	R!	reworked	L	large

IKU

VISUAL KEROGEN ANALYSIS

TABLE NO.: IX

WELL NO.: 7120/12-2

Sample	Depth	Composition of residue	Particle size	Preservation-palynomorphs	Thermal maturation index	Remarks
K-7922	2640	Cut,W,P,S/Am	F-M-L	poor to good	2/2+ 2+	Loose and less aggregates. Increase in fusinite/semi-fusinite. Cerebrop. bisaccates and small simple spores, Late Jurassic cysts. Aratrisporites.
K-7926	2700	*Cut,W,P,S/Am	F-M-L	poor		*Very light coloured vitrinite in the aggregates. Screened residues.
K-7928	2730	Cut,W,P,S/Am	F-M-L	poor to fair		Protohaploxypinus Baltispheridium Taeniaesporites some caved Late Jurassic cysts and pollen.

ABBREVATIONS

Am	amorphous	Cy	cysts, algae	W	woody material	F	fine
He	herbaceous	P	pollen grains	C	coal	M	medium
Cut	cuticles	S	spores	R!	reworked	L	large

032/N/ilh/6

IKU

VISUAL KEROGEN ANALYSIS

TABLE NO.: IX

WELL NO.: 7120/12-2

Sample	Depth	Composition of residue	Particle size	Preservation-palynomorphs	Thermal maturation index	Remarks
K-7931	2775	Cut,P,S,W/Am,Cy	F-M-L	poor to fair	2/2+ 2+	Loose aggregates mostly of cuticular matter. Haplxypinus and Diploxypinus, small Micrhystr. Alisp. Very small spores.
K-7942	2940		F-M-L	fair to poor	2/2+	Striatoabietites and other small bisaccates. Limbosp. lundbladii, Eucommiid. minor. Rich in pyrite framboids. Some fusinite.
K-7945	2985	Am/Cut,W,WR!,P,S	F-M	fair to good	2+	Kraeuselisporites, Kyrtomisp. Aratrisporites, cf Institisporites, Conbacculatisp., small cysts.

ABBREVATIONS

Am	amorphous	Cy	cysts, algae	W	woody material	F	fine
He	herbaceous	P	pollen grains	C	coal	M	medium
Cut	cuticles	S	spores	R!	reworked	L	large

032/N/jlh/7

IKU

VISUAL KEROGEN ANALYSIS

TABLE NO.: IX

WELL NO.: 7120/12-2

Sample	Depth	Composition of residue	Particle size	Preservation-palynomorphs	Thermal maturation index	Remarks
K-8073	4020	Am,Cy/W,WR!,Cut,P,S	F-M	poor to fair	3-/3 3	Inertinite and vitrinite is difficult to distinguish due to high thermal influence. Taeniaesp. Aratrisp. Riccisp. sp. small spinose cysts.
K-8392	4110	Cut,P,W,He,WR!/Am	F-M	poor to fair	3-/3 3	Well dispersed, rich in pyrite framboids and crystals. Some fusinite and inertinite Taeniaesp. Small cysts abundant.
K-8392	4110	**Am,Cy/W,He	F			**Amorphous opaque fragments, after chemical oxidation and screening remain only rare inertinite fragments.

ABBREVATIONS

Am	amorphous	Cy	cysts, algae	W	woody material	F	fine
He	herbaceous	P	pollen grains	C	coal	M	medium
Cut	cuticles	S	spores	R!	reworked	L	large

032/N/jlh/8

IKU

VISUAL KEROGEN ANALYSIS

TABLE NO.: IX

WELL NO.: 7120/12-2

Sample	Depth	Composition of residue	Particle size	Preservation-palynomorphs	Thermal maturation index	Remarks
K-8798	4121.05	Am/W,Cut,WR!,P,S	F-M	poor to fair	2+/3- 3+	Very much of structured woody material (Increased because of high coalification).
K-8799	4121	Am/W,R!,W,Cut,P,S	F-M	poor	3+	Pyrite framboids and crystals are very abundant. Structured woody material dominate after screening.
K-8396 coaly mudst.	4170	?Am/W	?F-M	?		Opaque amorphous aggregates. Mostly disappear by chemical oxidation.

ABBREVATIONS

Am amorphous
He herbaceous
Cut cuticles

Cy cysts, algae
P pollen grains
S spores

W woody material
C coal
R! reworked

F fine
M medium
L large

032/N/jlh/9

IKU

VISUAL KEROGEN ANALYSIS

TABLE NO.: IX

WELL NO.: 7120/12-2

Sample	Depth	Composition of residue	Particle size	Preservation-palynomorphs	Thermal maturation index	Remarks
K-8396 shale	4170	Cut,W,P/Am,Cy	F-M-L	?	3-/3-/3	Aggregates - loose mostly of cuticular nature, very rich in pyrite Cyclosporites Taeniaesp. ?Mostly caved lithologies.
K-8401 shale	4245	Am,Cy/Cut,W,P,S	F-M	fair	3+/3- 3-/3	Abundant small cysts. Taeniate pollen are considered as mostly pollutions from higher levels.
K-8401	4245	Am/He	F-M		3+	Opaque ?amorphous fragments most of which disappear by chemical oxidation.
K-8408 coxy mudst.	4350	Am/He	F-M	poor		As 4245 above.

ABBREVATIONS

Am	amorphous	Cy	cysts, algae	W	woody material	F	fine
He	herbaceous	P	pollen grains	C	coal	M	medium
Cut	cuticles	S	spores	R!	reworked	L	large

032/N/jlh/10

IKU

VISUAL KEROGEN ANALYSIS

TABLE NO.: IX

WELL NO.: 7120/12-2

Sample	Depth	Composition of residue	Particle size	Preservation-palynomorphs	Thermal maturation index	Remarks
K-8408 shale	4350	**P,S,W	F-M	poor		Very rich in pyrite small spherical spinose cysts. Illinites.
K-8639	4380	Am/He	F-M	poor		As 4350?
K-8641	4410	Am	F	poor		Small spherical aggregates of combined amorphous/inorganic nature. Carbonate.
K-8646	4485	Am/He	F			Small globular organic/inorganic aggregates. Oxidation does not improve. ??Primary structures.

ABBREVATIONS

Am amorphous
He herbaceous
Cut cuticles

Cy cysts, algae
P pollen grains
S spores

W woody material
C coal
R! reworked

F fine
M medium
L large

032/N/jlh/11

IKU

VISUAL KEROGEN ANALYSIS

TABLE NO.: IX

WELL NO.: 7120/12-2

Sample	Depth	Composition of residue	Particle size	Preservation-palynomorphs	Thermal maturation index	Remarks
K-8647	4500	Cut,He/Am	F-M-L			Loose aggregates with abundant pyrite framboids, probably pollutions from higher levels to judge by their light colour.
K-8649	4530	Cut,He/Am	F-M-L			As for 4500 m.

ABBREVATIONS

Am	amorphous	Cy	cysts, algae	W	woody material	F	fine
He	herbaceous	P	pollen grains	C	coal	M	medium
Cut	cuticles	S	spores	R!	reworked	L	large

032/N/jlh/12

TABLE 7

ROCK EVAL PYROLYSES

IKU No.	DEPTH (m)	S1	S2	S3	TOC (%)	HYDR. INDEX	OXYGEN INDEX	OIL OF GAS CONTENT S1+S2	PROD. INDEX S1/S1+S2	TEMP. max (C)
K7762	1500	.31	2.83	.57	4.61	61	12	3.14	.10	432
K7774	1680	.58	8.02	.39	3.20	251	12	8.60	.07	427
K7777	1725	.94	15.19	.53	4.50	338	12	16.13	.06	424
K7780	1770	1.07	20.64	.83	5.24	394	16	21.71	.05	424
K7784	1830	1.86	28.45	1.20	8.14	350	15	30.31	.06	421
K7786	1860	2.26	33.47	1.61	10.50	319	15	35.73	.06	419
Nordmela K7797	1995	1.43	19.46	2.14	6.19	314	35	20.89	.07	423
K7809	2175	1.25	19.19	1.69	5.99	320	28	20.44	.06	422
K7834	2265	1.41	19.34	1.91	5.86	330	33	20.75	.07	421
K7837	2310	1.01	12.57	1.64	4.30	292	38	13.58	.07	423
K7847	2460	.56	6.24	.51	2.72	229	19	6.80	.08	427
K7921	2625	1.05	13.74	.75	4.91	280	15	14.79	.07	423
K7922	2640	.56	6.94	.66	3.11	223	21	7.50	.07	426
K7926	2700	.87	13.31	.66	4.33	307	15	14.18	.06	423
K7928	2730	.91	12.31	.96	4.58	269	21	13.22	.07	422
K7931	2775	.49	5.29	.46	2.68	197	17	5.78	.08	429
K7942	2940	.27	1.68	.37	1.63	103	23	1.95	.14	438
K7945	2985	.33	1.18	.32	1.37	86	23	1.51	.22	441
K8073	4020	.71	.72	.54	1.55	46	35	1.43	.50	445
K8392	4110	.35	.22	.21	1.44	15	15	.57	.61	433
K8396	4170	.37	.26	.43	1.55	17	28	.63	.59	453
K8401	4245	.40	.25	.40	1.98	13	20	.65	.62	456
K8408	4350	.41	.07	.40	1.62	4	25	.48	.85	457

IKU

TABLE X

ROCK EVAL PYROLYSES

IKU No.	DEPTH (m)	S1	S2	S3	TOC (%)	HYDR. INDEX	OXYGEN INDEX	OIL OF GAS CONTENT S1+S2	PROD. INDEX S1/S1+S2	TEMP. max (C)
K8793	1983	42.88	246.15	2.87	62.31	395	5	289.03	.15	426
K8794	1993	43.78	286.25	3.10	71.20	402	4	330.03	.13	426
K8795	2026.8	9.75	139.54	2.08	34.86	400	6	149.29	.07	426
K8796	2041.2	16.82	209.94	2.42	54.62	384	4	226.76	.07	427
K8797	2044.2	7.77	121.49	2.46	53.67	226	5	129.26	.06	422
K8798	4121.05	.41	1.26	.53	2.55	49	21	1.67	.25	446
K8799	4124	.58	2.09	.33	3.98	53	8	2.67	.22	461

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société nationale
elf aquitaine (production)

EP/S/EXP/Lab.Pau n°87/151RP Pau, le 21 Août 1987

WELL 71-20/12-2
NORWAY - TROMSØ AREA

GEOCHEMICAL STUDY OF THE LOWER CRETACEOUS-PERMIAN SECTION AND OF A GAS SAMPLE

EP/S/EXP/Lab.Pau n°87/151RP

P. CAILLEAUX

adresse postale : ☐ tour Elf - Cédex 45 92078 Paris La Défense téléphone : 33 (1) 47.44.45.46 télex : Elfa 615 400 F
☒ Pau - 64018 Pau Cédex (33) 59.83.40.00 Petra 560 804 F
☐ Lacq - BP 22 Lacq 64170 Artix (33) 59.05.24.50 Petra 560 053 F
☐ Boussens - Boussens 31360 Saint Martory (33) 61.97.80.00 SNEA 530 385 F

Imp. 7332 SNEA(P) - RGM 953 006 004

DEPTH (m)	% VRo	eq. % VRo	T.A.I.
1595	0.4		
1600			2.5-
1680-1685			2.5
1800	0.5		
1805-1810			2.5
1860-1865			2.5
1955-1960			2.5
2010-2015			2.5/2.5+
2068	0.6		
2075-2080			2.5+
2160-2165			2.5+
2225-2230			2.5+
2285-2290			2.5+
2345-2350			2.5+/3-
2360	0.6		
2435-2440	0.65		3
2530-2535			3
2615-2620			3
2675-2680			3/3+
2683		0.7/0.8	
2765-2770			3+
2795-2800			3+
2855-2860			3+
2975-2980			3+
3005-3010			3+/3.5
3050-3055			3+/3.5
3110-3115			3.5
3225-3230			3.5
3420-3425			3.5
3480-3485			3.5+
3600-3605			3.5+
3660-3665			3.5+/4-
3715-3720			4-
3790-3795			4-
3830			
3905	1.00		
4208	1.10		

TABLE 1 71-20/12-2 ORGANIC INVENTORY

AGE	DEPTH	S	TOC	S1	S2	S3	PI	HI	OI	TM
L	1535	C	1.30	0.03	0.19	0.54	14	15	40	-
o	1600	C	2.87	0.38	3.40	1.01	10	120	35	432
w	1618	C	1.90	0.17	1.01	0.88	14	55	45	434
C.	1650	C	2.72	0.35	4.84	0.64	7	175	25	430
	1678	C	3.45	0.52	9.20	0.58	5	265	15	429
U	1710	C	4.63	0.89	16.00	0.71	5	365	15	425
p	1740	C	4.90	0.72	15.36	2.16	4	315	45	426
J	1770	C	4.69	1.07	20.88	1.15	5	445	25	425
U	1800	C	5.68	1.25	20.40	0.99	6	360	15	425
R	1830	C	8.28	2.14	29.63	0.97	7	355	10	419
	1860	C	10.52	1.76	30.16	1.68	6	285	15	421
MidJ	1890	C	3.81	1.11	10.04	2.06	10	265	55	426
	1920	C	1.96	0.65	4.20	0.96	13	215	50	429
L	2043	C	17.70	5.74	60.64	8.00	9	340	45	426
o	2070	C	15.74	2.30	36.00	2.00	6	230	10	432
w	2100	C	12.15	1.30	20.00	1.86	6	165	15	431
J.	2108	C	21.14	2.08	34.24	2.04	6	160	10	433
	2118	C	23.56	2.64	50.72	2.26	5	215	10	434
	2153	C	22.66	4.18	90.24	2.24	4	400	10	431
	2180	C	4.72	4.98	11.52	1.42	30	245	30	422
	2210	C	1.06	0.19	0.34	0.64	37	30	60	433
	2240	C	1.23	0.34	0.78	1.27	30	65	105	433
	2280	C	2.69	0.50	2.28	2.96	18	85	110	430
	2330	C	1.42	0.68	1.47	1.76	32	75	130	435
	2353	C	1.39	0.51	1.01	0.62	34	70	45	431
	2380	C	1.55	0.52	2.55	1.54	17	145	100	432
	2410	C	0.93	0.24	1.23	0.48	16	90	55	436
	2500	C	2.51	0.41	1.65	3.24	20	65	130	439
	2608	C	1.00	0.30	0.51	0.83	37	50	85	441
	2650	C	1.36	0.34	0.66	0.87	34	50	65	437
T	2680	C	2.72	0.59	1.86	0.80	24	70	30	437
r	2713	C	1.39	0.34	1.19	0.42	22	85	30	435
i	2740	C	0.84	0.34	0.41	0.60	46	50	70	430
a	2773	C	1.03	0.38	0.61	0.65	39	60	65	432
s	2800	C	0.85	0.38	0.77	0.56	33	90	65	429
s	2830	C	0.84	0.29	0.28	0.60	52	35	70	-
i	2860	C	0.80	0.27	0.15	0.32	64	20	40	-
c	2893	C	0.86	0.24	0.15	0.36	63	15	40	-
	2920	C	0.84	0.24	0.15	0.41	63	15	50	-
	2945	C	1.49	0.15	0.07	0.37	68	5	25	-
	2980	C	1.48	0.15	0.27	0.79	36	20	55	-
	2998	C	1.04	0.12	0.60	0.35	17	55	35	442
	3060	C	0.88	0.15	0.55	0.20	21	60	20	444
	3115	C	0.74	0.12	0.48	0.23	20	65	30	443
	3178	C	2.95	0.17	1.72	5.16	9	60	135	430
	3240	C	0.20	0.06	0.09	0.49	43	45	245	-
	3298	C	0.35	0.06	0.12	0.42	33	35	120	-
	3363	C	2.36	0.23	1.17	3.20	16	50	135	429
	3425	C	1.10	0.20	0.19	1.05	53	15	95	-
	3480	C	1.23	0.13	0.30	1.52	31	25	125	-
	3543	C	0.91	0.21	0.16	0.52	58	15	55	-
	3600	C	0.28	0.05	0.02	0.35	83	5	125	-
	3660	C	0.70	0.11	0.38	0.49	23	55	70	434
	3720	C	0.75	0.07	0.23	0.78	23	30	100	-
	3780	C	0.46	0.08	0.23	0.41	27	50	90	-
	3840	C	0.40	0.09	0.19	0.27	32	45	65	-
P	3900	C	0.96	0.12	0.46	0.96	21	45	100	437
e	3960	C	0.17	0.09	0.04	0.21	75	25	125	-
r	4023	C	1.37	0.31	0.65	0.76	32	45	55	437
m	4080	C	0.60	0.17	0.57	0.25	23	95	40	(430)
i	4143	C	0.93	0.18	0.38	0.32	32	40	35	(433)
a	4178	C	1.12	0.23	0.17	0.20	57	15	15	-
n	4203	C	1.54	0.25	0.53	1.25	32	35	80	(424)
	4260	C	1.09	0.33	0.32	0.54	52	30	50	-
	4320	C	0.51	0.11	0.24	0.30	32	45	60	-
	4380	C	0.75	0.18	0.21	0.27	47	30	35	-
	4440	C	1.00	0.25	0.88	0.94	22	90	95	(434)
	4500	C	0.51	0.09	0.24	0.26	28	45	50	-
	4540	C	0.27	0.13	0.14	0.21	50	50	75	-
	4580	C	0.22	0.11	0.07	0.30	61	30	130	-

TABLE 2 A 71-20/12-2

COMPOSITION OF THE EXTRACTS

AGE	DEPTH	EOM	EOM %TOC	SAT. %	ARO. %	POL. %	S/A
Up.J	1800	3560	6	15.7	16.6	67.7	0.95
"	1860	4640	4	8.7	24.9	66.4	0.35
Low.J	2043	10042	6	44.8	26.4	28.8	1.70
Trias	2153	7980	3	12.3	27.5	60.2	0.45
"	2318	2110	15	25.0	12.4	62.6	2.02
"	2680	10380	38	19.2	21.5	59.2	0.89
"	3425	1250	11	30.6	10.1	59.3	3.03
Perm.	4018	1540	11	24.1	11.8	64.1	2.04
"	4260	1440	13	23.4	10.8	65.8	2.17

TABLE 2 B 71-20/12-2

C15+ CHROMATOGRAPHICAL DATA

AGE	DEPTH	nAlk %SAT	Pr /n-C17	Ph /n-C18	Pr /Ph	A/B	MPI1	MPI2
Up.J	1800	9	2.95	1.86	1.80	1.58	0.36	0.59
"	1860	14	3.89	1.74	2.72	2.24	0.23	0.46
Low.J	2043	11	1.13	0.54	2.21	2.09	0.45	0.62
Trias	2153	23	2.81	0.46	6.33	3.16	-	-
"	2318	4	1.52	1.23	1.26	1.23	0.54	0.78
"	2680	1	1.78	0.71	2.03	2.50	-	-
"	3425	1	0.93	0.83	1.27	1.13		
Perm.	4018	6	0.66	0.38	1.73	1.74	-	-
"	4260	6	0.60	0.42	1.43	1.43		

TABLE 3 71-20/12-2

GAS COMPOSITION AND ISOTOPICAL DATA

WELL	71-20/12-2
GOR (m3/m3)	15000
N2	1.51
CO2	1.15
C1	91.26
C2	3.64
C3	1.51
i-C4	-
n-C4	-
C5+	-
C1/SCn	93.7
C1/(C2+C3)	17.7
d13C CH4	-44.3
C2H6	-30.0
CO2	-17.0