

### 5.3 Formation Pressure Measurements

A Repeat Formation Tester (RFT) with a HP-gauge was used to obtain formation pressure measurements and fluid samples in well 2/2-5 (table 5.3). The HP-pressure data from the pretests are not valid due to gauge failure. The interpretation is made with Strain gauge data.

A segregated sample was attempted at 3673 m. Both the 2 3/4 and the 1 gallon chamber were opened on the rig floor and contained mud filtrate only.

#### 5.4 Testing

The interval 3671.25 - 3675.5 mRKB (loggers depth) was perforated and tested. The main objectives were:

- Investigate reservoir extension and continuity.
- Determine productivity, permeability and skin.
- Determine initial reservoir conditions.
- Obtain formation fluid samples.

The test consisted of a 2.4 hour clean-up flow, followed by a 2.1 hour build-up period. The main flow period lasted for 31 hours. The flow was switched through the separator after 2.5 hours in the main flow period. Three different choke sizes of increasing order were used during the main flow; the well was opened and flowed for 7 hours through a 4.8 mm fixed choke, the choke was switched to a 6.4 mm fixed choke for 6 hours and finally the choke was increased to 7.9 mm (fixed) for the remaining 18 hours. No water was produced. The oilrate at the end of the main flow has measured to 600 Sm<sup>3</sup>/D with a corresponding wellhead pressure of 191 bar. The well was shut-in for a 24 hour build-up period.

H<sub>2</sub>S was produced during the test. A maximum of 16 ppm H<sub>2</sub>S was recorded.

#### 5.5 Sampling

During the test the following samples were taken:

Five monophasic oil samples, five separator sets and three separator oil samples. For details concerning sampling, see table 5.5. The samples have been sent to GECO - PRAKLA for analysis.

The samples have been validity checked and compositional analysis have been carried out on 3 monophasic samples and 3 separator sets.

It is decided to perform a PVT study on one of the monophasic oil samples.



TEST NO.	1
FLUID	OIL
PERFORATION INTERVAL (mRKB MD)	3671.25 - 3675.5
<b>STABLE MAIN FLOW:</b>	
LAST FLOWING RATE (sm <sup>3</sup> /d)	600
LAST FLOWING WELLHEAD PRESSURE (bar)	191
LAST FLOWING BOTTOMHOLE PRESSURE (bar)	487.1
- at DEPTH (mRKB MD)	3637.9
- CHOKE SIZE (mm)	7.9
DEAD OIL DENSITY (g/cm <sup>3</sup> )	0.86
GAS GRAVITY (air=1)	0.91
GOR (sm <sup>3</sup> /sm <sup>3</sup> )	44
- at SEPARATOR PRESSURE (bar)	8
- at SEPARATOR TEMPERATURE (degC)	57
RESERVOIR TEMPERATURE (degC)	141
RESERVOIR PRESSURE (bar)	520
- at DEPTH (mRKB MD)	3671

Well 2/2-5



no	date	start time (hr:min)	fluid	sampling			bottle no.	remarks
				point	press. [bar]	temp. [°C]		
1	12.02.92	02:20	oil	wellhead	219.0	26	TS-47-02	Monophasic 1
2	12.02.92	03:55	oil	wellhead	219.0	29	TS-45-03	Monophasic 2
3	12.02.92	04:50	oil	separator	6.5	42	TS-45-14	PVT set 1
4	12.02.92	04:50	gas	separator	6.5	42	A-15181	PVT set 1
5	12.02.92	04:50	gas	separator	6.5	42	A-14571	PVT set 1
6	12.02.92	05:45	oil	wellhead	219.0	31	TS-45-10	Monophasic 3
7	12.02.92	10:00	oil	wellhead	210.0	43	TS-45-09	Monophasic 4
8	12.02.92	10:30	oil	wellhead	210.0	43	TS-45-01	Monophasic 5
9	12.02.92	11:15	oil	separator	7.5	42	TS-41-02	PVT set 2
10	12.02.92	11:15	gas	separator	7.5	48	A-17192	PVT set 2
11	12.02.92	15:45	oil	separator	8.4	48	TS-45-02	PVT set 3
12	12.02.92	15:45	gas	separator	8.4	48	A-15223	PVT set 3
13	12.02.92	15:45	gas	separator	8.4	48	A-16276	PVT set 3
14	12.02.92	16:45	oil	separator	8.4	48	A-14560	
15	12.02.92	16:45	oil	separator	8.4	48	A-14640	
16	12.02.92	16:55	oil	separator	8.4	48	A-17189	
17	12.02.92	20:35	oil	separator	8.2	49	TS-45-06	PVT set 4
18	12.02.92	20:35	gas	separator	8.2	49	A-17195	PVT set 4
19	12.02.92	20:35	gas	separator	8.2	49	A-14910	PVT set 4
20	12.02.92	21:30	oil	separator	8.2	48	TS-40-08	PVT set 5
21	12.02.92	21:30	gas	separator	8.2	48	A-17163	PVT set 5
22	12.02.92	21:30	gas	separator	8.2	48	A-15426	PVT set 5

Table 5.5 Sampling

Date	Hole size	Hole depth	Mud weight	PV	YP	Gel strength	pH	Alkalinity Pf /Mf	Ca++ mg/l	Cl- mg/l	Sand %	Solids %	Mudtype
911106						/		/					SPUD MUD
911107	36"	162.0	1.05			/		/				****	SPUD MUD
911108	36"	190.0	1.20			/		/				****	SPUD MUD
911109	36"	190.0	1.10			/		/				3.0	SPUD MUD
911110	36"	190.0	1.10			/		/				****	SPUD MUD
911111	36"	190.0	1.10			/		/				****	SPUD MUD
911112	9 7/8"	245.0	1.10			/		/				3.0	SPUD MUD
911113	9 7/8"	502.0	1.10			/		/				3.0	SPUD MUD
911114	9 7/8"	918.0	1.10			/		/				3.0	SPUD MUD
911115	26"	918.0	1.10			/		/				3.0	SPUD MUD
911116	26"	918.0	1.20			/		/				7.0	SPUD MUD
911117	26"	918.0	1.20			/		/				4.0	KCL MUD
911118	26"	918.0	1.20	21.0	11.0	1/2	8.0	/ .7	80	6400		7.0	KCL MUD
911119	17 1/2"	1029.0	1.20	27.0	28.0	3/3	8.8	/ .7	180	60000		6.3	KCL MUD
911120	17 1/2"	1333.0	1.40	31.0	29.0	2/3	8.0	/ .8	300	70000		16.0	KCL MUD
911121	17 1/2"	1680.0	1.40	36.0	22.0	2/7	7.9	/ .7	400	66000		17.0	KCL MUD
911122	17 1/2"	1937.0	1.42	41.0	24.0	3/12	7.9	/ .9	520	62000		18.0	KCL MUD
911123	17 1/2"	2044.0	1.45	44.0	26.0	3/9	8.0	/1.0	560	64000		19.0	KCL MUD
911124	17 1/2"	2044.0	1.45	42.0	17.0	3/9	7.9	/1.6	400	67000		21.0	KCL MUD
911125	17 1/2"	2044.0	1.45	42.0	20.0	3/14	8.0	/1.8	500	63000	.3	19.0	KCL MUD
911126	17 1/2"	2044.0	1.45	39.0	24.0	4/18	7.9	/2.0	500	62000	.3	21.0	KCL MUD
911127	17 1/2"	2044.0	1.45	42.0	25.0	4/20	8.0	/1.9	440	54000	.3	21.0	KCL MUD
911128	17 1/2"	2044.0	1.45	40.0	27.0	4/19	8.0	/2.0	480	57000	.3	21.0	KCL MUD
911129	17 1/2"	2377.0	1.45	42.0	26.0	4/21	8.0	/2.1	440	56000	.3	21.0	KCL MUD
911130	12 1/4"	2377.0	1.45	41.0	26.0	4/20	8.0	/2.0	440	56000	.3	21.0	KCL MUD
911201	12 1/4"	2523.0	1.45	33.0	22.0	4/33	8.2	/2.3	520	50000	.3	20.0	KCL MUD
911202	12 1/4"	2704.0	1.45	37.0	29.0	4/36	8.1	/2.0	640	49000	.3	21.0	KCL MUD

Well: 2/2-5

Date	Hole size	Hole depth	Mud weight	PV	YP	Gel strength	pH	Alkalinity Pf /Mf	Ca++ mg/l	Cl- mg/l	Sand %	Solids %	Mudtype
911203	12 1/4"	2790.0	1.48	43.0	34.0	6/42	8.2	/2.0	280	48000	.3	22.0	KCL MUD
911204	12 1/4"	2906.0	1.48	39.0	31.0	5/30	8.3	/1.7	280	47000		22.0	KCL MUD
911205	12 1/4"	3034.0	1.48	32.0	18.0	3/15	8.1	/1.5	340	51000		21.0	KCL MUD
911206	12 1/4"	3140.0	1.48	31.0	14.0	3/14	7.9	/1.3	320	50000		21.0	KCL MUD
911207	12 1/4"	3148.0	1.48	28.0	16.0	3/16	7.9	/1.0	420	51000		21.0	KCL MUD
911208	12 1/4"	3283.0	1.50	35.0	24.0	4/25	7.9	/1.3	320	53000		22.0	KCL MUD
911209	12 1/4"	3334.0	1.52	37.0	27.0	5/28	7.8	/1.0	360	53000		22.0	KCL MUD
911210	12 1/4"	3365.0	1.52	34.0	19.0	3/17	7.8	/1.2	340	53000		22.0	KCL MUD
911211	12 1/4"	3365.0	1.52	32.0	17.0	4/19	7.9	/1.2	400	54000		22.0	KCL MUD
911212	12 1/4"	3365.0	1.52	30.0	17.0	4/18	7.9	/1.2	400	54000		22.0	KCL MUD
911213	12 1/4"	3365.0	1.52	32.0	19.0	4/20	7.9	/1.2	360	54000		22.0	KCL MUD
911214	8 1/2"	3381.0	1.52	27.0	14.0	4/27	8.4	.5/2.4	540	52000		22.0	KCL MUD
911215	8 1/2"	3418.0	1.50	25.0	18.0	5/40	8.3	/2.3	480	50000		22.0	KCL MUD
911216	8 1/2"	3475.0	1.50	24.0	19.0	5/42	8.2	/1.6	480	47000	.1	22.0	KCL MUD
911217	8 1/2"	3475.0	1.50	17.0	11.0	3/19	8.5	/1.4	400	40000		21.0	KCL MUD
911218	8 1/2"	3475.0	1.50	20.0	14.0	5/39	9.3	.1/3.0	500	33000	.1	22.0	KCL MUD
911219	8 1/2"	3475.0	1.50	17.0	13.0	4/35	11.3	.1/2.8	400	32000	.1	22.0	KCL MUD
911220	8 1/2"	3475.0	1.50	17.0	15.0	5/35	9.4	.1/3.0	400	31000	.1	22.0	KCL MUD
911221	8 1/2"	3475.0	1.50	16.0	14.0	5/35	8.6	.1/4.5	620	27000	.1	22.0	KCL MUD
911222	8 1/2"	3475.0	1.50	16.0	13.0	4/32	8.6	/4.6	560	27000	.1	22.0	KCL MUD
911223	8 1/2"	3414.0	1.50	14.0	10.0	4/25	9.5	.1/4.5	440	24000	.1	22.0	KCL MUD
911224	8 1/2"	3484.0	1.50	12.0	6.0	3/3	9.7	.3/2.5	220	6000	.1	20.0	HI TEMP POLYMER
911225	8 1/2"	3484.0	1.50	16.0	10.0	4/6	10.1	.3/2.5	260	5000		19.0	HI TEMP POLYMER
911226	8 1/2"	3349.0	1.51	16.0	10.0	4/6	10.1	.3/2.5	260	5000		19.0	HI TEMP POLYMER
911227	8 1/2"	3349.0	1.51	19.0	17.0	5/9	9.7	.3/2.8	240	5000		19.0	HI TEMP POLYMER
911228	8 1/2"	3349.0	1.51	18.0	17.0	5/8	9.9	.3/2.6	260	5000	.1	19.0	HI TEMP POLYMER
911229	8 1/2"	3349.0	1.51	20.0	16.0	5/8	9.9	.4/2.6	280	5000	.1	19.0	HI TEMP POLYMER

Well: 2/2-5

Date	Hole size	Hole depth	Mud weight	PV	YP	Gel strength	pH	Alkalinity Pf /Mf	Ca++ mg/l	Cl- mg/l	Sand %	Solids %	Mudtype
911230	8 1/2"	3349.0	1.51	19.0	17.0	5/9	9.9	.3/2.6	280	5000	.1	19.0	HI TEMP POLYMER
911231	8 1/2"	3349.0	1.51	19.0	15.0	4/8	10.2	.4/2.6	280	5000	.1	19.0	HI TEMP POLYMER
920101	8 1/2"	3787.0	1.51	19.0	15.0	4/9	10.0	.3/2.4	280	5000	.1	19.0	HI TEMP POLYMER
920102	8 1/2"	3806.0	1.51	19.0	14.0	4/9	9.9	.3/2.6	280	5000	.1	19.0	HI TEMP POLYMER
920103	8 1/2"	3865.0	1.51	20.0	13.0	4/10	10.4	.4/2.6	320	5500	.1	19.0	HI TEMP POLYMER
920104	8 1/2"	3951.0	1.51	19.0	14.0	4/8	10.4	.4/2.7	360	5500	.1	19.0	HI TEMP POLYMER
920105	8 1/2"	3972.0	1.51	22.0	17.0	5/35	10.5	.4/2.7	440	5700	.1	19.0	HI TEMP POLYMER
920106	8 1/2"	3981.0	1.51	20.0	15.0	4/11	10.0	.3/2.5	520	5500	.1	19.0	HI TEMP POLYMER
920107	8 1/2"	3981.0	1.51	20.0	16.0	4/11	10.0	.3/2.5	480	5500	.1	19.0	HI TEMP POLYMER
920108	8 1/2"	3985.0	1.51	19.0	15.0	5/13	10.0	.1/2.4	480	5300	.1	20.0	HI TEMP POLYMER
920109	8 1/2"	4059.0	1.51	18.0	12.0	4/10	10.1	.1/2.2	400	4900	.1	20.0	HI TEMP POLYMER
920110	8 1/2"	4082.0	1.51	20.0	14.0	5/10	10.0	.1/2.4	360	8700	.1	20.0	HI TEMP POLYMER
920111	8 1/2"	4082.0	1.52	23.0	19.0	6/30	9.5	.1/2.6	320	9700	.1	20.0	HI TEMP POLYMER
920112	8 1/2"	4082.0	1.54	20.0	14.0	4/21	10.0	.2/1.8	440	11000	.1	21.0	HI TEMP POLYMER
920113	8 1/2"	4082.0	1.54	19.0	12.0	4/17	9.8	.2/2.5	320	11200	.1	21.0	HI TEMP POLYMER
920114	8 1/2"	4082.0	1.54	17.0	11.0	4/17	9.9	.2/2.6	320	11200	.1	21.0	HI TEMP POLYMER
920115	8 1/2"	4082.0	1.54	20.0	12.0	4/20	10.4	.2/2.6	260	11200	.1	21.0	HI TEMP POLYMER
920116	8 1/2"	4082.0	1.54	20.0	10.0	5/22	10.6	.3/2.7	400	11000	.1	21.0	HI TEMP POLYMER
920117	8 1/2"	4082.0	1.54	19.0	12.0	5/22	10.6	.3/2.8	440	11000	.1	21.0	HI TEMP POLYMER
920118	8 1/2"	4082.0	1.54	25.0	14.0	6/25	10.0	.2/3.0	340	11000	.1	21.0	HI TEMP POLYMER
920119	8 1/2"	3760.0	1.54	21.0	10.0	5/26	10.4	.3/2.7	560	10000	.1	21.0	HI TEMP POLYMER
920120	8 1/2"	3760.0	1.54	19.0	10.0	4/23	10.4	.3/3.0	480	10000	.1	21.0	HI TEMP POLYMER
920121	8 1/2"	3760.0	1.54	21.0	10.0	5/27	10.2	.2/2.8	440	10000	.1	21.0	HI TEMP POLYMER
920122	8 1/2"	3760.0	1.54	22.0	12.0	6/30	10.5	.3/2.9	460	10000	.1	21.0	HI TEMP POLYMER
920123	8 1/2"	3760.0	1.54	22.0	11.0	5/28	10.5	.3/2.8	440	10000	.1	21.0	HI TEMP POLYMER
920124	DST#1	3760.0	1.54	23.0	11.0	5/29	10.5	.3/2.9	440	10000	.1	21.0	HI TEMP POLYMER
920125	DST#1	3760.0	1.54	16.0	9.0	4/22	10.2	.3/2.4	460	10000	.1	21.0	HI TEMP POLYMER

Date	Hole size	Hole depth	Mud weight	PV	YP	Gel strength	pH	Alkalinity Pf /Mf	Ca++ mg/l	Cl- mg/l	Sand %	Solids %	Mudtype
920126	DST#1	3760.0	1.54	17.0	8.0	3/20	10.5	.4/2.6	500	9500	.1	21.0	HI TEMP POLYMER
920127	DST#1	3760.0	1.54	16.0	10.0	4/20	10.2	.3/2.5	480	9500	.1	21.0	HI TEMP POLYMER
920128	DST#1	3660.0	1.54	16.0	10.0	4/20	10.5	.4/2.7	480	9500	.1	21.0	HI TEMP POLYMER
920129	DST#1	3660.0	1.54	15.0	10.0	4/18	10.0	.3/2.4	440	9500	.1	21.0	HI TEMP POLYMER
920130	DST#1	3660.0	1.54	16.0	8.0	3/16	10.6	.3/2.9	560	10500	.1	21.0	HI TEMP POLYMER
920131	DST#1	3660.0	1.54	16.0	8.0	3/17	10.6	.3/3.0	560	10500	.1	21.0	HI TEMP POLYMER
920201	DST#1	3660.0	1.54	18.0	10.0	3/19	10.3	.3/3.0	560	11000	.1	21.0	HI TEMP POLYMER
920202	DST#1	3660.0	1.54	18.0	10.0	4/19	10.3	.3/3.0	560	11000	.1	21.0	HI TEMP POLYMER
920203	DST#1	3660.0	1.54	20.0	11.0	4/23	10.0	.8/4.9	280	11000	.1	21.0	HI TEMP POLYMER
920204	DST#1	3660.0	1.54	21.0	15.0	8/39	10.5	.3/2.6	340	10000	.1	21.0	HI TEMP POLYMER
920205	DST#1	3660.0	1.54	20.0	12.0	7/29	10.5	.4/2.7	360	10000	.1	21.0	HI TEMP POLYMER
920206	DST#1	3660.0	1.54	20.0	12.0	7/29	10.4	.4/2.7	360	9000	.1	21.0	HI TEMP POLYMER
920207	DST#1	3660.0	1.54	20.0	11.0	7/29	10.6	.4/2.7	360	9000	.1	21.0	HI TEMP POLYMER
920208	DST#1	3660.0	1.54	20.0	11.0	7/29	10.6	.4/2.7	360	9000	.1	21.0	HI TEMP POLYMER
920209	DST#1	3660.0	1.54	21.0	11.0	5/22	10.5	.3/2.5	340	9000	.1	21.0	HI TEMP POLYMER
920210	DST#1	3660.0	1.54	18.0	11.0	5/21	10.2	.2/2.5	360	9000	.1	21.0	HI TEMP POLYMER
920211	DST#1	3660.0	1.54	18.0	11.0	5/21	10.2	.2/2.5	360	9000	.1	21.0	HI TEMP POLYMER
920212	DST#1	3660.0	1.54	18.0	11.0	5/21	10.2	.2/2.5	360	9000	.1	21.0	HI TEMP POLYMER
920213	DST#1	3660.0	1.54	18.0	11.0	6/30	11.5	.5/2.9	400	9000	.1	21.0	HI TEMP POLYMER
920214	DST#1	3660.0	1.54	18.0	11.0	6/30	11.5	.5/2.9	400	9000	.1	21.0	HI TEMP POLYMER
920215	P&A	3666.0	1.54	20.0	11.0	5/26	11.5	.6/2.9	440	7500	.1	21.0	HI TEMP POLYMER
920216	P&A	3666.0	1.54	20.0	11.0	5/26	11.5	.6/2.9	440	7500	.1	21.0	HI TEMP POLYMER
920217	P&A	3666.0	1.54	21.0	16.0	6/15	10.9	.3/2.5	400	8000	.1	21.0	HI TEMP POLYMER
920218	P&A					/		/					HI TEMP POLYMER
920219	P&A					/		/					HI TEMP POLYMER
920220	P&A					/		/					HI TEMP POLYMER



# Final Well Report 2/2-5

SAGA PETROLEUM A/S

6.2.2

MUD MATERIALS USED

Well : 2/2-5

Materials	Unit	36" Hole	26" Hole	17 1/2" Hole	12 1/4" Hole	8 1/2" Hole	Total
Agipac LV	25 kg	-	-	744	396	51	1191
Agipak Reg.	sxs	-	-	360	-	-	360
BARITE	M/T	-	95	476	245	775	1591
BENTONITE	M	36	31	2	-	24	93
BacBan 111	3 kg	-	-	-	-	14	14
CAUSTIC SODA	25 k	4	9	1	24	-	38
Citric Acid	25 kg	-	-	-	21	141	162
Desco F	25 lbs	-	-	-	-	397	397
GYP SUM	50 kg	-	-	-	-	38	38
HEC	25 kg	-	-	-	-	1	1
KCL - brine	bbl	-	-	4100	674	15	4789
KCL - sxs	25 kg	-	-	400	50	-	450
LIME	40 kg	-	18	-	-	200	218
Lampac Reg	25 kg	-	-	-	19	-	19
Lime	25 kg	-	-	-	-	10	10
PHPA (Polyacryl	25 kg	-	-	40	-	-	40
POT. BICARBONAT	50 kg	-	-	82	60	160	302
Poly Plus	25 kg	-	-	106	31	-	137
Polydrill	25 kg	-	-	-	-	407	407
Resinex	50 lbs	-	-	-	-	734	734
SODA ASH	50 k	4	8	-	55	3	70
Sil.Defoam	drm	-	-	-	-	3	3
Sodium Bicarbon	25 kg	-	-	-	-	120	120
Tackle+	can	-	-	-	-	334	334
XC-POLYMER	25 k	3	16	-	-	43	62
Xantum gum	25 kg	-	-	-	-	24	24
Xanvis	25 kg	-	-	15	-	5	20
Zink Carb	sxs	-	-	-	-	20	20

Table 6.2.2 Mud Materials Used

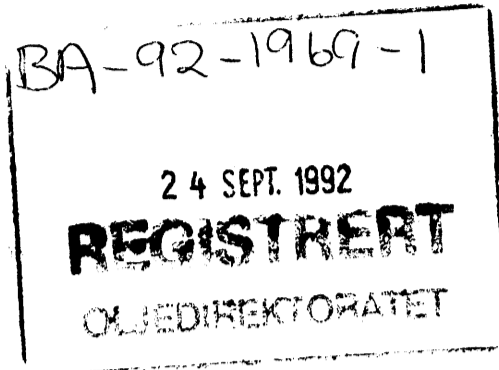
U1-705

3

**BP RESEARCH**

Sunbury Research Centre

Copy No. 9



EXPLORATION AND PRODUCTION DIVISION

EXPLORATION  
BRANCH

EXB/53/92

AUGUST 1992

---

**GEOCHEMICAL CHARACTERIZATION OF OIL  
FROM 2/2-5 DST#1, CENTRAL GRABEN,  
OFFSHORE NORWAY**

By  
M P Dee

Work By  
M P Dee and Analytical Division

Sponsored by:

BP Norway

Approved by:

R A Sedivy

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TABLE 1  
OIL ANALYSIS

SAMPLE 2/2-5  
DST#1  
DEPTH RANGE (m)  
SAMPTYPE CRUDE  
LOCATION  
OILFIELD  
API GRAVITY @ 15°C  
DENSITY @ 15°C  
WAX %wt 4.5  
POUR POINT  
ASPHALTENES %wt 0.30  
SULPHUR %wt  
NITROGEN ppm  
NICKEL ppm  
VANADIUM ppm  
VISCOSITY cST @ 20°C  
n-ALKANE CPI  
PRISTANE/PHYTANE 0.59  
PRISTANE/nC17 6.71  
PHYTANE/nC18 10.41  
ALKANE INDEX

TYPE ANALYSIS BY HPLC ON DE-ASPHALTENED RESIDUE>200°C

SATURATES %wt 64.8  
AROMATICS %wt 21.9  
RESIDUE %wt 13.2

CARBON ISOTOPE RATIOS per mil

TOTAL OIL  
ASPHALTENE  
SATURATES  
AROMATICS  
RESIDUE  
STANDARD

LIGHT HYDROCARBONS

MCH % 39.4  
HER 0.29  
HXR 0.42

BIOMARKER RATIOS

H1	0.57	S1	0.56	A1	0.72
H2	0.33	S2	0.50	A2	0.68
H3	0.91	S3	36:30:34	A3	0.38
H4		S4	32:29:21	A4	0.18
H5	100:96:41:28:9:5	S5	23.0	A5	0.38
H6	0.32	S6	51	A6	0.93
H7	0.63	S7		M2	0.79
H10		S8	21	M3	0.60
H11	9.00	S9		M4	52.80
H12	6.00	S10			
H13	10.00			MBP	3.8
H14				MDR	1.6
H15	0.00				
H16	41.00				
H17	34.80				

QUANTITATIVE ANALYSIS

SATURATE FRACTION	QSNALK	ppm
	QSN20	ppm
	QSC29ST	ppm
	QSC30HO	ppm
	QSC32HO	ppm
AROMATIC FRACTION	QAMONAR	ppm
	QATRIAR	ppm
	QAMEPH	ppm

CODING LISTINGS FOR BIOMARKERS CAN BE FOUND AT THE BACK OF THIS REPORT

## LIST OF TABLES

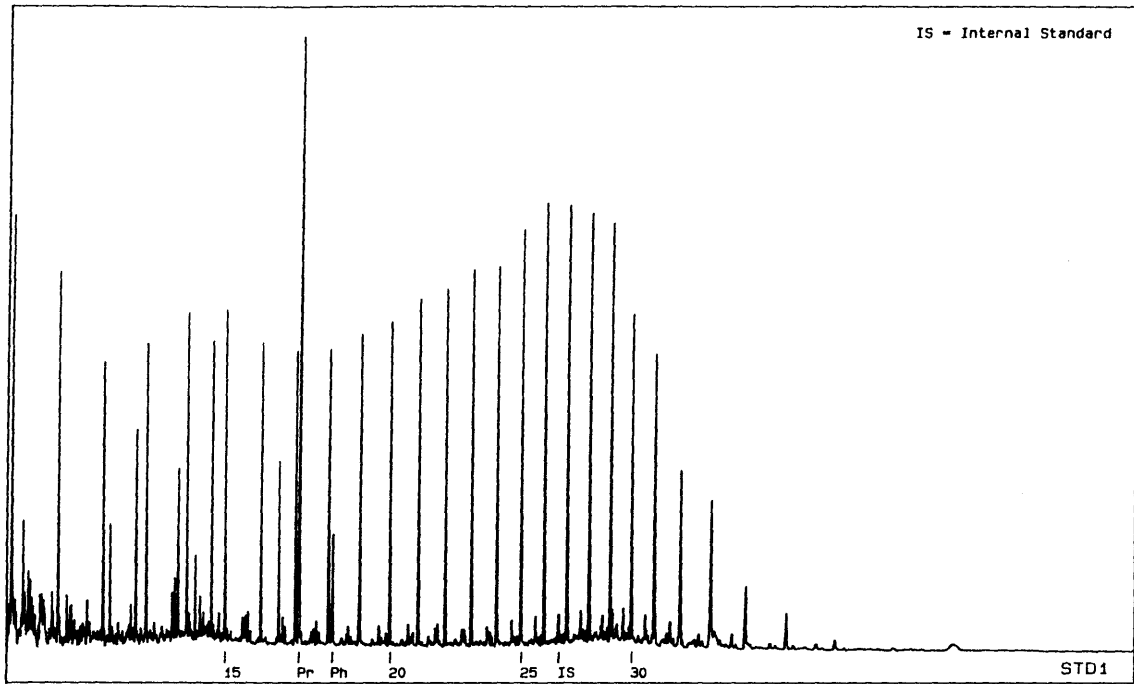
### Table No.

1 Oil Analysis

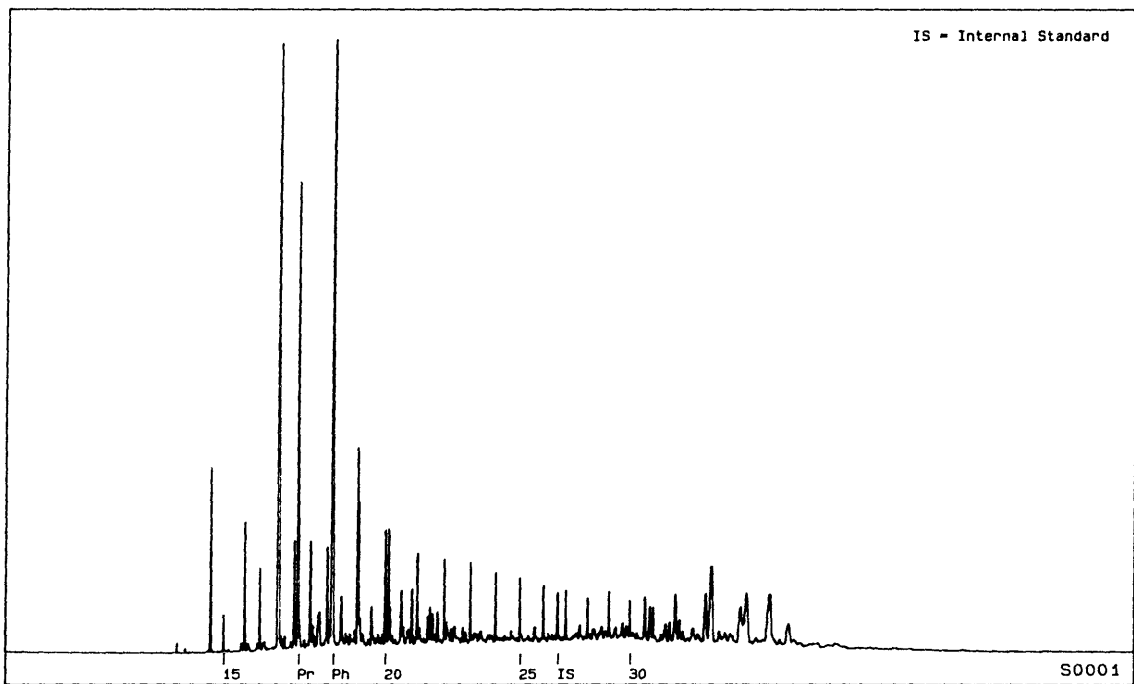
## LIST OF FIGURES

### Figure No.

1 Saturates Fraction GC  
2 Whole Oil GC  
3.1-3.2 Light Hydrocarbon Distribution  
4.1-4.3 Sterane and Triterpane Ion Chromatograms  
5 Aromatic Sterane Ion Chromatograms  
6 Phenanthrene and Methyl Phenanthrene Ion Chromatograms  
7 Biphenol and Dibenzothiophene Ion Chromatograms



STANDARD

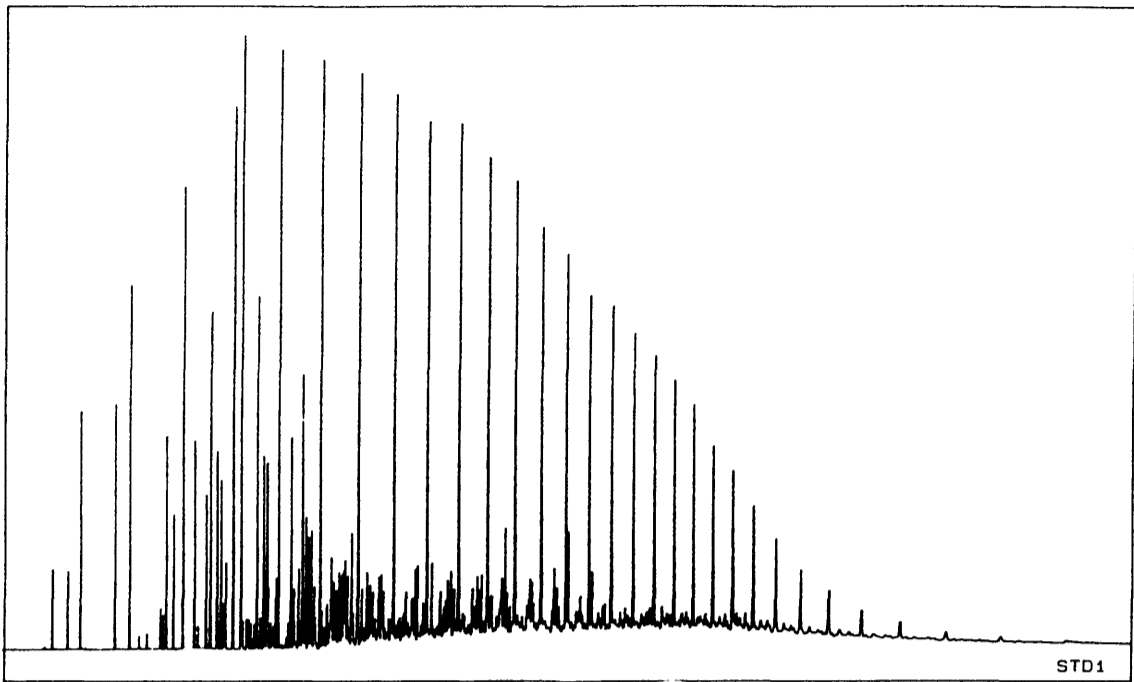


2/2-5 (CRU) DST#1

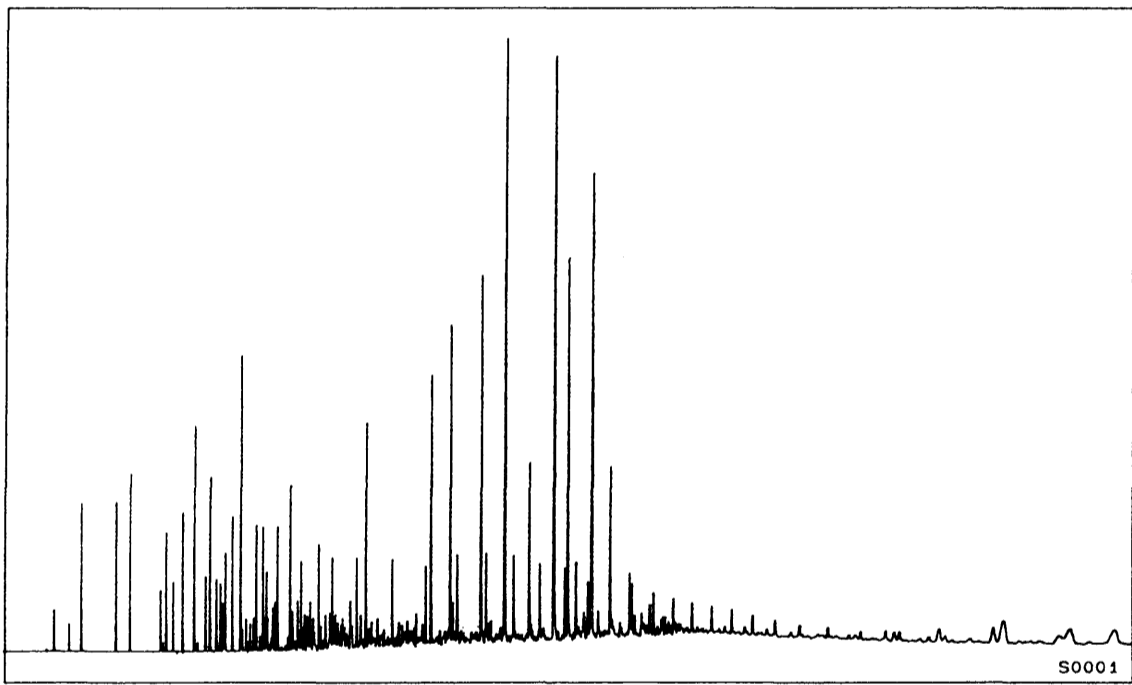
SAC FRACTION CHROMATOGRAMS

ETB ref. 92060IL005

Figure 1



STANDARD



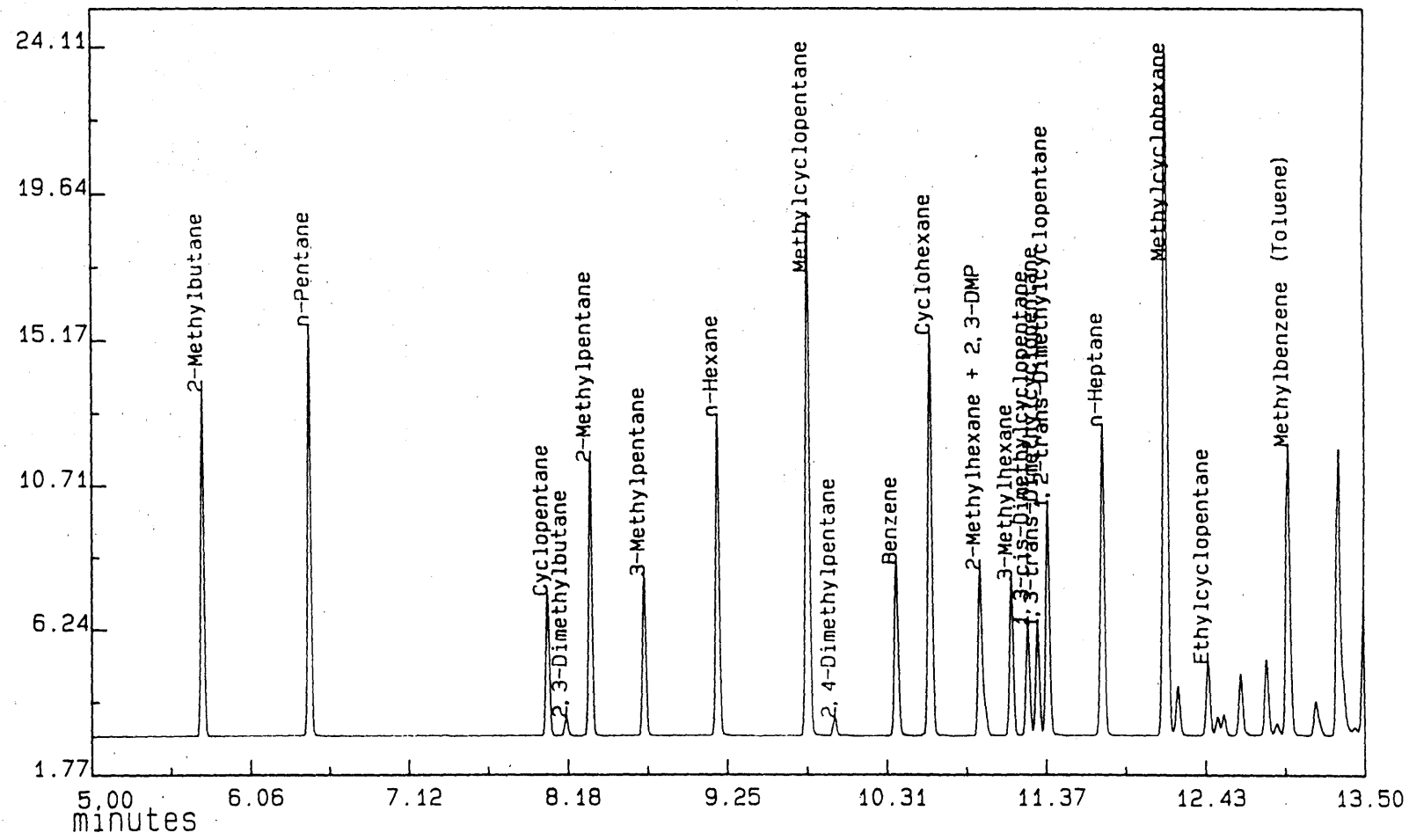
2/2-5 (CRU) DST#1

WHOLE OIL GC

ETB ref. 92060IL005

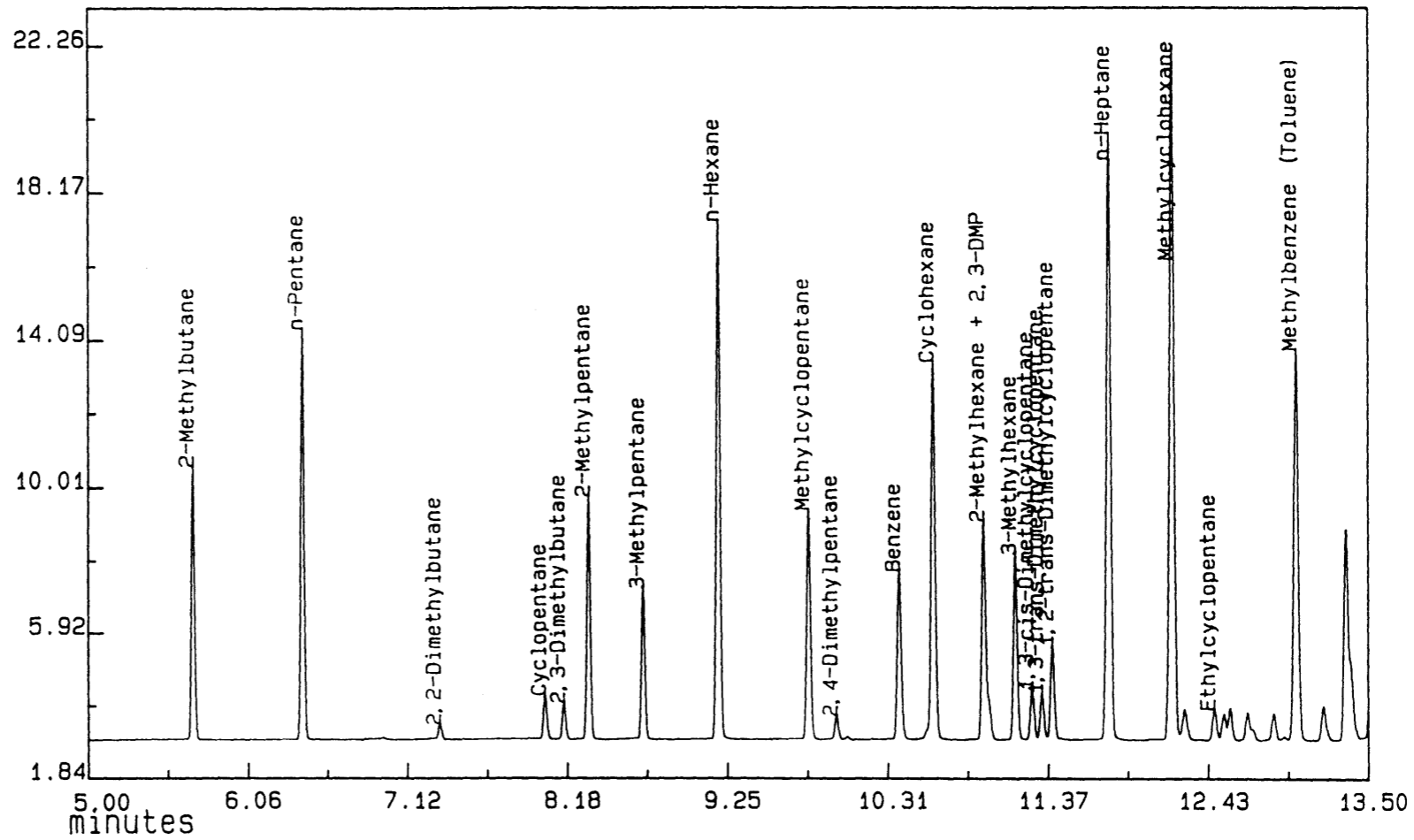
Figure 2

Figure 3.1



LIGHT HYDROCARBON DISTRIBUTION  
2/2-5 DST#1

Figure 3.2



LIGHT HYDROCARBON DISTRIBUTION  
MATURE LABORATORY STANDARD OIL



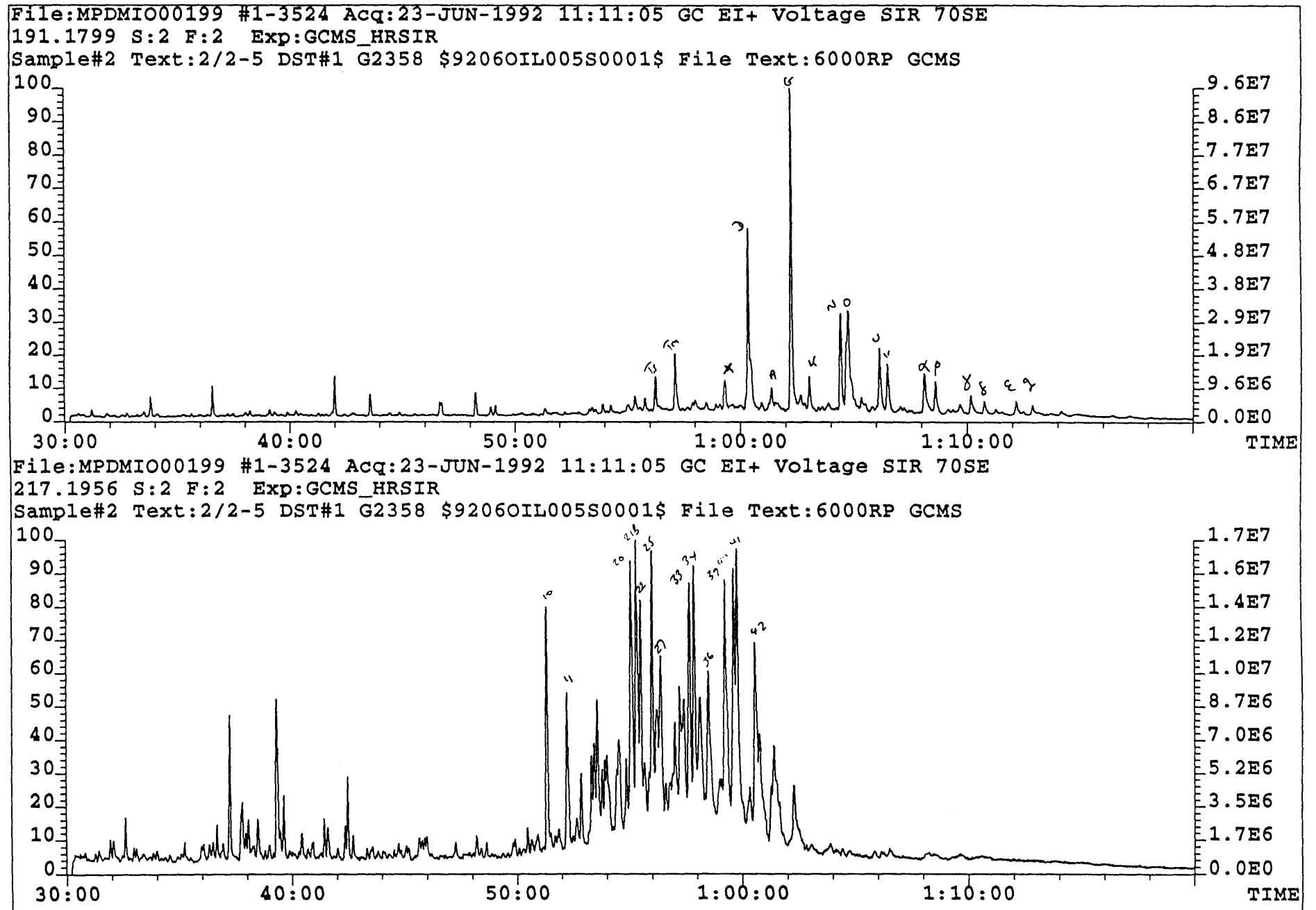


Figure 4.1

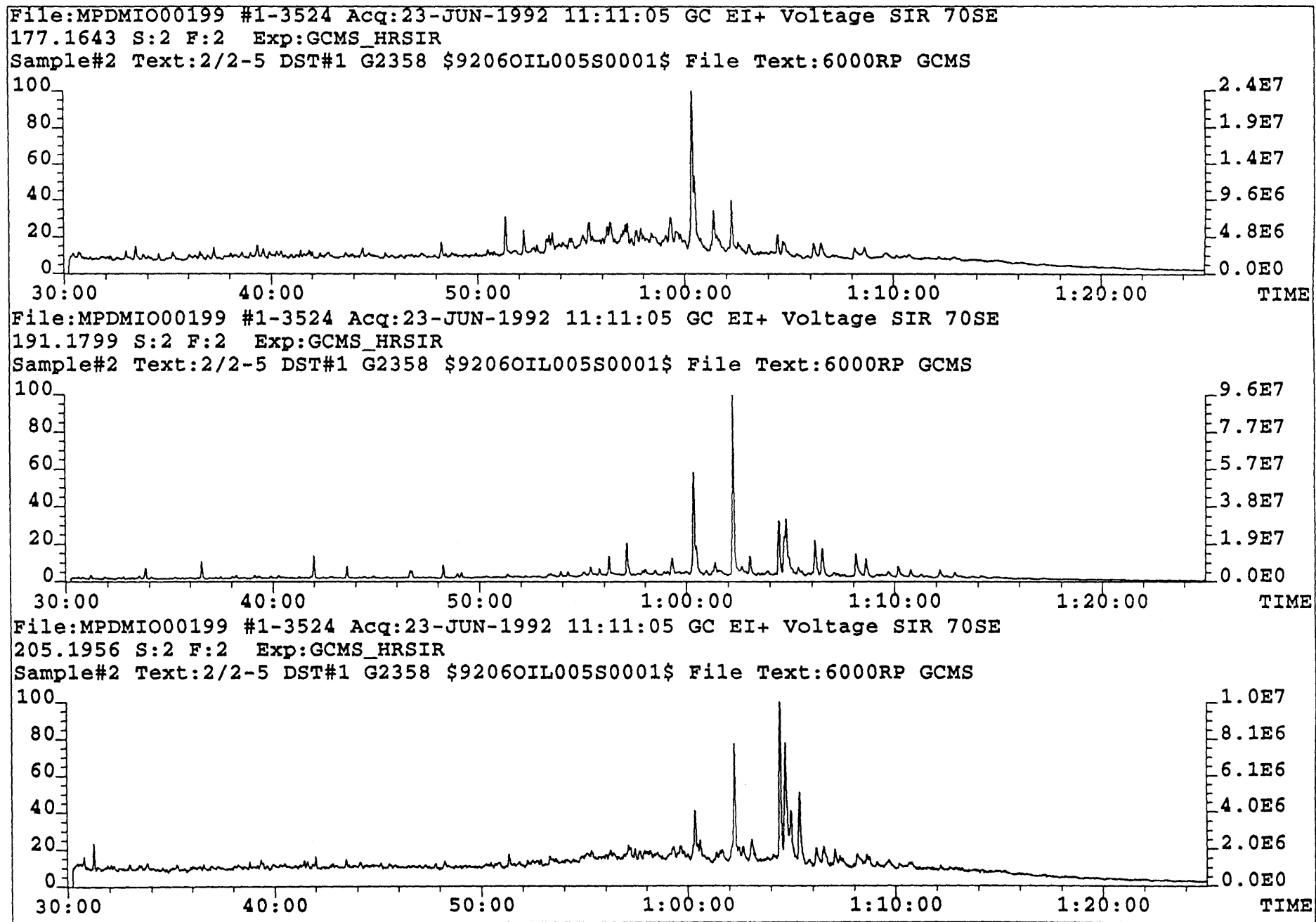


Figure 4.2

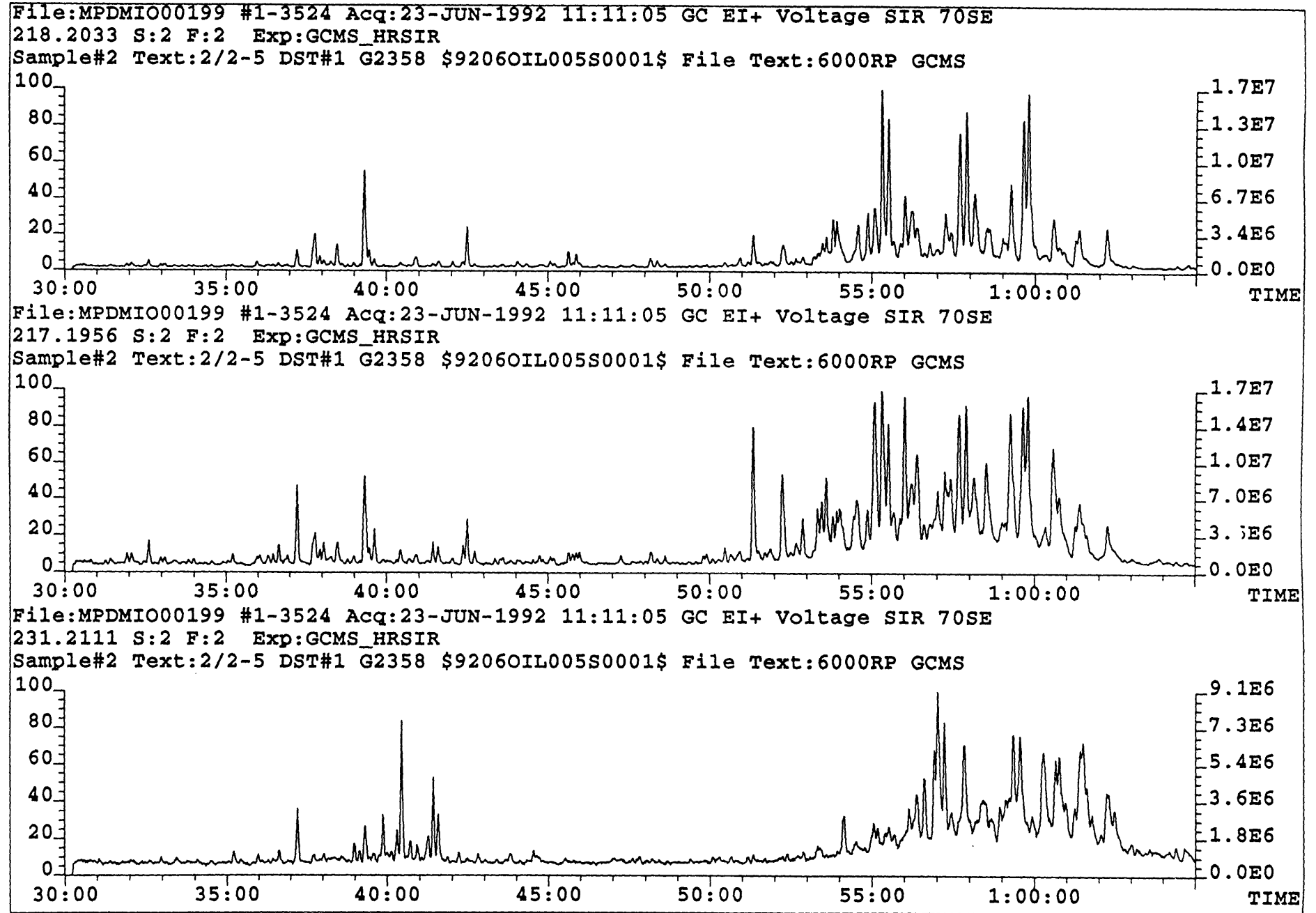
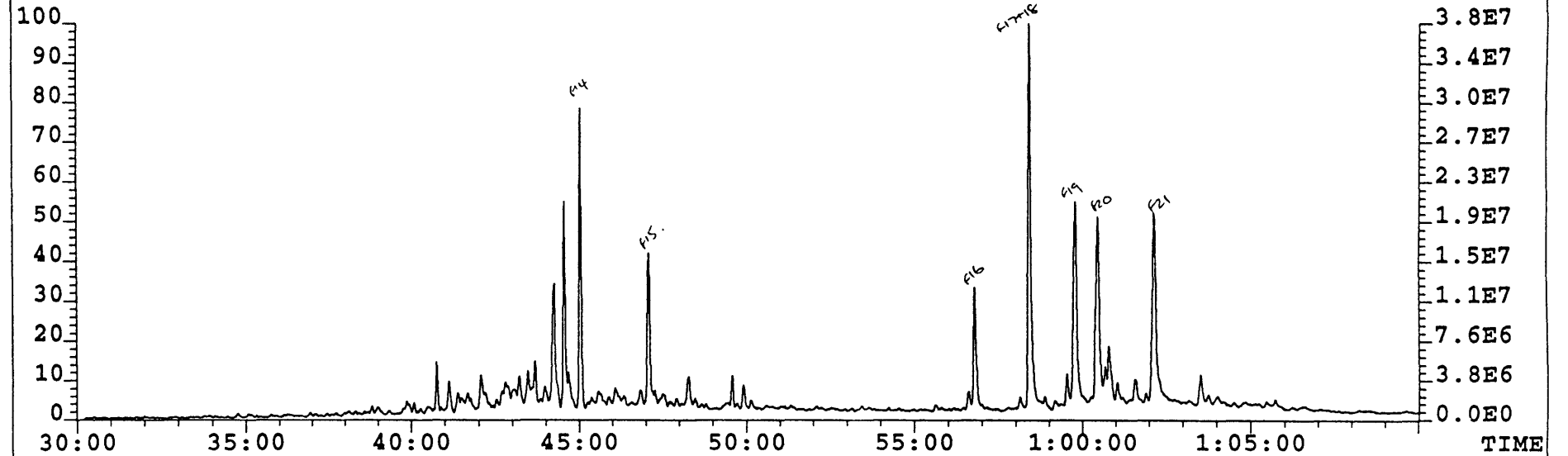


Figure 4.3

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231.1173 S:2 F:2 Exp:GCMS\_HRSIR  
Sample#2 Text:2/2-5 DST#1 G2358 \$9206OIL005S0001\$ File Text:6000RP GCMS



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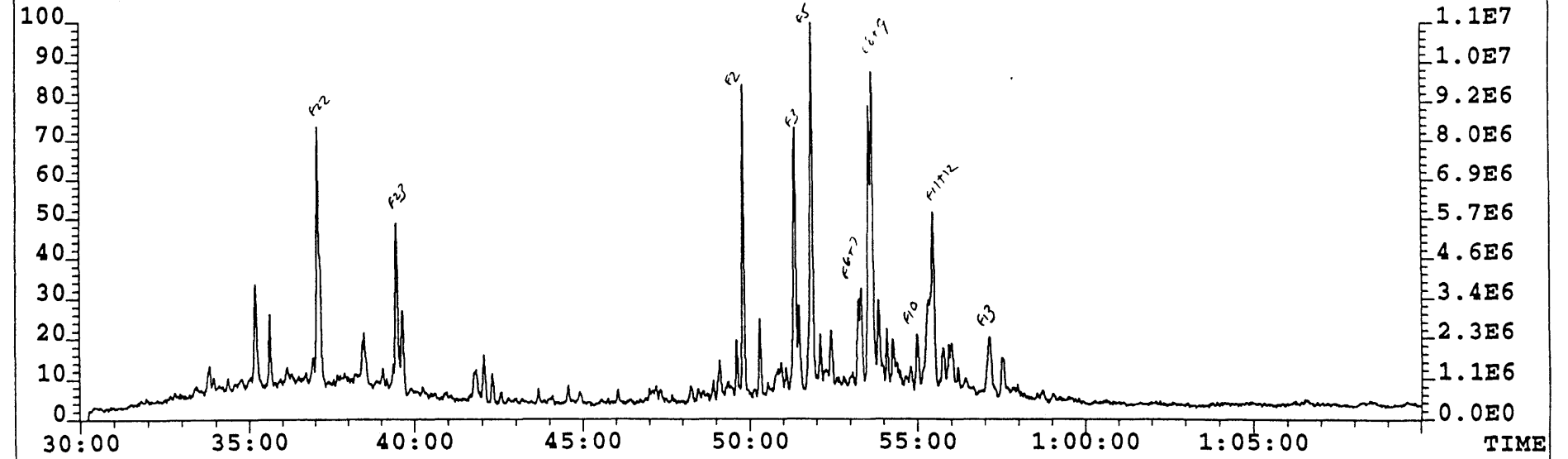
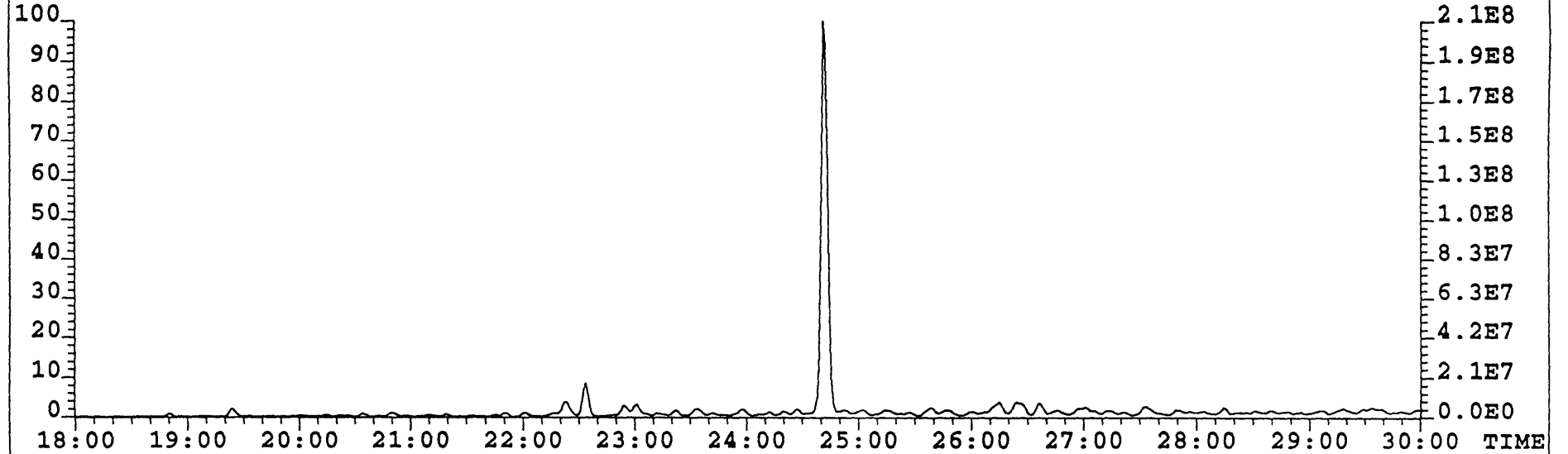


Figure 5

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178.0782 S:2 Exp:GCMS\_HRSIR  
Sample#2 Text:2/2-5 DST#1 G2358 \$9206OIL005S0001\$ File Text:6000RP GCMS



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192.0938 S:2 Exp:GCMS\_HRSIR  
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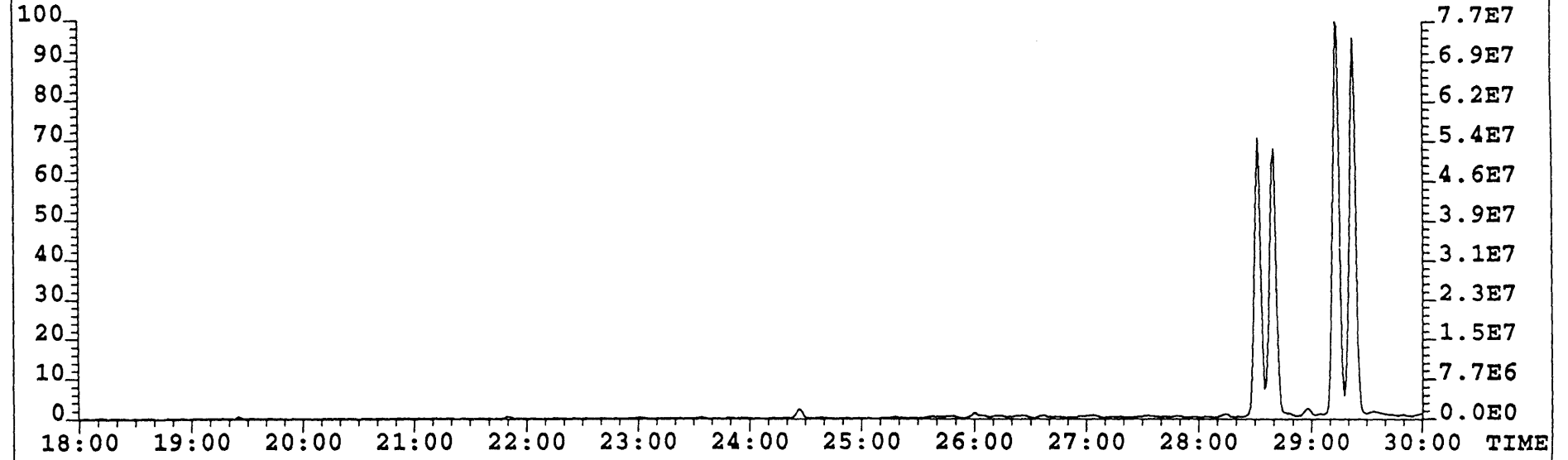
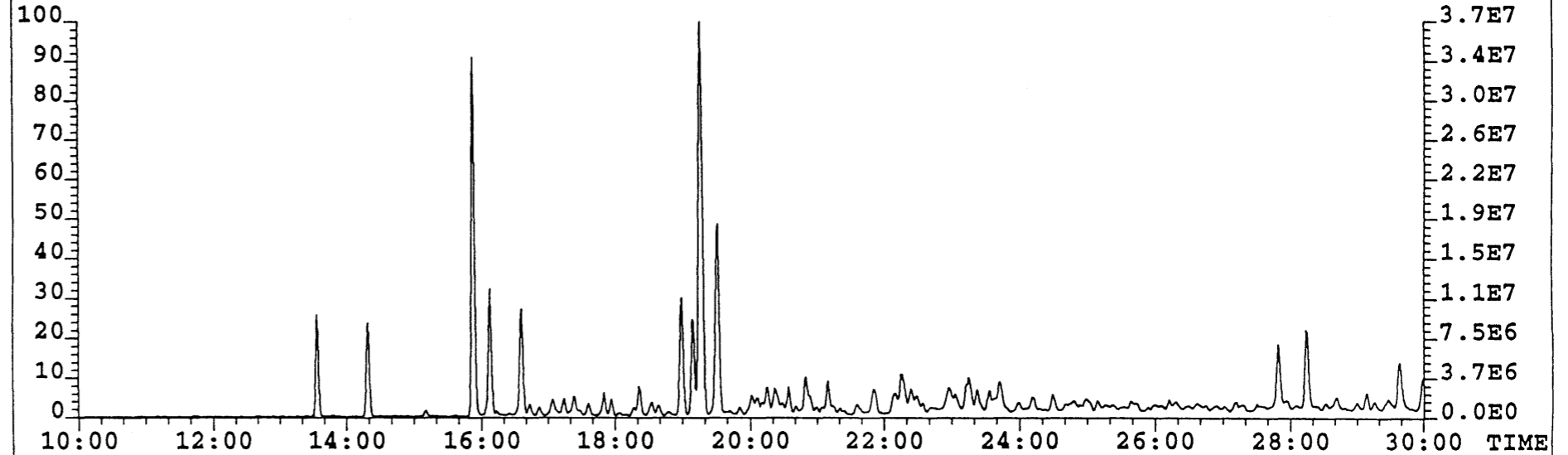


Figure 6

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168.0939 S:2 Exp:GCMS\_HRSIR  
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198.0503 S:2 Exp:GCMS\_HRSIR  
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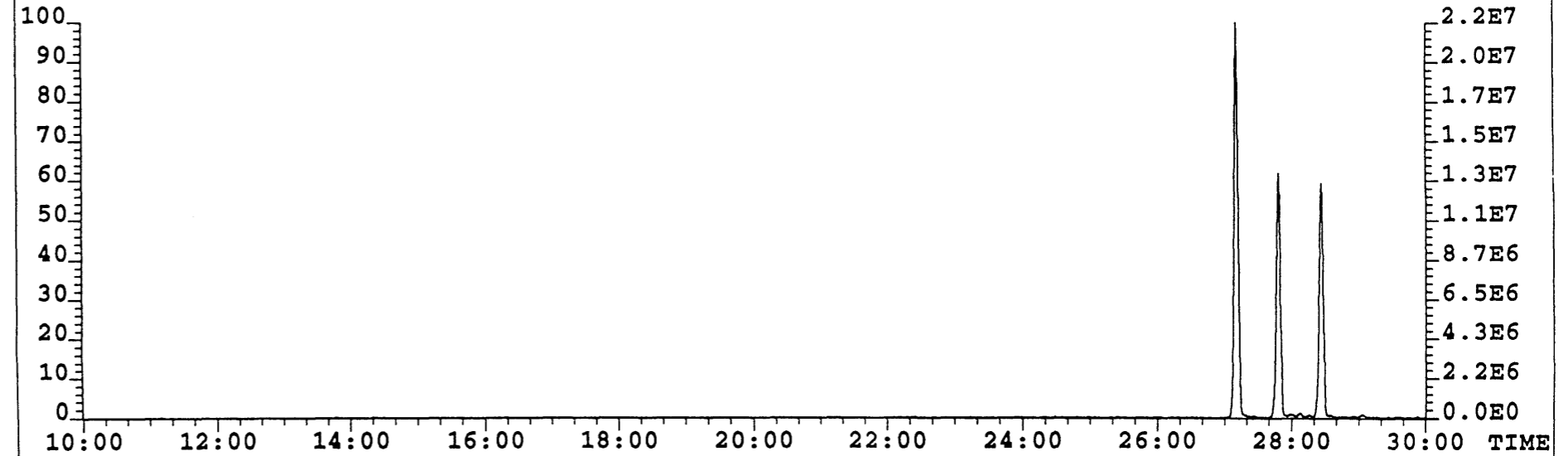
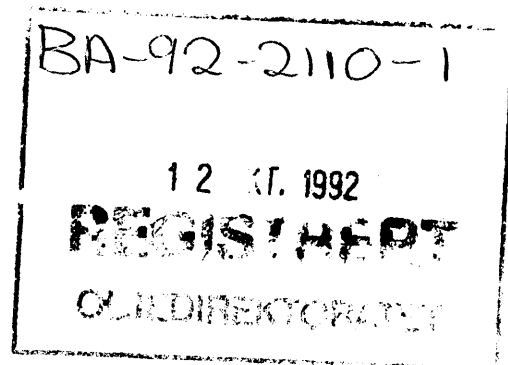


Figure 7



**Geochemical Report for**  
**Well NOCS 2/2-5**

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Date : 01.08.92

## Chapter 1

# INTRODUCTION

### 1.1 General Comments

Well 2/2-5 lies east of Gyda and north of Tor and Ekofisk oil fields in the Central Graben area in the Norwegian sector of North Sea. The present organic geochemical study of the well was performed on behalf of Saga Petroleum and was authorised by Tore Larsen and Per Erling Johansen.

Samples (cuttings, core chips and oil) were supplied by Saga Petroleum and screening analyses were performed as per Saga's instructions. A preliminary stratigraphy was also provided by Saga. The analytical program for detailed geochemistry was made by Saga based on the screening analyses results.

The report is presented, chapter and section-wise, in chronological order of analyses, starting from the first screening analysis. Each section discusses the results, where ever possible, in stratigraphic sequence (top to bottom).



## 1.2 Analytical Program

<u>Analysis type</u>	<u>No of samples</u>	<u>Figures</u>	<u>Tables</u>
Headspace/Occluded Gas	81	2a-c	1a-c
Lithology description	99	3	2
TOC	38	3	2,4
Iatroscan	8		3
Rock-Eval pyrolysis	38	4,5,6	4
Soxhlet Extraction of organic matter	16		5a-e
MPLC/HPLC separation	16+1		5a-e
Whole Oil GC	1	7a-b	
Saturated hydrocarbon GC	13+1	8a-h	6
Aromatic hydrocarbon GC	13+1	9a-b	7
Vitrinite reflectance	22	10	8
Visual kerogen microscopy	8	11	8,9
Isotope C <sub>1</sub> -C <sub>4</sub>	10		10a
del H on C <sub>1</sub> (Headspace Gas)	7		10b
Isotope composition C <sub>15</sub> + fractions	13+1	12,13	11a-b
GC-MS of saturated and aromatic HC	13+1	14a-z	12a-i
S, Ni, V, API Gravity of oil	1		13

- 1-

Table 1a: C1 to C7 hydrocarbons in HEADSPACE gas  
( $\mu$ l gas/kg rock)

Project: NOCS 2/2-5

Well: NOCS 2/2-5

Depth unit of measure: m

\* Indicated values in ml gas/kg rock

Depth	C1	C2	C3	iC4	nC4	C5+	sum C1-C4	sum C2-C4	%wet ness	iC4 --- nC4
2160.00	17	5	25	16	8	13	71	54	76.1	2.00
2180.00	30	17	96	96	71	283	310	280	90.3	1.35
2200.00	7	2	7	5	3	6	24	17	70.8	1.67
2210.00	3192	596	617	142	163	165	4710	1518	32.2	0.87
2220.00	109	30	85	58	36	302	318	209	65.7	1.61
2240.00	1295	285	488	230	123	224	2421	1126	46.5	1.87
2260.00	26	11	38	25	24	161	124	98	79.0	1.04
2300.00	18	3	26	34	30	142	111	93	83.8	1.13
2340.00	10	4	32	29	24	117	99	89	89.9	1.21
2380.00	65	30	127	111	68	213	401	336	83.8	1.63
2420.00	2578	404	824	568	261	654	4635	2057	44.4	2.18
2460.00	176	22	39	37	18	26	292	116	39.7	2.06
2500.00	480	51	55	34	13	35	633	153	24.2	2.62
2540.00	930	66	54	35	11	5	1096	166	15.2	3.18
2580.00	1476	66	56	30	12	17	1640	164	10.0	2.50
2620.00	2194	97	76	40	15	5	2422	228	9.4	2.67
2660.00	85	6	9	7	2	3	109	24	22.0	3.50
2700.00	59	21	41	20	10	5	151	92	60.9	2.00
2740.00	1059	158	252	96	73	58	1638	579	35.4	1.32
2780.00	68	28	104	24	64	62	288	220	76.4	0.38
2820.00	23	3	12	9	38	256	85	62	72.9	0.24
2860.00	24	8	25	8	15	19	80	56	70.0	0.53
2900.00	100	40	126	48	73	104	387	287	74.2	0.66

- 2-

Table 1a: C1 to C7 hydrocarbons in HEADSPACE gas  
( $\mu\text{l}$  gas/kg rock)

Project: NOCS 2/2-5

Well: NOCS 2/2-5

Depth unit of measure: m

\* Indicated values in ml gas/kg rock

Depth	C1	C2	C3	iC4	nC4	C5+	sum C1-C4	sum C2-C4	%wet ness	iC4 --- nC4
2940.00	6	1	3	1	3	3	14	8	57.1	0.33
2980.00	21	2	4	1	2	5	30	9	30.0	0.50
2990.00	198	35	66	32	41	80	372	174	46.8	0.78
3000.00	4	1	3	2	5	34	15	11	73.3	0.40
3010.00	3	-	2	2	4	17	11	8	72.7	0.50
3020.00	5	3	15	11	16	140	50	45	90.0	0.69
3030.00	49	15	28	14	21	94	127	78	61.4	0.67
3040.00	93	23	43	25	38	241	222	129	58.1	0.66
3050.00	2	-	1	1	2	5	6	4	66.7	0.50
3060.00	206	45	79	43	53	311	426	220	51.6	0.81
3070.00	946	105	123	64	78	298	1316	370	28.1	0.82
3080.00	174	32	46	20	27	178	299	125	41.8	0.74
3090.00	252	41	51	24	30	135	398	146	36.7	0.80
3100.00	482	79	111	59	70	316	801	319	39.8	0.84
3110.00	319	52	80	44	65	367	560	241	43.0	0.68
3120.00	205	32	51	34	51	447	373	168	45.0	0.67
3130.00	124	19	30	18	24	158	215	91	42.3	0.75
3135.00	228	176	519	58	292	387	1273	1045	82.1	0.20
3150.00	185	32	51	39	60	414	367	182	49.6	0.65
3160.00	233	29	49	39	57	288	407	174	42.8	0.68
3190.00	16	3	6	9	16	399	50	34	68.0	0.56
3220.00	4	-	1	1	1	17	7	3	42.9	1.00
3250.00	21	5	11	8	10	188	55	34	61.8	0.80

- 3-

Table 1a: C1 to C7 hydrocarbons in HEADSPACE gas  
( $\mu$ l gas/kg rock)

Project: NOCS 2/2-5

Well: NOCS 2/2-5

Depth unit of measure: m

\* Indicated values in ml gas/kg rock

Depth	C1	C2	C3	iC4	nC4	C5+	sum C1-C4	sum C2-C4	%wet ness	iC4 --- nC4
3280.00	5	1	1	1	1	12	9	4	44.4	1.00
3310.00	158	29	28	12	11	363	238	80	33.6	1.09
3340.00	11	1	2	1	1	11	16	5	31.3	1.00
3365.00	180	16	12	4	4	29	216	36	16.7	1.00
3400.00	27	37	123	38	130	370	355	328	92.4	0.29
3420.00	189	556	2185	495	1882	1648	5307	5118	96.4	0.26
3456.00	739	745	2424	595	2104	1573	6607	5868	88.8	0.28
3486.00	132	318	1087	255	844	504	2636	2504	95.0	0.30
3615.00	69	72	187	34	121	91	483	414	85.7	0.28
3624.00	49	67	223	46	175	171	560	511	91.3	0.26
3633.00	267	183	385	88	307	435	1230	963	78.3	0.29
3642.00	304	255	484	96	315	470	1454	1150	79.1	0.30
3651.00	187	207	812	112	634	665	1952	1765	90.4	0.18
3660.00	3	5	28	6	31	46	73	70	95.9	0.19
3669.00	-	-	-	-	-	-	-	-	-	-
3678.00	2613	2132	3539	670	1921	1422	10875	8262	76.0	0.35
3687.00	99	439	606	140	444	1134	1728	1629	94.3	0.32
3696.00	222	169	299	69	252	545	1011	789	78.0	0.27
3705.00	196	271	658	130	483	941	1738	1542	88.7	0.27
3714.00	524	286	406	93	297	487	1606	1082	67.4	0.31
3723.00	-	-	-	-	-	-	-	-	-	-
3732.00	2191	1597	2986	489	2098	2307	9361	7170	76.6	0.23
3741.00	771	443	684	143	466	911	2507	1736	69.3	0.31

- 4-

Table 1a: C1 to C7 hydrocarbons in HEADSPACE gas  
( $\mu\text{l}$  gas/kg rock)

Project: NOCS 2/2-5

Well: NOCS 2/2-5

Depth unit of measure: m \* Indicated values in ml gas/kg rock

Depth	C1	C2	C3	iC4	nC4	C5+	sum C1-C4	sum C2-C4	%wet ness	iC4 --- nC4
3759.00	562	325	429	69	240	380	1625	1063	65.4	0.29
3786.00	477	415	547	87	280	389	1806	1329	73.6	0.31
3822.00	25	41	88	10	54	60	218	193	88.5	0.19
3849.00	2	3	12	1	14	38	32	30	93.8	0.07
3885.00	219	304	426	59	187	134	1195	976	81.7	0.32
3912.00	163	140	256	44	152	228	755	592	78.4	0.29
3942.00	5	9	32	4	23	23	73	68	93.2	0.17
3975.00	372	499	772	100	335	342	2078	1706	82.1	0.30
4002.00	287	284	459	70	238	200	1338	1051	78.6	0.29
4029.00	25	54	120	19	84	151	302	277	91.7	0.23
4056.00	38	58	218	50	202	335	566	528	93.3	0.25
4082.00	22	22	154	44	214	619	456	434	95.2	0.21

- 1-

Table 1b: C1 to C7 hydrocarbons in CUTTINGS gas  
( $\mu$ l gas/kg rock)

Project: NOCS 2/2-5

Well: NOCS 2/2-5

Depth unit of measure: m

\* Indicated values in ml gas/kg source rock

Depth	C1	C2	C3	iC4	nC4	C5+	sum C1-C4	sum C2-C4	%wet ness	iC4 --- nC4
2160.00	32	4	14	21	12	45	83	51	61.5	1.75
2180.00	38	4	5	14	14	106	75	37	49.3	1.00
2200.00	55	10	39	41	29	137	174	119	68.4	1.41
2210.00	31	4	27	17	67	322	146	115	78.8	0.25
2220.00	47	14	57	46	33	144	197	150	76.1	1.39
2240.00	67	10	28	31	26	136	162	95	58.6	1.19
2260.00	46	6	17	30	28	260	127	81	63.8	1.07
2300.00	40	6	16	42	41	430	145	105	72.4	1.02
2340.00	41	7	47	74	72	482	241	200	83.0	1.03
2380.00	41	4	25	48	53	527	171	130	76.0	0.91
2420.00	30	7	52	79	60	407	228	198	86.8	1.32
2460.00	33	19	68	58	31	116	209	176	84.2	1.87
2500.00	53	19	61	57	27	99	217	164	75.6	2.11
2540.00	44	18	51	52	23	80	188	144	76.6	2.26
2580.00	53	10	13	11	8	30	95	42	44.2	1.38
2620.00	19	5	14	13	7	17	58	39	67.2	1.86
2660.00	24	4	14	17	7	17	66	42	63.6	2.43
2700.00	20	7	43	34	22	38	126	106	84.1	1.55
2740.00	19	6	46	29	32	51	132	113	85.6	0.91
2780.00	42	42	519	203	651	1729	1457	1415	97.1	0.31
2820.00	25	3	17	14	69	556	128	103	80.5	0.20
2860.00	27	17	114	41	106	248	305	278	91.2	0.39
2900.00	21	3	14	10	25	90	73	52	71.2	0.40

- 2-

Table 1b: C1 to C7 hydrocarbons in CUTTINGS gas  
( $\mu\text{l}$  gas/kg rock)

Project: NOCS 2/2-5

Well: NOCS 2/2-5

Depth unit of measure: m

\* Indicated values in ml gas/kg source rock

Depth	C1	C2	C3	iC4	nC4	C5+	sum C1-C4	sum C2-C4	%wet ness	iC4 --- nC4
2940.00	22	3	9	7	14	47	55	33	60.0	0.50
2980.00	30	9	33	22	37	122	131	101	77.1	0.59
2990.00	24	4	6	5	10	56	49	25	51.0	0.50
3000.00	23	4	4	6	12	254	49	26	53.1	0.50
3010.00	42	7	6	4	9	169	68	26	38.2	0.44
3020.00	19	3	8	7	11	97	48	29	60.4	0.64
3030.00	24	5	17	11	17	109	74	50	67.6	0.65
3040.00	22	4	7	7	17	191	57	35	61.4	0.41
3050.00	25	4	4	4	6	82	43	18	41.9	0.67
3060.00	21	4	11	8	21	210	65	44	67.7	0.38
3070.00	33	10	38	31	59	502	171	138	80.7	0.53
3080.00	28	10	35	24	49	470	146	118	80.8	0.49
3090.00	19	5	16	11	21	165	72	53	73.6	0.52
3100.00	20	5	15	11	23	182	74	54	73.0	0.48
3110.00	21	5	13	11	24	211	74	53	71.6	0.46
3120.00	30	6	11	11	24	223	82	52	63.4	0.46
3130.00	26	5	12	11	21	185	75	49	65.3	0.52
3135.00	33	10	65	16	117	413	241	208	86.3	0.14
3150.00	44	7	12	12	27	243	102	58	56.9	0.44
3160.00	36	7	14	17	37	410	111	75	67.6	0.46
3190.00	39	9	10	11	23	210	92	53	57.6	0.48
3220.00	39	8	9	8	15	248	79	40	50.6	0.53
3250.00	28	6	15	11	14	193	74	46	62.2	0.79

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Table 1b: C1 to C7 hydrocarbons in CUTTINGS gas  
( $\mu$ l gas/kg rock)

Project: NOCS 2/2-5

Well: NOCS 2/2-5

Depth unit of measure: m

\* Indicated values in ml gas/kg source rock

Depth	C1	C2	C3	iC4	nC4	C5+	sum C1-C4	sum C2-C4	%wet ness	iC4 --- nC4
3280.00	51	11	9	5	8	119	84	33	39.3	0.63
3310.00	37	8	12	11	14	195	82	45	54.9	0.79
3340.00	28	4	5	4	5	88	46	18	39.1	0.80
3365.00	30	6	16	10	12	80	74	44	59.5	0.83
3400.00	27	4	22	11	49	226	113	86	76.1	0.22
3420.00	43	49	859	481	2163	4846	3595	3552	98.8	0.22
3456.00	44	8	106	71	426	1535	655	611	93.3	0.17
3486.00	21	16	224	136	632	1998	1029	1008	98.0	0.22
3615.00	87	44	383	167	727	2469	1408	1321	93.8	0.23
3624.00	30	49	474	240	1053	3742	1846	1816	98.4	0.23
3633.00	25	29	240	114	531	2200	939	914	97.3	0.21
3642.00	36	58	376	151	671	2603	1292	1256	97.2	0.23
3651.00	190	11	72	56	286	2088	615	425	69.1	0.20
3660.00	109	43	419	171	766	2651	1508	1399	92.8	0.22
3669.00	140	57	378	183	793	2553	1551	1411	91.0	0.23
3678.00	187	400	1955	644	2632	7775	5818	5631	96.8	0.24
3687.00	120	134	524	237	1072	5715	2087	1967	94.3	0.22
3696.00	74	38	247	148	680	3854	1187	1113	93.8	0.22
3705.00	204	83	594	257	1115	4748	2253	2049	91.0	0.23
3714.00	528	108	526	257	1120	5279	2539	2011	79.2	0.23
3723.00	52	62	497	276	1211	3405	2098	2046	97.5	0.23
3732.00	133	65	302	162	729	4063	1391	1258	90.4	0.22
3741.00	87	60	362	173	764	4007	1446	1359	94.0	0.23



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Table 1b: C1 to C7 hydrocarbons in CUTTINGS gas  
( $\mu$ l gas/kg rock)

Project: NOCS 2/2-5

Well: NOCS 2/2-5

Depth unit of measure: m

\* Indicated values in ml gas/kg source rock

Depth	C1	C2	C3	iC4	nC4	C5+	sum C1-C4	sum C2-C4	%wet ness	iC4 --- nC4
3759.00	46	52	311	156	676	3470	1241	1195	96.3	0.23
3786.00	56	135	658	224	944	3911	2017	1961	97.2	0.24
3822.00	32	3	70	97	423	2666	625	593	94.9	0.23
3849.00	38	67	346	155	671	3156	1277	1239	97.0	0.23
3885.00	51	89	540	209	869	3283	1758	1707	97.1	0.24
3912.00	42	39	323	167	751	3344	1322	1280	96.8	0.22
3942.00	44	69	598	240	1062	4149	2013	1969	97.8	0.23
3975.00	64	206	1245	394	1700	6901	3609	3545	98.2	0.23
4002.00	62	106	656	275	1163	5778	2262	2200	97.3	0.24
4029.00	62	89	405	142	637	2622	1335	1273	95.4	0.22
4056.00	339	42	359	203	901	5318	1844	1505	81.6	0.23
4082.00	142	16	217	176	767	3624	1318	1176	89.2	0.23

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Table 1c: C1 to C7 hydrocarbons in HEADSPACE and CUTTINGS gas  
( $\mu$ l gas/kg rock)

Project: NOCS 2/2-5

Well: NOCS 2/2-5

Depth unit of measure: m

\* Indicated values in ml gas/kg source rock

Depth	C1	C2	C3	iC4	nC4	C5+	sum C1-C4	sum C2-C4	%wet ness	iC4 --- nC4
2160.00	49	9	39	37	20	58	154	105	68.2	1.85
2180.00	68	21	101	110	85	389	385	317	82.3	1.29
2200.00	62	12	46	46	32	143	198	136	68.7	1.44
2210.00	3223	600	644	159	230	487	4856	1633	33.6	0.69
2220.00	156	44	142	104	69	446	515	359	69.7	1.51
2240.00	1362	295	516	261	149	360	2583	1221	47.3	1.75
2260.00	72	17	55	55	52	421	251	179	71.3	1.06
2300.00	58	9	42	76	71	572	256	198	77.3	1.07
2340.00	51	11	79	103	96	599	340	289	85.0	1.07
2380.00	106	34	152	159	121	740	572	466	81.5	1.31
2420.00	2608	411	876	647	321	1061	4863	2255	46.4	2.02
2460.00	209	41	107	95	49	142	501	292	58.3	1.94
2500.00	533	70	116	91	40	134	850	317	37.3	2.28
2540.00	974	84	105	87	34	85	1284	310	24.1	2.56
2580.00	1529	76	69	41	20	47	1735	206	11.9	2.05
2620.00	2213	102	90	53	22	22	2480	267	10.8	2.41
2660.00	109	10	23	24	9	20	175	66	37.7	2.67
2700.00	79	28	84	54	32	43	277	198	71.5	1.69
2740.00	1078	164	298	125	105	109	1770	692	39.1	1.19
2780.00	110	70	623	227	715	1791	1745	1635	93.7	0.32
2820.00	48	6	29	23	107	812	213	165	77.5	0.21
2860.00	51	25	139	49	121	267	385	334	86.8	0.40

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Table 1c: C1 to C7 hydrocarbons in HEADSPACE and CUTTINGS gas  
( $\mu\text{l}$  gas/kg rock)

Project: NOCS 2/2-5

Well: NOCS 2/2-5

Depth unit of measure: m \* Indicated values in ml gas/kg source rock

Depth	C1	C2	C3	iC4	nC4	C5+	sum C1-C4	sum C2-C4	%wet ness	iC4 ---- nC4
2900.00	121	43	140	58	98	194	460	339	73.7	0.59
2940.00	28	4	12	8	17	50	69	41	59.4	0.47
2980.00	51	11	37	23	39	127	161	110	68.3	0.59
2990.00	222	39	72	37	51	136	421	199	47.3	0.73
3000.00	27	5	7	8	17	288	64	37	57.8	0.47
3010.00	45	7	8	6	13	186	79	34	43.0	0.46
3020.00	24	6	23	18	27	237	98	74	75.5	0.67
3030.00	73	20	45	25	38	203	201	128	63.7	0.66
3040.00	115	27	50	32	55	432	279	164	58.8	0.58
3050.00	27	4	5	5	8	87	49	22	44.9	0.63
3060.00	227	49	90	51	74	521	491	264	53.8	0.69
3070.00	979	115	161	95	137	800	1487	508	34.2	0.69
3080.00	202	42	81	44	76	648	445	243	54.6	0.58
3090.00	271	46	67	35	51	300	470	199	42.3	0.69
3100.00	502	84	126	70	93	498	875	373	42.6	0.75
3110.00	340	57	93	55	89	578	634	294	46.4	0.62
3120.00	235	38	62	45	75	670	455	220	48.4	0.60
3130.00	150	24	42	29	45	343	290	140	48.3	0.64
3135.00	261	186	584	74	409	800	1514	1253	82.8	0.18
3150.00	229	39	63	51	87	657	469	240	51.2	0.59
3160.00	269	36	63	56	94	698	518	249	48.1	0.60
3190.00	55	12	16	20	39	609	142	87	61.3	0.51

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Table 1c: C1 to C7 hydrocarbons in HEADSPACE and CUTTINGS gas  
( $\mu\text{l}$  gas/kg rock)

Project: NOCS 2/2-5

Well: NOCS 2/2-5

Depth unit of measure: m

\* Indicated values in ml gas/kg source rock

Depth	C1	C2	C3	iC4	nC4	C5+	sum C1-C4	sum C2-C4	%wet ness	iC4 --- nC4
3220.00	43	8	10	9	16	265	86	43	50.0	0.56
3250.00	49	11	26	19	24	381	129	80	62.0	0.79
3280.00	56	12	10	6	9	131	93	37	39.8	0.67
3310.00	195	37	40	23	25	558	320	125	39.1	0.92
3340.00	39	5	7	5	6	99	62	23	37.1	0.83
3365.00	210	22	28	14	16	109	290	80	27.6	0.88
3400.00	54	41	145	49	179	596	468	414	88.5	0.27
3420.00	232	605	3044	976	4045	6494	8902	8670	97.4	0.24
3456.00	783	753	2530	666	2530	3108	7262	6479	89.2	0.26
3486.00	153	334	1311	391	1476	2502	3665	3512	95.8	0.26
3615.00	156	116	570	201	848	2560	1891	1735	91.8	0.24
3624.00	79	116	697	286	1228	3913	2406	2327	96.7	0.23
3633.00	292	212	625	202	838	2635	2169	1877	86.5	0.24
3642.00	340	313	860	247	986	3073	2746	2406	87.6	0.25
3651.00	377	218	884	168	920	2753	2567	2190	85.3	0.18
3660.00	112	48	447	177	797	2697	1581	1469	92.9	0.22
3669.00	140	57	378	183	793	2553	1551	1411	91.0	0.23
3678.00	2800	2532	5494	1314	4553	9197	16693	13893	83.2	0.29
3687.00	219	573	1130	377	1516	6849	3815	3596	94.3	0.25
3696.00	296	207	546	217	932	4399	2198	1902	86.5	0.23
3705.00	400	354	1252	387	1598	5689	3991	3591	90.0	0.24
3714.00	1052	394	932	350	1417	5766	4145	3093	74.6	0.25

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Table 1c: C1 to C7 hydrocarbons in HEADSPACE and CUTTINGS gas  
( $\mu\text{l}$  gas/kg rock)

Project: NOCS 2/2-5

Well: NOCS 2/2-5

Depth unit of measure: m

\* Indicated values in ml gas/kg source rock

Depth	C1	C2	C3	iC4	nC4	C5+	sum C1-C4	sum C2-C4	%wet ness	iC4 --- nC4
3723.00	52	62	497	276	1211	3405	2098	2046	97.5	0.23
3732.00	2324	1662	3288	651	2827	6370	10752	8428	78.4	0.23
3741.00	858	503	1046	316	1230	4918	3953	3095	78.3	0.26
3759.00	608	377	740	225	916	3850	2866	2258	78.8	0.25
3786.00	533	550	1205	311	1224	4300	3823	3290	86.1	0.25
3822.00	57	44	158	107	477	2726	843	786	93.2	0.22
3849.00	40	70	358	156	685	3194	1309	1269	96.9	0.23
3885.00	270	393	966	268	1056	3417	2953	2683	90.9	0.25
3912.00	205	179	579	211	903	3572	2077	1872	90.1	0.23
3942.00	49	78	630	244	1085	4172	2086	2037	97.7	0.22
3975.00	436	705	2017	494	2035	7243	5687	5251	92.3	0.24
4002.00	349	390	1115	345	1401	5978	3600	3251	90.3	0.25
4029.00	87	143	525	161	721	2773	1637	1550	94.7	0.22
4056.00	377	100	577	253	1103	5653	2410	2033	84.4	0.23
4082.00	164	38	371	220	981	4243	1774	1610	90.8	0.22

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Table 2 : Lithology description for well NOCS 2/2-5

Depth unit of measure: m

Depth	Type	Grp	Frm	Age	Trb	Sample
Int	Cvd	TOC%	%	Lithology description		
2160.00						0001
	0.94		90	Sh/Clst: m ol gy to m gy		0001-1L
			10	Sh/Clst: m drk gy		0001-2L
2180.00						0002
			90	Sh/Clst: m drk gy to drk gy		0002-2L
			10	Sh/Clst: m ol gy to m gy		0002-1L
			tr	Other : y brn, prp		0002-3L
2200.00						0003
			85	Sh/Clst: m ol gy to m gy		0003-1L
			10	Sh/Clst: m drk gy to drk gy		0003-2L
			5	Kaolin : w, lt brn		0003-3L
			tr	S/Sst : w		0003-4L
2210.00						0087
			85	Sh/Clst: lt gy to m gy to drk gy, calc, pyr, slt		0087-1L
			10	S/Sst : lt gy w to lt gy, mic, f, l		0087-2L
			5	Ca : lt brn gy		0087-3L
			tr	Cont : prp		0087-4L
2220.00						0004
			50	Sh/Clst: m ol gy to m gy		0004-1L
			35	S/Sst : w		0004-4L
			10	Ca : pl w, lt brn		0004-3L
			5	Sh/Clst: m drk gy to drk gy		0004-2L

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Table 2 : Lithology description for well NOCS 2/2-5

Depth unit of measure: m

Depth	Type	Grp	Frm	Age	Trb	Sample
Int	Cvd	TOC%	%	Lithology description		
2260.00						0005
	1.04	75	Sh/Clst:	m ol gy to m gy		0005-1L
		10	Other :	y brn, dd		0005-5L
		5	Sh/Clst:	m drk gy to drk gy		0005-2L
		5	Ca :	pl w, lt brn		0005-3L
		5	S/Sst :	w		0005-4L
2300.00						0006
		95	Sh/Clst:	m ol gy to m gy		0006-1L
		5	S/Sst :	w		0006-3L
		tr	Sh/Clst:	m drk gy to drk gy		0006-2L
2340.00						0007
	0.85	95	Sh/Clst:	m ol gy to m gy		0007-1L
		5	Other :	y brn, dd		0007-4L
		tr	S/Sst :	w		0007-2L
		tr	Ca :	pl brn w		0007-3L
2380.00						0008
		95	Sh/Clst:	m ol gy		0008-1L
		5	Ca :	pl y w		0008-2L
		tr	Other :	w, cem		0008-3L
2420.00						0009
	1.25	90	Sh/Clst:	drk ol gy		0009-3L
		5	Sh/Clst:	m ol gy		0009-1L
		5	Ca :	pl y w		0009-2L
		tr	Other :	w, cem		0009-4L

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Table 2 : Lithology description for well NOCS 2/2-5

Depth unit of measure: m

Depth	Type	Grp	Frm	Age	Trb	Sample	
Int Cvd	TOC%	%	Lithology description				
2460.00						0010	
		50	Sh/Clst:	m drk ol gy		0010-1L	
		45	Sh/Clst:	m ol gy		0010-2L	
		5	Ca	: lt y brn		0010-3L	
		tr	S/Sst	: w		0010-4L	
2500.00						0011	
	1.10	95	Sh/Clst:	m lt ol gy		0011-1L	
		5	Ca	: lt y brn		0011-2L	
		tr	S/Sst	: w		0011-3L	
		tr	Other	: y, pyr		0011-4L	
2540.00						0012	
		95	Sh/Clst:	m lt ol gy		0012-1L	
		5	Ca	: lt y brn		0012-2L	
		tr	S/Sst	: w		0012-3L	
		tr	Other	: y, pyr		0012-4L	
2580.00						0013	
		60	Sh/Clst:	m lt ol gy		0013-1L	
		40	Sh/Clst:	lt gn gy		0013-4L	
		tr	Ca	: lt y brn		0013-2L	
		tr	Other	: y, pyr		0013-3L	
2620.00						0014	
	0.45	100	Sh/Clst:	m drk gn gy to m drk ol gy		0014-1L	
			tr	Other : y, pyr		0014-2L	



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Table 2 : Lithology description for well NOCS 2/2-5

Depth unit of measure: m

Depth	Type	Grp	Frm	Age	Trb	Sample
Int Cvd	TOC%	%	Lithology description			
2660.00						0015
		95	Sh/Clst: m drk gn gy to m drk ol gy			0015-1L
		5	Ca : lt y brn			0015-2L
2700.00						0016
	0.46	85	Sh/Clst: gn gy to m ol gy			0016-1L
		15	Sh/Clst: brn			0016-2L
		tr	Other : y, pyr			0016-3L
2740.00						0017
		60	Sh/Clst: lt gn gy			0017-4L
		20	Sh/Clst: gn gy to m ol gy			0017-1L
		10	Sh/Clst: brn			0017-2L
		10	Sh/Clst: pl gn w, calc			0017-5L
		tr	Other : y, pyr			0017-3L
2780.00						0033
	2.06	80	Sh/Clst: m drk gy to m gy, slt			0033-1L
		15	Sh/Clst: lt gn gy			0033-2L
		5	sltst : lt gy			0033-3L
2820.00						0018
	1.16	85	Sh/Clst: m gy to m ol gy			0018-1L
		5	Sh/Clst: lt gn gy			0018-3L
		5	Kaolin : w			0018-4L
		5	Other : brn, dd			0018-5L
		tr	Other : y, pyr			0018-2L

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Table 2 : Lithology description for well NOCS 2/2-5

Depth unit of measure: m

Depth	Type	Grp	Frm	Age	Trb	Sample
Int	Cvd	TOC%	%	Lithology description		
2860.00						0019
	1.47	50	Sh/Clst:	m gy to m ol gy		0019-1L
		25	S/Sst	: pl gy w		0019-7L
		10	Sh/Clst:	m drk gy		0019-6L
		5	Sh/Clst:	lt gn gy		0019-3L
		5	Kaolin	: w		0019-4L
		5	Other	: brn, dd		0019-5L
		tr	Other	: y, pyr		0019-2L
2900.00						0020
		60	Sh/Clst:	m lt gy to m lt ol gy		0020-1L
		30	Marl	: lt gy		0020-5L
		5	Sh/Clst:	lt gn gy		0020-3L
		5	Sh/Clst:	brn		0020-4L
		tr	Other	: y, pyr		0020-2L
2940.00						0021
	0.15	50	Ca	: w, dol		0021-3L
		45	Sh/Clst:	m lt gy to m lt ol gy		0021-1L
		5	Sh/Clst:	brn		0021-2L
2980.00						0022
		65	Ca	: w, dol		0022-3L
		35	Sh/Clst:	m lt gy to m lt ol gy		0022-1L
		tr	Sh/Clst:	brn		0022-2L
2990.00						0023
		85	Ca	: w, dol		0023-3L
		15	Sh/Clst:	m lt gy to m lt ol gy		0023-1L
		tr	Sh/Clst:	brn		0023-2L

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Table 2 : Lithology description for well NOCS 2/2-5

Depth unit of measure: m

Depth	Type	Grp	Frm	Age	Trb	Sample	
Int Cvd	TOC%	%	Lithology description				
3000.00						0024	
		95	Ca	: w, dol		0024-2L	
		5	Sh/Clst:	m lt gy to m lt ol gy		0024-1L	
3010.00						0025	
		95	Ca	: w, dol		0025-2L	
		5	Sh/Clst:	m lt gy to m lt ol gy		0025-1L	
3020.00						0026	
		95	Ca	: w, dol		0026-2L	
		5	Sh/Clst:	m lt gy to m lt ol gy		0026-1L	
3030.00						0027	
		95	Ca	: w, dol		0027-2L	
		5	Sh/Clst:	m lt gy to m lt ol gy		0027-1L	
3040.00						0028	
	0.15	85	Ca	: w, dol		0028-2L	
		15	Sh/Clst:	m lt gy to m lt ol gy		0028-1L	
		tr	Sh/Clst:	brn		0028-3L	
3050.00						0029	
		85	Ca	: w, dol		0029-2L	
		15	Sh/Clst:	m lt gy to m lt ol gy		0029-1L	
		tr	Sh/Clst:	brn		0029-3L	
		tr	Other	: y, pyr		0029-4L	
		tr	Other	: y brn, dd		0029-5L	