

1.7 TESTS

1.7.1 MDT Pressure Data

12 ¼" section Run 1 b 1

Test	Depth mMDBRT	Depth mTVDSS	Mud Hydrostatic (psia)	Formation Pressure	Comment
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			Before	After	(psia)	
1	2787.97	2763,0	6160.04	6156.40	5395.6	Good test
2	2788.96	2764,0	6158.74	6157.26		Tight test
3	2790.08	2765,1	6160.78	6159.41		Tight test
4	2791.13	2766,2	6162.57	6160.91		Tight test
5	2929.25	2904,3	6470.79	6466.98	5817.0	Good test
6	3027.83	3002.9	6684.64	6679.10	6220.0	Tight? /Supercharged?
7	3028.54	3003.6	6679.60	6677.30	6202.3	Good test/Supercharged?
8	3029.3	3004,3	6679.11	6676.64		Tight test
9	3046.68	3021.7	6719.70	6719.90	6185.17	Good test
10	3055.45	3030.5	6738.30	6735.30	6214.75	Good test/probe problem
11	3056.63	3031.7	6737.90	6736.10	6214.47	Good test/probe problem
12	3057.93	3033.0	6739.10	6737.60	6219.20	Good test
13	3059.15	3034.1	6739.66	6737.40	6222.52	Good test
14	3071.15	3046.2	6770.90	6768.60	6230.93	Good test
15	3071.85	3046.8	6770.90	6765.30	6233.00	Overshot on 2 attempts
17	3074.04	3049.1	6771.20	6770.2	6234.85	Good test/rapid build-up
18	3074.86	3049.9	6771.80			Abandoned
19	3083.3	3058.3	6795.10	6791.60	6247.90	Good test
20	3084.13	3059,2	6793.50	6791.80	6249.88	Good test
21	3085.04	3060.1	6793.79	6792.73	6250.40	Good test
22	3089.84	3064.9	6806.89	6802.65	6261.65	Good test/long stabilisation.
23	3101.53	3076.6	6835.57	6830.75	6275.67	Good test/long stabilisation.
24	3102.94	3078.0	6834.21	6833.16	6275.95	Good test
25	3110.76	3085.8	6855.7	6850.63	6290.60	Good test/long stabilisation.
26	3117.95	3093.0	6871.33	6869.19		Tight test
27	3210.05	3185.1	7074.00	7077.44		Tight test
28	3211.85	3186.9	7081.34	7077.13	6822.60	Good test
29	3214.05	3189,1	7082.45	7079.90		Tight test
30	3217.37	3192,4	7088.53	7084.68		Tight test/aborted
31	3220.80	3195,8	7094.70	7091.61	6829.33	Good test
32	3225.05	3200,1	7102.91	7100.61		Tight test/aborted
33	3232.86	3207,9	7122.32	7120.59		Tight test/aborted
34	3235.0	3210.0	7126.22	7124.05		Tight test
35	3235.94	3211.0	7125.80	7121.90	6890.00	Aborted Supercharged
36	3239.96	3215.0	7133.36	7130.29	6891.44	Good test
37	3244.0	3219.0	7142.16	7137.41	6924.55	Good test/ Supercharged?
38	3244.7	3219.7	7138.75	7136.26	6912.00	Good test/slow build-up
39	3245.4	3220.4	7140.12	7136.97		Tight test/aborted
40	2791.0	2766.0	6142.55	6142.26		Tight test
41	2791.5	2766.5	6142.80	6142.80		Tight test
49	2790.8	2765.8	6140.76	6140.21		Tight test
51	2792.4	2767.4	6143.26	6142.21		Very slow build-up

8 ½" section Run 2 c 1

Test	Depth mMDBRT	Depth mTVDSS	Mud Hydrostatic (psia)		Formation Pressure (psia)	Comment
			Before	After		
1	3514	3488.7	6396.70	6397.3	5338.40	Good test
2	3516.2	3490.9	6403.3	6401.6	5338.81	Good test
3	3518.3	3493.0	6405.5	6405.8	5338.20	Supercharged, Inc DD by 10cc, better but not

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						stable
4	3520.3	3520.3	6407.8	6407.83	5339.26	Good test
5	3522.6	3497.3	6411.5	6412.85	5340.14	Good test
6	3524.9	3499.6	6415.6	6415.9	5341.09	Good test
7	3530.1	3502.0	6420.5	6420.21	5342.74	Good test
8	3530.1	3504.8	6425.4	6425.8	5343.84	Good test
9	3532.3	3507.0	6429.8	6429.6	5344.90	Good test
10	3534.5	3509.2	6433.5	6433.6	5345.81	Supercharged, Repeat 10cc + 10cc DD - GOOD TEST
11	3536.1	3510.8	6435.6	6435.8	5346.47	Erratic 1st attempt, reset packer - GOOD TEST
12	3538	3512.7	6439.4	6440.05	5347.24	Good test
13	3539.9	3514.6	6442.01	6442.06	5348.10	Good test
14	3541.7	3516.4	6445.18	6445.43	5348.63	Good test
15	3543.2	3517.9	6448.52	6448.38	5350.02	Good test
16	3545.5	3520.2	6452.51	6452.68	5352.16	Good test
17	3547.7	3522.4	6455.89	6455.77	5354.07	Good test
18	3549.8	3524.5	6459.50	6459.34	5355.70	Good test
19	3553.0	3527.7	6466.09	6465.73	5358.82	Initially pressure wouldn't stabilise, reset probe - Good test
20	3556.0	3530.7	6470.95	6470.39	5361.33	Good test
21	3559.6	3534.3	6477.12	6476.89	5364.64	Good test
22	3562.6	3537.3	6483.07	6482.85	5367.36	Good test
23	3565.6	3540.3	6488.45	6488.39	5370.04	Pressure initially stable, then unstable reset probe - OK slight leak before probe retracted.
24	3567.4	3542.1	6491.41	6491.38	5371.91	Good test
25	3569.1	3543.8	6494.76	6494.53	5373.13	Good test
26	3574.8	3549.5	6505.04	6504.62	5378.59	Good test (Base Garn)
27	3582.7	3557.4	6519.46	6519.11	5387.34	Unstable, retracted and reset probe - Good test (Not Formation)
28	3610.7	3585.4	6570.08	6570.19	5423.71	Good test (Top Ile)
29	3615.7	3590.4	6579.33	6579.55	5431.35	Unstable, retracted and reset probe - Good test
30	3617.4	3592.1	6582.05	6582.55	5433.23	Unstable pressure, DD another 10cc, still unstable, retract and reset probe - OK.
31	3619.6	3594.3	6586.24	6586.96	5436.10	Unstable, retracted and reset probe - Good test
32	3621.6	3596.3	6590.55	-	5440.67	Unstable pressure, DD another 10cc, still unstable, retract and reset probe

Run 2 c 2

Test	Depth mMDBRT	Depth mTVDS	Mud Hydrostatic (psia)		Formation Pressure (psia)	Comment
			Before	After		
33	3562.6	3537.3	6481.60	6481.60	5367.34	Calibration check - correlation within 0.02psi.
34	3567.4	3542.1	6491.00	6491.00	5371.58	Calibration check - Good
35	3572.0	3546.7	6499.90	6499.29	5376.35	Good test
36	3575.8	3550.5	6506.40	6506.38	5379.38	Good test

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37	3582.7	3557.4	6519.00	6518.99	5387.16	Good test
38	3587.5	3562.2	6528.20	6527.44		Supercharged
39	3610.7	3585.4	6569.50	6569.40		Calibration check - 3.5PSI TOO HIGH
40	3619.6	3594.3	6586.30	6586.30	5436.14	Calibration check - Supercharged 3.5cc, retract & reset 10cc - Good test
41	3623.8	3598.5	6594.50	6594.30	5443.47	Good test
42	3625.7	3600.4	6597.60	6597.60	5445.04	Good test
43	3627.3	3602.0	6601.00	6600.50		Tight test (2.3cc + 1.3cc DD)
44	3629.0	3603.7	6604.70	6603.90		Tight test (1.3cc + 2.8cc DD)
45	3679.7	3654.3	6697.50	6696.90		Tight test (2.8cc DD)
46	3688.1	3662.7	6712.50	6712.20	5553.60	Good test
47	3690.3	3664.9	6715.70	6715.60	5556.72	Good test
48	3693.6	3668.2	6724.40	6723.60		Supercharged
49	3696.8	3671.4	6729.30	6728.00	5572.80	Good test
50	3698.9	3673.5	6732.40	6732.70	5576.90	Good test
51	3700.4	3675.0	6735.60	6735.20	5570.80	Good test - pressure low by 7-8psi.
52	3703.6	3678.2	6740.90	6740.90	5577.43	Good test
53	3706.7	3681.3	6747.90	6747.60		Supercharged (1.8cc + 1.3cc DD)
54	3711.5	3686.1	6755.90	6755.70	5586.40	Good test
55	3713.2	3687.8	6757.20	6759.20		LOST SEAL
56	3714.8	3689.4	6763.00	6762.70	5592.57	Good test
57	3718.1	3692.7	6768.70	6768.60		Supercharged (2.3cc DD)
58	3724.8	3699.4	6780.20	6781.30		Tight test (2.2cc DD) - very slow build
59	3727.7	3702.3	6786.50	6787.10	5624.40	Good test - 6 MINUTES BUILD UP TIME
60	3730.7	3705.3	6792.20	6791.80		Supercharged (2.9cc + 4.9cc DD)
61	3736.6	3711.1	6803.00	6803.90		Supercharged (3.7cc DD)
62	3738.3	3712.8	6806.00	6806.00	5648.70	Probably Supercharged (3.0cc + 2.2cc DD) 8 psi higher than expected
63	3740.7	3715.2	6809.60	6808.20	5653.80	Good test (4.9cc, slightly unstable)
64	3742.2	3716.7	6812.20	6213.30		Supercharged (2.6cc + 4.9cc DD)
65	3748.3	3722.8	6823.10	6824.89		Supercharged (3.0cc + 2.0cc DD)
66	3752.8	3727.3	6833.00	6832.80		Tight test
Test	Depth mMDBRT	Depth mTVDS	Mud Hydrostatic (psia)		Formation Pressure (psia)	Comment
			Before	After		
67	3758.8	3733.3	6844.50	6844.50		Tight test (1.1cc)
68	3773.1	3747.5	6871.30	6870.70		Tight test (1.8cc)
69	3786.3	3760.6	6899.60	6897.60		GR Correlation (-0.8m correction), TIGHT (1.8cc)
70	3792.1	3766.4	6908.30	6907.10	6054.90	2.3cc + 1.1cc, Supercharged?

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71	3811.5	3785.7	6945.40	6945.70	5884.10	20cc Vol, Pressure unstable, retract and reset probe - OK, Supercharged?
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1.7.2 MDT Sampling Data

12 ¼" section

Tool Set	Depth mBRT	Depth mTVDSS	Mobility Md/cp	Hydrostatic psia	Initial Pressure psia	Flowing Pressure psia	Shutin Pressure psia	Volume cm ³	Comments
1	3055.2	3030.2	16.3	6738	6213.5	5550.0	8213.0	2 ¾ Gal	T 100.6 ° C, dd 664
2	3055.2	3030.2	16.3	6738	6213.5	5770.0	6214.0	250	T 100.6 ° C,

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									dd 444
3	3055.2	3030.2	16.3	6738	6213.5	5740.0	6214.0	450	T 100.7 ° C, dd 474
4	3055.2	3030.2	16.3	6738	6213.5	5670.0	6214.0	450	T 100.8 ° C, dd 554
5	3055.2	3030.2	16.3	6738	6213.5	5740.0	6214.0	450	T 100.8 ° C, dd 474
6	3055.2	3030.2	16.3	6738	6213.5	5860.0	8997.0	250	T 100.9 ° C, dd 354
7	3083.0	3058	1393.	6795	6247.42	6240.0	8997.0	450	T 102.6 ° C, dd 7
8	3083.0	3058	1393.2	6795	6247.42	6240.0	8997.0	450	T 102.9 ° C, dd 7
9	3083.0	3058	1393.2	6795	6247.42	6240.0	9825.0	450	T 102.9 ° C, dd 7
10	3220.8	3195.8	14.0	7094.7	6824.65	6100.0	6825.0	2 ¾ Gal	T 108.2 ° C, dd 725
11	3220.8	3195.8	14.0	7094.7	6824.65	6460.0	8100.0	250	T 108.4 ° C, dd 365
12	3220.8	3195.8	14.0	7094.7	6824.65	6390.0	10075.0	450	T 108.2 ° C, dd 435
13	3220.8	3195.8	14.0	7094.7	6824.65	6400.0	10075.0	450	T 108.2 ° C, dd 425
14	3220.8	3195.8	14.0	7094.7	6824.65	6400.0		450	T 108.2 ° C, dd 425

8 ½" section

Tool Set	Depth mBRT	Depth mTVDSS	Mobility Md/cp	Hydrostatic psia	Initial Pressure psia	Flowing Pressure psia	Shutin Pressure psia	Volume cm ³	Comments
1	3559.8	3534.5	891	6476.0	5364,93	5359.0	8928.0	2 ¾ Gal	T 126.0 ° C, dd 5.9
2	3559.8	3534.5	891	6476.0	5364,93	5359.0	6476.0	250	T 126.0 ° C, dd 5.9
3	3559.8	3534.5	891	6476.0	5364,93	5359.0	9004.0	450	T 126.0 ° C,

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									dd 5.9
4	3559.8	3534.5	891	6476.0	5364.93	5359.0	9004.0	450	T 126.0 ° C, dd 5.9
5	3559.8	3534.5	891	6476.0	5364.93	5359.0	6476.0	250	T 126.0 ° C, dd 5.9
6	3582.7	3557.4	2058.7	6520.7	5389.7	3331.0			No sample
7	3514.0	3488.7	488.7	6391.7	5336.4	5327.5	6392.0	250	T 120.4 ° C, dd 8.9
8	3514.0	3488.7	84.9	6393.5	5337.15	5325.0	10445.0	450	T 123.5 ° C, dd 12.1
9	3514.0	3488.7	84.9	6393.5	5337.15	5326.0	9988.0	450	T 123.5° C, dd 11.1
10	3514.0	3488.7	84.9	6393.5	5337.15	5287.0	6394.0	250	T 123.7 ° C, dd 50.1
11	3514.0	3488.7	84.9	6393.5	5337.15	5300.0	10749.0	1 Gal	T 123.8 ° C, dd 37.1
12	3514.0	3488.7	84.9	6393.5	5337.15	5317.0	8617.0	2 ¾ Gal	T 124.0 ° C, dd 20.1
13	3575.4	3550.1	143.8	6503.47	5379.4	4710	8727.0	450	T 128.6 ° C, dd 669.4

1.7.3 DST Pressure Test Data

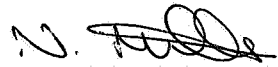
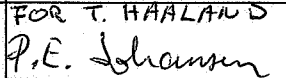
The well was plugged and abandoned, with a sidetrack 6507/5-4A drilled from 1480 mBRT.

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1 Introduction

A total of 14 core chip samples from well 6507/5-4 were received. Selected samples have been analysed by Rock-Eval, Gas Chromatography (GC), Gas Chromatography-Mass Spectrometry (GC-MS) and Sr isotope ratios. Table 1 gives an overview of analyses performed on the different samples.

Table 1. Analyses performed on samples from 6507/5-4.

Sample type	Depth (m)	APT ID	Analyses			
			Sr	Rock-Eval	GC	GC-MS
COCH	3523.0	11596	✓	✓	✓	✓
COCH	3542.7	11597	✓	✓	✓	✓
COCH	3544.0	11598		✓		
COCH	3563.0	11599	✓			
COCH	3567.7	11600	✓	✓	✓	✓
COCH	3569.0	11601	✓	✓		
COCH	3578.0	11602	✓	✓	✓	✓
COCH	3595.0	11603		✓	✓	✓
COCH	3606.0	11604	✓	✓	✓	✓
COCH	3617.0	11605	✓	✓	✓	✓
COCH	3624.0	11606	✓	✓	✓	✓
COCH	3681.0	11607	✓		✓	✓
COCH	3703.7	11608	✓		✓	✓
COCH	3717.7	11609	✓		✓	✓

2 Analytical procedures

2.1 Sr isotopes

The samples were disaggregated by gentle crushing, in order to expose the salts left behind after evaporation of the formation water in the cores, then leached with 10 ml of water (Millipore Milli Q water purification system) for 30 minutes. 7 ml of the leachate was removed and centrifuged. From the centrifugate 5 ml was pipetted off and evaporated to dryness. The residue was dissolved in 3 M HNO₃ and loaded onto ion exchange columns packed with crown ether resin, which retained Sr and allowed most other elements to pass. After rinsing out the remaining unwanted elements from the columns, Sr was washed out with water and the collected Sr fractions were evaporated to dryness. The isotopic composition of Sr was determined by thermal ionization mass spectrometry (TIMS) on a Finnigan MAT 261. The NBS 987 std gave $0,71026 \pm 0,00003$ during the period of analysis.

2.2 Rock-Eval

The samples were crushed in a mortar, and weighed directly into Rock-Eval vials before analyses on a Rock-Eval 6 instrument. The analysis is performed in two steps, pyrolysis and oxidation, when TOC is measured. The temperature programs used were:

Pyrolysis 300 °C (3 min) – 25°C/min – 650 °C (0 min.)

Oxidation 400 °C (3 min) – 25°C/min – 850 °C (5 min.)

2.3 Extraction of COCH

The samples were crushed in a mortar and about 10 g of each sample were extracted in an ultrasonic bath for 15 minutes using 60 ml dichloromethane (with 7% methanol) as solvent. The extracts were then evaporated almost to dryness, and 2 ml of hexane were added to each sample. These extracts were then analysed by GC and GC-MS.

2.4 GC

The samples were analysed on a HP 5890 series II GC equipped with a HP 7673 automatic injector. The column used was a WCOT fused silica CP-SIL 5 CB-MS (25 m, 0,25 mm ID, DF=0,25). The temperature program used was: 50 °C (1 min) – 4°C/min – 310 °C (25 min.).

2.5 GC-MS

The samples were analysed on a ProSpec mass spectrometer equipped with a HP 6890 Plus GC using a HP 6890 automatic injector. The resolution of the instrument was 3000, which is enough to separate aliphatic and aromatic compounds. The column used was a WCOT fused silica CP-SIL 5 CB-MS (60 m, 0,25 mm ID, DF=0,25). The temperature program used was: 50 °C (1 min) – 20°C/min – 120 °C – 2 °C/min – 310 °C (25 min.).

3 Results

3.1 Sr isotopes

Depth	APT ID	$^{87}\text{Sr} / ^{86}\text{Sr}$	+/- 2s
3523.0	11596	0.7152	0.000100
3542.7	11597	0.7198	0.000100
3563.0	11599	0.7214	0.000035
3567.7	11600	0.7220	0.000057
3569.0	11601	0.7219	0.000100
3578.0	11602	0.7221	0.000026
3606.0	11604	0.7215	0.000119
3617.0	11605	0.7218	0.000100
3624.0	11606	0.7216	0.000073
3681.0	11607	0.7218	0.000017
3703.7	11608	0.7218	0.000037
3717.7	11609	0.7210	0.000094

3.2 Rock-Eval

Well	APT ID	Depth	S1 (mg/g)	S2 (mg/g)	S3 (mg/g)	Tmax (°C)	PP (mg/g)	PI (wt ratio)	HI (mg HC/g TOC)	OI (mg CO2/g TOC)	TOC (%)
6507/5-4	11596	3523.0	0.5	0.25	0.17	537	0.76	0.67	358.57	242.86	0.07
6507/5-4	11597	3542.7	7.72	1.53	0.03	290	9.25	0.83	198.96	3.9	0.77
6507/5-4	11598	3544.0	6.45	1.5	0.05	306	7.95	0.81	227.42	7.58	0.66
6507/5-4	11600	3567.7	18.38	4.51	0.03	294	22.89	0.8	237.58	1.58	1.9
6507/5-4	11601	3569.0	17.11	4.07	0.07	291	21.17	0.81	231.02	3.98	1.76
6507/5-4	11602	3578.0	3.4	1.37	0.13	409	4.78	0.71	343.25	32.5	0.4
6507/5-4	11603	3595.0	0.41	5.68	0.16	452	6.09	0.07	1092.31	30.77	0.52
6507/5-4	11604	3606.0	1.27	1.23	0.28	337	2.49	0.51	583.33	133.33	0.21
6507/5-4	11605	3617.0	1.26	0.76	0.08	438	2.02	0.62	447.06	47.06	0.17
6507/5-4	11606	3624.0	0.6	0.84	0.16	439	1.44	0.42	699.17	133.33	0.12

3.3 GC peak areas of individual compounds

Well	Depth (m)	APT no	n-C10	n-C11	n-C12	i-C13	i-C14	n-C13	i-C15	n-C14	i-C16	n-C15	n-C16	i-C18	n-C17	Pr	n-C18	Ph	n-C19
6507/5-4	3523.0	11 596	2.93E+2	1.35E+3	8.08E+3	2.46E+3	1.66E+3	1.65E+4	6.44E+3	2.33E+4	9.90E+3	2.25E+4	1.91E+4	7.34E+3	1.60E+4	1.34E+4	1.25E+4	7.92E+3	1.05E+4
6507/5-4	3542.7	11 597	5.12E+4	8.84E+4	9.63E+4	2.63E+4	3.39E+4	9.92E+4	3.03E+4	1.19E+5	4.40E+4	1.10E+5	9.91E+4	3.84E+4	9.44E+4	7.70E+4	8.57E+4	5.19E+4	8.37E+4
6507/5-4	3567.7	11 600	2.83E+4	4.20E+4	4.45E+4	1.17E+4	1.66E+4	4.58E+4	1.37E+4	5.47E+4	2.02E+4	4.94E+4	4.46E+4	1.79E+4	4.20E+4	3.51E+4	3.54E+4	2.13E+4	3.42E+4
6507/5-4	3578.0	11 602	1.49E+4	3.55E+4	4.65E+4	1.22E+4	1.86E+4	5.16E+4	1.64E+4	6.42E+4	2.45E+4	5.94E+4	5.46E+4	2.27E+4	5.36E+4	4.55E+4	4.78E+4	2.86E+4	4.50E+4
6507/5-4	3595.0	11 603	3.27E+3	4.74E+3	5.08E+3	8.09E+2	1.22E+4	5.65E+3	1.09E+3	1.14E+4	2.11E+3	7.32E+3	6.02E+3	1.83E+3	6.78E+3	8.15E+3	5.52E+3	8.82E+2	6.69E+3
6507/5-4	3606.0	11 604	3.62E+3	9.64E+3	1.44E+4	3.86E+3	7.06E+3	1.78E+4	6.07E+3	2.38E+4	9.27E+3	2.34E+4	2.17E+4	8.39E+3	2.02E+4	1.76E+4	1.76E+4	1.12E+4	1.72E+4
6507/5-4	3617.0	11 605	3.35E+3	9.06E+3	1.42E+4	3.72E+3	6.83E+3	1.72E+4	6.02E+3	2.35E+4	8.74E+3	2.26E+4	2.17E+4	8.85E+3	2.09E+4	1.84E+4	1.84E+4	1.16E+4	1.81E+4
6507/5-4	3624.0	11 606	2.06E+3	6.02E+3	9.71E+3	2.50E+3	4.76E+3	1.20E+4	4.09E+3	1.59E+4	5.94E+3	1.49E+4	1.38E+4	5.28E+3	1.29E+4	1.11E+4	1.17E+4	7.41E+3	1.11E+4
6507/5-4	3681.0	11 607	6.84E+3	1.18E+4	1.49E+4	3.79E+3	5.77E+3	1.63E+4	5.48E+3	2.24E+4	7.38E+3	2.05E+4	1.91E+4	7.33E+3	1.89E+4	1.57E+4	1.71E+4	1.00E+4	1.66E+4
6507/5-4	3703.7	11 608	8.62E+3	1.71E+4	2.33E+4	6.04E+3	1.04E+4	2.74E+4	8.61E+3	3.88E+4	1.31E+4	3.60E+4	3.32E+4	1.30E+4	3.31E+4	2.48E+4	2.93E+4	1.54E+4	2.78E+4
6507/5-4	3717.7	11 609	2.24E+4	4.59E+4	5.75E+4	1.47E+4	2.26E+4	6.56E+4	1.97E+4	8.45E+4	3.06E+4	7.82E+4	7.13E+4	2.73E+4	6.64E+4	5.18E+4	5.80E+4	2.92E+4	5.57E+4

Well	Depth (m)	APT no	n-C20	n-C21	n-C22	n-C23	n-C24	n-C25	n-C26	n-C27	n-C28	n-C29	n-C30	n-C31	n-C32	n-C33	n-C34	n-C35	n-C36
6507/5-4	3523.0	11 596	1.05E+4	8.26E+3	6.88E+3	6.03E+3	5.09E+3	4.16E+3	3.55E+3	2.57E+3	2.03E+3	1.84E+3	1.30E+3	8.55E+2	7.03E+2	4.26E+2	4.31E+2	0.00E+0	0.00E+0
6507/5-4	3542.7	11 597	8.63E+4	7.69E+4	7.77E+4	7.09E+4	6.85E+4	6.23E+4	5.54E+4	4.82E+4	4.20E+4	3.99E+4	3.20E+4	2.47E+4	1.87E+4	1.70E+4	2.63E+4	1.42E+4	7.36E+3
6507/5-4	3567.7	11 600	3.41E+4	3.13E+4	3.19E+4	2.91E+4	2.83E+4	2.54E+4	2.24E+4	1.92E+4	1.81E+4	1.68E+4	1.35E+4	1.01E+4	8.16E+3	7.35E+3	1.12E+4	6.30E+3	3.31E+3
6507/5-4	3578.0	11 602	4.46E+4	4.14E+4	4.20E+4	3.80E+4	3.76E+4	3.41E+4	2.94E+4	2.65E+4	2.36E+4	2.23E+4	1.74E+4	1.34E+4	1.09E+4	9.36E+3	1.32E+4	8.07E+3	4.08E+3
6507/5-4	3595.0	11 603	5.40E+3	5.74E+3	5.22E+3	5.20E+3	4.38E+3	4.15E+3	3.69E+3	3.69E+3	2.62E+3	3.01E+3	2.10E+3	1.74E+3	1.02E+3	8.16E+2	5.40E+2	3.09E+2	1.24E+2
6507/5-4	3606.0	11 604	1.73E+4	1.58E+4	1.63E+4	1.51E+4	1.51E+4	1.36E+4	1.24E+4	1.10E+4	9.82E+3	9.96E+3	7.89E+3	5.94E+3	4.75E+3	4.15E+3	5.64E+3	2.86E+3	1.78E+3
6507/5-4	3617.0	11 605	1.79E+4	1.68E+4	1.76E+4	1.64E+4	1.65E+4	1.49E+4	1.36E+4	1.21E+4	1.08E+4	1.04E+4	8.22E+3	6.52E+3	5.22E+3	4.37E+3	6.26E+3	3.14E+3	1.94E+3
6507/5-4	3624.0	11 606	1.10E+4	1.02E+4	1.08E+4	1.01E+4	1.01E+4	9.04E+3	8.24E+3	7.28E+3	6.50E+3	6.54E+3	5.09E+3	4.01E+3	3.18E+3	2.82E+3	3.62E+3	2.63E+3	1.09E+3
6507/5-4	3681.0	11 607	1.82E+4	1.58E+4	1.60E+4	1.50E+4	1.47E+4	1.28E+4	1.21E+4	1.04E+4	9.07E+3	9.27E+3	7.10E+3	5.81E+3	4.83E+3	3.99E+3	4.88E+3	2.10E+3	1.10E+3
6507/5-4	3703.7	11 608	2.79E+4	2.60E+4	2.70E+4	2.49E+4	2.47E+4	2.22E+4	1.96E+4	1.66E+4	1.43E+4	1.38E+4	1.13E+4	9.30E+3	7.03E+3	6.14E+3	8.40E+3	3.60E+3	1.99E+3
6507/5-4	3717.7	11 609	5.45E+4	5.02E+4	5.13E+4	4.63E+4	4.57E+4	4.08E+4	3.64E+4	3.31E+4	2.95E+4	2.77E+4	2.26E+4	1.73E+4	1.44E+4	1.23E+4	1.82E+4	9.97E+3	5.54E+3

3.4 GC-MS peak height of saturated compounds

m/z 177.1643					m/z 191.1800													
Well	Depth	APT no	25nor28ab	25nor30ab	20/3	21/3	23/3	24/3	25/3R	25/3S	24/4	26/3R	26/3S	28/3R	28/3S	29/3R	29/3S	27Ts
6507/5-4	3523.0	11 596	2.20E+5	2.00E+4	1.49E+5	1.44E+5	2.48E+5	2.14E+5	7.87E+4	8.45E+4	1.66E+5	5.92E+4	5.41E+4	4.87E+4	4.23E+4	6.93E+4	6.68E+4	3.49E+5
6507/5-4	3542.7	11 597	4.19E+6	5.77E+5	1.12E+6	1.29E+6	2.60E+6	2.29E+6	1.02E+6	1.05E+6	2.40E+6	7.43E+5	7.10E+5	7.11E+5	7.10E+5	1.19E+6	1.14E+6	6.29E+6
6507/5-4	3567.7	11 600	3.47E+6	5.23E+5	9.08E+5	1.02E+6	2.08E+6	1.80E+6	7.92E+5	8.24E+5	2.02E+6	6.23E+5	5.60E+5	6.30E+5	5.93E+5	1.06E+6	1.00E+6	5.41E+6
6507/5-4	3578.0	11 602	2.47E+6	3.27E+5	7.27E+5	8.12E+5	1.57E+6	1.42E+6	6.03E+5	6.28E+5	1.51E+6	4.65E+5	4.36E+5	4.41E+5	4.45E+5	7.13E+5	7.15E+5	3.90E+6
6507/5-4	3595.0	11 603	1.68E+4	0.00E+0	1.14E+5	5.49E+4	4.44E+4	2.22E+4	8.42E+3	6.84E+3	3.86E+5	8.68E+3	1.15E+4	1.00E+4	1.32E+4	7.32E+3	1.15E+4	3.53E+5
6507/5-4	3606.0	11 604	2.48E+6	3.54E+5	5.74E+5	6.79E+5	1.35E+6	1.18E+6	5.09E+5	5.61E+5	1.38E+6	3.77E+5	3.60E+5	3.67E+5	3.77E+5	6.47E+5	6.31E+5	3.52E+6
6507/5-4	3617.0	11 605	1.91E+6	2.87E+5	4.73E+5	5.40E+5	1.02E+6	9.38E+5	3.97E+5	4.15E+5	1.07E+6	2.95E+5	3.00E+5	2.79E+5	2.87E+5	4.62E+5	4.55E+5	2.82E+6
6507/5-4	3624.0	11 606	1.69E+6	2.37E+5	4.09E+5	4.74E+5	8.70E+5	8.02E+5	3.49E+5	3.64E+5	9.51E+5	2.58E+5	2.47E+5	2.49E+5	2.45E+5	4.12E+5	4.23E+5	2.44E+6
6507/5-4	3681.0	11 607	1.66E+6	2.50E+5	5.19E+5	6.05E+5	1.16E+6	1.03E+6	4.30E+5	4.56E+5	1.17E+6	3.32E+5	3.28E+5	3.02E+5	3.00E+5	5.09E+5	4.92E+5	3.14E+6
6507/5-4	3703.7	11 608	2.11E+6	3.61E+5	7.43E+5	8.01E+5	1.58E+6	1.43E+6	6.36E+5	6.81E+5	1.49E+6	4.92E+5	4.75E+5	4.97E+5	5.04E+5	8.56E+5	8.19E+5	4.82E+6
6507/5-4	3717.7	11 609	2.55E+6	4.77E+5	9.16E+5	9.80E+5	1.97E+6	1.82E+6	7.84E+5	8.20E+5	2.03E+6	6.15E+5	5.77E+5	6.30E+5	6.21E+5	1.07E+6	9.94E+5	5.90E+6

m/z 191.1800																		
Well	Depth	APT no	27Tm	30/3R	30/3S	28ab	25nor30ab	29ab	29Ts	30d	29ba	300	30ab	30ba	31abS	31abR	30G	32abS
6507/5-4	3523.0	11 596	2.66E+5	5.66E+4	4.00E+4	3.44E+5	3.48E+4	7.26E+5	2.93E+5	1.41E+5	0.00E+0	0.00E+0	1.57E+6	1.34E+5	6.00E+5	4.22E+5	4.60E+4	3.91E+5
6507/5-4	3542.7	11 597	5.18E+6	9.25E+5	8.57E+5	6.81E+6	6.53E+5	1.50E+7	6.03E+6	2.94E+6	0.00E+0	0.00E+0	3.31E+7	3.07E+6	1.40E+7	9.90E+6	1.28E+6	9.37E+6
6507/5-4	3567.7	11 600	4.16E+6	7.79E+5	7.17E+5	5.51E+6	5.74E+5	1.22E+7	5.06E+6	2.53E+6	0.00E+0	0.00E+0	2.82E+7	2.54E+6	1.18E+7	8.57E+6	1.08E+6	8.32E+6
6507/5-4	3578.0	11 602	3.31E+6	5.74E+5	5.17E+5	4.35E+6	4.18E+5	9.60E+6	3.75E+6	1.78E+6	0.00E+0	0.00E+0	2.07E+7	1.92E+6	9.07E+6	6.31E+6	7.54E+5	5.89E+6
6507/5-4	3595.0	11 603	1.14E+6	0.00E+0	0.00E+0	4.40E+4	0.00E+0	3.29E+6	8.00E+5	4.44E+5	0.00E+0	0.00E+0	5.59E+6	1.03E+6	2.77E+6	1.88E+6	1.02E+5	1.43E+6
6507/5-4	3606.0	11 604	3.21E+6	5.35E+5	4.78E+5	4.27E+6	4.09E+5	9.57E+6	3.53E+6	1.56E+6	0.00E+0	0.00E+0	2.14E+7	1.94E+6	9.31E+6	6.47E+6	8.01E+5	6.16E+6
6507/5-4	3617.0	11 605	2.32E+6	3.60E+5	3.24E+5	3.19E+6	3.10E+5	7.04E+6	2.75E+6	1.14E+6	0.00E+0	0.00E+0	1.57E+7	1.44E+6	6.64E+6	4.59E+6	5.53E+5	4.37E+6
6507/5-4	3624.0	11 606	2.08E+6	3.48E+5	3.05E+5	2.91E+6	2.55E+5	6.13E+6	2.34E+6	1.05E+6	0.00E+0	0.00E+0	1.41E+7	1.30E+6	6.03E+6	4.12E+6	5.27E+5	4.04E+6
6507/5-4	3681.0	11 607	2.50E+6	4.05E+5	3.69E+5	3.44E+6	2.90E+5	7.16E+6	2.97E+6	1.37E+6	0.00E+0	0.00E+0	1.67E+7	1.51E+6	6.88E+6	4.93E+6	6.23E+5	4.57E+6
6507/5-4	3703.7	11 608	2.84E+6	6.76E+5	5.60E+5	3.50E+6	4.04E+5	7.88E+6	4.10E+6	2.09E+6	0.00E+0	0.00E+0	1.95E+7	1.78E+6	7.53E+6	5.47E+6	8.13E+5	5.07E+6
6507/5-4	3717.7	11 609	3.73E+6	8.27E+5	7.03E+5	4.39E+6	5.14E+5	1.03E+7	5.13E+6	2.57E+6	0.00E+0	0.00E+0	2.48E+7	2.32E+6	9.36E+6	6.97E+6	1.01E+6	6.51E+6

GC-MS peak heights of saturated compounds, continued

m/z 191.1800

Well	Depth	APT no	33αβS	33αβR	34αβS	34αβR	35αβS	35αβR
6507/5-4	3523.0	11 596	2.48E+5	1.60E+5	1.48E+5	9.04E+4	1.32E+5	8.11E+4
6507/5-4	3542.7	11 597	5.97E+6	3.80E+6	3.85E+6	2.45E+6	3.54E+6	2.34E+6
6507/5-4	3567.7	11 600	5.58E+6	3.72E+6	3.77E+6	2.49E+6	3.77E+6	2.37E+6
6507/5-4	3578.0	11 602	3.92E+6	2.54E+6	2.59E+6	1.68E+6	2.50E+6	1.58E+6
6507/5-4	3595.0	11 603	7.77E+5	5.09E+5	4.69E+5	2.96E+5	1.78E+5	1.30E+5
6507/5-4	3606.0	11 604	4.26E+6	2.77E+6	2.86E+6	1.80E+6	2.82E+6	1.76E+6
6507/5-4	3617.0	11 605	2.86E+6	1.84E+6	1.87E+6	1.18E+6	1.69E+6	1.12E+6
6507/5-4	3624.0	11 606	2.72E+6	1.78E+6	1.82E+6	1.17E+6	1.75E+6	1.15E+6
6507/5-4	3681.0	11 607	2.96E+6	1.92E+6	1.89E+6	1.20E+6	1.84E+6	1.12E+6
6507/5-4	3703.7	11 608	3.42E+6	2.17E+6	2.18E+6	1.39E+6	2.04E+6	1.32E+6
6507/5-4	3717.7	11 609	4.37E+6	2.81E+6	2.79E+6	1.78E+6	2.61E+6	1.71E+6

m/z 217.1956

21αα	21ββ	22αα	22ββ	27δβS	27δβR	27ααR	27ααS	28δβS#1	28δβS#2
2.97E+5	2.74E+5	2.37E+5	1.42E+5	4.66E+5	2.67E+5	9.69E+4	1.28E+5	1.88E+5	1.89E+5
2.65E+6	2.82E+6	2.33E+6	1.71E+6	6.71E+6	4.02E+6	1.61E+6	2.09E+6	3.14E+6	2.97E+6
2.08E+6	2.20E+6	1.85E+6	1.35E+6	5.57E+6	3.27E+6	1.36E+6	1.69E+6	2.57E+6	2.45E+6
1.52E+6	1.56E+6	1.22E+6	9.77E+5	3.75E+6	2.30E+6	9.40E+5	1.15E+6	1.66E+6	1.62E+6
7.69E+4	6.80E+4	4.22E+4	2.43E+4	1.41E+5	8.01E+4	3.60E+4	4.81E+4	5.90E+4	5.59E+4
1.42E+6	1.51E+6	1.16E+6	9.35E+5	3.71E+6	2.18E+6	9.08E+5	1.08E+6	1.68E+6	1.56E+6
1.08E+6	1.18E+6	8.85E+5	7.09E+5	2.67E+6	1.66E+6	6.48E+5	8.27E+5	1.26E+6	1.21E+6
9.44E+5	1.00E+6	7.83E+5	6.09E+5	2.40E+6	1.50E+6	5.86E+5	7.55E+5	1.11E+6	1.06E+6
1.18E+6	1.30E+6	1.03E+6	7.68E+5	3.08E+6	1.84E+6	7.58E+5	9.37E+5	1.41E+6	1.37E+6
1.68E+6	1.76E+6	1.60E+6	1.02E+6	4.56E+6	2.81E+6	1.14E+6	1.47E+6	2.24E+6	2.15E+6
2.08E+6	2.09E+6	1.98E+6	1.24E+6	5.77E+6	3.50E+6	1.40E+6	1.80E+6	2.72E+6	2.62E+6

m/z 217.1956

Well	Depth	APT no	28δβR#1	28δβR#2	28ααR	27ααS	27ββR+ 29δβS	27ββS	28ααS	27ααR	29δβR	29ααR	28ααS	29ααS	28ββR	28ββS	28ααR	29ααS	29ββR
6507/5-4	3523.0	11 596	1.12E+5	1.24E+5	8.11E+4	1.11E+5	2.84E+5	1.50E+5	6.15E+4	1.01E+5	1.86E+5	1.11E+5	3.91E+4	9.19E+4	1.25E+5	1.61E+5	5.51E+4	1.08E+5	1.56E+5
6507/5-4	3542.7	11 597	1.88E+6	2.28E+6	1.46E+6	2.00E+6	4.93E+6	2.91E+6	1.12E+6	1.92E+6	3.43E+6	2.13E+6	8.71E+5	1.93E+6	2.48E+6	3.36E+6	1.18E+6	2.31E+6	3.34E+6
6507/5-4	3567.7	11 600	1.58E+6	1.87E+6	1.15E+6	1.67E+6	4.00E+6	2.42E+6	9.28E+5	1.63E+6	2.75E+6	1.73E+6	6.75E+5	1.53E+6	1.99E+6	2.74E+6	1.02E+6	2.01E+6	2.94E+6
6507/5-4	3578.0	11 602	1.05E+6	1.24E+6	8.01E+5	1.13E+6	2.68E+6	1.65E+6	5.87E+5	1.10E+6	1.88E+6	1.13E+6	3.91E+5	9.69E+5	1.30E+6	1.80E+6	6.59E+5	1.32E+6	1.90E+6
6507/5-4	3595.0	11 603	3.29E+4	4.09E+4	2.64E+4	3.24E+4	1.86E+5	2.89E+4	2.94E+4	3.48E+4	1.15E+5	6.05E+4	1.52E+4	7.51E+4	2.96E+4	2.86E+4	1.90E+4	6.84E+4	6.22E+4
6507/5-4	3606.0	11 604	1.00E+6	1.17E+6	7.88E+5	1.13E+6	2.66E+6	1.69E+6	6.13E+5	1.13E+6	1.84E+6	1.15E+6	4.56E+5	1.05E+6	1.39E+6	1.90E+6	7.08E+5	1.34E+6	2.06E+6
6507/5-4	3617.0	11 605	7.42E+5	8.51E+5	5.84E+5	7.82E+5	1.98E+6	1.20E+6	4.59E+5	8.27E+5	1.38E+6	8.49E+5	3.78E+5	8.02E+5	1.05E+6	1.44E+6	4.90E+5	9.57E+5	1.44E+6
6507/5-4	3624.0	11 606	6.74E+5	7.86E+5	5.04E+5	7.31E+5	1.80E+6	1.10E+6	3.83E+5	7.13E+5	1.23E+6	7.49E+5	2.76E+5	6.65E+5	8.68E+5	1.23E+6	4.48E+5	8.94E+5	1.31E+6
6507/5-4	3681.0	11 607	8.46E+5	9.98E+5	6.46E+5	9.02E+5	2.18E+6	1.27E+6	5.03E+5	8.36E+5	1.53E+6	9.47E+5	3.59E+5	8.23E+5	1.10E+6	1.50E+6	5.10E+5	1.02E+6	1.54E+6
6507/5-4	3703.7	11 608	1.23E+6	1.57E+6	9.88E+5	1.16E+6	3.32E+6	1.73E+6	7.82E+5	1.16E+6	2.27E+6	1.47E+6	5.25E+5	1.32E+6	1.44E+6	2.09E+6	6.97E+5	1.35E+6	2.03E+6
6507/5-4	3717.7	11 609	1.54E+6	1.91E+6	1.26E+6	1.47E+6	4.13E+6	2.14E+6	9.51E+5	1.45E+6	2.77E+6	1.83E+6	5.93E+5	1.51E+6	1.79E+6	2.60E+6	8.70E+5	1.75E+6	2.61E+6

GC-MS peak heights of saturated compounds, continued

m/z 217.1956

Well	Depth	APT no	29βPS	29ααR	30ααS	30βPR	30βPS	30ααR
6507/5-4	3523.0	11 596	1.46E+5	7.83E+4	4.92E+4	5.12E+4	3.48E+4	2.42E+4
6507/5-4	3542.7	11 597	3.12E+6	1.75E+6	1.16E+6	1.22E+6	8.88E+5	5.78E+5
6507/5-4	3567.7	11 600	2.67E+6	1.62E+6	9.61E+5	1.09E+6	7.63E+5	5.67E+5
6507/5-4	3578.0	11 602	1.76E+6	1.02E+6	6.50E+5	7.24E+5	4.90E+5	3.60E+5
6507/5-4	3595.0	11 603	5.06E+4	5.53E+4	7.10E+4	1.41E+4	0.00E+0	0.00E+0
6507/5-4	3606.0	11 604	1.87E+6	1.07E+6	7.07E+5	7.98E+5	5.28E+5	4.04E+5
6507/5-4	3617.0	11 605	1.35E+6	7.39E+5	5.04E+5	5.44E+5	3.90E+5	2.61E+5
6507/5-4	3624.0	11 606	1.25E+6	7.18E+5	4.46E+5	4.85E+5	3.45E+5	2.46E+5
6507/5-4	3681.0	11 607	1.42E+6	8.02E+5	5.34E+5	5.40E+5	3.89E+5	2.67E+5
6507/5-4	3703.7	11 608	1.97E+6	1.01E+6	6.74E+5	7.37E+5	5.43E+5	3.41E+5
6507/5-4	3717.7	11 609	2.44E+6	1.31E+6	8.25E+5	9.46E+5	7.03E+5	4.30E+5

m/z 218.2035

27βPR	27βPS	28βPR	28βPS	29βPR	29βPS	30βPR	30βPS
3.16E+5	2.65E+5	2.00E+5	2.39E+5	2.85E+5	2.68E+5	6.76E+4	7.01E+4
5.80E+6	5.12E+6	4.10E+6	4.90E+6	5.92E+6	5.61E+6	1.73E+6	1.66E+6
4.68E+6	4.26E+6	3.45E+6	4.10E+6	5.01E+6	4.88E+6	1.58E+6	1.46E+6
3.13E+6	2.88E+6	2.24E+6	2.74E+6	3.32E+6	3.15E+6	9.83E+5	8.95E+5
6.22E+4	4.47E+4	3.49E+4	4.32E+4	1.01E+5	8.94E+4	0.00E+0	0.00E+0
3.28E+6	2.92E+6	2.43E+6	2.96E+6	3.75E+6	3.53E+6	1.11E+6	1.01E+6
2.45E+6	2.18E+6	1.71E+6	2.13E+6	2.62E+6	2.47E+6	7.23E+5	7.19E+5
2.22E+6	1.99E+6	1.56E+6	1.91E+6	2.46E+6	2.32E+6	7.16E+5	6.60E+5
2.60E+6	2.25E+6	1.86E+6	2.21E+6	2.80E+6	2.62E+6	7.66E+5	7.13E+5
3.39E+6	2.93E+6	2.40E+6	2.95E+6	3.58E+6	3.46E+6	1.03E+6	1.02E+6
4.26E+6	3.70E+6	3.01E+6	3.72E+6	4.55E+6	4.33E+6	1.34E+6	1.30E+6

3.5 GC-MS peak heights of aromatic compounds

m/z 142.0783				
Well	Depth	APT no	2-MN	1-MN
6507/5-4	3523.0	11 596	1.28E+8	9.46E+7
6507/5-4	3542.7	11 597	1.06E+9	7.90E+8
6507/5-4	3567.7	11 600	1.02E+9	7.15E+8
6507/5-4	3578.0	11 602	7.11E+8	4.92E+8
6507/5-4	3595.0	11 603	7.74E+8	5.58E+8
6507/5-4	3606.0	11 604	5.75E+8	3.96E+8
6507/5-4	3617.0	11 605	4.52E+8	3.28E+8
6507/5-4	3624.0	11 606	4.79E+8	3.28E+8
6507/5-4	3681.0	11 607	5.66E+8	3.95E+8
6507/5-4	3703.7	11 608	8.03E+8	5.53E+8
6507/5-4	3717.7	11 609	9.68E+8	7.26E+8

m/z 156.0939														
2-EN	1-EN	2,6-DMN	2,7-DMN	1,3- + 1,7-DMN	1,6-DMN	2,3- + 1,4-DMN	1,5-DMN	1,2-DMN	1,8-DMN	1,3,7-TMN	1,3,6-TMN	1,3,5- + 1,4,6-TMN	2,3,6-TMN	
1.44E+7	6.59E+6	5.14E+7	4.55E+7	1.09E+8	8.61E+7	3.24E+7	2.11E+7	1.66E+7	3.59E+4	3.28E+7	4.17E+7	3.71E+7	2.49E+7	
7.93E+7	3.64E+7	2.23E+8	2.26E+8	5.07E+8	4.12E+8	1.65E+8	1.03E+8	7.89E+7	1.66E+5	1.33E+8	1.73E+8	1.68E+8	1.04E+8	
7.09E+7	3.27E+7	1.99E+8	1.98E+8	4.52E+8	3.73E+8	1.44E+8	8.97E+7	6.98E+7	1.70E+5	1.14E+8	1.52E+8	1.42E+8	9.22E+7	
6.14E+7	3.00E+7	1.75E+8	1.65E+8	4.04E+8	3.22E+8	1.26E+8	8.08E+7	6.57E+7	2.41E+5	9.93E+7	1.34E+8	1.29E+8	8.19E+7	
4.28E+7	2.40E+7	1.27E+8	1.21E+8	2.87E+8	2.36E+8	1.03E+8	5.49E+7	5.76E+7	4.70E+5	4.44E+7	6.29E+7	5.70E+7	4.68E+7	
4.08E+7	2.19E+7	1.12E+8	1.04E+8	2.57E+8	2.05E+8	8.58E+7	5.07E+7	4.77E+7	2.75E+5	6.32E+7	8.48E+7	8.20E+7	5.31E+7	
3.37E+7	1.80E+7	9.45E+7	8.57E+7	2.15E+8	1.70E+8	6.91E+7	4.21E+7	3.79E+7	1.86E+5	5.16E+7	6.85E+7	6.74E+7	4.25E+7	
3.26E+7	1.76E+7	9.00E+7	8.29E+7	2.03E+8	1.67E+8	6.71E+7	4.00E+7	3.79E+7	1.92E+5	4.81E+7	6.42E+7	6.26E+7	3.99E+7	
3.80E+7	1.81E+7	1.14E+8	1.07E+8	2.59E+8	2.09E+8	7.89E+7	5.06E+7	4.15E+7	1.28E+5	6.37E+7	8.51E+7	8.06E+7	5.16E+7	
5.38E+7	2.32E+7	1.72E+8	1.67E+8	3.91E+8	3.08E+8	1.20E+8	7.29E+7	5.68E+7	1.64E+5	1.04E+8	1.36E+8	1.25E+8	8.37E+7	
7.12E+7	3.21E+7	2.12E+8	2.11E+8	4.95E+8	3.93E+8	1.54E+8	9.45E+7	7.38E+7	2.88E+5	1.31E+8	1.70E+8	1.61E+8	1.02E+8	

m/z 170.1096						
Well	Depth	APT no	1,2,7-TMN	1,6,7 + 1,2,6-TMN	1,2,4-TMN	1,2,5-TMN
6507/5-4	3523.0	11 596	1.01E+7	2.38E+7	4.74E+6	1.73E+7
6507/5-4	3542.7	11 597	4.11E+7	1.15E+8	2.01E+7	7.67E+7
6507/5-4	3567.7	11 600	3.56E+7	9.61E+7	1.75E+7	6.50E+7
6507/5-4	3578.0	11 602	3.50E+7	8.34E+7	1.82E+7	6.57E+7
6507/5-4	3595.0	11 603	1.96E+7	4.43E+7	1.10E+7	4.69E+7
6507/5-4	3606.0	11 604	2.40E+7	5.53E+7	1.28E+7	4.76E+7
6507/5-4	3617.0	11 605	2.00E+7	4.33E+7	1.06E+7	3.87E+7
6507/5-4	3624.0	11 606	1.85E+7	4.01E+7	9.63E+6	3.55E+7
6507/5-4	3681.0	11 607	2.16E+7	5.19E+7	1.09E+7	4.10E+7
6507/5-4	3703.7	11 608	2.98E+7	8.32E+7	1.42E+7	5.39E+7
6507/5-4	3717.7	11 609	3.92E+7	1.10E+8	1.89E+7	7.10E+7

m/z 178.0783	
P	
3.10E+7	
2.04E+8	
1.65E+8	
1.23E+8	
2.42E+8	
1.21E+8	
8.76E+7	
8.83E+7	
1.06E+8	
1.76E+8	
2.17E+8	

m/z 192.0939			
3-MP	2-MP	9-MP	1-MP
9.76E+6	1.09E+7	1.74E+7	1.20E+7
7.60E+7	8.46E+7	1.27E+8	9.53E+7
6.18E+7	6.75E+7	1.05E+8	7.54E+7
5.95E+7	6.69E+7	1.06E+8	7.33E+7
4.80E+7	5.43E+7	8.34E+7	6.42E+7
3.90E+7	4.22E+7	6.80E+7	4.98E+7
3.09E+7	3.43E+7	5.44E+7	3.86E+7
2.89E+7	3.19E+7	5.15E+7	3.68E+7
3.80E+7	4.24E+7	6.94E+7	4.82E+7
6.43E+7	7.47E+7	1.11E+8	8.03E+7
8.04E+7	8.95E+7	1.36E+8	9.98E+7

m/z 206.1096					
2-EP+9-EP+3,6-DMP	1-EP	2,6- + 2,7- + 3,5-DMP	1,3- + 2,10- + 3,9- + 3,10-DMP	1,6- + 2,5- + 2,9-DMP	
1.90E+6	3.00E+6	1.94E+6	1.15E+7	5.26E+6	
1.57E+7	2.41E+7	1.49E+7	1.01E+8	4.64E+7	
1.27E+7	1.91E+7	1.24E+7	8.17E+7	3.62E+7	
1.28E+7	1.89E+7	1.21E+7	7.79E+7	3.66E+7	
5.58E+6	7.07E+6	4.01E+6	2.57E+7	1.20E+7	
8.08E+6	1.16E+7	7.47E+6	4.73E+7	2.15E+7	
6.12E+6	8.75E+6	5.71E+6	3.69E+7	1.68E+7	
5.62E+6	8.22E+6	5.31E+6	3.29E+7	1.56E+7	
7.30E+6	1.09E+7	7.23E+6	4.67E+7	2.15E+7	
1.25E+7	2.07E+7	1.39E+7	8.70E+7	3.98E+7	
1.55E+7	2.52E+7	1.63E+7	1.08E+8	4.89E+7	

GC-MS peak heights of aromatic compounds, continued

m/z 206.1096

Well	Depth	APT no	1,7-DMP	2,3-DMP	1,9- + 4,9- + 4,10-DMP	1,8-DMP	1,2-DMP
6507/5-4	3523.0	11 596	6.84E+6	1.63E+6	3.40E+6	1.50E+6	9.52E+5
6507/5-4	3542.7	11 597	5.88E+7	1.42E+7	3.06E+7	1.35E+7	8.58E+6
6507/5-4	3567.7	11 600	4.77E+7	1.13E+7	2.50E+7	1.09E+7	7.15E+6
6507/5-4	3578.0	11 602	4.61E+7	1.18E+7	2.49E+7	1.14E+7	7.99E+6
6507/5-4	3595.0	11 603	1.50E+7	5.54E+6	9.29E+6	4.19E+6	4.27E+6
6507/5-4	3606.0	11 604	2.91E+7	7.15E+6	1.46E+7	6.67E+6	4.91E+6
6507/5-4	3617.0	11 605	2.20E+7	5.61E+6	1.15E+7	5.40E+6	3.91E+6
6507/5-4	3624.0	11 606	2.12E+7	5.35E+6	1.06E+7	5.16E+6	3.84E+6
6507/5-4	3681.0	11 607	2.93E+7	6.98E+6	1.45E+7	6.67E+6	4.57E+6
6507/5-4	3703.7	11 608	5.27E+7	1.25E+7	2.82E+7	1.20E+7	7.26E+6
6507/5-4	3717.7	11 609	6.51E+7	1.53E+7	3.36E+7	1.44E+7	9.15E+6

m/z 219.1174

Retene
2.69E+6
2.70E+7
2.23E+7
2.00E+7
8.24E+6
1.59E+7
1.24E+7
1.13E+7
1.20E+7
1.55E+7
2.14E+7

m/z 184.0347

DBT
1.30E+7
8.19E+7
7.06E+7
6.75E+7
8.28E+7
4.14E+7
3.28E+7
3.23E+7
4.02E+7
6.04E+7
7.18E+7

m/z 198.0503

4-MDBT	(3+2)-MDBT	1-MDBT
1.34E+7	7.72E+6	3.58E+6
9.52E+7	5.72E+7	2.76E+7
7.80E+7	4.68E+7	2.27E+7
9.02E+7	5.22E+7	2.69E+7
4.34E+7	2.67E+7	1.78E+7
4.16E+7	2.85E+7	1.46E+7
3.53E+7	2.17E+7	1.17E+7
3.28E+7	2.08E+7	1.13E+7
4.62E+7	2.76E+7	1.35E+7
7.66E+7	4.38E+7	1.93E+7
9.13E+7	5.49E+7	2.43E+7

m/z 231.1174

Well	Depth	APT no	C20TA	C21TA	SC26TA	RC26TA+ SC27TA	SC28TA	RC27TA	RC28TA
6507/5-4	3523.0	11 596	2.02E+5	1.13E+5	9.19E+3	1.06E+5	7.34E+4	1.39E+4	1.49E+5
6507/5-4	3542.7	11 597	2.27E+6	1.39E+6	2.01E+5	2.03E+6	1.54E+6	3.06E+5	3.02E+6
6507/5-4	3567.7	11 600	1.78E+6	1.07E+6	1.64E+5	1.62E+6	1.29E+6	2.57E+5	2.37E+6
6507/5-4	3578.0	11 602	2.09E+6	1.35E+6	2.05E+5	1.98E+6	1.43E+6	3.12E+5	2.78E+6
6507/5-4	3595.0	11 603	9.49E+4	5.96E+4	4.57E+3	5.21E+4	4.52E+4	6.13E+3	7.03E+4
6507/5-4	3606.0	11 604	1.23E+6	6.97E+5	1.27E+5	1.15E+6	8.19E+5	2.29E+5	1.67E+6
6507/5-4	3617.0	11 605	8.32E+5	4.79E+5	7.82E+4	7.40E+5	5.50E+5	1.46E+5	1.10E+6
6507/5-4	3624.0	11 606	7.84E+5	4.76E+5	8.08E+4	7.54E+5	5.48E+5	1.30E+5	1.07E+6
6507/5-4	3681.0	11 607	8.77E+5	5.24E+5	7.09E+4	6.86E+5	5.31E+5	1.20E+5	9.96E+5
6507/5-4	3703.7	11 608	1.18E+6	7.15E+5	1.12E+5	8.24E+5	6.61E+5	1.70E+5	1.12E+6
6507/5-4	3717.7	11 609	1.52E+6	9.68E+5	1.57E+5	1.10E+6	8.17E+5	2.21E+5	1.44E+6

m/z 253.1956

C21MA	C22MA	BSC27MA	BSC27DMA	BRC27MA+ BRC27DMA	αSC27MA	BSC28MA+ BSC28DMA+ αRC27DMA	αSC27DMA	αRC27MA
1.79E+4	8.23E+3	1.35E+4	9.50E+4	9.81E+4	7.33E+3	6.07E+4	5.44E+3	3.90E+5
4.84E+5	2.21E+5	4.27E+5	2.11E+6	2.20E+6	2.29E+5	1.51E+6	1.62E+5	5.40E+6
3.91E+5	1.97E+5	3.51E+5	1.71E+6	1.77E+6	1.84E+5	1.25E+6	1.35E+5	4.37E+6
4.50E+5	2.25E+5	4.14E+5	2.04E+6	1.98E+6	2.51E+5	1.49E+6	1.74E+5	3.18E+6
2.36E+4	6.02E+3	9.51E+3	4.80E+4	1.42E+5	9.60E+3	9.27E+4	7.89E+3	1.62E+6
2.86E+5	1.73E+5	2.96E+5	1.21E+6	1.26E+6	1.69E+5	9.26E+5	1.31E+5	3.00E+6
1.84E+5	9.33E+4	1.79E+5	7.84E+5	8.02E+5	1.05E+5	5.82E+5	7.21E+4	2.18E+6
1.70E+5	9.20E+4	1.63E+5	7.97E+5	7.89E+5	1.03E+5	5.64E+5	7.06E+4	2.13E+6
1.63E+5	8.23E+4	1.51E+5	7.16E+5	7.48E+5	8.44E+4	5.32E+5	5.92E+4	2.52E+6
2.04E+5	1.12E+5	2.05E+5	8.62E+5	8.60E+5	1.18E+5	6.16E+5	7.79E+4	3.53E+6
2.74E+5	1.60E+5	2.62E+5	1.07E+6	1.11E+6	1.62E+5	7.89E+5	1.13E+5	4.52E+6

Peak heights of aromatic compounds, continued

m/z 253.1956

Well	Depth	APT no	α SC28MA	β RC28MA+ β RC28DMA	β SC29MA+ β SC29DMA	α SC29MA	α RC28MA+ β RC29MA+ β RC29DMA	α RC29MA
6507/5-4	3523.0	11 596	3.75E+5	5.37E+4	2.37E+5	1.24E+5	1.00E+5	1.13E+5
6507/5-4	3542.7	11 597	5.83E+6	1.31E+6	5.59E+6	3.20E+6	2.61E+6	3.08E+6
6507/5-4	3567.7	11 600	4.92E+6	1.16E+6	4.92E+6	2.80E+6	2.30E+6	2.96E+6
6507/5-4	3578.0	11 602	3.49E+6	8.33E+5	3.41E+6	1.91E+6	1.57E+6	1.98E+6
6507/5-4	3595.0	11 603	1.35E+6	2.53E+5	4.64E+5	4.13E+5	1.93E+5	4.40E+5
6507/5-4	3606.0	11 604	3.34E+6	8.49E+5	3.67E+6	2.07E+6	1.65E+6	2.18E+6
6507/5-4	3617.0	11 605	2.50E+6	6.08E+5	2.41E+6	1.41E+6	1.10E+6	1.40E+6
6507/5-4	3624.0	11 606	2.31E+6	5.36E+5	2.30E+6	1.35E+6	1.07E+6	1.38E+6
6507/5-4	3681.0	11 607	2.75E+6	5.30E+5	2.19E+6	1.36E+6	1.05E+6	1.39E+6
6507/5-4	3703.7	11 608	3.93E+6	6.54E+5	2.38E+6	1.44E+6	1.13E+6	1.46E+6
6507/5-4	3717.7	11 609	4.99E+6	8.88E+5	3.11E+6	1.89E+6	1.49E+6	1.96E+6



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1 Introduction

13 gasbag samples from well 6507/5-4 are analysed for gas composition and isotopic composition. The gas samples range from 2650 m to 3600 m in depth.

On the gas samples C_1 - C_5 and inorganic gases are quantified and the $\delta^{13}C$ value is measured on methane, ethane, propane, the butanes and CO_2 when possible.

2 Analytical procedures

Aliquots of 1.0 ml of the different gas samples are sampled with a syringe for analysis on a Porabond Q column connected with flame ionisation (FID) and thermal conductivity/hot wire (TCD/HWD) detectors. The detection limit for the hydrocarbon gas components is 0.001 $\mu\text{l/ml}$ and for H_2S and CO_2 0.05 $\mu\text{l/ml}$. Three different calibration programs are used for determination of the actual concentration of the different gaseous components;

FID8 for hydrocarbon concentrations < 2 $\mu\text{l/ml}$

FID11 for hydrocarbon concentrations $\geq 2 \mu\text{l/ml}$ < 60 $\mu\text{l/ml}$

HWD for hydrocarbon concentrations $\geq 60 \mu\text{l/ml}$ and for all inorganic components.

Due to low hydrocarbon gas concentration in the gas samples the carbon isotopic composition of the hydrocarbon gas components and carbon dioxide are determined by a GC-C-IRMS system. Aliquots are sampled with a syringe and analysed on a VG Isochrom connected on line to a VG Optima Mass spectrometer. A HP 5890 II with a Poraplot Q column is used for the separation and helium is used as a carrier gas. The injections are performed both in splitless and split mode, depending on the individual methane concentrations. Determination of hydrogen or oxygen isotopic composition is not included in the analytical procedure.

The uncertainty in the reported results is $\pm 1 \text{ ‰}$ for methane, ethane and CO_2 and $\pm 0.5 \text{ ‰}$ for the other components based on repeated analysis of IFEs laboratory standard (test gas concentration) over a period of 3 years.

3 Results

The normalised volume composition of the gas samples is shown in Table 1 and Figure 1. No H₂S is detected in the samples. A mixture of nitrogen/oxygen (air) is detected in all samples, however the amount is not quantified. Gas chromatograms from the flame ionisation detection (FID) are shown in Appendix A.

The stable isotope composition of the different gas samples is shown in Table 2 and Figure 2. The isotopic composition is not determined on all components in all samples, due to low hydrocarbon concentrations.

The system is checked with the laboratory gas mixture with acceptable results.

Table 1 Volume composition of gasbag samples (normalised values) from well 6507/5-4

IFE no GEO	Depth	C ₁ %	C ₂ %	C ₃ %	iC ₄ %	nC ₄ %	iC ₅ %	nC ₅ %	CO ₂ %	Sum C ₁ -C ₅	Wet- ness	iC ₄ / nC ₄	ppmv
20011142	2650	3.5	0.2	0.2		0.3	0.2	0.7	94.9	5.1	0.32		637
20011143	2750	39.3	0.8	0.2	0.0	0.1	0.1	0.2	59.2	40.8	0.04	0.27	1244
20011144	2850	73.7	2.0	0.6	0.1	0.2	0.1	0.1	23.2	76.8	0.04	0.46	3334
20011145	2910	93.8	1.5	0.4	0.1	0.1	0.0	0.0	4.1	95.9	0.02	0.56	23886
20011146	2950	74.8	2.9	0.9	0.1	0.2	0.1	0.1	20.8	79.2	0.06	0.53	4458
20011147	3050	90.3	4.9	1.5	0.2	0.4	0.2	0.2	2.4	97.6	0.07	0.52	36649
20011148	3198	92.9	3.1	1.0	0.1	0.3	0.1	0.1	2.2	97.8	0.05	0.46	22783
20011149	3250	67.3	5.8	2.8	0.4	1.0	0.5	0.7	21.5	78.5	0.14	0.42	2778
20011150	3350	63.8	4.7	2.9	0.5	1.1	0.6	0.8	25.5	74.5	0.14	0.42	2011
20011151	3450	29.5	2.2	1.3	0.2	0.5	0.3	0.5	65.5	34.5	0.14	0.32	649
20011152	3500	38.3	3.3	1.3	0.2	0.5	0.1	0.2	56.1	43.9	0.13	0.41	638
20011153	3506	92.4	4.0	1.3	0.1	0.2	0.0	0.0	1.9	98.1	0.06	0.41	16608
20011154	3600	79.6	7.0	3.3	0.3	0.8	0.2	0.3	8.5	91.5	0.13	0.36	6493

Table 2 Isotopic composition of gasbag samples from well 6507/5-4

IFE no GEO	Depth	C ₁ δ ¹³ C	C ₂ δ ¹³ C	C ₃ δ ¹³ C	iC ₄ δ ¹³ C	nC ₄ δ ¹³ C	nC ₅ δ ¹³ C	CO ₂ δ ¹³ C
20011142	2650	too little gas						
20011143	2750	-37.3						-22.4
20011144	2850	-31.0	-26.9	-26.9		-27.4		-25.9
20011145	2910	-38.3	-29.2	-27.7		-28.0		-29.5
20011146	2950	-38.2	-29.1	-27.8		-26.6		-28.6
20011147	3050	-36.2	-28.0	-26.4	-23.7	-26.3		-27.9
20011148	3198	-36.7	-28.0	-26.5		-26.1		-24.0
20011149	3250	-39.3	-29.5	-27.8		-27.6		-26.2
20011150	3350	-38.9	-29.5	-27.9	-27.7	-26.3	-27.0	-26.7
20011151	3450	too little gas						
20011152	3500	too little gas						
20011153	3506	-35.2	-28.6	-27.7		-27.5		-20.7
20011154	3600	-35.0	-29.3	-28.4	-28.7	-27.4	-29.8	-17.7

**PETROLEUM GEOCHEMISTRY OF THE SKARV COMPLEX
&
A COMPARISON WITH IDUN**

IMPLICATIONS FOR EXPLORATION IN THIS REGION

Updated version of the 2001 report – now with data from the new well
6507/5-4

A project between

**PL 159 & 212
&
Department for Geology**

Dag A. Karlsen

Jan 2002

**REGISTRERT
OLJEDIREKTORATET**

15 MAI 2002

8A 02-446-1

1. Samples, methods, explorational context

1.1 Samples

The Idun well 6507/3-3 was sampled for a total of 25 selected samples. Selection criteria – as always in inclusion projects – sandstones from the respective formations, which may, due to their geologic characteristics, have constituted the first and earliest sandstones to have built up oil saturation.

Note – the descriptions given below of the samples is tentative only and is mostly for internal use in helping to rationalize the occurrences of mud contamination and real oil saturation and to separated from these dry samples.

6507/3-3

2733.30m siltstone with shaly fragments – not a good inc. sample

2733.75m siltstone

2744.78m siltstone

2745.03m muddy siltstone – not a good inc. sample.

Comment: no ideal fluid inc. samples exist in this formation

3376.54m sandstone, fine sand, top quality inc. sample with visible oil stain

3376.70m sandstone, well sorted, top quality inc. sample (TQIS)

3380.17m sandstone, medium fine sand, top quality inc. sample (TQIS)

3383.35m sandstone, medium fine sand, TQIS with visible oil stain

3391.53m sandstone, well sorted, coarse to very coarse

3393.55m muddy siltstone, bioturbated, appearing dry

3399.08m sandstone, coarse, appearing dry

3404.51m clean well sorted, very coarse, appearing dry

3410.68m very fine sandstone, TQIS

3416.25m clean, well sorted fine sand, TQIS

3428.44m clean well sorted coarse sandstone TQIS

Comment: – several good to very good samples i.e. clean well sorted sandstones with high poroperm characteristics i.e. sandstones which would clearly, within their formation would have been among the first to have received and built up oil saturation.

3463.75m muddy siltstone, bioturbated, with some intact shaly lamina, app. dry

3468.10m muddy, sandstone, bad sorting

3470.22m clean coarse to medium sandstone, TQIS

3470.60m mudstone with shaly bands

3472.15m mud containing siltstone, apparently dry

3475.29m mud containing siltstone, apparently dry

Comment: some good fluid inclusions samples, but generally worse sorting than in the Garn Fm.

3546.71m muddy with shaly bands and c. 50% very coarse sandstone, app. dry

3552.51m clean sandstone, fine sand, well sorted, TQIS

3554.58m clean, very coarse sandstone

3561.24m clean well sorted sandstone, TQIS

3569.09m clean well sorted sandstone, TQIS

The Skarv wells 6507/5-1, 6507/5-2 6507/5-4 and 6507/6-2 were sampled for a total of 89 selected samples. Selection criteria – as always in inclusion projects – sandstones from the respective formations which may, due to their geologic characteristics, have constituted the first and earliest sandstones to have built up oil saturation.

It was generally easier to get a good number cleaner TQIS from Skarv than from Idun.

6506/5-1

3398.7m	coarse well sorted ss clean, TQIS, oil/mud wetted
3403.9m	TQIS, oil/mud wetted
3424.6m	TQIS, oil mud wetted
3435.2m	GQIS, less well sorted than samples above, and drier
3455.8m	GQIS, muddy ss, bioturbated
3485.0m	GQIS, muddy ss, bioturbated
3499.9m	TQIS, wells sorted ss
3506.8m	TQIS, fine sand, wetted by oil/mud
3590.5m	TQIS, fine sand, wetted by oil/mud
3609.8m	TQIS, fine sand, wetted by oil/mud
3622.0m	TQIS fine sand, wetted by oil/mud
3676.6m	TQIS, fine sand, apparently dry
3692.0m	TQIS, coarse grained well-sorted ss, apparently very dry

6507/5-2

3628.0m	TQIS, ss, with some palaeo-oil saturation? (P-O-S?)
3633.9m	TQIS, ss, (P-O-S?)
3639.5m	TQIS, ss, (P-O-S?)
3643.7m	TQIS, mud cont. ss, (P-O-S?)
3643.9m	TQIS, dark stained polar-enriched-zone (PEZ) with high oil saturation
3645.4m	TQIS mud cont.ss
3645.8m	TQIS, dark stained PEZ with high oil saturation, high porosity
3652.5m	TQIS, fine sand, apparently dry
3660.6m	TQIS, coarse grained high porosity ss, apparently dry
3666.7m	TQIS, coarse grained high porosity ss, apparently dry
3669.5m	GQIS, fine sand, apparently dry
3706.6m	GQIS, fine sand, apparently dry
3719.0m	muddy fine sand, apparently dry
3781.93m	very coarse ss, GQIS, apparently dry.
3791.48m	muddy fine grained ss partly laminated, apparently dry
3801.7m	muddy fine grained sandstone, partly laminated, apparently dry
3807.75m	muddy fine grained sandstone, apparently dry

6507/6-2

3728.3m ss	very well cemented ss
3731.4m ss	as above
3735.5m ss	as above
3738.5m ss	as above
3738.7m ss	as above

6507/5-4

3514.98m
3516.42m
3521.39m
3522.72m
3525.82m
3529.96m
3531.34m
3535.98m
3540.50m
3542.36m
3544.70m
3546.90m
3548.43m
3548.70m
3551.20m
3552.70m
3553.13m
3555.13m
3557.56m
3559.50m
3563.70m
3567.70m
3570.70m
3575.72m

3577.54m
3581.32m
3588.43m
3592.60m
3599.50m
3602.60m
3608.70m
3610.53m
3616.43m
3622.50m
3628.72m
3635.66m
3641.55m
3647.63m
3652.63m
3658.67m
3665.67m
3672.63m
3678.98m
3680.43m
3681.60m
3683.68m
3685.18m
3690.23m
3694.56m
3702.67m
3706.63m
3711.50m
3716.62m
3722.50m

1.2 METHODS

1.2.1 Analytical Procedure

A schematic diagram of the analytical protocol is given below as **Fig. 1** and also given is a schematic representation of fluid inclusions in authigenic quartz cements, see **Fig. 2**. It is the occurrence of these inclusions formed in the mineral cements, together with any residual bitumen in the inter-grain porosity, that inform on whether or not dry structures held oil previously or if presently dry structure were always dry or did contain gas. Sample preparation is extensive in this type of projects.

All samples were be disintegrated manually after an initial brushing off of external mud and a quick external wash in dichloromethane:methanol (93:7% vol). The disintegration step is a very time consuming process, including breaking down the sandstones into singular grains without grinding them to dust.

Secondly, were all samples extracted by dichloromethane:methanol to get out bitumen and other co-extractives like drilling fluids. All extracts were analysed on Iatroscan TLC-FID to determine the nature of the core extracts *i.e.* are the core extracts residual oil, tar mats, live oil or mud additives. Data was quantified in terms of mg extract per gram rock and the amounts of saturated hydrocarbons, aromatic hydrocarbons and polars like resins and asphaltenes were determined. All extracts were run on GC-FID to produce normal alkane and isoprenoide fingerprints.

This data helps to establish general characteristics of the bitumen and oils (facies and maturity) and are most helpful in establishing if reservoir strata which today hold gas earlier held oil and similarly – if *water zones* earlier held petroleum.

- A. All samples containing organic compounds indicating bitumen or autochthonous or in-situ generated hydrocarbons were analysed on GC-MS to allow determination of organic facies and maturity parameters. It was seen as possible that in Cretaceous reservoir sections might some in-situ generated compounds like oleanane occur.
All core extracts were analysed on GC-FID to determine their molecular compositions.
- B. All sandstones now in disintegrated singular grain form were acid washed and treated with H_2O_2 . The chromic acid and H_2O_2 treatment is destroying all organic matter external to the minerals. This allows for a meaningful inspection of the organic matter in inclusions. This is again a very time consuming procedure and the success of the process relies also on the quality of the disintegration of the sandstones *e.g.* in siltstones with lots of clay may *in-situ* derived organic matter contribute to the “inclusion extracts” concerning biomarkers. Such *in-situ* contamination is, however, not a problem for analysis of gas from inclusions.
- C. All sands were crushed under closed conditions to liberated gas from inclusions. This gas may be magmatic in origin *i.e.* coming from water inclusions in the detrital quartz and feldspar grains or the gas may come from diagenetic later formed inclusions. Gas is characterised as methane, ethane, propane, butanes and pentanes, thus allowing a detailed inspection of gas wetness. Thus, gas from inclusions can be compared directly to gas produced from the reservoir today, both in terms of composition and carbon isotopes. This is a very powerful method for evaluating palaeo-gases and palaeo-

petroleums in traps with present petroleums and associated gases. Most of the Idun and Skarv samples do contain large amount of inclusion gas.

- D. All sands were inspected under UV light on the microscope for detection of fluorescent inclusions. This most important step allows us to identify samples containing fluorescent inclusions and these indicate that these specific sandstones contained oil in the past. The amount of fluorescent inclusions is recorded on a scale from 0-5.
- E. Samples containing fluorescent inclusions were investigated to determine the fluorescent colours and the relative size of the gas bubbles so that we can estimate the API and *GOR* of the palaeo-fluids.
- F. Samples rich in fluorescent inclusions were crushed manually under super clean solvents to allow us to extract biomarkers. These extracts are analysed on GC-MS to allow a determination of maturity and organic facies signatures of the entrapped petroleum. Unfortunately did both Idun and Skarv contain few fluorescent inclusions and only one sample from Idun and 3 from Skarv could be successfully analysed for biomarkers despite something like 30 attempts. The low amount of fluorescent inclusions in Idun reflect that the trap only contained oil for a short time in the time interval when inclusion formation could occur, which for both Skarv and Idun is on the order of c. 5 M.Y.b.p.
- G. Geochemical data on core extracts and gases have been analyzed using several empiric diagram and general knowledge. Comparisons have also been undertaken with oils from Alve, Norne and Smørbukk S. to add in some regional elements to the interpretations and –as a bonus- to compensate for the late delivery of this report. A much more comprehensive correlation with other Mid-Norway oils is possible but would need a separate contract.
- H. Biomarker and gas data from inclusions was compared with similar data from live oils and gases in Idun and Skarv as well as with gas data from a field in the Smørbukk area.

1.2.2 Data treatment and Principal Component Analysis (PCA)

Geochemical data on the biomarkers and medium range facies and maturity parameters and also the gas composition and isotope parameters are in our projects analysed and evaluated visually by comparing chromatograms and parameters with empirical interpretation schemes, using the human brains as the main tool.

No statistical approach can ever come close to the human brains in pulling out other than standard suggested interpretations. Relying too much on such tools means that one is going to be completely miss out on the important aspects of “negative results” and in particular on creative interpretations along the line of complex synthesis.

This is needed to approach a geological understanding of complex geologic problem scenarios and I have all too often witnessed the lack of willingness among specialists to draw up “objective interpretations”, “subjective interpretations” and more uncertain “suggested complex synthetic models”. The basis for this more complex approach takes time to establish *i.e.* time to digest the data. We are in this project delayed about 1 month due to unforeseen circumstances and we are sorry for this, still this has allowed us even more time to “digest the data – play around with possible scenarios - and to reach an even higher level of understanding of the Idun / Skarv system.

Thus the simple approach of looking at data from the perspective of a thorough geologic understanding is the prime method for extracting geologically relevant information from gases, oil, core extracts and geochemical data from authigenic inclusions and all

interpretations must rely on a thorough understanding of the limitations and potential of the different parameters and data sets.

I stress this thing about using empirical knowledge and focusing on the targets of the study *i.e.* the tools and methods employed are always tailored to meet the requirements of the client – not the other way around.

Basing everything too much on statistical methods results in one regularly missing out on important issues. Of primary concern here is the non-linearity of many of the maturity parameters, limitations of other maturity parameters in certain maturity ranges, facies parameters becoming useless at certain maturities, problems related to mixing, biodegradation and phase separation to name a few.

Still, it can often be helpful to display geochemical variation in a data set in the form of principal component plots. This, and related methods, must however, never substitute for a thorough analysis of the data set using the human mind.

Principal Component Analysis (PCA) is used in this study as an auxiliary tool helping to display the geochemical variation in the data sets and to group samples of potential genetic relationship. All variables (parameters) have been standardised to the so called “standard normal form” before analysis *i.e.* the arithmetic mean of the observations was subtracted from each observation and the difference was divided by the standard deviation.

In PCA with n variables produce n principal components (which are linear combinations of the variables) in such a way that the first principal components make up for as much of the total variation in the data set as possible. The first principal component (PC 1) – so constructed – will have an orientation through the “centre of gravity for the cloud” of data points and will have an orientation along the major axis of this “cloud or galaxy”. PC 2 corresponds to the longest axis, which can be constructed orthogonal to PC 1. Other PCs representing successively lower degree of variation in the data set are called PC 3, PC 4 and so on.

Due to the high degree of co-variation that normally exists in geochemical data, the first 2 PCs will often be found to represent a substantial and representative part of the total variance in the data set.

The principal components themselves can be viewed as a “new” set of parameters and each sample, in our case, oils and core extracts, can be assigned co-ordinates or scores in each PC. The contribution of each parameter to each PC is called the weight factor of the variable or loading *i.e.* reflecting to what extent each parameter “loads” onto the PC or contributes to each PC.

In so called bi-plots, as we will show below, the weight-factor of each parameter will equal the projection of the parameter onto the PC. The score value will therefore give a basis for comparing samples and groups of samples, whilst the loading (weight factor) will visualise to what extent each parameter contributes to each PC and to what extent the individual parameters help to separate or “identify” groups of samples. We utilise the Statgraphics (STSC Inc.) software.

1.2.3 Analytical methods

Cleansed and disintegrated sand samples used for UV-microscopic determination of the amount of fluorescing inclusions and for inclusion gas analyses were prepared by crushing core samples with a hammer. The samples were later dry-sieved and separated into size-fractions. The silt/clay fraction was discarded. This procedure of grain disintegration was repeated until the sample consisted of almost 100% single sand grains. The single grain sample was then extracted with dichloromethane:methanol=97:3 (vol %) in a Soxtech apparatus, and further cleaned by soaking in chromic acid followed by another soaking, this time in H_2O_2 .

This effectively removes organic material on the grains.

The total amount (volume) of fluorescing inclusions in each cleaned sand sample was subjectively determined by UV-microscopy and rated on a scale from 0 to 5, where 5 represents amounts equal to the highest amount of fluorescing inclusions that has been encountered in the 50 previous inclusion studies carried out at this department. This maximum is represented by some samples from the Ula and the Gullfaks Sør field. Inclusion gas samples were prepared by crushing 5.0 grams of cleansed sand in a gas tight sling mill chamber and extracting 1.0 ml headspace gas with a gas tight syringe. The gas was then injected and analysed on a Varian 3500 GC-FID using the following equipment and analytical conditions: 25m Chrompack, 0.32mm i.d., CP- Al_2O_3 /KCl PLOT column with a film thickness of 5.0 μm , carrier gas: nitrogen, column temperature program: 38°C hold for 2min and 10°C/min for 10 min. The amount of methane in inclusions, measured as a mV FID signal, is used in this study as a measure of the total amount of gas in the inclusions.

Core extracts for Iatroscan TLC-FID and GC-FID analyses were prepared by extracting a weighed amount (2-3 grams) of fine crushed bulk sample with 10 ml DCM:MeOH=97:3 in a sealed vial (overnight + 30 min. ultrasonication).

For Iatroscan TLC-FID analyses was the method described by Karlsen and Larter (1991) used.

GC-FID analyses of core extracts were run on a Varian 3400 GC equipped with a 60m DB-1 column, film thickness: 0.1 μm , carrier gas: nitrogen, temperature program: 40°C - 320°C at 4°C/min plus 10 minutes at the final temp.

GC-MS analysis of inclusion and core extracts were analysed on molecular sieved extracts using a Fison MD 800 GC-MS equipped with a 50 m Chrompack CP-SIL 5CB-MS (WCOT fused silica) column, (0.32 mm i.d. 0.40 micro meter film) and helium as carrier. Temp. prog. 80°C - 180°C at 10°C/min followed by a gradient of 1.7°C to 325°C plus 30 min at the final temp.

MICROTHERMOMETRY OF FLUID INCLUSIONS			
Field	Well	Core depth (m)	Homogenization temp. (°C) of oil and water inclusions
Idun	6507/3-3	2733.75	oil: 75.5, 84.5, 85.5, 88, 88.5, 99.5, 111 water: 96, 103
Idun	6507/3-3	3404.51	oil: 96.5
Idun	6507/3-3	3468.10	oil: 118, 121, 122.5, 124.5
Idun	6507/3-3	3472.15	oil: 102.5, 119
Idun	6507/3-3	3552.51	oil: 86, 109, 145
Skarv	6507/5-1	3435.20	oil: 117.5, 118, 119, 121, 121, 121, 125, 127, 129, 130, 131 water: 117.5, 117.5
Skarv	6507/5-1	3622.00	oil: 115, 131, 145
Skarv	6507/5-2	3669.50	oil: 108, 113, 121, 123, 126.5, 128, 135 water: 119

MICROPHOTOGRAPHS OF THICK SECTIONS - IDUN FILM 1											
photo nr.	well	core depth (m)	objective magn.	grain size (mm)	porosity (H/M/L)	Amt. Of overgr.	petroleum inclusions				
							amount	host min.	colour	% gas	occur.
1	6507/3-3	3569.09	10	0.5-2	H	L	0				
2	6507/3-3	3561.24	10	0.2-0.5	H	L	0				
3	6507/3-3	3470.22	5	0.3-3	H	L	0				
4	6507/3-3	3416.25	10	0.1-0.2	H	L	0				
5	6507/3-3	3376.54	5	0.15-0.5	H	L	0				
6	6507/3-3	2733.30	5	0.1-0.3	M	L	0				
7	6507/3-3	3380.17	5	0.2-0.4	H	L	0				
8	6507/3-3	3391.53	5	0.4-1.5	H	L	0				
9	6507/3-3	3383.35	5	0.2-0.6	H	L	0				
10	6507/3-3	2733.75	20	0.1-0.3	M	L	2	qtz	b-yg	5-10	PS
11	6507/3-3	2733.75	52	0.1-0.3	M	L	2	qtz	b-yg	5-10	PS
12	6507/3-3	2733.75	20	0.1-0.3	M	L	2	qtz	b-yg	10-20	PS
13	6507/3-3	2733.75	20	0.1-0.3	M	L	2	qtz	b-yg	10-20	PS
14	6507/3-3	2733.75	52	0.1-0.3	M	L	2	qtz	yg	10	P?
15	6507/3-3	2744.78	5	0.1-0.3	M	L	0				
16	6507/3-3	2745.03	100	0.1-0.4	M	L	1	qtz	y	20	P?
17	6507/3-3	2745.03	100	0.1-0.4	M	L	1	qtz	y	20	P?
18	6507/3-3	2745.03	52	0.1-0.4	M	L	1	qtz	b	10	PS
19	6507/3-3	2745.03	52	0.1-0.4	M	L	1	qtz	b	10	PS
20	6507/3-3	3393.55	10	0.05-0.1	M	L	0				
21	6507/3-3	3399.08	5	0.4-1.0	H	L	0				
22	6507/3-3	3428.44	5	0.1-1.0	H	L	0				
23	6507/3-3	3410.68	5	0.1-0.25	H	L	0				
24	6507/3-3	3552.51	100	0.1-0.5	H	L	0.5	qtz	yg	10	PS
25	6507/3-3	3552.51	100	0.1-0.5	H	L	0.5	qtz	yg	10	PS
ABBREVIATIONS:											
Porosity/amount of overgrowths: H/M/L = high/medium/low											
Amount of petroleum inclusions: relative scale 0-5											
Host mineral: qtz = quartz, fsp = feldspar											
Fluorescence colour: b = blue, g = green, y = yellow											
% gas : gas bubble volume relative to inclusion volume											
Occurrence: P = primary, PS = pseudo secondary, S = secondary											

Tab. 0.2

MICROPHOTOGRAPHS OF THICK SECTIONS - IDUN FILM 2

photo nr.	well	core depth (m)	objective magn.	grain size (mm)	porosity (H/M/L)	Amt. Of overgr.	petroleum inclusions				
							amount	host min.	colour	% gas	occur.
1	6507/3-3	3552.51	100	0.1-0.5	H	L	0.5	qtz	y-g	ca. 10	PS
2	6507/3-3	3546.71	100	0.5-5	H	L	0.5	qtz	y-g	ca. 20	PS
3	6507/3-3	3546.71	5	0.5-5	H	L	0.5	qtz	y-g	ca. 20	PS
4	6507/3-3	3468.10	100	0.05-2	H	L	0.5	qtz	y-g	ca. 10	PS
5	6507/3-3	3468.10	100	0.05-2	H	L	0.5	qtz	y-g	ca. 10	PS
6	6507/3-3	3468.10	100	0.05-2	H	L	0.5	qtz	y-g	ca. 10	PS
7	6507/3-3	3475.29	10	0.05-0.1	H-M	L	0				
8	6507/3-3	3404.51	20	0.4-1	H	L	1	qtz	b-g	ca. 20	PS
9	6507/3-3	3404.51	20	0.4-1	H	L	1	qtz	b-g	ca. 20	PS
10	6507/3-3	3463.75	10	0.05-0.5	L	L	0				
11	6507/3-3	3470.60	5	0.05-0.5	L	L	0				
12	6507/3-3	3472.15	100	0.05-0.1	M	L	1	qtz	y-g	ca. 10	PS
13	6507/3-3	3472.15	100	0.05-0.1	M	L	1	qtz	y-g	ca. 10	PS
14	6507/3-3	2733.75	52	0.1-0.3	M	L	2	qtz	y-g	ca. 10	P
15	6507/3-3	2733.75	52	0.1-0.3	M	L	2	qtz	y-g	ca. 10	P

Tab. 0.3

MICROPHOTOGRAPHS OF THICK SECTIONS - SKARV FILM 1

photo nr.	well	core depth (m)	objective magn.	grain size (mm)	porosity (H/M/L)	Amt. Of overgr.	petroleum inclusions				
							amount	host min.	colour	% gas	occure.
1	6507/5-1	3398.70	52	0.3-0.4	H	L	0.5	qtz	y-g & b	10-15 & 70-80	PS
2	6507/5-1	3398.70	100	0.3-0.4	H	L	0.5	qtz	y-g & b	10-15 & 70-81	PS
3	6507/5-1	3398.70	100	0.3-0.4	H	L	0.5	qtz	y-g & b	10-15 & 70-82	PS
4	6507/5-1	3403.90	52	0.3-0.4	H	L	0.5	qtz	y-g	10-15	PS
5	6507/5-1	3403.90	52	0.3-0.4	H	L	0.5	qtz	y-g	10-15	PS
6	6507/5-1	3403.90	100	0.3-0.4	H	L	0.5	qtz	y-g	10-15	PS
7	6507/5-1	3424.60	52	0.3-0.4	H	L	0.5	qtz	light b	10-15	P
8	6507/5-1	3424.60	52	0.3-0.4	H	L	0.5	qtz	light b	10-15	P
9	6507/5-1	3424.60	52	0.3-0.4	H	L	0.5	qtz	light b	10-15	P
10	6507/5-1	3424.60	52	0.3-0.4	H	L	0.5	qtz	light b	10-15	P
11	6507/5-1	3435.20	100	0.1-0.2	H	L	2.5	qtz	y-g	10-15	PS
12	6507/5-1	3435.20	100	0.1-0.2	H	L	2.5	qtz	y-g	10-15	PS
13	6507/5-1	3435.20	100	0.1-0.2	H	L	2.5	qtz	y-g	10-15	PS
14	6507/5-1	3435.20	52	0.1-0.2	H	L	2.5	qtz	y-g	10-15	PS
15	6507/5-1	3435.20	52	0.1-0.2	H	L	2.5	qtz	y-g	10-15	PS
16	6507/5-1	3435.20	100	0.1-0.2	H	L	2.5	qtz	y-g	20	P?
17	6507/5-1	3435.20	100	0.1-0.2	H	L	2.5	qtz	y-g	10	P?
18	6507/5-1	3455.80	100	0.05-0.1	M	L	2	qtz	y-g	10	PS
19	6507/5-1	3499.90	20	0.2-0.4	M	M	0				
20	6507/5-2	3628.00	20	0.2-0.5	M	M	0				
21	6507/5-2	3633.90	52	0.2-0.4	M-H	M	0.5	fsp	b	15	P
22	6507/5-2	3807.75	52	0.1-0.2	L	H	0.5	qtz	y-g	10-15	PS
23	6507/5-2	3666.70	20	0.2-1.0	M	M	3.5	qtz	y-g	10	P
24	6507/5-2	3666.70	20	0.2-1.0	M	M	3.5	qtz	y-g & b	10 & 60-70	P?
25	6507/5-2	3669.50	20	0.2-0.8	M	M	5	qtz	y-g	10	PS & P?

Tab. 0.4

MICROPHOTOGRAPHS OF THICK SECTIONS - SKARV FILM 2

photo nr.	well	core depth (m)	objective magn.	grain size (mm)	porosity (H/M/L)	Amt. Of overgr.	petroleum inclusions				
							amount	host min.	colour	% gas	occur.
1	6507/5-2	3706.60	5	0.4-1.2	L	L-M	0				
2	6507/5-2	3660.60	52	0.3-0.6	M	L-M	3	qtz	y	50	P
3	6507/5-2	3660.60	52	0.3-0.6	M	L-M	3	qtz	y	50	P
4	6507/5-2	3660.60	52	0.3-0.6	M	L-M	3	qtz	y	50	P
5	6507/5-2	3660.60	20	0.3-0.6	M	L-M	3	qtz	y	50	P
6	6507/5-2	3660.60	20	0.3-0.6	M	L-M	3	qtz	y	50	P
7	6507/5-2	3660.60	100	0.3-0.6	M	L-M	3	qtz	y-g	10	P
8	6507/5-2	3660.60	100	0.3-0.6	M	L-M	3	qtz	y-g	10	P
9	6507/5-2	3652.50	20	0.2-0.4	M	L-M	0				
10	6507/5-2	3639.50	5	0.2-0.6	M	L-M	0				
11	6507/5-2	3643.90	5	0.3-0.6	M	L-M	0				
12	6507/5-2	3801.70	100	0.1-0.2	L-M	L-M	1	qtz	y-g	10	PS
13	-	-	-	-	-	-	-	-	-	-	-
14	6507/5-2	3801.70	100	0.1-0.2	L-M	L-M	1	qtz	y-g	10	PS
15	6507/5-2	3801.70	100	0.1-0.2	L-M	L-M	1	qtz	y-g	10	PS
16	6507/5-2	3801.70	100	0.1-0.2	L-M	L-M	1	qtz	y-g	10	PS
17	6507/5-2	3794.48	100	0.1-0.2	L-M	L-M	1	qtz	b	50	PS
18	6507/5-2	3794.48	100	0.1-0.2	L-M	L-M	1	qtz	b	50	PS
19	6507/5-2	3645.80	52	0.1-0.2	L-M	L-M	1.5	qtz	y-g	10	PS?
20	6507/5-2	3645.80	52	0.1-0.2	L-M	L-M	1.5	qtz	y-g	10	PS?
21	6507/5-2	3645.80	52	0.1-0.2	L-M	L-M	1.5	qtz	y-g	10	PS?
22	6507/5-2	3645.80	100	0.1-0.2	L-M	L-M	1.5	qtz	y-g	10	PS
23	6507/5-2	3645.80	100	0.1-0.2	L-M	L-M	1.5	qtz	y-g	10	PS
24	6507/5-2	3784.93	5	0.3-1.0	M	M-H	0				

Tab. 0.5

MICROPHOTOGRAPHS OF THICK SECTIONS - SKARV FILM 3											
photo nr.	well	core depth (m)	objective magn.	grain size (mm)	porosity (H/M/L)	Amt. Of overgr.	petroleum inclusions				
							amount	host min.	colour	% gas	occur.
1	6507/5-2	3794.48	100	0.1-0.2	L-M	L-M	1	qtz	b	10	PS?
2	6507/5-2	3794.48	100	0.1-0.2	L-M	L-M	1	qtz	b	10	PS?
3	6507/5-2	3719.00	10	0.1-0.2	L	L-M	0.5	qtz	y-g	10	PS?
4	6507/5-2	3719.00	100	0.1-0.2	L	L-M	0.5	qtz	y-g	10	PS?
5	6507/5-2	3719.00	100	0.1-0.2	L	L-M	0.5	qtz	y-g	10	PS?
6	6507/5-2	3719.00	100	0.1-0.2	L	L-M	0.5	qtz	y-g	10	PS?
7	6507/5-2	3719.00	100	0.1-0.2	L	L-M	0.5	qtz	y-g	10	PS?
8	6507/5-2	3643.70	5	0.2-0.5	M	L	0				
9	6507/5-1	3485.00	5	0.1-0.2	M	L	0				
10	6507/5-1	3622.00	5	0.4-1.0	H	L	0				
11	6507/5-1	3506.80	100	ca. 0.1	H	L	1	qtz	y-g	10	P
12	6507/5-1	3506.80	100	ca. 0.1	H	L	1	qtz	y-g	10	P
13	6507/5-1	3590.50	5	0.1-0.2	L-M	L	0				
14	6507/5-1	3609.80	100	0.1-0.2	M	M	2	qtz	y-g	10	P
15	6507/5-1	3609.80	100	0.1-0.2	M	M	2	qtz	y-g	10	P
16	6507/5-1	3676.60	52	0.1-0.3	L	H	1	qtz	y-g	10	P
17	6507/5-1	3676.60	52	0.1-0.3	L	H	1	qtz	y-g	10	P
18	6507/5-1	3676.60	10	0.1-0.3	L	H	1	qtz	y-g	10	P
19	6507/6-2	3728.30	5	0.2-0.6	M	M-H	0				
20	6507/6-2	3735.50	5	0.3-1.0	M	M-H	0				
21	6507/6-2	3738.70	5	0.3-1.0	M	M-H	0				
22	6507/6-2	3731.40	5	0.2-1.0	M	M	0				
23	6507/6-2	3738.50	5	0.2-2.0	M	M-H	0				

Tab. 0.6

Iatroscan TLC-FID of core extracts from Skarv and Idun										
Well	Core depth (m)	SAT (mg/g rock)	ARO (mg/g rock)	POL (mg/g rock)	TOT EXT (mg/g rock)	SAT (%)	ARO (%)	POL (%)	SAT/ARO	ARO/POL
6507/3-3	2733.3	16.0	0.3	1.0	17.3	92.8	1.5	5.8	64.1	0.3
6507/3-3	2733.75	12.5	0.0	0.2	12.7	98.3	0.2	1.6	62.3	0.1
6507/3-3	2744.78	4.4	0.1	0.1	4.6	95.6	2.2	2.2	43.9	1.0
6507/3-3	2745.03	8.4	0.3	0.2	8.9	94.3	3.5	2.2	27.1	1.6
6507/3-3	3376.54	0.5	0.0	2.1	2.6	18.9	1.5	79.6	12.5	0.0
6507/3-3	3380.17	0.8	0.1	3.1	4.0	20.2	1.8	78.1	11.4	0.0
6507/3-3	3383.35	0.2	0.1	1.6	1.9	11.2	3.7	85.1	3.0	0.0
6507/3-3	3391.53	0.2	0.0	1.1	1.3	11.7	2.3	85.9	5.0	0.0
6507/3-3	3393.55	0.3	0.1	2.3	2.7	9.4	3.8	86.8	2.5	0.0
6507/3-3	3399.08	0.2	0.1	1.9	2.2	10.1	2.8	87.2	3.7	0.0
6507/3-3	3404.51	0.2	0.0	4.3	4.6	4.8	0.9	94.3	5.5	0.0
6507/3-3	3410.68	0.2	0.1	3.6	3.8	4.5	1.3	94.2	3.4	0.0
6507/3-3	3416.25	0.1	0.0	2.0	2.2	5.6	1.9	92.6	3.0	0.0
6507/3-3	3428.44	0.3	0.1	1.4	1.8	17.0	6.0	76.9	2.8	0.1
6507/3-3	3463.75	0.2	0.1	0.5	0.8	25.6	13.4	61.0	1.9	0.2
6507/3-3	3468.1	0.2	0.1	4.2	4.6	4.6	3.1	92.3	1.5	0.0
6507/3-3	3470.22	0.2	0.1	2.2	2.5	8.9	2.4	88.7	3.7	0.0
6507/3-3	3470.6	0.2	0.1	1.6	1.9	12.0	4.2	83.8	2.9	0.1
6507/3-3	3472.15	0.3	0.1	1.5	1.9	15.0	4.8	80.2	3.1	0.1
6507/3-3	3475.29	0.3	0.1	2.5	2.9	9.7	3.8	86.5	2.6	0.0
6507/3-3	3546.71	0.2	0.1	1.0	1.3	11.9	8.7	79.4	1.4	0.1
6507/3-3	3552.51	0.3	0.1	1.5	1.9	14.6	4.3	81.1	3.4	0.1
6507/3-3	3554.58	0.2	0.1	1.3	1.6	12.9	7.4	79.8	1.8	0.1
6507/3-3	3561.24	0.4	0.1	1.4	1.9	18.9	5.4	75.7	3.5	0.1
6507/3-3	3569.09	0.2	0.1	3.2	3.5	6.6	1.4	92.0	4.6	0.0
6507/5-1	3398.7	16.6	0.0	0.7	17.2	96.2	0.0	3.8	-	0.0
6507/5-1	3403.9	10.0	0.1	1.5	11.6	86.3	1.1	12.6	78.8	0.1
6507/5-1	3424.6	14.4	0.0	0.5	14.9	96.8	0.0	3.2	-	0.0
6507/5-1	3435.2	23.3	0.0	0.4	23.7	98.2	0.0	1.8	-	0.0
6507/5-1	3455.8	16.9	0.0	0.4	17.3	97.9	0.0	2.1	-	0.0
6507/5-1	3485.0	17.5	0.1	0.4	18.0	97.4	0.6	2.0	160.8	0.3
6507/5-1	3499.9	24.0	0.0	0.6	24.6	97.6	0.0	2.4	-	0.0
6507/5-1	3506.8	30.4	0.1	0.7	31.3	97.3	0.4	2.3	227.1	0.2
6507/5-1	3590.5	22.6	10.7	1.4	34.6	65.2	30.9	3.9	2.1	7.9
6507/5-1	3609.8	28.9	0.7	3.4	33.0	87.5	2.2	10.3	39.6	0.2
6507/5-1	3622.0	34.8	4.1	1.8	40.8	85.3	10.2	4.5	8.4	2.2
6507/5-1	3676.6	6.6	1.2	1.9	9.7	68.1	12.6	19.3	5.4	0.7
6507/5-1	3692.0	5.8	0.5	0.5	6.8	85.9	6.9	7.3	12.5	0.9
6507/5-2	3628.0	0.6	0.1	0.2	0.9	67.4	6.7	25.9	10.0	0.3
6507/5-2	3633.9	0.5	0.3	2.3	3.2	16.9	9.8	73.4	1.7	0.1
6507/5-2	3639.5	0.6	0.1	2.3	3.1	21.3	2.9	75.8	7.4	0.0
6507/5-2	3643.7	0.5	0.5	1.6	2.6	20.0	18.7	61.3	1.1	0.3
6507/5-2	3643.9	14.1	0.1	5.2	19.4	72.9	0.5	26.6	133.9	0.0
6507/5-2	3645.4	1.6	0.3	2.1	4.0	40.3	7.1	52.5	5.7	0.1
6507/5-2	3645.8	10.6	0.2	1.6	12.5	85.3	1.7	13.0	49.8	0.1
6507/5-2	3652.5	0.5	0.0	0.4	1.0	50.1	4.0	45.9	12.5	0.1
6507/5-2	3660.6	1.5	0.4	1.1	3.0	50.9	12.3	36.8	4.2	0.3
6507/5-2	3666.7	2.9	1.0	1.4	5.3	54.2	19.2	26.5	2.8	0.7
6507/5-2	3669.5	1.5	0.4	1.5	3.4	44.0	12.7	43.3	3.5	0.3
6507/5-2	3706.6	0.2	0.0	0.8	1.0	24.1	0.0	75.9	-	0.0
6507/5-2	3719.0	0.8	0.0	0.4	1.2	66.9	0.0	33.1	-	0.0
6507/5-2	3784.93	0.5	0.2	0.1	0.8	63.9	25.6	10.5	2.5	2.4
6507/5-2	3794.48	0.4	0.0	0.1	0.4	86.5	0.0	13.5	-	0.0
6507/5-2	3801.7	0.5	0.0	0.1	0.6	86.7	0.0	13.3	-	0.0
6507/5-2	3807.75	0.5	0.0	0.1	0.7	80.4	7.2	12.4	11.2	0.6
6507/6-2	3728.3	0.05	0.00	0.09	0.14	33.6	0.0	66.4	0.0	0.0
6507/6-2	3731.4	0.04	0.00	0.06	0.10	36.3	0.0	63.7	0.0	0.0
6507/6-2	3735.5	0.00	0.00	0.00	0.00	0.0	0.0	0.0	-	-
6507/6-2	3738.5	0.00	0.00	0.00	0.00	0.0	0.0	0.0	-	-
6507/6-2	3738.7	0.07	0.03	0.14	0.24	31.0	10.7	58.2	2.9	0.2

TAB 1

Iatroscan TLC-FID of 6507/5-4 core extracts								
Sample nr.	Core depth (m)	SAT(mg/g rock)	ARO(mg/g rock)	POL(mg/g rock)	TOT EXT(mg/g rock)	SAT%	ARO%	POL%
1	3514.98	4.53	0.23	1.90	6.66	68.00	3.51	28.50
2	3516.42	0.36	0.24	0.25	0.85	41.94	28.34	29.72
3	3521.39	0.30	0.16	1.82	2.28	13.09	7.06	79.85
4	3522.72	11.30	0.00	1.25	12.55	90.01	0.00	9.99
5	3525.82	0.45	0.00	1.31	1.76	25.37	0.00	74.63
6	3529.96	15.49	0.14	2.69	18.31	84.57	0.75	14.68
7	3531.34	0.55	0.00	2.62	3.17	17.40	0.00	82.60
8	3535.98	3.45	1.34	1.40	6.20	55.64	21.69	22.67
9	3540.5	0.54	0.00	3.28	3.82	14.15	0.00	85.85
10	3542.36	2.15	0.80	3.43	6.37	33.73	12.49	53.78
11	3544.7	4.12	1.82	4.30	10.25	40.24	17.79	41.97
12	3546.9	6.84	3.42	2.88	13.14	52.09	25.99	21.92
13	3548.43	5.97	2.64	1.93	10.54	56.66	25.02	18.32
14	3548.7	9.81	0.79	5.09	15.69	62.53	5.05	32.41
15	3551.2	10.41	0.25	1.12	11.78	88.38	2.14	9.48
16	3552.7	8.71	4.63	1.63	14.97	58.17	30.91	10.92
17	3553.13	10.46	2.62	7.39	20.47	51.11	12.82	36.07
18	3555.13	7.21	0.82	2.58	10.61	67.96	7.75	24.29
19	3557.56	7.71	3.91	5.99	17.61	43.77	22.21	34.02
20	3559.5	8.36	4.65	4.24	17.24	48.45	26.98	24.56
21	3563.7	7.69	3.80	8.35	19.84	38.74	19.15	42.11
22	3567.7	3.60	1.10	9.52	14.23	25.33	7.76	66.91
23	3570.7	6.87	3.51	4.67	15.05	45.64	23.33	31.02
24	3575.72	7.14	3.51	2.33	12.98	55.00	27.02	17.98
25	3577.54	5.71	2.95	2.70	11.36	50.25	25.96	23.79
26	3581.32	7.20	3.95	3.98	15.13	47.61	26.08	26.30
27	3588.43	0.31	0.21	0.55	1.07	29.26	19.70	51.04
28	3592.6	0.46	0.21	0.48	1.16	40.11	18.31	41.57
29	3599.5	0.16	0.08	0.32	0.56	28.41	14.06	57.54
30	3602.6	1.22	0.46	0.49	2.17	56.18	21.27	22.56
31	3608.7	1.16	0.47	0.42	2.05	56.80	22.88	20.33
32	3610.53	0.64	0.35	1.50	2.49	25.67	14.17	60.17
33	3616.43	4.68	0.19	0.27	5.15	90.97	3.79	5.25
34	3622.5	1.38	0.44	0.15	1.97	70.24	22.23	7.53
35	3628.72	0.00	0.00	0.46	0.46	0.00	0.00	100.00
36	3635.66	0.09	0.06	0.28	0.42	20.37	14.29	65.34
37	3641.55	0.08	0.09	0.10	0.27	28.71	34.72	36.57
38	3647.63	0.11	0.13	0.21	0.46	24.66	28.87	46.47
39	3652.63	0.11	0.12	0.33	0.56	19.87	20.55	59.58
40	3658.67	0.23	0.21	0.23	0.67	34.76	31.68	33.55
41	3665.67	0.22	0.41	0.23	0.85	25.47	47.93	26.60
42	3672.63	0.08	0.23	0.11	0.42	18.96	54.67	26.37
43	3678.98	2.93	1.02	0.35	4.30	68.14	23.68	8.18
44	3680.43	1.47	0.46	1.24	3.17	46.31	14.42	39.27
45	3681.6	1.21	0.42	1.63	3.26	37.03	12.96	50.01
46	3683.68	1.36	0.42	1.39	3.17	42.99	13.22	43.79
47	3685.18	2.43	1.05	1.94	5.42	44.84	19.46	35.70
48	3690.23	1.17	0.43	0.21	1.81	64.56	23.64	11.80
49	3694.56	1.92	0.74	1.24	3.90	49.26	18.92	31.81
50	3702.67	2.24	0.78	0.26	3.27	68.47	23.73	7.80
51	3706.63	2.30	0.79	0.47	3.56	64.69	22.12	13.19
52	3711.5	3.11	1.11	0.25	4.47	69.69	24.76	5.55
53	3716.62	1.93	0.55	1.85	4.33	44.52	12.71	42.77
54	3722.5	3.37	1.08	0.74	5.19	64.90	20.90	14.20

Iatroscan TLC-FID of petroleum tests from Skarv and Idun							
Well	Core depth (m)	SAT (%)	ARO (%)	POL (%)	SAT/ARO	ARO/POL	Evap. Loss (%)
6507/3-3	GARN OIL	60.0	39.9	0.1	1.5	399.0	
6507/5-1	DST 1	62.1	28.6	9.2	2.2	3.1	32.4
6507/5-1	DST 2	73.6	19.9	6.6	3.7	3.0	81.6
6507/5-1	DST 2A	72.1	24.0	3.8	3.0	6.3	80.4
6507/5-1	DST 3	73.8	21.0	5.2	3.5	4.0	46.5
6507/5-2	Condensate	72.9	26.0	1.0	2.8	24.9	55.1

GC-FID data of core extracts and Garn oil - Idun				
Well	Core depth (m)	Pr/n-C17	Ph/n-C18	Pr/Ph
6507/3-3	2733.30	0.30	0.14	2.7
6507/3-3	2733.75	0.24	0.14	2.3
6507/3-3	2744.78	0.28	0.17	1.8
6507/3-3	2745.03	0.34	0.19	2.4
6507/3-3	3376.54	0.46	0.18	2.4
6507/3-3	3383.35	0.40	0.10	2.8
6507/3-3	3391.53	-	-	3.2
6507/3-3	3393.55	0.52	0.17	3.5
6507/3-3	3399.08	0.35	0.09	3.8
6507/3-3	3404.51	0.31	0.08	4.0
6507/3-3	3410.68 *	0.40	0.20	3.0
6507/3-3	3416.25	0.47	0.10	5.5
6507/3-3	3428.44	0.37	0.12	2.8
6507/3-3	3468.10	0.40	0.20	3.0
6507/3-3	3470.22	0.40	0.20	2.5
6507/3-3	3472.15 *	0.41	0.14	3.4
6507/3-3	3552.51	0.42	0.14	3.4
6507/3-3	3554.58	0.41	0.10	2.8
6507/3-3	3569.09	0.23	0.10	2.7
6507/3-3	GARN OIL	0.34	0.11	3.5

TAB 3

* Denotes those extracts which among the full set are the least contaminated

GC-FID data of core extracts and petroleum tests - Skarv									
Well	Core depth (m)	n-C17	Pr	n-C18	Ph	Pr/n-C17	Ph/n-C18	Pr/Ph	Comment
6507/5-1	3398.7	-	-	-	-	-	-	-	BIG UCM C13-19
6507/5-1	3403.9	105	30	70	15	0.29	0.21	2.00	diesel
6507/5-1	3424.6	108	30	71.5	15	0.28	0.21	2.00	diesel
6507/5-1	3435.2	105.5	25	75	20	0.24	0.27	1.25	diesel
6507/5-1	3455.8	111.5	30	67	17	0.27	0.25	1.76	diesel
6507/5-1	3485.0	111.5	30	77.5	17	0.27	0.22	1.76	diesel
6507/5-1	3499.9	118	57	127	31	0.48	0.24	1.84	diesel (C18 exceeding scale limit)
6507/5-1	3506.8	105	31.5	75	16.5	0.30	0.22	1.91	diesel
6507/5-1	3590.5	107	30	75	17.5	0.28	0.23	1.71	diesel
6507/5-1	3609.8	110	29	80	20	0.26	0.25	1.45	mostly diesel, but some long-chain n-alk
6507/5-1	3622.0	110	39	85	28	0.35	0.33	1.39	mostly diesel, but some long-chain n-alk
6507/5-1	3676.6	112	53	94	34.5	0.47	0.37	1.54	"oil profile"
6507/5-1	3692.0	102	35	80	22	0.34	0.28	1.59	"oil + diesel"
6507/5-2	3645.8	67.5	40	73.5	41	0.59	0.56	0.98	oil profile, but big UCM C22-24
6507/5-2	3652.5	114.5	94	95	56.5	0.82	0.59	1.66	oil profile, but lean sample
6507/5-2	3652.5	129.5	109	108.5	68	0.84	0.63	1.60	nice oil profile
6507/5-2	3660.6	108	75	111.5	56	0.69	0.50	1.34	waxy oil type profile
6507/5-2	3666.7	136	115.5	138	88	0.85	0.64	1.31	waxy oil type profile
6507/5-2	3669.5	108.5	78.5	111	62.5	0.72	0.56	1.26	waxy oil type profile
6507/5-2	3706.6	48	47.5	49	24.5	0.99	0.50	1.94	oil profile, but huge UCM C22-26
6507/5-2	3784.93	52	42	60	20.5	0.81	0.34	2.05	waxy oil type profile
6507/5-2	3794.48	138	59	129.5	22	0.43	0.17	2.68	strange profile - oil type plus a few light HCs
6507/5-2	3801.7	113.5	39	95	19	0.34	0.20	2.05	mixed oil/diesel profile
6507/5-2	3807.75	120	45.5	92	23.5	0.38	0.26	1.94	mixed oil/diesel profile
6507/5-2	3628.0	125	107.5	113.5	65	0.86	0.57	1.65	oil profile - UCM at C22-26
6507/5-2	3633.9	122	109	120	70	0.89	0.58	1.56	oil profile
6507/5-2	3639.5	115	97	96	58	0.84	0.60	1.67	nice oil profile
6507/5-2	3643.7	120	94.5	92	54.5	0.76	0.59	1.68	oil profile
6507/5-2	3643.9	96.5	58	87	46.5	0.60	0.53	1.25	oil profile, but big UCM C22-24
6507/5-2	3645.4	98	71	66	36.5	0.72	0.55	1.95	like oil profile, but higher C15-17 than normal
6507/5-2	3719.0	55	51	53.5	28	0.93	0.52	1.82	like oil profile, but huge UCM at C22-26
6507/6-2	3728.3	62	50	65	28	0.81	0.43	1.79	a lot of contaminants - strange profile
6507/6-2	3731.4	87	78	105.5	51	0.90	0.48	1.53	mainly contaminants
6507/6-2	3735.5	88	81.5	59.5	32	0.93	0.54	2.55	mainly contaminants
6507/6-2	3738.5	112.5	144.5	91	45	1.28	0.49	3.21	almost normal oil profile
6507/6-2	3738.7	93.5	50	134	45	0.53	0.34	1.11	almost oil profile, UCM C22-26
6507/5-1	DST1	111.5	86.5	101	57.5	0.78	0.57	1.50	normal oil profile
6507/5-1	DST2	96	69.5	77.5	40.5	0.72	0.52	1.72	light oil/condensate profile
6507/5-1	DST2A	140.5	114.5	119	68.5	0.81	0.58	1.67	light oil/condensate profile
6507/5-1	DST3	136.5	97	126	60	0.71	0.48	1.62	normal oil profile
6507/5-2	COND. 3647m	107	87	82	46	0.81	0.56	1.89	condensate profile

[illegible]

marker parameters - core extracts and produced petroleums

WELL	CORE DEPTH (m)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
6507/5-1	3398.7	0.22	0.18	0.58	0.82	0.07	0.11	0.54	0.13	1.86	0.32	0.42	0.36	28.4	38.7	32.9	0.47	0.41	-	-	-	-	-	-	-	-	-
6507/5-1	3403.9	0.46	0.56	0.60	0.86	0.20	0.22	0.99	0.17	2.18	0.45	0.51	0.50	34.6	32.5	32.8	0.84	0.35	0.86	0.40	0.40	3.20	0.88	0.64	0.72	0.74	1.68
6507/5-1	3424.6	0.33	0.40	0.59	0.84	0.12	0.15	0.78	0.16	1.66	0.40	0.46	0.45	32.8	34.7	32.5	0.75	0.38	1.60	0.34	0.52	2.79	1.17	0.60	1.00	0.71	2.09
6507/5-1	3435.2	0.50	0.40	0.54	0.85	0.15	0.12	10.07	0.79	1.94	0.45	0.45	0.80	43.1	30.2	26.7	0.90	0.29	1.70	0.58	0.57	3.33	1.20	0.75	1.11	0.75	3.91
6507/5-1	3455.8	0.35	0.45	0.57	0.85	0.16	0.17	0.85	0.13	2.04	0.43	0.46	0.42	32.7	33.5	33.8	0.62	0.42	2.19	0.83	0.60	2.87	1.32	0.90	1.18	0.72	2.18
6507/5-1	3485.0	0.35	0.40	0.57	0.86	0.15	0.16	0.64	0.12	1.67	0.43	0.44	0.37	31.5	33.3	35.2	0.71	0.43	1.25	0.23	0.47	-	1.06	0.54	0.90	-	-
6507/5-1	3499.9	0.30	0.31	0.58	0.84	0.11	0.13	1.09	0.13	2.19	0.37	0.43	0.42	31.1	34.6	34.3	0.30	0.46	1.85	0.90	0.55	2.12	1.24	0.94	1.06	0.66	2.19
6507/5-1	3506.8	0.30	0.29	0.57	0.83	0.09	0.13	0.96	0.13	1.90	0.37	0.43	0.39	30.1	36.6	33.3	0.61	0.29	3.25	0.30	0.69	-	1.51	0.58	1.37	-	-
6507/5-1	3590.5	0.33	0.35	0.57	0.84	0.12	0.14	0.69	0.12	1.97	0.39	0.42	0.37	29.5	35.4	35.1	0.62	0.41	3.50	0.33	0.69	-	1.55	0.60	1.38	-	-
6507/5-1	3609.8	0.51	0.64	0.58	0.90	0.23	0.26	0.62	0.13	2.12	0.54	0.54	0.49	34.4	29.9	35.7	0.68	0.48	1.15	0.25	0.45	5.58	1.02	0.55	0.84	0.92	1.08
6507/5-1	3622.6	0.55	0.70	0.58	0.92	0.28	0.31	0.69	0.14	2.26	0.61	0.58	0.53	34.7	30.7	34.6	0.67	0.48	0.97	0.41	0.44	3.00	0.94	0.65	0.82	0.73	1.69
6507/5-1	3676.6	0.52	0.70	0.58	0.93	0.26	0.31	0.55	0.13	2.44	0.61	0.62	0.53	34.4	30.2	35.4	0.66	0.45	0.77	0.44	0.39	3.04	0.83	0.66	0.72	0.73	2.11
6507/5-1	3692.0	0.51	0.67	0.62	0.92	0.27	0.33	0.54	0.12	2.29	0.61	0.58	0.50	33.9	31.2	34.9	0.67	0.38	0.91	0.52	0.43	3.00	0.91	0.71	0.80	0.73	2.23
6507/5-2	3628.0	0.81	0.78	0.59	0.89	0.25	0.26	2.40	0.45	-	-	-	0.72	41.3	28.8	29.9	0.74	0.48	0.85	0.59	0.40	3.00	0.87	0.75	0.73	0.73	2.01
6507/5-2	3633.9	0.57	0.69	0.59	0.91	0.28	0.33	2.00	0.29	1.48	0.58	0.68	0.62	38.7	31.0	30.4	0.82	0.33	0.86	0.66	0.41	3.16	0.88	0.80	0.75	0.74	1.84
6507/5-2	3639.5	0.57	0.70	0.60	0.91	0.29	0.32	1.40	0.25	2.22	0.59	0.62	0.65	38.0	30.7	31.3	0.80	0.39	0.94	0.57	0.43	3.43	0.92	0.74	0.80	0.76	1.81
6507/5-2	3643.7	0.56	0.68	0.59	0.92	0.30	0.33	1.31	0.29	1.69	0.58	0.67	0.65	40.0	30.1	29.9	0.81	0.38	0.92	0.57	0.42	3.12	0.91	0.74	0.76	0.74	1.73
6507/5-2	3643.9	0.75	0.47	0.57	0.93	0.19	0.09	0	0	1.58	0.63	0.67	0.92	55.1	23.5	21.4	-	-	0.90	0.65	0.45	3.04	0.90	0.79	0.83	0.73	2.40
6507/5-2	3645.4	0.72	0.54	0.58	0.92	0.21	0.10	0	0	1.38	0.62	0.63	0.89	53.2	23.7	23.0	-	-	0.79	0.64	0.43	3.36	0.83	0.79	0.80	0.76	2.47
6507/5-2	3645.8	0.55	0.65	0.61	0.91	0.28	0.32	1.78	0.28	1.22	0.59	0.66	0.61	39.5	30.9	29.6	0.83	0.37	0.86	0.53	0.40	3.16	0.88	0.72	0.74	0.74	1.83
6507/5-2	3652.5	0.51	0.68	0.62	0.90	0.29	0.38	2.17	0.36	2.29	0.59	0.58	0.71	41.4	28.8	29.8	0.83	0.37	0.97	0.67	0.45	3.16	0.94	0.80	0.83	0.74	2.20
6507/5-2	3660.6	0.55	0.52	0.60	0.87	0.23	0.23	4.42	0.65	1.60	0.52	0.63	0.81	48.4	26.1	25.5	0.74	0.40	0.82	0.41	0.40	2.40	0.85	0.65	0.74	0.69	5.42
6507/5-2	3666.7	0.53	0.67	0.59	0.92	0.25	0.30	0.93	0.17	2.23	0.61	0.63	0.59	37.0	29.7	33.3	0.69	0.42	0.91	0.58	0.42	3.43	0.90	0.75	0.78	0.76	1.84
6507/5-2	3669.5	0.54	0.75	0.59	0.91	0.27	0.32	0.93	0.16	2.06	0.60	0.62	0.57	36.2	29.9	33.9	0.73	0.40	0.87	0.55	0.41	3.12	0.88	0.73	0.75	0.74	1.88
6507/5-2	3706.6	0.57	0.73	0.59	0.91	0.28	0.29	1.21	0.22	2.22	0.60	0.62	0.59	37.3	29.2	33.4	0.74	0.45	0.93	0.59	0.42	3.29	0.92	0.75	0.78	0.75	1.88
6507/5-2	3719.0	0.66	0.54	0.59	0.90	0.27	0.13	9.27	1.05	2.05	0.55	0.59	0.85	47.8	27.8	24.4	0.78	0.36	0.84	0.42	0.42	2.14	0.87	0.65	0.77	0.67	8.40
6507/5-2	3789.9	0.42	0.64	0.59	0.86	0.29	0.12	1.17	0.41	4.49	0.47	0.60	0.72	39.4	24.4	36.2	0.61	0.49	0.86	0.48	0.39	2.17	0.88	0.69	0.71	0.67	10.09
6507/5-2	3794.5	0.39	0.60	0.60	0.86	0.26	0.13	0.56	0.31	4.29	0.48	0.64	0.49	33.5	26.0	40.6	0.77	0.32	0.88	0.44	0.41	2.38	0.89	0.66	0.76	0.68	14.39
6507/5-2	3801.7	0.50	0.64	0.59	0.90	0.29	0.13	0.58	0.23	7.33	0.51	0.60	0.54	35.9	26.5	37.6	0.79	0.42	0.83	0.45	0.40	2.41	0.86	0.67	0.74	0.69	12.46
6507/5-2	3807.8	0.51	0.53	0.59	0.91	0.26	0.17	4.48	0.65	2.94	0.57	0.56	0.69	45.6	27.4	27.0	0.79	0.01	0.90	0.44	0.41	2.74	0.90	0.67	0.76	0.71	10.01
6507/6-2	3731.4 + 3735.5	0.51	0.40	0.56	0.89	0.20	0.12	4.25	0.79	2.51	0.58	0.60	0.71	44.9	27.0	28.1	0.75	0.20	1.16	0.78	0.50	4.65	1.02	0.87	0.95	0.85	3.56
6507/6-2	3738.5	0.24	0.61	0.60	0.87	0.13	0.13	0.80	0.21	3.54	0.50	0.62	0.43	23.3	24.4	52.3	0.63	0.22	1.10	0.51	0.44	3.04	1.00	0.71	0.82	0.73	8.91
6507/6-2	3738.7	0.87	0.50	0.57	0.91	0.20	0.12	8.89	1.48	2.05	0.58	0.59	0.80	45.7	27.4	27.0	0.62	0.26	1.07	0.47	0.44	3.21	0.98	0.68	0.82	0.74	3.94
6507/3-3	2733.8	0.45	0.40	0.61	0.82	0.30	0.19	0.70	0	1.41	0.45	0.27	0.62	46.8	26.3	28.9	0.92	0.29	0.78	0.96	0.39	-	0.83	0.98	0.71	0.51	-
6507/3-3	2745.0	0.39	0.42	0.57	0.85	0.27	0.25	2.07	0.48	2.00	0.51	0.45	0.72	44.8	25.4	29.8	0.77	0.25	0.91	1.11	0.42	-	0.91	1.06	0.79	0.51	-
6507/3-3	3383.4	0.40	0.74	0.59	0.87	0.28	0.06	1.03	0.37	7.61	0.50	0.55	0.46	28.2	21.4	50.5	0.94	0.18	1.59	1.13	0.56	2.95	1.17	1.08	1.09	0.73	7.08
6507/3-3	3468.1	0.51	0.70	0.59	0.88	0.28	0.08	0.73	0.29	7.72	0.56	0.42	0.52	36.7	21.2	42.0	0.86	0.59	1.02	0.74	0.45	1.97	0.96	0.85	0.83	0.65	5.33
6507/3-3	3546.7	0.44	0.73	0.61	0.87	0.28	0.05	0.68	0.21	8.30	0.54	0.45	0.66	35.2	23.4	41.4	0.96	0.39	2.50	1.19	0.56	1.67	1.39	1.11	1.09	0.63	6.20
6507/3-3	3552.5	0.41	0.74	0.61	0.89	0.27	0.05	0.39	0.13	10.31	0.57	0.55	0.43	30.7	20.3	49.0	0.55	0.73	0.57	0.57	0.33	4.33	0.68	0.74	0.58	0.83	2.23
6507/5-1	DST1	0.57	0.71	0.57	0.93	0.27	0.31	2.07	0.47	2.16	0.65	0.65	0.78	40.2	27.2	32.6	0.84	0.30	1.21	0.71	0.46	4.51	1.04	0.83	0.87	0.84	1.46
6507/5-1	DST2	0.57	0.72	0.60	0.92	0.29	0.31	2.16	0.36	2.08	0.60	0.63	0.72	40.8	29.9	29.3	0.86	0.32	1.26	0.57	0.50	4.29	1.06	0.74	0.95	0.82	2.12
6507/5-1	DST2A	0.57	0.74	0.59	0.91	0.28	0.31	2.19	0.36	2.02	0.61	0.65	0.71	40.3	30.2	29.5	0.85	0.31	1.10	0.53	0.49	4.43	0.99	0.72	0.93	0.83	2.10
6507/5-1	DST3	0.60	0.76	0.56	0.91	0.35	0.24	5.87	1.23	1.73	0.80	0.67	0.87	45.8	27.5	26.7	0.84	0.27	0.77	0.52	0.45	4.08	0.82	0.71	0.85	0.81	1.66
6507/5-2	Condensate	0.56	0.71	0.60	0.92	0.28	0.29	1.42	0.23	1.95	0.61	0.62	0.63	38.4	30.1	31.5	0.81	0.31	1.07	0.56	0.47	4.08	0.98	0.74	0.89	0.81	2.00
6507/3-3	Oil sat. fract.	0.44	0.63	0.60	0.89	0.25	0.06	0.57	0.15	2.61	0.60	0.48	0.46	25.2	29.0	45.8	0.72	0.56	1.73	0.78	0.59	9.33	1.21	0.87	1.15	1.19	7.72
6507/10-2	DST2	0.47	0.65	0.57	0.91	0.22	0.22	1.23	0.23	1.78	0.60	0.59	0.55	34.2	31.1	34.8	0.83	0.33	1.93	0.55	0.60	4.44	1.26	0.73	1.19	0.83	4.36
6506/12-3	DST1	0.78	0.95	-	-	0.54	0.21	2.30	-	0.90	0.62	0.56	0.75	35.0	35.0	30.0	1.00										

- 1: Ts/(Ts + Tm), (SEIFERT og MOLDOWAN, 1978)
- 2: diahopane/(diahopane + normoretan), (CORNFORD et al., 1986)
- 3: 22S/(22S+22R) of C31 17a(H), 21β(H)-hopanes (MACKENZIE et al., 1980)
- 4: C30-hopane/(C30-hopane + C30-morethane), (MACKENZIE et al., 1985)
- 5: 29Ts/(29Ts + norhopane)
- 6: bisnorhopane/(bisnorhopane + norhopane)
- 7: C23-C29 tricyclic terpanes/C30 αβ-hopane (modified from MELLO et al., 1988)
- 8: C24 tetracyclic terpane/C30 αβ-hopane (MELLO et al., 1988)
- 9: hopane/sterane (MACKENZIE et al., 1984)
- 10: ββ/(ββ+aa) of C29 (20R+20S) sterane isomers (MACKENZIE et al., 1980)
- 11: 20S/(20S+20R) of C29 5a(H),14a(H),17a(H) sterane isomers (MACKENZIE, 1984)
- 12: diasteranes/(diasteranes + regular steranes)
- 13: % C27 of C27+C28+C29 ββ-steranes
- 14: % C28 of C27+C28+C29 ββ-steranes
- 15: % C29 of C27+C28+C29 ββ-steranes
- 16: C20/(C20+C28) triaromatic steroids (TA) (MACKENZIE et al., 1985)
- 17: C28 TA/(C28 TA+C29 MA)
- 18: Methyl phenanthrene ratio, MPR (RADKE et al., 1982b)
- 19: Methyl phenanthrene index 1, MPI1 (RADKE et al., 1982a)
- 20: Methyl phenanthrene distribution fraction 1, MPDF (F1) (KVALHEIM et al., 1987)
- 21: Methyl dibenzothiophene ratio, MDR (RADKE, 1988)
- 22: Calculated vitrinite reflection, $R_m = 1.1 \cdot \log_{10} \text{MPR} + 0.95$ (RADKE, 1988)
- 23: Calculated vitrinite reflection, $\%R_c = 0.60 \cdot \text{MPI1} + 0.40$ (RADKE, 1988)
- 24: Calculated vitrinite reflection, $\%R_o = 2.242 \cdot F1 - 0.166$ (KVALHEIM et al., 1987)
- 25: Calculated vitrinite reflection, $R_m = 0.073 \cdot \text{MDR} + 0.51$ (RADKE, 1988)
- 26: 3-methyl phenanthrene/4-methyl dibenzothiophene

GC-MS parameters of 6507/5-4 samples																													
WELL	CORE DEPTH (m)	SAMPLE TYPE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
6507/5-4 Skarv	3514.98	Extract	0.70	0.56	0.56	0.90	0.25	0.17	6.04	1.28	2.19	0.63	0.60	0.75	42	27	30	0.73	0.48	0.88	0.55	0.41	3.20	0.88	0.73	0.76	0.74	1.57	0.25
6507/5-4 Skarv	3516.42	Extract	0.55	0.69	0.60	0.92	0.30	0.34	1.21	0.20	2.15	0.61	0.59	0.61	37	32	31	0.74	0.49	0.70	0.62	0.36	2.67	0.78	0.77	0.63	0.70	1.81	0.19
6507/5-4 Skarv	3521.39	Extract	0.58	0.71	0.60	0.89	0.31	0.35	1.24	0.23	2.09	0.62	0.58	0.61	36	31	33	0.74	0.48	0.76	0.55	0.38	3.20	0.82	0.73	0.70	0.74	1.45	0.24
6507/5-4 Skarv	3522.72	Extract	0.73	0.48	0.57	0.92	0.24	0.10	8.53	1.80	1.96	0.83	0.80	0.79	46	26	29	0.95	0.39	0.78	0.52	0.39	3.20	0.83	0.71	0.70	0.74	1.41	0.25
6507/5-4 Skarv	3525.82	Extract	0.57	0.68	0.59	0.91	0.28	0.33	1.20	0.19	2.35	0.60	0.56	0.62	39	30	31	0.76	0.48	0.80	0.62	0.40	3.20	0.85	0.77	0.72	0.74	1.55	0.23
6507/5-4 Skarv	3529.96	Extract		0.50	0.55	0.92	0.23	0.09	0.00	0.00																			
6507/5-4 Skarv	3531.34	Extract	0.58	0.68	0.60	0.91	0.28	0.33	1.13	0.19	1.41	0.70	0.62	0.52	45	16	39	0.80	0.44	0.91	0.56	0.42	3.81	0.91	0.73	0.78	0.79	1.30	0.28
6507/5-4 Skarv	3535.98	Extract	0.58	0.71	0.59	0.93	0.30	0.34	1.09	0.25	2.65	0.63	0.63	0.66	37	29	34	0.77	0.45	0.87	0.62	0.43	4.00	0.88	0.77	0.80	0.80	1.23	0.31
6507/5-4 Skarv	3540.50	Extract	0.57	0.74	0.59	0.93	0.30	0.33	1.10	0.27	2.57	0.64	0.57	0.68	36	29	34	0.79	0.42	1.03	0.67	0.45	3.81	0.97	0.80	0.84	0.79	1.54	0.23
6507/5-4 Skarv	3542.36	Extract	0.57	0.75	0.58	0.92	0.29	0.33	1.07	0.24	2.41	0.62	0.57	0.65	38	29	33	0.80	0.45	0.93	0.59	0.42	4.00	0.91	0.76	0.78	0.80	1.47	0.24
6507/5-4 Skarv	3544.70	Extract	0.57	0.71	0.59	0.92	0.29	0.33	1.33	0.29	2.28	0.63	0.58	0.65	39	30	31	0.82	0.43	0.90	0.60	0.42	3.43	0.90	0.76	0.78	0.76	1.62	0.23
6507/5-4 Skarv	3546.40	Extract	0.56	0.71	0.59	0.92	0.29	0.32	0.57	0.11	2.54	0.61	0.56	0.53	34	31	35	0.69	0.51	0.86	0.58	0.42	3.95	0.88	0.75	0.79	0.80	1.50	0.25
6507/5-4 Skarv	3548.43	Extract	0.55	0.73	0.59	0.92	0.28	0.32	0.57	0.11	2.36	0.63	0.53	0.52	32	31	37	0.73	0.51	0.88	0.58	0.43	3.76	0.89	0.75	0.80	0.78	1.46	0.25
6507/5-4 Skarv	3548.70	Extract	0.58	0.71	0.58	0.92	0.28	0.32	0.56	0.11	2.34	0.62	0.56	0.54	34	31	35	0.73	0.52	0.89	0.60	0.42	3.43	0.89	0.76	0.77	0.76	1.48	0.23
6507/5-4 Skarv	3551.20	Extract	0.57	0.64	0.60	0.91	0.28	0.32	2.47	0.41	2.56	0.61	0.59	0.71	40	29	32	0.81	0.56	0.92	0.55	0.42	4.16	0.91	0.73	0.78	0.81	1.42	0.24
6507/5-4 Skarv	3552.70	Extract	0.55	0.71	0.59	0.92	0.29	0.30	0.51	0.10	2.49	0.62	0.54	0.51	34	30	36	0.68	0.52	0.91	0.56	0.43	3.95	0.91	0.73	0.79	0.80	1.47	0.26
6507/5-4 Skarv	3553.13	Extract	0.60	0.69	0.59	0.92	0.27	0.27	0.20	0.00	1.75	0.63	0.56	0.64	38	29	35	0.79	0.49	0.91	0.61	0.45	4.94	0.90	0.76	0.84	0.87	1.23	0.29
6507/5-4 Skarv	3555.13	Extract	0.63	0.56	0.63	0.92	0.25	0.22	0.22	0.00	2.59	0.63	0.57	0.66	37	27	36	0.83	0.45				3.43				0.76	0.00	
6507/5-4 Skarv	3557.56	Extract	0.54	0.70	0.59	0.92	0.29	0.34	0.88	0.13	2.54	0.63	0.58	0.56	32	31	37	0.68	0.54	1.02	0.55	0.45	4.39	0.96	0.73	0.85	0.83	1.31	0.25
6507/5-4 Skarv	3559.80	Extract	0.56	0.67	0.59	0.92	0.29	0.33	0.93	0.14	2.41	0.63	0.57	0.55	32	30	38	0.66	0.53	1.22	0.49	0.49	4.94	1.04	0.69	0.93	0.87	1.17	0.28
6507/5-4 Skarv	3514.98	Inclusion extract	0.71	0.67	0.58	0.92	0.27	0.20	0.00	0.00	1.94	0.58	0.56	0.74	41	28	31			0.75	0.54	0.40	2.47	0.81	0.73	0.72	0.69	2.21	0.19
6507/5-4 Skarv	3525.82	Inclusion extract	0.54	0.69	0.59	0.91	0.30	0.27	0.87	0.13	1.60	0.59	0.48	0.80	36	31	33	0.47	0.54	0.93	0.62	0.41	2.61	0.92	0.77	0.76	0.70	2.40	0.16
6507/5-4 Skarv	3055.2	condensate MDT 5094-EA	0.58	0.69	0.59	0.91	0.33	0.26	0.84	0.18	2.42	0.60	0.53	0.62	36	33	31	0.46	0.48	1.29	0.55	0.53	3.47	1.07	0.73	1.01	0.76	0.93	0.49

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- 4: C30-hopane/(C30-hopane + C30-morethane), (MACKENZIE et al., 1985)
- 5: 29Ts/(29Ts + norhopane)
- 6: bisnorhopane/(bisnorhopane + norhopane)
- 7: C23-C29 tricyclic terpanes/C30 aß-hopane (modified from MELLO et al., 1988)
- 8: C24 tetracyclic terpane/C30 aß-hopane (MELLO et al., 1988)
- 9: hopane/sterane (MACKENZIE et al., 1984)
- 10: ßß/(ßß+aa) of C29 (20R+20S) sterane isomers (MACKENZIE et al., 1980)
- 11: 20S/(20S+20R) of C29 5a(H), 14a(H), 17a(H) sterane isomers (MACKENZIE, 1984)
- 12: diasteranes/(diasteranes + regular steranes)
- 13: % C27 of C27+C28+C29 ßß-steranes
- 14: % C28 of C27+C28+C29 ßß-steranes
- 15: % C29 of C27+C28+C29 ßß-steranes
- 16: C20/(C20+C28) triaromatic steroids (TA) (MACKENZIE et al., 1985)
- 17: C28 TA/(C28 TA+C29 MA) (MACKENZIE et al., 1985)
- 18: Methyl phenanthrene ratio, MPR (RADKE et al., 1982b)
- 19: Methyl phenanthrene index 1, MPI1 (RADKE et al., 1982a)
- 20: Methyl phenanthrene distribution fraction 1, MPDF (F1) (KVALHEIM et al., 1987)
- 21: Methyl dibenzothiophene ratio, MDR (RADKE, 1988)
- 22: Calculated vitrinite reflection, Rm = 1.1*log10 MPR + 0.95 (RADKE, 1988)
- 23: Calculated vitrinite reflection, %Rc = 0.60*MPI1 + 0.40 (RADKE, 1988)
- 24: Calculated vitrinite reflection, %Ro = 2.242*F1 - 0.166 (KVALHEIM et al., 1987)
- 25: Calculated vitrinite reflection, Rm = 0.073*MDR + 0.51 (RADKE, 1988)
- 26: 3-methyl phenanthrene/4-methyl dibenzothiophene
- 27: 4+(3+2)+1 methyl dibenzothiophenes/3+2+9+1 methyl phenanthrenes

LIGHT HYDROCARBONS IN IDUN AND SKARV - PRODUCTION- AND FLUID INCLUSION DATA												
Field	Well	Depth (m)	Sample	C1 (mV)	C1 (%)	C2 (%)	C3 (%)	i-C4 (%)	n-C4 (%)	i-C4/n-C4	C1/C2+C3	C2+ (%)
Idun	6507/3-3	2733.30	Fluid inclusions	500	76.6	6.9	5.7	5.1	5.7	0.90	6.09	23.4
Idun	6507/3-3	2733.75	Fluid inclusions	500	77.2	7.6	7.0	3.2	5.1	0.63	5.30	22.8
Idun	6507/3-3	2744.70	Fluid inclusions	400	73.5	7.8	8.4	4.2	7.2	0.58	4.52	27.4
Idun	6507/3-3	2745.03	Fluid inclusions	300	72.3	7.2	7.2	5.4	7.8	0.69	5.00	27.7
Idun	6507/3-3	3376.54	Fluid inclusions	3600	78.5	10.8	6.2	1.5	3.1	0.50	4.64	21.5
Idun	6507/3-3	3380.17	Fluid inclusions	2600	79.5	10.5	5.8	1.6	2.6	0.60	4.87	20.5
Idun	6507/3-3	3383.35	Fluid inclusions	6000	80.4	10.3	5.4	1.5	2.5	0.60	5.13	19.6
Idun	6507/3-3	3391.54	Fluid inclusions	8000	78.6	11.2	6.8	2.0	3.4	0.57	4.24	23.4
Idun	6507/3-3	3393.55	Fluid inclusions	1300	71.1	12.4	8.3	2.8	5.5	0.50	3.44	28.9
Idun	6507/3-3	3399.08	Fluid inclusions	7000	79.6	10.2	5.8	1.5	2.9	0.50	4.97	20.4
Idun	6507/3-3	3404.51	Fluid inclusions	7000	79.3	10.6	5.8	1.9	2.4	0.80	4.85	20.7
Idun	6507/3-3	3410.68	Fluid inclusions	2400	79.9	10.4	5.7	1.3	2.6	0.50	4.94	20.1
Idun	6507/3-3	3416.25	Fluid inclusions	2600	80.0	9.7	6.0	1.6	2.7	0.60	5.10	20.0
Idun	6507/3-3	3428.44	Fluid inclusions	7400	81.0	9.9	5.7	1.3	2.1	0.63	5.20	19.0
Idun	6507/3-3	3463.75	Fluid inclusions	800	73.0	11.2	8.4	2.8	4.5	0.63	3.71	27.0
Idun	6507/3-3	3468.10	Fluid inclusions	2300	75.2	10.6	6.4	2.8	5.1	0.54	4.43	24.8
Idun	6507/3-3	3470.22	Fluid inclusions	5400	78.8	10.3	5.9	2.0	3.0	0.67	4.85	21.2
Idun	6507/3-3	3470.60	Fluid inclusions	1900	75.8	10.6	7.1	2.5	4.0	0.63	4.29	24.3
Idun	6507/3-3	3472.15	Fluid inclusions	1800	74.7	11.9	7.7	2.1	3.6	0.57	3.81	25.3
Idun	6507/3-3	3475.29	Fluid inclusions	1100	72.6	12.7	8.0	2.4	4.3	0.56	3.50	27.4
Idun	6507/3-3	3546.71	Fluid inclusions	1100	68.2	13.2	9.3	3.9	5.4	0.71	3.03	31.8
Idun	6507/3-3	3552.51	Fluid inclusions	900	82.7	8.6	4.9	1.2	2.5	0.50	6.09	17.3
Idun	6507/3-3	3554.58	Fluid inclusions	2900	76.9	11.3	6.4	2.0	3.5	0.57	4.33	23.2
Idun	6507/3-3	3561.24	Fluid inclusions	4400	76.4	12.3	6.9	1.5	3.0	0.50	3.97	23.7
Idun	6507/3-3	3569.09	Fluid inclusions	2600	81.0	9.5	5.3	1.6	2.7	0.60	5.47	19.1
Skarv	6507/5-1	3398.70	Fluid inclusions	6000	74.7	12.5	7.5	1.6	3.7	0.43	3.74	25.3
Skarv	6507/5-1	3403.90	Fluid inclusions	4100	74.3	12.2	7.8	1.7	3.9	0.44	3.71	25.7
Skarv	6507/5-1	3424.60	Fluid inclusions	5700	75.6	12.1	7.1	1.7	3.6	0.47	3.94	24.4
Skarv	6507/5-1	3435.20	Fluid inclusions	2500	75.6	12.1	7.1	1.6	3.6	0.46	3.94	24.4
Skarv	6507/5-1	3455.80	Fluid inclusions	620	74.3	11.4	8.0	2.3	4.0	0.57	3.82	25.7
Skarv	6507/5-1	3485.00	Fluid inclusions	600	79.1	12.1	7.3	1.5	3.0	0.50	4.08	23.2
Skarv	6507/5-1	3499.90	Fluid inclusions	2400	74.8	13.2	7.2	1.5	3.2	0.46	3.66	25.2
Skarv	6507/5-1	3506.80	Fluid inclusions	500	74.5	12.9	7.5	1.7	3.4	0.50	3.66	25.5
Skarv	6507/5-1	3590.50	Fluid inclusions	630	74.0	12.2	8.1	1.5	4.3	0.34	3.85	26.0
Skarv	6507/5-1	3609.80	Fluid inclusions	360	83.5	7.6	4.8	1.4	2.7	0.50	6.74	16.5
Skarv	6507/5-1	3622.00	Fluid inclusions	205	84.8	6.9	4.3	1.3	2.7	0.48	7.58	15.2
Skarv	6507/5-1	3676.60	Fluid inclusions	170	85.3	5.2	4.7	1.6	3.1	0.50	8.58	14.7
Skarv	6507/5-1	3692.00	Fluid inclusions	360	89.0	5.2	2.9	1.1	1.8	0.60	11.00	11.0
Skarv	6507/5-2	3628.00	Fluid inclusions	8900	78.5	11.0	7.0	1.1	2.4	0.47	4.36	21.5
Skarv	6507/5-2	3633.90	Fluid inclusions	8000	77.0	12.0	7.4	1.3	2.3	0.55	3.98	23.0
Skarv	6507/5-2	3639.50	Fluid inclusions	2000	77.9	11.1	7.2	1.2	2.6	0.45	4.26	22.1
Skarv	6507/5-2	3643.70	Fluid inclusions	3000	78.2	11.6	6.9	1.1	2.3	0.46	4.23	21.9
Skarv	6507/5-2	3643.90	Fluid inclusions	2800	77.4	11.2	7.3	1.7	2.4	0.73	4.18	22.7
Skarv	6507/5-2	3645.40	Fluid inclusions	3800	78.1	11.3	7.2	1.1	2.3	0.48	4.21	21.9
Skarv	6507/5-2	3645.80	Fluid inclusions	5100	76.9	11.7	7.6	1.2	2.6	0.47	4.00	23.1
Skarv	6507/5-2	3652.50	Fluid inclusions	2700	78.9	10.9	6.7	1.1	2.3	0.48	4.48	21.1
Skarv	6507/5-2	3660.60	Fluid inclusions	5000	76.9	12.6	7.2	1.1	2.2	0.48	3.90	23.1
Skarv	6507/5-2	3667.70	Fluid inclusions	3700	74.0	13.1	8.3	1.5	3.1	0.48	3.46	26.0
Skarv	6507/5-2	3669.50	Fluid inclusions	1250	71.0	12.6	9.9	2.0	4.5	0.45	3.16	29.0
Skarv	6507/5-2	3706.60	Fluid inclusions	540	90.5	5.0	2.8	0.7	1.0	0.67	11.60	9.5
Skarv	6507/5-2	3719.00	Fluid inclusions	290	73.0	9.9	10.3	2.1	4.8	0.43	3.61	27.0
Skarv	6507/5-2	3728.30	Fluid inclusions	340	91.6	5.4	1.3	0.5	1.1	0.50	13.62	8.4
Skarv	6507/5-2	3731.40	Fluid inclusions	190	94.3	2.5	1.2	1.0	1.0	1.00	25.35	5.7
Skarv	6507/5-2	3735.50	Fluid inclusions	300	95.2	3.2	1.6	0.0	0.0		20.01	4.8
Skarv	6507/5-2	3738.50	Fluid inclusions	440	94.5	3.8	1.1	0.6	0.0		19.57	5.5
Skarv	6507/5-2	3738.70	Fluid inclusions	85	97.1	2.9	0.0	0.0	0.0		33.97	2.9
Skarv	6507/5-2	3784.93	Fluid inclusions	470	90.7	4.2	2.8	1.0	1.4	0.75	13.06	9.3
Skarv	6507/5-2	3794.48	Fluid inclusions	420	83.9	5.5	5.7	1.4	3.6	0.40	7.51	16.1
Skarv	6507/5-2	3801.70	Fluid inclusions	350	88.8	5.3	3.4	1.0	1.5	0.65	10.18	11.2
Skarv	6507/5-2	3807.75	Fluid inclusions	380	87.8	5.1	4.1	1.0	2.0	0.50	9.56	12.2
Skarv	6507/6-2	3728.30	Fluid inclusions	340	91.6	5.4	1.3	0.5	1.1	0.50	13.60	8.4
Skarv	6507/6-2	3731.40	Fluid inclusions	190	94.3	2.5	1.2	1.0	1.0	1.00	25.33	5.7
Skarv	6507/6-2	3735.50	Fluid inclusions	300	95.2	3.2	1.6	0.0	0.0		20.00	4.8
Skarv	6507/6-2	3738.50	Fluid inclusions	440	94.5	3.8	1.1	0.6	0.0		19.56	5.5
Skarv	6507/6-2	3738.70	Fluid inclusions	85	97.1	2.9	0.0	0.0	0.0		34.00	2.9
Idun	6507/3-3	2686.10	MDT RUN 1B	*	96.0	2.7	1.1	0.1	0.1	0.58	25.06	4.0
Idun	6507/3-3	3388	MDT RUN 2B	*	94.0	3.7	1.9	0.1	0.3	0.36	16.81	6.0
Idun	6507/3-3	3468.20	MDT RUN 2A	*	93.5	3.9	2.0	0.2	0.4	0.58	15.96	6.5
Idun	6507/3-3	3543.80	MDT RUN 2A	*	92.9	4.3	2.3	0.2	0.4	0.58	14.20	7.1
Idun	6507/3-3	3700.50	MDT RUN 2A	*	94.2	3.6	1.8	0.1	0.3	0.38	17.65	5.8
Skarv	6507/5-1	2993-3001	DST 3	*	87.7	7.0	3.7	0.6	1.1	0.53	8.25	12.3
Skarv	6507/5-1	3430-3442	DST 2A	*	88.2	6.8	3.6	0.4	1.0	0.36	8.46	11.8
Skarv	6507/5-1	3494-3514	DST 2B	*	87.3	5.9	5.6	0.3	0.8	0.40	7.57	12.7
Skarv	6507/5-1	3607-3653	DST 1	*	83.1	9.8	5.2	0.6	1.4	0.43	5.57	16.9
Skarv	6507/5-2	3637	EX CYLINDER 5837	*	90.5	5.4	2.8	0.4	0.9	0.43	11.03	9.5
Skarv	6507/5-2	3647	EX CYLINDER 1561	*	90.6	5.4	2.7	0.4	0.9	0.47	11.18	9.5

GC-FID of inclusion gases 6507/5-4												
Sample nr.	Core depth (m)	%C1	%C2	%C3	%i-C4	%n-C4	%C5	%C2+	C1/C2+C3	i-C4/n-C4	C1-C5 (mV)	
1	3515.0	69.0	14.0	8.3	2.1	3.7	2.9	31.0	3.1	0.6	19200	
2	3516.4	56.5	15.8	12.2	3.2	6.1	6.1	43.5	2.0	0.5	8733	
3	3521.4	68.3	14.9	9.2	1.6	3.2	2.8	31.7	2.8	0.5	19133	
4	3522.7	52.8	15.4	15.1	3.3	6.0	7.4	47.2	1.7	0.6	5493	
5	3525.8	72.3	12.8	7.7	1.7	3.0	2.6	27.7	3.5	0.6	19333	
6	3530.0	72.1	13.5	7.2	1.4	3.2	2.7	27.9	3.5	0.4	12080	
7	3531.3	73.6	12.3	7.1	1.4	2.8	2.8	26.4	3.8	0.5	14533	
8	3536.0	72.0	12.8	7.1	1.9	3.3	2.8	28.0	3.6	0.6	8307	
9	3540.5	71.1	12.9	8.0	1.8	2.7	3.6	28.9	3.4	0.7	13231	
10	3542.4	71.1	12.8	7.1	1.9	3.8	3.3	28.9	3.6	0.5	7634	
11	3544.7	69.4	12.8	7.7	1.5	5.1	3.6	30.6	3.4	0.3	9259	
12	3546.9	69.8	12.8	7.0	1.7	5.2	3.5	30.2	3.5	0.3	7200	
13	3548.43	68.3	12.0	7.2	2.4	6.0	4.0	31.7	3.5	0.4	15882	
14	3548.7	72.8	11.7	7.0	1.4	4.7	2.3	27.2	3.9	0.3	9788	
15	3551.2	70.0	12.4	8.1	1.9	3.8	3.8	30.0	3.4	0.5	4857	
16	3552.7	70.7	12.1	7.9	1.9	4.2	3.3	29.3	3.5	0.4	11012	
17	3553.13	72.8	12.2	7.0	1.4	3.3	3.3	27.2	3.8	0.4	7120	
18	3555.13	72.8	12.5	6.7	1.3	3.6	3.1	27.2	3.8	0.4	12571	
19	3557.56	70.2	11.6	7.9	1.4	4.2	4.7	29.8	3.6	0.3	9976	
20	3559.5	70.5	11.5	7.5	2.2	4.4	4.0	29.5	3.7	0.5	5006	
21	3563.7	76.0	14.7	9.2	0.0	0.0	0.0	24.0	3.2		4030	
22	3567.7	69.1	11.5	7.8	1.4	2.8	7.4	30.9	3.6	0.5	3378	
23	3570.7	74.0	10.9	7.8	2.1	5.2	0.0	26.0	3.9	0.4	2637	
24	3575.72	66.4	12.7	8.6	2.7	4.1	5.5	33.6	3.1	0.7	3481	
25	3577.54	86.9	13.1	0.0	0.0	0.0	0.0	13.1	6.7		1333	
26	3581.32	86.2	13.8	0.0	0.0	0.0	0.0	13.8	6.3		859	
27	3588.43	100.0	0.0	0.0	0.0	0.0	0.0	0.0			148	
28	3592.6	100.0	0.0	0.0	0.0	0.0	0.0	0.0			148	
29	3599.5	100.0	0.0	0.0	0.0	0.0	0.0	0.0			163	
30	3602.6	67.6	11.7	9.4	4.2	4.7	2.3	32.4	3.2	0.9	1722	
31	3608.7	77.8	15.6	6.7	0.0	0.0	0.0	22.2	3.5		1304	
32	3610.53	74.0	12.8	6.1	2.6	4.6	0.0	26.0	3.9	0.6	2519	
33	3616.43	77.6	12.5	9.9	0.0	0.0	0.0	22.4	3.5		1326	
34	3622.5	100.0	0.0	0.0	0.0	0.0	0.0	0.0			296	
35	3628.72	100.0	0.0	0.0	0.0	0.0	0.0	0.0			222	
36	3635.66	100.0	0.0	0.0	0.0	0.0	0.0	0.0			148	
37	3641.55	100.0	0.0	0.0	0.0	0.0	0.0	0.0			207	
38	3647.63	100.0	0.0	0.0	0.0	0.0	0.0	0.0			148	
39	3652.63	100.0	0.0	0.0	0.0	0.0	0.0	0.0			148	
40	3658.67	100.0	0.0	0.0	0.0	0.0	0.0	0.0			252	
41	3665.67	100.0	0.0	0.0	0.0	0.0	0.0	0.0			148	
42	3672.63	100.0	0.0	0.0	0.0	0.0	0.0	0.0			133	
43	3678.98	100.0	0.0	0.0	0.0	0.0	0.0	0.0			237	
44	3680.43	85.0	15.0	0.0	0.0	0.0	0.0	15.0	5.7		622	
45	3681.6	85.8	14.2	0.0	0.0	0.0	0.0	14.2	6.1		519	
46	3683.68	82.8	17.2	0.0	0.0	0.0	0.0	17.2	4.8		607	
47	3685.18	100.0	0.0	0.0	0.0	0.0	0.0	0.0			430	
48	3690.23	100.0	0.0	0.0	0.0	0.0	0.0	0.0			444	
49	3694.56	100.0	0.0	0.0	0.0	0.0	0.0	0.0			344	
50	3702.67	100.0	0.0	0.0	0.0	0.0	0.0	0.0			333	
51	3706.63	100.0	0.0	0.0	0.0	0.0	0.0	0.0			344	
52	3711.5	100.0	0.0	0.0	0.0	0.0	0.0	0.0			278	
53	3716.62	100.0	0.0	0.0	0.0	0.0	0.0	0.0			233	
54	3722.5	100.0	0.0	0.0	0.0	0.0	0.0	0.0			289	

TAB 6 cont.

Skarv & Idun petroleum tests - gas isotopes

Field	Well	Depth (m)	Sample	C1 $\delta^{13}\text{C}$	C1 $\delta^2\text{H}$	C2 $\delta^{13}\text{C}$	C3 $\delta^{13}\text{C}$	C4 $\delta^{13}\text{C}$	iC4 $\delta^{13}\text{C}$	CO ₂ $\delta^{13}\text{C}$	CO ₂ $\delta^{18}\text{O}$
Idun	6507/3-3	2686,1	MDT RUN 1B	- 41.5	-191	-30.1	-28.2	-27.6	-26.4	-14.3	-8.9
Idun	6507/3-3	3388	MDT RUN 2B	- 35	-191	-27.4	-26.7	-25.9	-22.7	-9.7	-16.9
Idun	6507/3-3	3468,2	MDT RUN 2A	- 34.8	-172	-27.4	-27.1	-26.5	-23.6	-9.3	-11.8
Idun	6507/3-3	3543,8	MDT RUN 2A	- 34.7	-165	-27.3	-26.5	-25.6	-23.5	-8.2	-10.6
Idun	6507/3-3	3700,5	MDT RUN 2A	- 34.4		-27.1	-26.9	-27	-22.5	-7.3	-18
Skarv	6507/5-1	2993-3001	DST 3	- 41	-197	-31.4	-28.8	-28.3	-27.0	-12	-14.3
Skarv	6507/5-1	3430-3442	DST 2A	- 38.5	-203	-30.4	-29.3	-29.3	-25.3	-12.4	-11.5
Skarv	6507/5-1	3494-3514	DST 2B	- 38.5	-208	-30.4	-29.3	-29.2	-27.8	-12	-13.3
Skarv	6507/5-1	3607-3653	DST 1	- 38.8	-215	-30.2	-29.1	-28.8	-25.7	-13	-11.5
Skarv	6507/5-2	3637	EX CYLINDER 5837	- 38.4		-29.6	-29.6	-29.0	-28.0	-10.7	
Skarv	6507/5-2	3647	EX CYLINDER 1561	- 38.3		-30.3	-29.5	-29.6	-30.1	-11.1	
Skarv	6507/5-4	3055.20		-41.5	-185	-30.4	-28.3	-28.0	-27.2	-11.0	-11.5
Skarv	6507/5-4	3220.80		-42.2	-193	-30.4	-28.1	-27.8	-26.8	-9.2	-9.9
Skarv	6507/5-4	3514.00		-40.1	-185	-30.5	-28.7	-28.9	-28.4	-11.8	-9.9
Skarv	6507/5-4	3559.80		-40.4	-187	-30.7	-28.7	-29.2	-28.5	-10.0	-11.3
Skarv	6507/5-4	3733.60		-40.1	-187	-30.4	-28.5	-28.8	-27.2	-10.9	-7.7
Skarv	6507/5-4	3748.70		-40.4	-184	-30.5	-28.3	-28.3	-26.8	-9.6	-9.4

TAB 7

Inclusion gas isotopes											
Field	Well	core depth	Sample	C1	C2	C3	iC4	nC4	iC6	nC6	CO ₂
		m	type	($\delta^{13}\text{C}$)	($\delta^{13}\text{C}$)	($\delta^{13}\text{C}$)	($\delta^{13}\text{C}$)	($\delta^{13}\text{C}$)	($\delta^{13}\text{C}$)	($\delta^{13}\text{C}$)	($\delta^{13}\text{C}$)
Idun	6507/3-3	2745.03	fluid inc.	-68.4	-	-	-	-	-25.7	-25.4	-
Idun	6507/3-3	3391.53	fluid inc.	-39.5	-28.5	-25.4	-	-26.0	-27.5	-25.7	-
Idun	6507/3-3	3404.51	fluid inc.	-49.4	-30.8	-26.9	-	-	-27.8	-26.3	-
Idun	6507/3-3	3428.44	fluid inc.	-43.8	-30.4	-26.9	-	-	-26.9	-26.0	-
Idun	6507/3-3	"	fluid inc.	-45.0	-30.9	-26.5	-	-	-28.6	-26.9	-
Idun	6507/3-3	3470.22	fluid inc.	-43.0	29.3	-25.7	-	-	-26.5	-25.4	-
Idun	6507/3-3	3561.24	fluid inc.	-61.5	-	-	-	-	-26.0	-25.4	-
Idun	6507/3-3	"	fluid inc.	-61.5	-	-	-	-	-26.2	-25.8	-
Skarv	6507/5-1	3398.7	fluid inc.	-42.8	-28.9	-28.9	-25.3	-28.7	-	-	-23.2
Skarv	6507/5-1	3424.6	fluid inc.	-44.0	-30.4	-28.0	-	-24.6	-	-	-20.8
Skarv	6507/5-1	3499.9	fluid inc.	-48.7	-29.5	-27.0	-	-	-	-	-15.1
Skarv	6507/5-2	3628.0	fluid inc.	-46.2	-29.7	-27.5	-	-	-	-	-21.6
Skarv	6507/5-2	3645.8	fluid inc.	-48.1	-34.1	-30.4	-	-31.7	-	-	-21.0

Inclusion gas isotopes Skarv								
Well	core depth	Sample	C1	C2	C3	iC4	nC4	CO2
	m	type	$\delta^{13}\text{C}$	$\delta^{13}\text{C}$	$\delta^{13}\text{C}$	$\delta^{13}\text{C}$	$\delta^{13}\text{C}$	$\delta^{13}\text{C}$
6507/5-4	3514.98	fluid inc.	-37.2	-28.3	-27.7	-28.6	-27.9	-12.2
6507/5-4	3525.82	fluid inc.	-37.4	-28.4	-27.8	-25.7	-27.2	-10.8
6507/5-4	3542.36	fluid inc.	-39.0	-27.9	-27.4		-29.6	-9.6
6507/5-4	3552.7	fluid inc.	-38.1	-28.0	-27.3		-27.9	-10.5
6507/5-4	3559.5	fluid inc.	-37.9	-28.4	-28.6		-28.4	-9.8

TAB 8 cont.

Isotopes of liquid petroleums - Idun and Skarv						
Field	Well	Sample ID	Whole oil $\delta^{13}\text{C}$	Sats $\delta^{13}\text{C}$	Aros $\delta^{13}\text{C}$	Polars $\delta^{13}\text{C}$
Idun	6507/3-3	Garn oil	-26.75	-28.02	-26.22	-30.69
Skarv	6507/5-1	DST1	-28.7			
Skarv	6507/5-1	DST2	-29.1			
Skarv	6507/5-1	DST2A	-29.1			
Skarv	6507/5-1	DST3	-29.5			
Skarv	6507/5-2	3647m oil	-28.4	-29.4	-27.68	-27.4
Skarv	6507/5-4	3055.2 cond.	-29.2			
Skarv	6507/5-4	3220.8 oil	-28.6			

TAB 9

MICROTHERMOMETRY ON FLUID INCLUSIONS			
Well	Thick section nr.	Core depth (m)	Homogenization temp. (°C) of oil and water inclusions
6507/3-3	25	2733.75	oil: 88.5, 99.5, 111, 75.5, 84.5, 85.5, 88 water: 103, 96
6507/3-3	7	3404.51	oil: 96.5
6507/3-3	24	3468.10	oil: 121, 122.5, 124.5, 118
6507/3-3	22	3472.15	oil: 102.5, 119
6507/3-3	10	3552.51	oil: 86, 109, 145