

Four FMT-runs (A,B,C and D) were performed by Dresser.

Run A,B, and C were carried out with a HP- Crystal Gauge. In run C, the HP-gauge collapsed and a strain gauge was therefore used in run D.

A total of 15 pressure points were taken in run A. Based on these points, an oil- and a water gradient can be estimated.

Three pressure points were included in estimating the oil gradient. These were at the depths of 2929.0-, 2932.0- and 2937.0 mRKB. This gave an oil gradient of 6.31 kPa/m (SG = 0.643 g/cm³). The three pressure points measured above 2920.0 mRKB seemed to be influenced by supercharging. These points together with the pressure point value measured at 2923.5 mRKB, which also seems to be too high to be a part of an oil gradient, were then excluded from the oil gradient estimation.

The water gradient was estimated based on five of the seven pressure point values in the water zone. The two values at the depths of 2959- and 2970 mRKB were excluded due to some instability of the measuring system. The water gradient was then estimated to 10.90 kPa/m (SG = 1.111 g/cm³).

Run B contains one pressure point at 2937.0 mRKB. The pressure value is in good agreement with the pressure value measured at the same depth in run A. The difference is only 7.6 kPa.

Run C was a misrun and no data were obtained.

The data obtained from the strain gauge in run D were of poor quality compared with the data available from the

HP- crystal gauge in run A. An estimation of the oil- and water gradient based on the data from run D is not favourable.

Sampling

Bottom hole samples were taken in each run except in run C which was a misrun. The following samples were taken:

Run A

Measuring depth : 2919.3 mRKB
2 3/4 gallon chamber
Opening pressure : 0 kPa
Sampling time : 10 min

Content : 3.2 l oil

Measuring depth : 2923.5 mRKB
1 gallon chamber
Opening pressure : 2758 kPa
Sampling time : 6 min 55 sec

This chamber was sent onshore for PVT analysis.

Run B

Measuring depth : 2937.0 mRKB
2 3/4 gallon chamber
Opening pressure : 7584 kPa
Sampling time : 6 min 10 sec

Content : 0.425 l gas
7.3 l oil

Measuring depth : 2937.0 mRKB
1 gallon chamber
Opening pressure : 0 kPa
Sampling time : 7 min

Content : 0.5 l oil

Run D

Measuring depth : 2941.5 mRKB
2 3/4 gallon chamber
Opening pressure : 2068 kPa
Sampling time : 2 min 5 sec

Content : 0.0227 l gas
0.2 l oil
8.8 l water

Measuring depth : 2941.5 mRKB
1 gallon chamber
Opening pressure : 2068 kPa
Sampling time : 6 min 40 sec

This sample was sent onshore for PVT-analysis. Separation and quantification of the sample in the PVT-laboratory were difficult due to high-viscous oil polluted with mud. The analysis resulted as follows:

Content : 2.33 l water/mudfiltrate
0.32 l oil/mud

Total : 2.65 l

Run A (HP- crystal gauge)

Depth pressure (mRKB)	Formation (kPa)
2919.	34363
2919.5	34182
2919.3	34191
2923.5	34151
2929.	34121
2932.	34139
2937.	34171
2940.	34195
2950.	34316
2959.	34424
2970.	34550
2980.	34640
2999.	34850
3009.	34947
2923.5	33971

Run B (HP- Crystal gauge)

2937.	34179
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Run D (strain gauge)

2933.	34288
2935.	34322
2937.	34329
2939.	34329
2941.	34329
2941.5	34343
2944.	34370
2946	34405
2948	34439
2950	34481

Example Well Mud volume distribution summary

Well: 15/12-5

Rig: Ross Isle

Hole size	Hole from-to	Hole length	Mud/Brine built	Dumped	Lost to formation	Lost over solids control equipment	Mud left between csg/csg	Cuttings volume drilled	Mud transf. to next sec.	Mud type used for interval
36"	105.5-217 m	111.5m	311 m ³	0 m ³	(305) ^x m ³				6 m ³	Spud mud
26"	217 -619 m	402 m ³	1119 m ³	120 m ³	578 m ³	205 m ³	0 m ³	137 m ³	222 m ³	Gel/ seawater/ XC-Polymer
17 1/2"	619 -1622m	1003 m	1179 m ³	764 m ³	-	195 m ³	10 m ³	156 m ³	432 m ³	Gyp/ Polymer
12 1/4"	1622 -2889m	1267 m ³	946 m ³	303 m ³	116 m ³	603 m ³	42 m ³	97 m ³	314 m ³	Gyp/ Polymer
8 1/2"	2289 -3150m	261 m ³	129 m ³	41 m ³	-	40 m ³	0 m ³	10 m ³	362 m ³	Gel/ Ligno/ Lignite
Prod. test			36 m ³	20 m ³	2 m ³	21 m ³	0 m ³	0 m ³	355 m ³	Gel/ Ligno/Lignite
P & A			20 m ³	271 m ³	3 m ³	12 m ³	89 m ³		0 m ³	

Totals:

Mud/Brine built	: 3740 m ³	Total Mud/Brine left in hole/+ between csg./csg.:	141 m ³ + 121 lost to formation
Mud/Brine dumped	: 1519 m ³	Total Mud/Brine to sea	: 3478 m ³
Mud/Brine lost to formation	: 1004 m ³	Total cuttings volume drilled	: 400 m ³
Mud/Brine lost over solids control equipment	: 1076 m ³		
Mud/Brine left between csg/csg	: 141 m ³		

^x Returns going to seabed.

STATOIL WELL NO-15/12-5

DRILLING MUD PROPERTIES RECORD

MUD SYSTEM:		SPUD MUD/GYP POLYMER/GEL-LIGN.										AREA	NORTH SEA									
												RIG	ROSS ISLE									
DAY	DATE	DEPTH	M.W.	F.V.	A.V.	P.V.	Y.P.	Gel	Gel	API	Cake	HPHT	pH	Chl-ppm	Calc.	Pf	%Oil	%sol.	%Sand	MBT	GYP	
No.	1986	metre	sg	s/qt	cps	cps		0	10	Filt.	32nds	Filt.		*1000	g/lit					ppb	ppb	
1		11.3																				
2		12.3	181	1.07	100								10.3									
3		13.3	217	1.1	50	20.5	8	25					9.7									
4		14.3	217	1.1	48	18.5	7	23					9.5									
5		15.3	220	1.1	42	20	6	28	13	13			10.1									
6		16.3	522	1.1	43	16.5	7	19	15	28	N.C		10.7							.25		
7		17.3	618	1.1	45	20.5	7	27	16	28	N.C		9.9							Tr.		
8		18.3	520	1.11	41	17.5	5	25	16	28	N.C		10									
9		19.3	618	1.16	40	21	6	30	23	32			9.4									
10		20.3	618	1.16	43	17.5	5	25	12	14			10									
11		21.3	618	1.16	42	16	5	22	12	13			10.2									
12		22.3	618	1.1	58	31.5	23	17	2	3	4.5	1	9.2									3.5
13		23.3	698	1.1	52	27	19	16	2	3	4	1	9.3	19.50	2.84	.03		8		5	2	
14		24.3	1068	1.1	54	30.5	22	17	2	3	3.4	1	8.8	22.00	4	.05		8	Tr.	10	2.6	
15		25.3	1337	1.11	52	29.5	21	17	2	3	3.4	1	9	21.00	4.2	.06		8	Tr.	10	2.3	
16		26.3	1622	1.18	52	31	22	18	2	3	3.5	1	9.2	21.00	4.4	.06		9	Tr.	10	2.4	
17		27.3	1622	1.22	55	27.5	19	17	4	7	3.7	1	9.2	21.00	3.7	.05		10	.25	10	2.7	
18		28.3	1622	1.22	55	27.5	19	17	3	7	3.6	1	9.1	21.00	3.6	.05		10	Tr.	10	2.4	
19		29.3	1622	1.22	52	26.5	19	15	3	7	4.1	1	8.8	21.50	3.69	.05		10	Tr.	10	1.9	
20		30.3	1768	1.22	60	28	19	18	3	10	5.1	1	19	10.2	22.00	1.6	.1		10	Tr.	10	2.4
21		31.3	2084	1.27	63	33	24	18	3	15	4.1	1	15	9.6	21.00	3	.1		12	Tr.	10	2.5
22		1.4	2223	1.27	65	31.5	22	19	3	12	4.2	1	15	9.7	21.00	2.1	.1		12	Tr.	15	3.2
23		2.4	2341	1.57	60	51.5	40	23	5	31	4.4	1	14.5	9.9	21.00	2.2	.1		20	Tr.	16	2.8
24		3.4	2445	1.57	57	42.5	32	21	4	30	4.6	1	18.5	9.6	22.00	2.4	.1		20	Tr.	17.5	2.8
25		4.4	2505	1.57	58	42.5	32	21	4	30	4.5	1	12	9.6	21.50	2.4	.05		20	Tr.	17.5	3
26		5.4	2579	1.57	59	40	31	18	4	19	3.9	1	10.5	9.8	22.00	2.2	.1		20	Tr.	17	3.1
27		6.4	2601	1.57	57	39	30	18	3	17	3.8	1	11	9.8	22.00	1.9	.05		20	Tr.	16	2.8
28		7.4	2696	1.57	56	39	30	18	3	22	4.2	1	15.5	9.7	22.00	1.76	.05		20	Tr.	15	2.4
29		8.4	2755	1.57	61	34	34	20	4	24	4.2	1	16	9.4	21.50	1.6	.05		20	Tr.	14	2.1
30		9.4	2798	1.57	55	39	30	18	3	22	4.3	1	17	9.3	21.50	1.64	.05		20	Tr.	14	1.4
31		10.4	2842	1.57	57	40	31	18	4	26	4.2	1	15	9.7	22.80	1.64	.05		20	Tr.	14	1.2

STATOIL WELL NO.15/12-5

DRILLING MUD PROPERTIES RECORD

MUD SYSTEM:		SPUD MUD/GYP POLYMER/GEL-LIGN.										AREA	NORTH SEA											
												RIG	ROSS ISLE											
DAY No.	DATE 1986	DEPTH metre	M.W. sg	F.V. s/qt	A.V. cps	P.V. cps	Y.P. cps	Gel 0	Gel 10	API Filt.	Cake 32nds	HPHT Filt.	pH	Chl. ppm	Calc. ±1000 g/lit	Pf	%Oil	%sol.	%Sand	MBT ppb	GYP ppb			
32	11.4	2880	1.57	56	39.5	30	19	5	33	4.5	1	14	9.3	22.00	1.64	.05		20	Tr.	14.5	1			
33	12.4	2889	1.57	58	40	30	20	6	38	4.5	1	12.5	9.5	22.00	1.64	.05		20	Tr.	15	.9			
34	13.4	2889	1.57	58	38	29	18	5	34	4.5	1	13	9.5	22.00	1.64	.05		20	Tr.	14	.9			
35	14.4	2889	1.57	59	31	23	16	4	30	5	1	15	10	22.00	1.72	.2		20	Tr.	14				
36	15.4	2892	1.35	60	33.5	26	15	4	30	5.2	1	14	9.4	13.00	1.16	.1		14	.25	22				
37	16.4	2918	1.35	58	24.5	18	13	3	24	5.4	1	15	9.9	13.50	.8	.1		14	.25	23				
38	17.4	2966	1.35	60	23.5	18	11	3	19	5.3	1	14	10	13.00	.32	.1		14	.25	23				
39	18.4	3144	1.35	60	24.5	19	11	3	22	5.4	1	14.6	10.5	13.50	.3	.25		14	.25	22.5				
40	19.4	3150	1.35	65	26.5	20	13	3	23	5.3	1	14.7	9.8	13.50	.32	.15		14	.25	22.5				
41	20.4	3150	1.35	65	26.5	20	13	3	23	5.4	1	14.7	9.8	13.50	.32	.15		14	.25	22.5				
42	21.4	3150	1.35	80	25.5	19	13	3	23	5.3	1	14.5	9.7	13.50	.4	.15		14	.25	22.5				
43	22.4	2724	1.35	78	25	19	12	4	40	6.4	1	17.5	11.7	13.50	.46	.45		14	Tr.	21.5				
44	23.4	3109	1.35	70	24	18	12	3	32	6.6	1	18	11.3	14.50	.48	.4		14	Tr.	21				
45	24.4	3109	1.35	65	22	17	10	3	30	6.6	1	18	11.3	14.50	.48	.4		14	Tr.	21				
46	25.4	3109	1.35	65	22	17	10	3	30	6.6	1	18	11.3	14.50	.48	.4		14	Tr.	21				
47	26.4	3109	1.35	64	22	17	10	3	30	6.6	1	18.5	11.3	15.00	.48	.35		14	Tr.	21				
48	27.4	3109	1.35	65	21	16	10	3	30	6.6	1	18.5	11.3	15.00	.48	.35		14	Tr.	21				
49	28.4	3109	1.35	61	20.5	16	9	3	28	6.7	1	18.5	11.3	15.00	.48	.35		14	Tr.	20				
50	29.4	2885	1.35	60	20.5	16	9	3	28	6.6	1	18.5	11.3	15.00	.48	.35		14	Tr.	20				
51	30.4	2621	1.57	59	24.5	20	9	3	25	7.2	1		11.3	16.00	.54	.35		20	Tr.	20				
52	1.5	1472	1.57	62	24	19	10	4	35	8.6	1		11.2	16.50	.6	.4		20	.5	19				
53	2.5	1472	1.57	63	24	19	10	3	32	8.9	1		10.8	16.50	.62	.35		20	.5	19				