R.F.T. RESULTS 31/4 - 7

No.	Depth. (mRKB)	P.H.I. psia	P.F. psia	P.H.A. psia	Perm/remarks
RUN 3 A					
1/3A	2030	3834.8	3097.8	3835.2	Supercharged
2/3A	2031.5	3837.8	3092.8	3837.9	Low perm
3/3A	2033.7	3842.0	3098.2	3842.3	Low perm.
4/3A	2030	3835.4	3097.8	3835.4	Supercharged
5/3A	2035.5	3846	—	3846.2	Tight
6/3A	2035.2	3845	—	3845.3	Tight
7/3A	2036.5	3845.9	—	3846.4	Tight
8/3A	2038.7	3849.9	—	3850.5	Tight
9/3A	2045.5	3862.9	3129.5	3863	V. poor perm.
10/3A	2048.5	3868.4	—	3868.7	Tight
11/3A	2120	4001.7	3191.3	4002.4	Poor perm.
12/3A	2031.5	3837.1	3092.8	3836.1	Segr. sample
Attempted segregated sample at 2031.5 m: Lost seal after 1 minute and recovered 5.7 litre mud filtrate and thin oil film from $2^3/_4$ gal chamber.					
RUN 3 B					
1/3B	2031.2	3834.0	3092.7	3834.2	Low perm/lost seal
2/3B	2030.5	3832.6	—	3832.8	Tight
3/3B	2030	3831.4	—	3831.9	Tight
4/3B	2031	3833.8	—	3833.8	Tight
5/3B	2033.7	3838.5	—	3838.5	Tight
6/3B	2031.5	3834.6	—	3834.5	Seal failure
RUN 4 C					
1/4C	2030	3987.2	3098.9	3988.0	Supercharged
2/4 C	2031.5	3990.9	3094.2	3991.0	Low perm.
3/4 C	2033.7	3995.4	—	3995.7	Tight
4/4 C	2035.5	3998.8	—	3999.0	Tight
5/4 C	2045.5	4017.9	3135.4	4018.5	V. poor perm
6/4 C	2120	4162.2	3198.3	4162.8	Poor perm.
7/4 C	2237	4387.6	3308.3	4387.9	Good perm.
8/4 C	2243.7	4401.2	3318.0	4401.6	V. good perm.
9/4 C	2247.8	4409.6	3324.3	4409.5	Fair perm.
10/4 C	2391.2	4685.3	3549.8	4685.0	Fair perm.
11/4 C	2393.7	4690.6	3551.8	4690.5	V. good perm.
12/4 C	2396	4695.5	3554.3	4695.8	V. good perm.
13/4 C	2397.7	4698.8	3556.0	4698.7	V. good perm.
14/4 C	2400.5	4703.6	3558.8	4703.5	V. good perm.
15/4 C	2406.5	4715.3	3564.8	4715.0	V. good perm.
16/4 C	2417	4736.0	3580.6	4736.2	V. good perm.
17/4 C	2429	4758.6	3597.5	4758.8	V. good perm.
18/4 C	2436.5	4773.3	3608.3	4773.2	V. good perm.
19/4 C	2458.2	4815.0	3639.9	4815.2	V. good perm.
20/4 C	2490.5	4877.4	3686.9	4877.8	V. good perm.
21/4 C	2031.5	3991.3	—	3991.8	Attempted sample. seal failure.
22/4 C	2031.5	3991.7	—	3991.8	Seal failure.
RUN 4 D					
1/4 D	2396	4697.2	3554.7	4697.6	Segr. sample - aborted.
2/4 D	2395.7	4696.7	3554.3	4696.8	
Took segregated sample at 2395.7 m and recovered 7.3 oil, 275 l gas and 1.7 l mud filtrate.					

DST RESULTS 31/4 - 7

DST 1

Perforated interval	:	2389.9 - 2397.9 m (RKB)
Choke size	:	40/64"
Oil flow rate	:	4300 BOPD
Oil gravity	:	0.83 g/cm^3
Gas flow rate	:	0.88 - 10^6 scf/d
Gas gravity	:	0.775 (air = 1)
GOR	:	205 scf/bbl
CO_2	:	0.25%
H_2S	:	0
BSW	:	0.25%
Wellhead pressure	:	725 psia

DST 2

Perforated interval	:	2028.5 - 2039.5 m (RKB)
Choke size	:	32/64"
Gas flow rate	:	0.95 . 10^6 scf/d
Gas gravity	:	0.77 (air = 1)
Condensate flow rate	:	Not measureable
Condensate gravity	:	0.75 g/cm^3
CO_2	:	Trace - 0.5%
H_2S	:	0
BSW	:	—
Wellhead pressure	:	175 psia.

6.4 Mud report

36" Hole Section:

This section was drilled from 161 m to 248 m using seawater and high viscosity pills pumped on each connection.
Before running the 30" casing, 56 m^3 of high viscosity mud was sirculated into the well.
The casing was run and cemented without problems.

26" Holesection:

This section was drilled using the same technique as for the 36" hole section.
At TD of the 17 1/2" pilot hole, 15.9 m^3 of high viscosity mud was circulated through the hole before a wipertrip was made. Before logging, the 17 1/2" hole was displaced with totally 111m^3 of the same high viscosity mud.

The 17 1/2" hole was then underreamed to 26" using seawater and high viscosity pills pumped whenever necessary.
At TD, 15,9 m^3 of high viscosity mud was circulated through the well before the hole was displaced with 159 m^3 of the same mud.

Before running casing a 26" bit was run in hole. Tight spots were seen at 525 m and 581 m.

Before pulling out of the hole 95.4 m^3 of high viscosity mud was circulated into the hole.The casing was run and cemented without problems.

17 1/2" Hole Section

This section was drilled using a KCL-polymer drilling fluid which was displaced into the hole before the cement was drilled out. A leakoff test was performed to 1.80 SG. During drilling to 1367m the mudweight was gradually increased to 1.20 SG. A survey was dropped and the bit pulled. Tight hole with max. overpull of 700 KN was seen from 1367m to 1000m.

When running back in hole the sections from 1120 m to 1135m, 1228m to 1243m and 1367m to 1490m were reamed and washed.

During drilling to 1496m the mudweight was increased to 1.29 SG.

When reaching 1528 m a 8 m^3 high viscosity pill was circulated around before a 10 stands wiper trip was made.

Tight hole was seen from 1446m to 1371m.

During drilling to 1671m the mudweight was increased to 1.34 SG.

Another wipertrips was made to 1471m. Tight hole were seen from 1598m to 1570m, 1551m to 1522m with max. overpull of 266 KN.

New hole was drilled down to 1816m. At this depth 8 m^3 of high viscosity mud was circulated around before a multishot survey was dropped and the bit pulled out to the 20" shoe. Tight hole was seen from 1800 m to 1656 m with max. overpull of 625 KN.

When running back in hole, the hole was reamed from 1675 m to 1720 m and from 1800m to 1816 m.

At this depth 8 m^3 of high viscosity mud was pumped around. During this circulation the mudweight was increased to 1.40 SG. Cavings were seen.

The hole was logged without problems.

Before running casing a wipertrip was made.

The casing was run and cemented without problem.

Interval discussion, conclusion and recommendation:

The problems seen when drilling the 17 1/2" holesection is beleaved to be caused by plastic flow of the claystone into the well. The tight hole seen was cured by reaming and increased the mudweight. At TD the mudweight was increased to 1.40 SG. This seemed to be enough to allow the hole to be logged and the casing run without problem.

12 1/4" Hole section

The 12 1/4" section was drilled using a special designed drilling fluid to prevent formation damage and ensure good log quality.

It contained:

NaCl Salt (60 000 mg/L),
Polyanionic Cellulose,
Starch.
XC- Polymer.

During the first days of drilling, only minor problems were seen. These problems were mainly reaming and washing and fill on the bottom.

After increasing the YP up to 10 to 15 Pa the problems disappeared. Except for these, few or none other problems were seen during drilling, logging or running casing.

Daily mud properties

Date.850201

Well.....: 31/4-7

Mud Contractor..: Int. Dr. Fluid

Norsk Hydro

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Date	Mid. depth (m)	Mud dens. (r.d)	PV cps	YP mPa	GEL 0 mPa	GEL 10 mPa	Ph	100psi (cc)	HP/HT (cc)	Cl- mg/l	Alkalinity Pf	Alkalinity Pb	Alkalinity Mf	Ca++ mg/l	Oil %	Sol %	H2O %	V.G. meter at 115AF 600 rpm	300 rpm	200 rpm	100 rpm	6 rpm	3 rpm	MUD TYPE
840726	248	1.08															100						Gel spud mud
840727	248	1.08															100						Gel spud mud
840728	864	1.08	28	19	12	30	9.0		NC						10		100						Gel spud mud
840729	1000	1.08	40	24	14	34	9.0		NC						10		100						Gel spud mud
840730	1000	1.08	32	18	12	26	10.0		NC	1100	0.2		0.4		10	5	95						Gel spud mud
840731	1000	1.08	36	26	16	26	9.0		NC	1200	0.2		0.3		10	4	96						Gel spud mud
840801	1000	1.08	38	30	24	38	10.0		NC	1100	0.3		0.4		10	5	95						Gel spud mud
840802	1000	1.15															100						KCL-IDBOND
840803	1124	1.15	12	5	1	3	8.7	10		64000	0.1		0.2		10	6	94						KCL-IDBOND
840804	1367	1.24	15	7	1	2	9.7	12		60000	0.4		0.6		10	8	92						KCL-IDBOND
840805	1671	1.31	16	12	1	2	9.8	9.4		67000	.08		.25		10	10	90						KCL-IDBOND
840806	1816	1.31	18	14	2	2	9.0	9.0		64500	0		.18		10	12	88						KCL-IDBOND
840807	1816	1.40	20	11	1	2	8.5	9.2		64000	0		.18		10	14	86						KCL-IDBOND
840808	1816	1.40	21	17	1	2	8.5	8.6		60000	.08		.28		10	14	86						KCL-IDBOND
840809	1816	1.30	21	15	1	2	8.5	9.0		61000	.08		.28		10	14	86						KCL-IDBOND
840810	1870	1.30	28	26	7	8	9.0	9.0			.1		.2		10		100						NaCl/POLYMER
840811	2045	1.30	16	30	7	12	8.1	3.4		67000	0		.15		10	3	97						NaCl/POLYMER
840812	2064	1.30	11	10	2	2	8.5	4		62000	.05		.2		10	4	96						NaCl/POLYMER
840813	2096	1.30	11	13	2	4	8.5	4.6		66000	.05		.18		10	5	95						NaCl/POLYMER
840814	2139	1.30	12	16	2	2	9.0	4.8		65000	.10		.21		10	6	94						NaCl/POLYMER
840815	2150	1.30	26	12	2	3	9.0	4.0		65000	.10		.25		10	11	89						NaCl/POLYMER
840816	2150	1.30	25	13	4	7	8.8	4.0		65000	.05		.20		10	10	90						NaCl/POLYMER
840817	2241	1.31	25	13	4	8	8.5	4.0		65000	.10		.25		10	10	90						NaCl/POLYMER
840818	2369	1.32	24	13	3	8	8.2	4.0		68000	.10		.25		10	10	90						NaCl/POLYMER
840819	2490	1.325	25	10	4	10	7.8	6.0		68000	.05		.25		10	10	90						NaCl/POLYMER
840820	2505	1.33	26	16	8	12	8.0	4.0		66000	.10		.25		10	10	90						NaCl/POLYMER
840821	2505	1.33	24	16	8	12	8.0	4.0		66000	.10		.25		10	11	89						NaCl/POLYMER
840822	2505	1.33	28	17	10	18	7.8	5.0		70000	.20		.04		10	13	87						NaCl/POLYMER
840823	2505	1.33	28	14	6	16	8.0	5.0		72000	.30		.04		10	13	87						NaCl/POLYMER
840824	2451	1.34	25	14	6	20	8.2	5.2		70000	.40		.10		10	13	87						NaCl/POLYMER
840825	2451	1.27	26	13	6	10	8.0	5.4		66000	.30		.10		10	11	89						NaCl/POLYMER
840826	2451	1.15	18	11	4	10	8.8	6.4		53000	.10		.25		10	7	93						NaCl/POLYMER
840827	2451	1.15	18	13	4	14	8.6	6.6		52000	.10		.02		10	7	93						NaCl/POLYMER
840828	2451	1.15	18	12	4	16	8.8	6.6		54000	.10		.25		10	7	93						NaCl/POLYMER
840829	2451	1.15	19	14	4	16	8.8	6.8		52000	.10		.25		10	7	93						NaCl/POLYMER
840830	2451	1.15	16	12	4	12	8.8	6.8		58000	.10		.20		10	7	93						NaCl/POLYMER
840831	2451	1.15	18	15	4	10	8.0	7.0		52000	.10		.20		12	7	91						NaCl/POLYMER
840901	2451	1.15	16	13	5	10	8.3	6.8		52000	.10		.30		12	7	91						NaCl/POLYMER
840902	2385	1.16	12	12	5	11	8.1	7.0		52000	.10		.20		11	8	91						NaCl/POLYMER
840903	2385	1.16	14	11	5	11	8.0	8.0		50000	.30		.50		11	8	91						NaCl/POLYMER
840904	2385	1.16	13	11	5	11	9.5	8.0		50000	.30		.50		11	8	91						NaCl/POLYMER
840905	2385	1.16	13	12	5	10	9.7	6.8		50000	.30		.50		11	8	91						NaCl/POLYMER
840906	2385	1.16	13	12	5	10	9.5	6.8		50000	.25		.40		11	8	91						NaCl/POLYMER

Table B-4

Norsk Hydro

Daily mud properties

Date.850201

Well.....: 31/4-7

Mud Contractor..: Int. Dr. Fluid

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Date	Mid. depth (m)	Mud dens. (r.d)	PV cps	YP mPa	GEL 0 mPa	GEL 10 mPa	Ph	100psi (cc)	HP/HT (cc)	Cl- mg/l	Alkalinity Pf	Alkalinity Pb	Alkalinity Mf	Ca++ mg/l	Oil %	Sol %	H2O %	V.G. meter at 115AF 600 rpm	300 rpm	200 rpm	100 rpm	6 rpm	3 rpm	MUD TYPE
840907	2385	1.16	15	15	6	11	9.5	16		50000	.20				2	8	90							NaCl/POLYMER
840908	2024	1.15	9	11	8	11	9.8	8.5		50000	.25		.32		2	10	88							SALT+POLYMER
840909	2024	1.15	10	10	7	10	10	9.2		46000	.15				1	10	89							SALT+POLYMER
840910	205	1.15	15	15	11	14	10	9.8		46000	.20				1	10	89							SALT+POLYMER
840911	205	1.17															100							SALT+POLYMER

TABLE B-5

MUD MATERIAL CONSUMPTION

Material	Quantity	Unit/Weight
Barite	415	M/t
Bentonite	97	M/t
Caustic Soda	27	25 kg/sx
Soda Ash	46	50 kg/sx
NaCl	1033	50 kg/sx
KCl	1858	50 kg/sx
Lime	7	40 kg/sx
SM (x)	13	25 kg/sx
Idbond	60	25 kg/sx
FLR-100	242	25 kg/sx
Idvis	138	25 kg/sx
Idflo	151	25 kg/sx
Idcide L	38	25 kg/sx
CMC	40	25 kg/sx
Drispac R	4	25 kg/sx
Defoamer	2	Drums