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FINAL WELL REPORT

34/4-7

Norwegian Continental Shelf

Classification / Distribution

☒ Saga and partners

	Exploration	Petr.Tech.	Drilling	34/7 T.O.Expl.De
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2. SUMMARY

2.1 Exploration

The primary purpose of the well 34/4-7 was to provide data on the reservoir quality of both oil and water bearing parts of upper Lunde, and to investigate potential changes in porosity and permeability across the oil/water contact. Further objectives were to verify a revised model for the 34/4 part of the Snorre Field and reduce structural uncertainty.

The final depth (T.D.) of 2950 m RKB was reached in the sandstones of the late Triassic age. Apart from the sandy Utsira Formation of Pliocene - late Miocene age, a late Oligocene (1175 - 1200 m RKB) and middle - late Eocene (1455 - 1480 m RKB) sandstone unit within the Hordaland Group, the upper section down to Triassic consists mainly of claystones.

The Triassic Lunde Formation is composed of sandstones with minor siltstones in the upper part. From 2736 m RKB the upper Lunde consists of interbedded sandstone, claystone and limestone and from about 2872 m RKB down to T.D. the lithology is mainly sandstones with minor claystones and limestones.

The Lunde Formation was encountered at 2502 m RKB.

Ten cores in the interval 2506.0 - 2711.5 m RKB, totalling 205.5 m, were cut (recovered 199.4 m, 97%) in the Lunde Formation.

Hydrocarbons were encountered in the section belonging to the upper member of the Lunde Formation. The OWC was defined at 2586 m RKB.

The well was drilled to 2950 m RKB (driller's depth) into the lower member of the Triassic Lunde Formation. It was plugged and temporary abandoned after testing as an oil discovery.

2.2 Operation

The drilling rig "Treasure Saga" arrived on location February 16, 1987, and the well was spudded February 17 at 1700 hrs.

The 36" hole was drilled from 380 m RKB (Seabed) to 470 m RKB, and the 30" casing was run and cemented with the shoe at 465 m RKB.

The seabed diverter was run on riser before a 17 1/2" pilot hole was drilled down to 915 m RKB. The hole was opened to 26" with an underreamer. The seabed diverter was pulled, and the 20" casing was run and cemented with the shoe at 902 m RKB. The BOP was then installed. The 20" casing shoe was drilled out with a 17 1/2" bit and the section drilled to 1887 m RKB. The 17 1/2" section was logged. The 13 3/8" casing was run and cemented with the shoe at 1872 m RKB. Cement was drilled out, and the 12 1/4" hole was drilled to 2423 m RKB where the mud was displaced to a KCl system.

The 12 1/4" hole was continued to 2506 m RKB where 10 cores were cut before the section was drilled to T.D. at 2950 m RKB. The 12 1/4" section was logged, and the 9 5/8" casing was run and cemented with the shoe at 2921 m RKB.

2 DSTs were performed. The DST No. 1 interval was sealed off using a 7" liner. After DST No. 2 two memory gauges were hung off just above actual interval. The gauges were programmed to last 60-120 days. The well was temporarily abandoned, and a trawler cap will be set in October 1987. The rig left location on May 12, 1987 at 2130 hrs.

2.3

Testing and Formation Evaluation

Well 34/4-7 penetrated the reservoir at 2502 m RKB. The oil/water contact was defined in the upper member of the Lunde Formation at 2586 m RKB. The average log porosity in the oil zone was 23.8%, the net/gross was 0.50 and the average water saturation was 40%.

A total of 10 cores were cut and recovered during drilling of the well. The cores were cut in the interval 2506.0 - 2711.5 m RKB (driller's depth). 199.4 m of cores were recovered corresponding to an average recovery of 97.0%.

Two production tests were performed in the upper member of the Lunde Formation. Test No. 1 was carried out from two intervals straddling the oil/water contact. The test proved mobile oil down to 2586 m RKB. Seawater was successfully injected into both intervals.

Test No. 2 was carried out from five intervals in the oil zone. The well was produced continuously for 18 days. The oil rate dropped from 1550 to 1378 Sm³/d during the last 17 days of flow. The wellhead pressure dropped from 184 to 161 bar.

Further information on testing and formation evaluation is presented in section 5.

3. GENERAL INFORMATION

3.1 Licence and General Well Information

Licence 057, awarded on April 6, 1979, covers block 34/4 on the Tampen Spur, approximately 240 km northwest of Bergen. About 50% of the area was relinquished in 1985. The retained area consists of 246 km². The location map is shown in fig. 3.1.

<u>Group Members</u>	<u>Working Interest</u>	<u>Net Interest</u>
Saga (operator)	15%	15%
Statoil	15%	50%
Deminex	30%	15%
Amoco	20%	10%
Amerada Hess	10%	5%
Texas Eastern	10%	5%

Rig taken over by PL 057: February 14, 1987.

Spud date: February 17, 1987.

T.D. date: March 18, 1987.

Rig released from PL 057: May 12, 1987.

Completion status: Plugged and temporary abandoned as an oil discovery.

Final location coordinates: Latitude 61° 31' 09.83" N
Longitude 02° 15' 15.45" E

UTM-coordinates: 6821 032.2 m N
460 326.5 m E

Seismic position: Saga/Geco 8420, row 084, column 595.

Rig: "Treasure Saga"

RKB - MSL: 26 m

MSL - Seabed (water depth): 354 m

RKB - Seabed: 380 m

RKB - T.D. 2950 m RKB (driller's depth)

2942 m RKB (logger's depth)

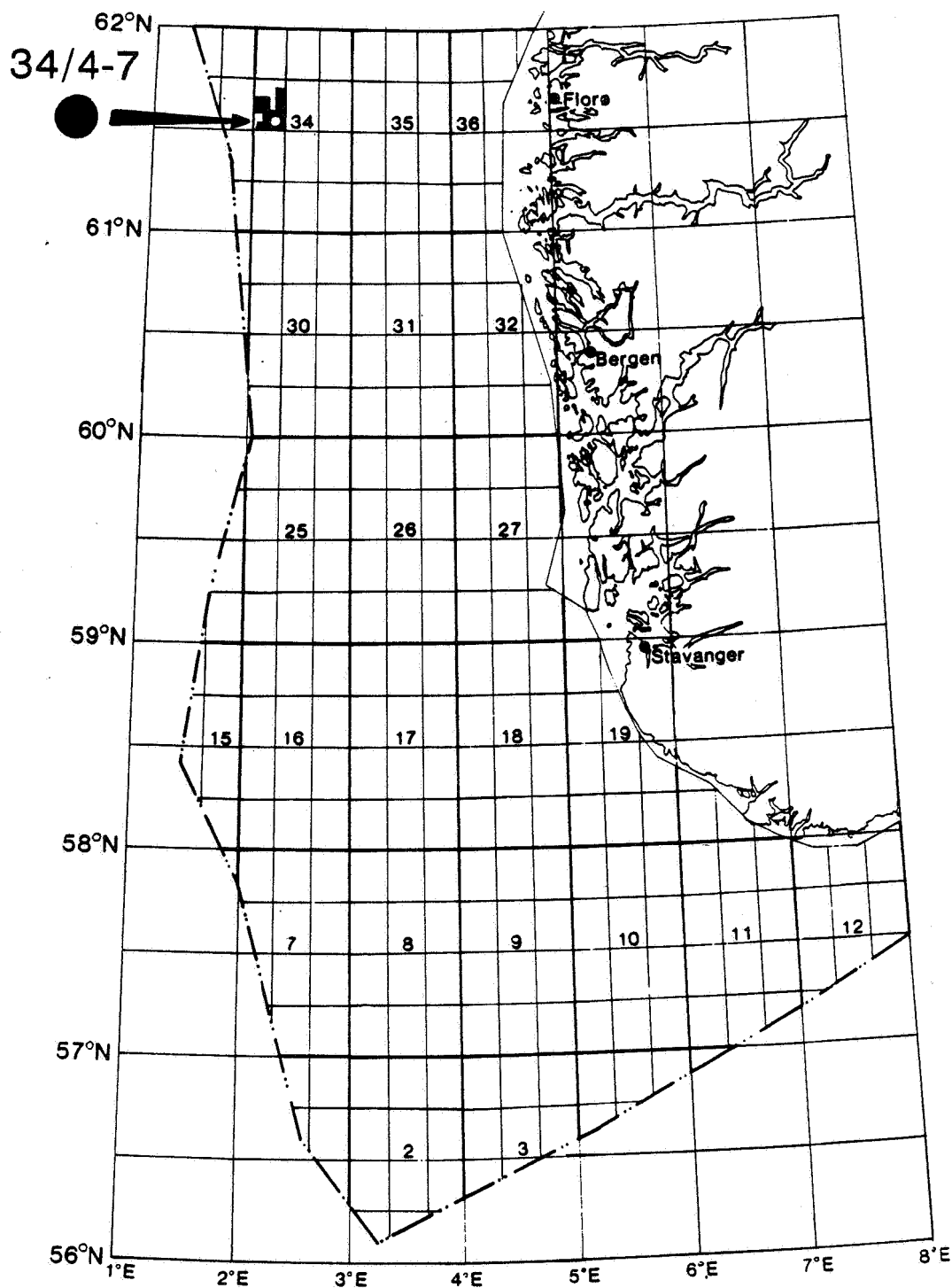


Fig. 3.1: Location map showing the position of block 34/4 approx 240km NW of Bergen.

Date	Oct.87.	Auth.	BRF	Appr.	TSo
Draw by	RHK	Ref			

3.2 Saga Personnel

3.2.1 Drilling

Onshore:

Vice President, Drilling Department:

Reidar O. Nyvik

Senior Manager, Drilling Operations:

Terje Vatn

Senior Drilling Engineer:

Kristian Sirevaag

Offshore:

Drilling Supervisors:

Tom Bjerke

Johan Bysveen

Kjell Randulff

Jan Petter Rød

Jon Arne Aase

Assistant Drilling Supervisors:

Ole Kristian Brobakk

Einar Framnes

Øivind Holte

Trond Myrseth

3.2.2 Engineering

Onshore:

Senior Manager, Engineering:

Paul T. Klavenes

Chief Engineer, Engineering:

Tor Stein Ølberg

Senior Drilling Engineers:

Svein Bjørheim

Jarle Haga

Helge Varhaug

Drilling Engineers:

Frode Leraand

Hilde Ødegaard

Chief Engineer Well Testing:

Anders P. Hjellen

Senior Engineer Well Testing:

Yngve Andbo

3.2.3 Geology

Onshore:

Exploration Department

Vice President, Exploration:

Senior Manager, Operation Geology:

Operation Geologist:

Operation Engineer:

Senior Manager, Geophysical Laboratory:

Geophysicist:

Geologist:

Senior Manager, Geological Laboratory:

Micropaleontologist:

Palynologist:

Sedimentologists:

Geochemist:

Sample distribution:

Hans Chr. Rønnevik

Terje Solli

Bjørn Karlstad

Jan Egil Pedersen

Kristian Kolbjørnsen

Steven Helmore

Kirsten Tibballs

Hans O. Augedal

Sven A. Bäckström

Frøydis Eide

Per Bakøy

Ellen Sofie Mo

Kari Chruchow

Offshore:

Well-site Geologists:

Carl W. Carstens

Geir Dalen

Brit Riise Fredheim

Tormod Lid Larsen

Øystein Mjelde

34/7 Team Organization, Exploration Department:

Exploration Manager:

Exploration Deputy Manager:

Senior Geological Manager:

Licence Geologists:

Nils B. Hollander

Bryan G. Pryce

Chris P. Stockbridge

Geir W. Diesen

Knut Jorde

Nils Ræstad

Senior Geophysical Manager:

Kari Bøyum

Licence Geophysicists:

John Battie

Atle Edvardsen

Mark Gorski

Mona Kjølsest

3.2.4 Petroleum Technology

Onshore:

Vice President, Petroleum Technology:

Arne Westeng

Senior Manager, Formation Evaluation:

Bjørn A. Rasmussen

Offshore:

Petrophysicists:

Tormod Førland

Pål Smestad

Test Engineers:

Bård Beldring

Sven-Ove Brandvold

Bengt Hultberg

Gabriel Jensen

Robert Nygård

Ingeborg Vrenne

Production Chemists:

Jon Magne Hvidsten

Birgitta Neigart

3.3 Contractors and Service Companies

Drilling Contractor:	Wilh. Wilhelmsen
Mud Logging:	Exploration Logging Norge A/S
Wireline Services:	Dresser Atlas
VSP:	Seismograph Services
Mud Engineering:	Dresser Norway A/S, Magcobar
Mud Tracer:	IFE
Cement and Pumping Services:	B.J. Hughes B.V.
Casing Services:	Weatherford Norge A/S
Cutting Services:	Salvesen
Coring Services:	Diamond Boart
Underreaming:	Tri-State
MWD Logging:	Anadrill Schlumberger
ROV Service:	Bergen Underwater Services
Well Head System:	Vetco
Jarring Services:	Eastman Christensen
Stabilizers:	Eastman Christensen
Surface Test Equipment:	Flopetrol
Production Testing:	Flopetrol
DST-Equipment:	Halliburton
Pressure Recording:	Flopetrol/Sperry Sun/Baker
Perforating:	Schlumberger
Oil/Gas and Water Sampling:	Petrotech
Radioactive Tracer Analyses:	IFE
Water Consultant:	Aquateam
Supply Boats:	"Nordfonn" and "Skandi Beta"
Standby Boat:	"Standby Master"
Helicopter Service:	Helicopter Service A/S
Catering Service:	Wilh. Wilhelmsen

4. GEOLOGY AND GEOPHYSICS

4.1 Geographic and Structural Setting

The 34/4-7 well was drilled in the south-eastern part of the block towards the north-eastern margin of the Snorre Field (fig. 4.1). The Late Triassic - Early Jurassic reservoirs of the Snorre Field are made up of a complete series of rotated fault blocks dipping between 5 and 12 degrees in generally to the west and northwest. The structure is divided into elongated fault blocks by major NNE-SSW trending faults. The structure map is defined at the Base Cretaceous/Top Reservoir contours.

4.2 Purpose of the Well

The primary purpose of well 34/4-7 was to assess the upper member of the Lunde Formation. The well was located to provide data on the reservoir quality of both oil and water bearing parts of upper Lunde, and to investigate potential changes in porosity and permeability across the oil/water contact.

Further objectives were to verify a revised velocity model for the 34/4 part of the Snorre Field and reduce structural uncertainty.



TOP RESERVOIR STRUCTURE CONTOUR SUBCROP MAP (DEPTH)

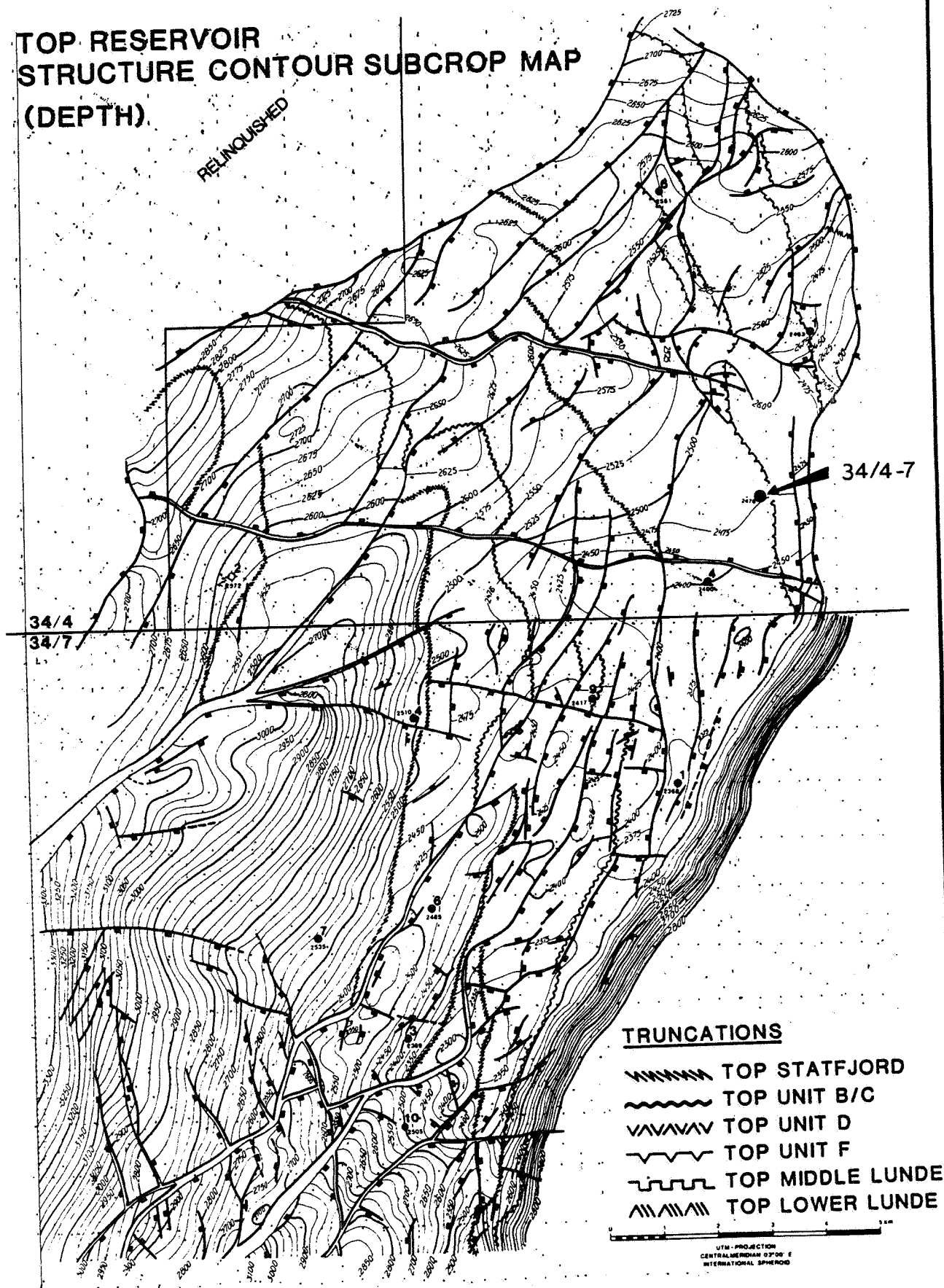


Fig. 4.1: Structure map showing the position of well 34/4-7.

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4.3 Sampling

4.3.1 Routine Samples

The following routine samples were collected:

- a) Six sets of wet ditch cuttings (a 1/2 kg).
- b) Two sets of well-site washed and dried cuttings.
 - No returns: 380 (Seabed) - 470 m RKB
 - 10 m intervals: 470 - 1820 m RKB
 - 5 m intervals: 1820 - 2470 m RKB
 - 3 m intervals: 2470 - 2950 m RKB
- c) One set of canned composite wet samples for geochemical analyses.
 - 10 m intervals: 470 - 2470 m RKB
 - 9 m intervals: 2470 - 2950 m RKB

4.3.2 Distribution and Analyses of Samples

Six sets of wet cutting samples, two sets of washed and dried samples, and one set of canned samples were collected from first sample return to total depth. These samples were distributed in the following way:

Wet samples:

- a) Sent to Robertson Research for paleodating. The rest material was returned to Saga.
- b) Treated according to NPD regulations by Geco and sent to NPD.
- c) Washed and divided into 10 splits by Geco and transferred to Statoil as trade sets.

- d) Washed and dried by Geco, and sent to Saga, Høvik.
- e) Sent to Saga, Høvik, for paleontological and mineralogical analyses.
- f) Washed and divided into 5 splits by Geco. One split containing one half of this set was transferred to Statoil, and the other splits were sent to partners.

Washed and dried samples directly from the rig:

- a) One set transferred to Saga, Høvik.
- b) One set transferred to NPD.

Canned samples were sent to Saga, Arkivrommet, Hamang Næringssenter, Byvind Lychesvei 21C, 1300 Sandvika.

The petrophysical measurements and the slabbing of the cores were carried out by Geco. Cut C was sent to Statoil and cut D to NPD. Cuts A and B were transferred to Arkivrommet, Sandvika, for detailed sedimentological and structural description together with petrographical and paleontological analysis. The A and B cuts will be stored at Arkivrommet, Hamang Næringssenter, Byvind Lychesvei 21C, 1300 Sandvika, when the analyses are completed.

The sidewall cores (SWC) were sent to Saga, Høvik, for paleontological, geochemical and petrographical analysis. Selected SWC were sent to Robertson Research for paleodating.

4.3.3 Conventional Cores

Core No. 1	Cut	: 2506.0 - 2512.0 m RKB
	Recovered	: 2506.0 - 2511.0 m RKB
	Recovery	: 5 m (83%)
	Correction factor	: +2 m
	Recovered interval, log	: 2508.0 - 2513.0 m RKB
Core No. 2	Cut	: 2512.0 - 2536.0 m RKB
	Recovered	: 2512.0 - 2531.2 m RKB
	Recovery	: 19.2 m (80%)
	Correction factor	: +2 m
	Recovered interval, log	: 2514.0 - 2533.2 m RKB
Core No. 3	Cut	: 2536.0 - 2563.5 m RKB
	Recovered	: 2536.0 - 2563.5 m RKB
	Recovery	: 27.5 m (100%)
	Correction factor	: +1.5 m
	Recovered interval, log	: 2537.5 - 2565.0 m RKB
Core No. 4	Cut	: 2563.5 - 2591.3 m RKB
	Recovered	: 2563.5 - 2591.3 m RKB
	Recovery	: 27.8 m (100%)
	Correction factor	: +1.5 m
	Recovered interval, log	: 2565.0 - 2592.8 m RKB
Core No. 5	Cut	: 2591.3 - 2619.3 m RKB
	Recovered	: 2591.3 - 2619.3 m RKB
	Recovery	: 28 m (100%)
	Correction factor	: +2 m
	Recovered interval, log	: 2593.3 - 2621.3 m RKB
Core No. 6	Cut	: 2619.3 - 2647.0 m RKB
	Recovered	: 2619.3 - 2647.0 m RKB
	Recovery	: 27.7 m (100%)
	Correction factor	: +2 m
	Recovered interval, log	: 2621.3 - 2649.0 m RKB

Core No. 7	Cut	: 2647.0 - 2656.5 m RKB
	Recovered	: 2647.0 - 2656.5 m RKB
	Recovery	: 9.5 m (100%)
	Correction factor	: +2 m
	Recovered interval, log	: 2649.0 - 2658.5 m RKB
Core No. 8	Cut	: 2656.5 - 2675.0 m RKB
	Recovered	: 2656.5 - 2675.0 m RKB
	Recovery	: 18.5 m (100%)
	Correction factor	: +2.25 m
	Recovered interval, log	: 2658.75 - 2677.25 m RKB
Core No. 9	Cut	: 2675.0 - 2693.0 m RKB
	Recovered	: 2675.0 - 2692.7 m RKB
	Recovery	: 17.7 m (98%)
	Correction factor	: +2 m
	Recovered interval, log	: 2677.0 - 2694.7 m RKB
Core No. 10	Cut	: 2693.0 - 2711.5 m RKB
	Recovered	: 2693.0 - 2711.5 m RKB
	Recovery	: 18.5 m (100%)
	Correction factor	: +1.75 m
	Recovered interval, log	: 2694.75 - 2713.25 m RKB

Remarks: Cores 8 and 9 slightly overlaps.

Comments:

All core depths (cut) in section 4.3.3 correspond to driller's depth. The log depths correspond to the CDL-CNL-GR logs. The wellsite core descriptions are presented in Enclosure III, and the core analyses are given in chapter 5.2.

4.3.4 Sidewall Cores

Four runs were made with coregun, attempting a total of 200 sidewall cores.

89 cores were recovered (45%), 39 were lost, 15 were empty and 57 were misfires. The high numbers of misfires are due to tool failure in runs number 3B and 3D, no shots fired on lower gun.

The geological descriptions are given in table 4.1.

Table 4.1: Sidewall Core Description, well 34/4-7

No.	Depth	Lithology
on log	m RKB	
1	918	Clyst, v slty, sl aren, m gy - m dk gy, stc-frm, sl calc
2	951	Clyst, slty, sl aren, olv gy, stc, sl mic-mica, calc
3	1010	Sample as above
4	1038	Sample as above
5	1057	Clyst, slty, aren, olv gy, stc-frm, sl mic-mica, sl calc
6	1061	Sample as above
7	1063	Ss, v arg, lt gy - gn gy, vf-f, w srted, sbang-sbrnd, fri, mic-mica, v calc-calc
8	1076	Clyst, sl aren, olv gy, stc, sl mic-mica, calc-v calc
9	1104	Clyst, slty, sl aren, m dk gy, stc, sl mic-mica, sl calc
10	1134	Clyst, aren, m dk gy - olv gy, stc, sl mic-mica, sl calc
11	1168	Clyst, sl slty, brn gy - olv gy, stc, mic-mica, calc
12	1180	Ss, v glauc, blk, trns, (salt & pepper tex), f-m, w-mod srted, sbrnd, fri, calc
13	1190	Sample as above, but v calc
14	1192	Sample as above
15	1204	Clyst grdg sltst, brn gy - lt olv gy, frm, mic-mica, sl calc
16	1236	Sample as above, but non calc
17	1263	Clyst, slty, brn gy - olv gy, frm, sl mic-mica, non calc
18	1303	Clyst grdg sltst, brn gy - olv gy, frm, sl mic-mica, non calc
19	1334	Sample as above
20	1363	Clyst grdg sltst, m dk gy - olv gy, frm, mic-mica, non calc
21	1365	Clyst, sl slty, m dk gy - dk gn gy, stc-frm, sl mic-mica, non calc
22	1378	Clyst, dk gn gy, stc-frm, non calc
23	1400	Clyst, olv gy, stc-frm, sl mic-mica, non calc
24	1432	Clyst, olv gy, frm-stc, sl mic-mica, non calc
25	1472	Sample as above
26	1496	Sample as above
27	1534	Clyst, olv gy - dk gy, frm-stc, sl mic-mica, non calc
28	1570	Sample as above

No.	Depth	Lithology
on log	m RKB	
29	1618	Clyst, olv gy - dk gy, frm-stc, sl mic-mica, non calc
30	1652	Sample as above
31	1692	Clyst, sl slty, vgt, m gy - rd brn, frm-stc, sl mic-mica, calc
32	1699	Clyst, sl tuf, gy gn, occ wh spec, frm, calc
33	1701	Clyst, m dk gy, occ blk spc, frm, calc
34	1704	Clyst, sl tuf, vgt, m dk gy - lt gy, occ blk spec, mic-mica, calc
35	1727	Clyst, dk gy - gy blk, frm, sbfis, sl mic-mica, sl calc
36	1732	Clyst, olv gy, frm, mic-mica, sl calc
37	1734	Sample as above
38	1740	Clyst, olv gy, frm, sl mic-mica, non calc
39	1790	Sample as above
40	1810	Clyst, slty-aren, m gy - dk gn gy, frm, mic-mica, non calc
41	1820	Clyst, olv gy, frm, sl mic-mica, non calc
42	1822	Clyst, aren, m gy - gn gy, frm, sl mic-mica, sl calc, pyr
43	1824	Clyst, m dk gy, frm, sl mic-mica, non calc
44	1826	Clyst, m dk gy - olv gy, frm-stc, sl mic-mica, v calc
45	1833	Sample as above
46	1851	Clyst, m gy, frm, sl mic-mica, v calc
47	1867.3	Sample as above
48	1876	Clyst, slty, m gy, sft-brit, v calc
49	1900	Clyst, slty, brn gy, sft-brit, calc
50	1912	Clyst, slty, m gy - m dk gy, sft-brit, calc - v calc
51	1936	Clyst, slty, brn gy, plas-brit, sbfis, sl calc - calc
52	1994	Clyst, brn gy - m gy, sft-brit, sl calc
53	2016	Sample as above
54	2028	Sample as above, but non calc
55	2062	Sample as above
56	2178	Sample as above
57	2190	Sample as above
58	2207	Clyst, olv gy - brn gy, sft-brit, sbfis, calc (mm-thn ls str)
59	2246	Clyst, m dk gy - brn gy, sft-frm, sbfis, calc, (mm-thn wh ls str)

No.	Depth	Lithology
on log	m RKB	
60	2275	Clyst, m dk gy - brn gy, sft-frm, sbfis, calc, (mm-thn wh ls str)
61	2287	Clyst, m gy - brn gy, sft-brit, sl calc
62	2390	Clyst, m dk gy, brit-frm, non calc
63	2405	Sample as above, but sl calc
64	2488	Clyst, m dk gy, sft-brit, sl calc
65	2489	Sample as above
66	2492	Clyst, slty, dk rd brn, sft-frm, non calc
67	2494	Clyst, slty, mod-dk rd brn, sft-frm, v calc (mrl)
68	2498	Sample as above
69	2501.5	Ls/mrl, gy wh - lt gn gy, sft-brit
70	2505	Clyst, slty, dk rd brn - gn gy, brit, frm, calc
71	2505.5	Ss, lt brn (100% oil stn), vf-f, w srted, sbang-sbrnd, lse-fri, mica, sl calc Shows, lt brn oil stn, bri yel wh flor, inst strmg mlky wh - bl wh cut, lt yel res upon evap
72	2506	Sample as above, shows as above
73	2715	Ss, gy wh, vf-m, mod srted, sbang-sbrnd, mica, calc
74	2733	Sample as above
75	2736.5	Sh/ls interlam Sh, slty, dk rd brn, brit, mic-mica Ls, gy wh, brit
76	2738.5	Ss, slty, lt olv gy, vf-f, w srted, sbang-sbrnd, lse-fri, mica, v calc
77	2760	Clyst/ls interlam Clyst, dk m gy - brn gy, sft-fri, calc Ls, gy wh, brit-frm
78	2788	Ss, slty, lt gy, vf-f, w srted, sbrnd, lse-fri, calc
79	2797	Clyst/ls interlam Clyst, dk m gy - brn gy, sft-fri, calc Ls, gy wh, brit-frm
80	2815	Sample as above
81	2855	Sample as above
82	2867	Clyst, slty, m rd brn, sft, calc, /ls lenses

No.	Depth	Lithology
on log	m RKB	
83	2871	Sh, slty, dk rd brn, sft-brit, calc
84	2873	Ss, gy wh, f-m, w-mod srted, sbang-sbrnd, lse-fri, calc
85	2875	Clyst /ls lam Clyst, m rd brn, sft, calc Ls, gy wh, brit
86	2891	Ls with interlam clyst Ls, gy wh, brit Clyst, dk m gy - brn gy, sft-fri, calc
87	2911	Sltst /clyst lam Sltst, lt gy, brit, sl calc - calc Clyst, m lt gy, sft-brit, sl calc
88	2918	Ss, lt gy, f-m, pred f, w-mod srted, lse-fri, calc
89	2925	Sample as above

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SAGA

4.4 Open Hole Logs

Casing Record	Hole Size	Logged Interval (m RKB)	Type of Log	Run No.	Date
30" 465 m	36" to 470 m				
20" 902 m	26" to 915 m		MWD		
13 3/8" 1872 m	17 1/2" to 1887 m	902.8 - 1882.2 902.8 - 1863.5 47 cores rec.	MWD DIFL-LSBHC-GR CDL-GR COREGUN	1A 1A 1A	02.03.87 02.03.87 02.03.87
9 5/8" 2921 m T.D. 2942 m (logger's depth)	12 1/4" to 2950 m	<u>Intermediate run</u> 1872.2 - 2647.2 2450.0 - 2646.8 <u>At T.D.</u> 1872.2 - 2939.3 2472.0 - 2940.3 1872.2 - 2941.0 42 cores rec. 640.0 - 1872.2	MWD CDL-CNL-GR DLL-MLL-GR FMT (HP-gauge) DIFL-LSBHC-GR CDL-CNL-GR DIPLOG FMT (HP-gauge) VSP COREGUN CBL-GR	2B 2A 2A-C 3B 3C 3A 3D-F 3A 3B-D 3A	13.03.87 13.03.87 13.03.87 19.03.87 20.03.87 20.03.87 21.03.87 21.03.87 21.03.87 19.03.87

4.5

Well Velocity Survey

A zero offset VSP was acquired and processed by Seismograph Services. The data were acquired in a single run on March 28, 1987, 96 levels being shot. The nominal depth interval was 20 m from 2500 to 1200 m RKB, and 100 m from 1200 to 500 m RKB. Sonic, density, caliper and gamma ray logs were acquired by Dresser Atlas.

The seismic source was one 160 cu.in. airgun at a depth of 9.1 m, and an offset of 44.5 m.

Full details are contained in the Well Velocity Survey Report (SSL). Note that the well deviation is not included in the check shot report. The reader is referred to the MWD deviation report (Anadrill).

For processing details the reader is referred to the calibrated velocity log header. The sonic and density logs were edited by Dresser Atlas. The sonic log was drift corrected by the check shot values. The velocity log was blocked in the time domain to reduce aliasing. After examining a set of frequency tests, a set of "Interpreters Composite Plots", including time domain logs, VSP and synthetic seismograms were produced at minimum and zero phase and both polarities. A single 8 - 40 Hz BPF was used in these displays.

A seismic summary is given in fig. 4.2 and in table 4.2

34/4-7



34/4 - 7

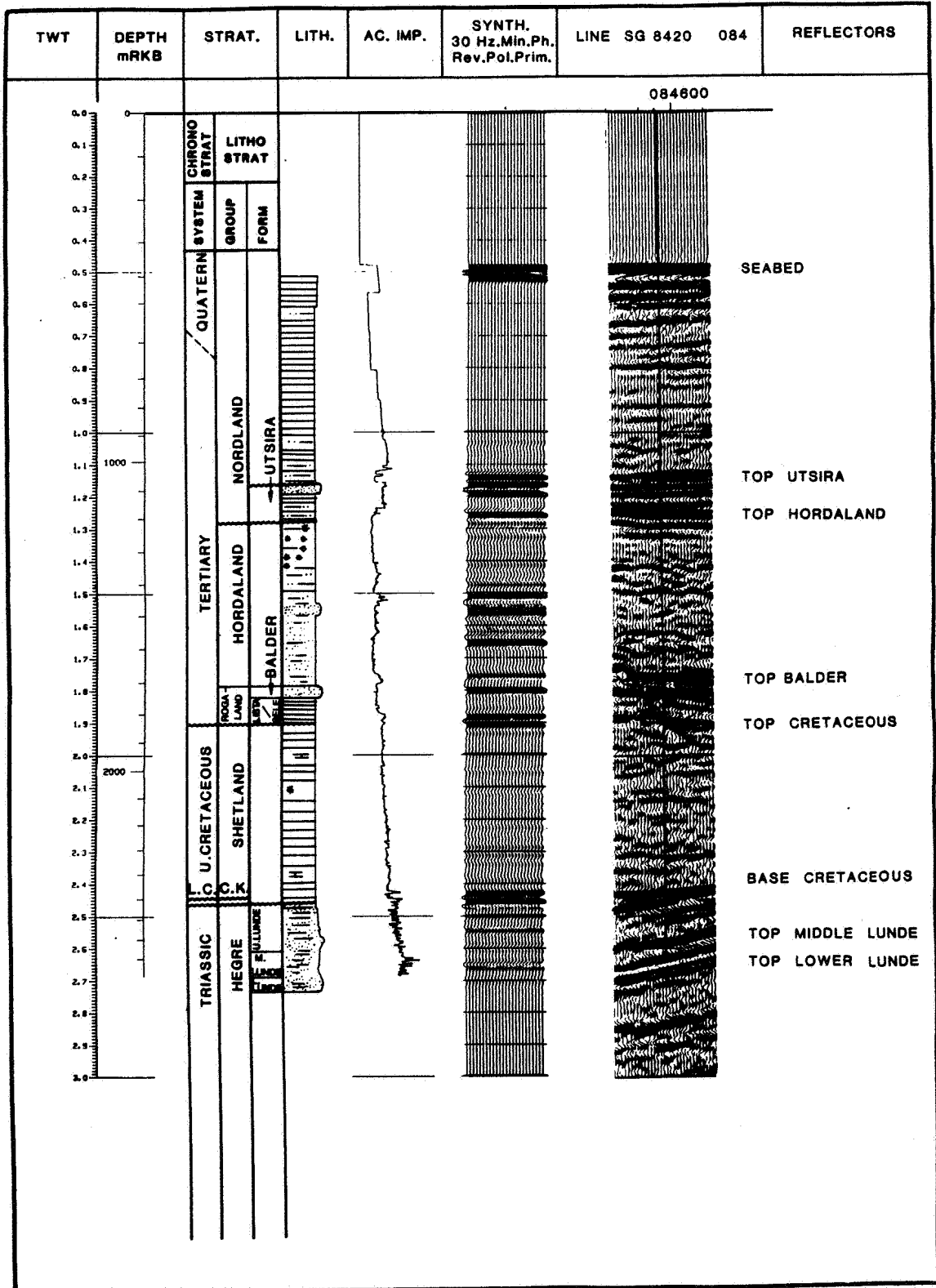


Fig. 4.2: Seismic Summary.

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Draw by		Ref			

Table 4.2: Seismic summary, line SG 8420, SP 084.

HORIZONS	TWT	DEPTH		ΔZ	ΔT	VINT
	ms	m RKB	m MSL	m	ms	m/s
Seabed	0.4784	380.0	354.0	354.0	0.478	1480
				682.0	0.641	2129
T. Utsira	1.1190	1062.0	1036.0	131.0	0.117	2239
T. Hordaland	1.2360	1193.0	1167.0	23.0	0.022	2091
Intra Oligocene Unc.	1.2580	1216.0	1190.0	484.0	0.492	1964
T. Balder	1.7500	1700.0	1674.0	33.0	0.030	2200
Lista/Sele	1.7800	1733.0	1707.0	91.0	0.091	2000
T. Cretaceous	1.8710	1824.0	1798.0	668.0	0.551	2425
Cromer Knoll	2.4220	2492.0	2466.0	10.0	0.006	3333
T. upper Lunde	2.4280	2502.0	2476.0	234.5	0.151	3099
T. middle Lunde	2.5790	2736.0	2710.0	136.5	0.078	3500
T. lower Lunde	2.6570	2872.5	2846.5	77.5	0.045	3444
T.D.	2.7020	2950.0	2924.0	(driller's depth)		

4.6 Formation Temperature

The maximum recorded temperatures (BHT) obtained during logging have been converted to static formation temperatures (T_f) using a Horner plot technique. The recorded BHTs and the estimated static formation temperatures are listed in table 4.3. The data used for the calculations are listed in table 4.4.

All the data have been plotted in fig. 4.3.

In addition to the calculated static formation temperatures, bottom hole temperatures were measured during testing:

m RKB	Temp. °C
2536	100.8
2579	100.3

Table 4.3: Average bottom hole temperatures (BHT) and static formation temperatures (T_f).

Depth m RKB	No. of BHT readings	Average BHT °C	T_f °C
1861	3	38	
2635	3	55	
2638.5	3	65	85
2918.5	3	63	
2932.2	3	77	90
2927.6	3	80	

Table 4.4: Temperature Data

Log	Date	Run No.	Btm log interval (m RKB)	Avg. rec. temp. °C (BHT)	Time since circ. hrs. (d t)	Circ. time hrs. (t)
DIFL-LSBHC-GR	02.03.87	1A	1882	38	5.8	3
DLL-MLL-GR	13.03.87	2A	2646.8	55	5.5	2.3
DIFL-LSBHC-GR	13.03.87	2B	2647.2	65	8.75	2.3
DIFL-LSBHC-GR	19.03.87	3C	2940.3	63	5.6	2
CDL-CNL-GR	20.03.87	3C	2940.3	77	12.9	2
DIPLOG	20.03.87	3A	2941	80	16.9	2

FORMATION TEMPERATURE

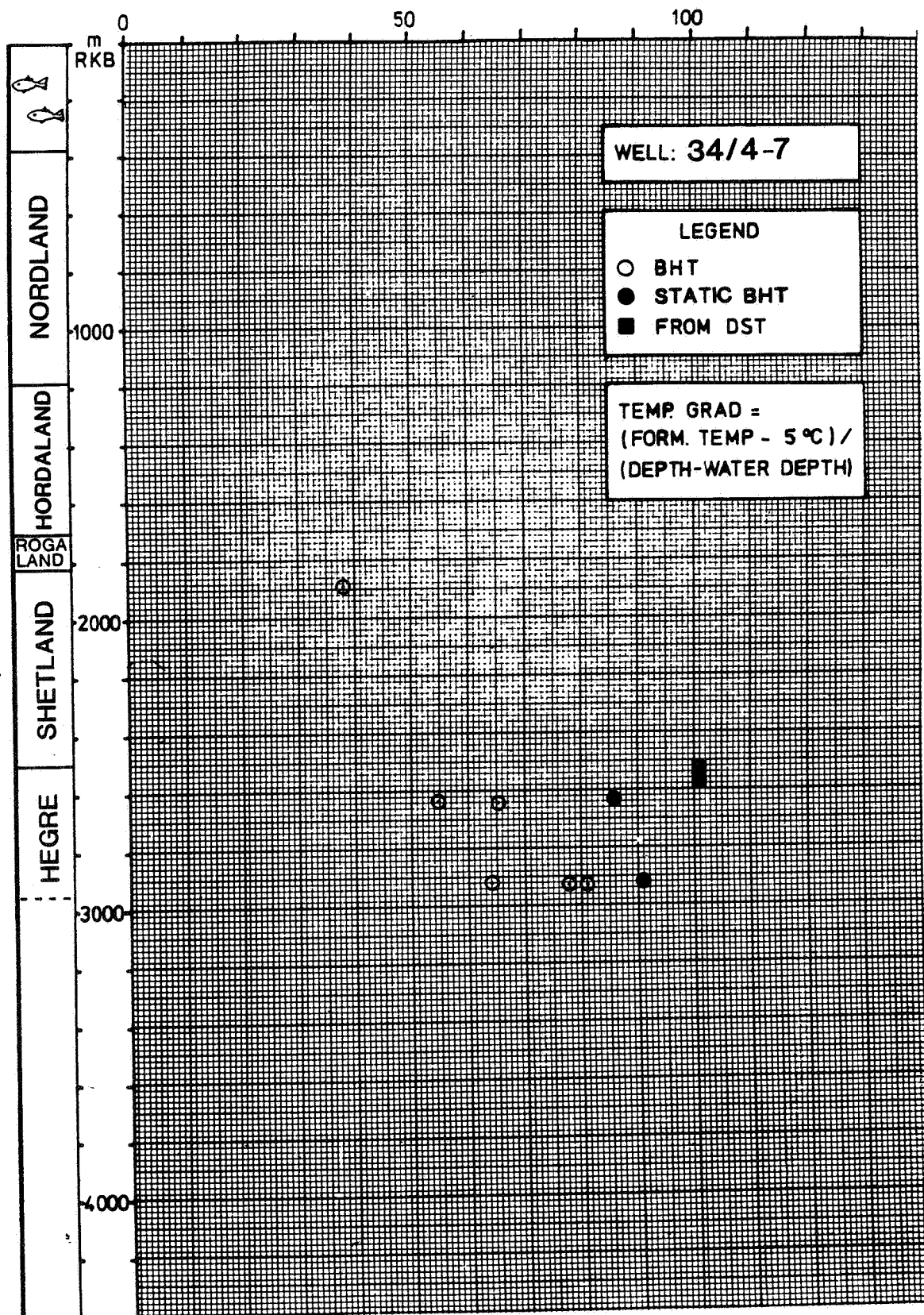


Fig. 4.3: Formation Temperature Plot.

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4.7 Formation Pressure

The most relevant pressure parameters are plotted in the Formation Pressure Evaluation Sheet, see Enclosure II. In fig. 4.4 a formation pressure gradient summary is given, including stratigraphy, mud weight (ECD), leak-off data and FMT results. The interpreted formation pressure gradients are mainly based on the d_c -exponent, the sonic log and the gas/mud weight relationship. For the quantitative evaluation the sonic log is looked upon as the most reliable parameter.

In the sediments of the Nordland Group (380 - 1193 m RKB) no signs of overpressure is seen. Both the d_c -exponent and the sonic log display normal compaction trends in the clay/claystone intervals. A normal gradient of 1.04 g/cm^3 subsea (EMW = 1.01 g/cm^3 at 800 m RKB) therefore prevails over this section. The upper part of the Hordaland Group down to approximately 1420 m RKB is also normally pressured. A shift in the normal compaction trend is seen on the sonic log and on the d_c -exponent over this interval, reflecting another clay mineralogy than in the Nordland Group. Background gas is rather low (around 0.1%) even in sandy intervals with a mud weight of 1.15 g/cm^3 (ECD = 1.17 g/cm^3).

A build-up in pressure gradient seems to take place from approximately 1420 m RKB. This is most clearly reflected in the sonic log curve which deviates towards higher Δt_s in a rather uniform claystone sequence. The d_c -exponent is rather scattered at this level, but the overall trend indicates a build-up in pressure gradient. Background gas data remains very low (less than 0.1%). This is most likely due to a stepwise increase in the mud weight from 1.15 g/cm^3 at 1400 m RKB to 1.30 g/cm^3 at 1625 m RKB. A pressure estimate at 1650 m RKB indicates a pressure gradient of 1.27 g/cm^3 subsea (EMW = 1.25 g/cm^3). The increase in pressure gradient continues throughout the lowermost part of the Hordaland Group and Rogaland Group into the Shetland Group.

FORMATION PRESSURE GRADIENT

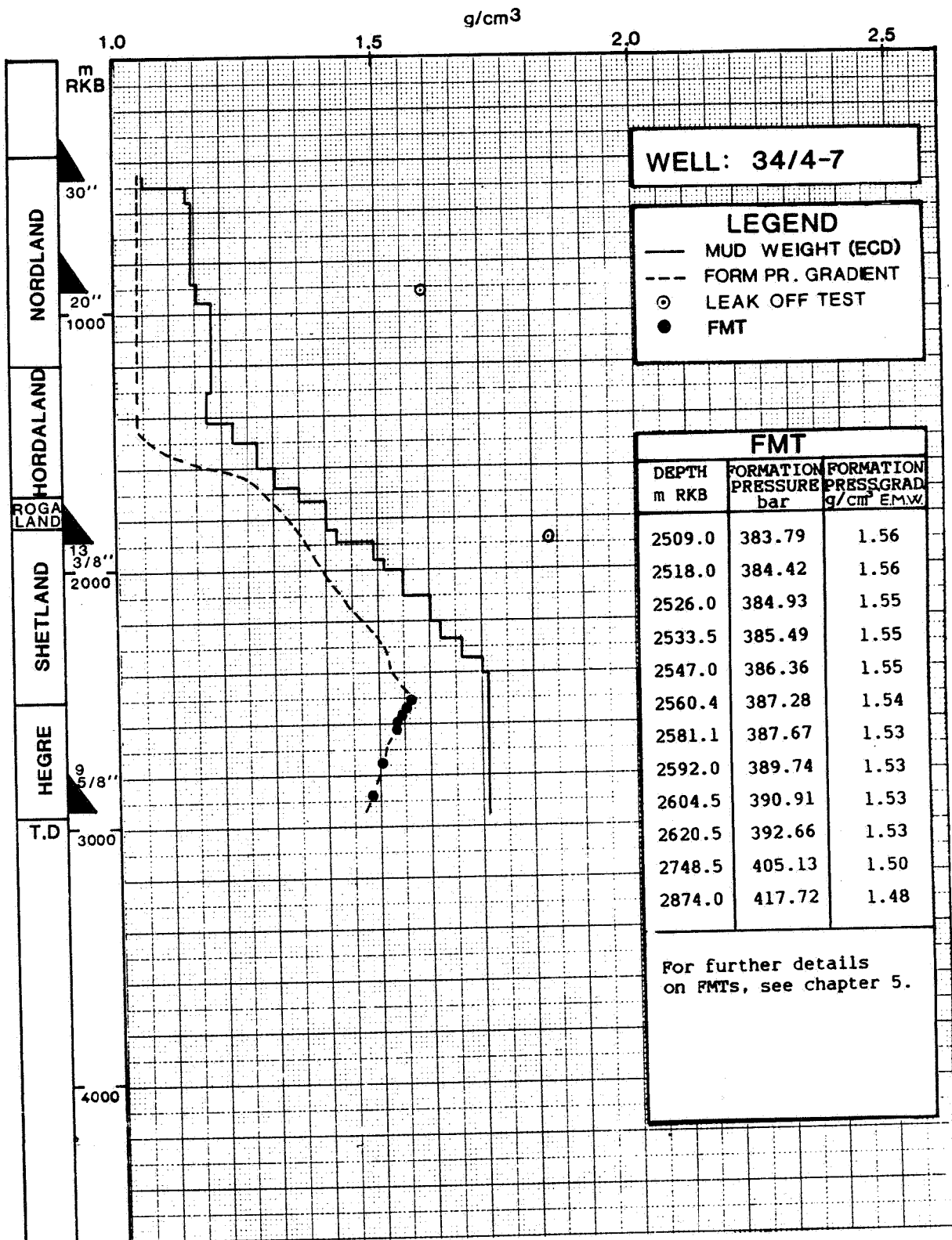


Fig. 4.4

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Trend lines have to be adjusted according to formation changes both on the sonic curve and the d_c -exponent. The sonic log clearly indicates overpressured sediments in the Rogaland Group and in the upper part of the Shetland Group down to 2075 m RKB. Below 1920 m RKB a slight increase is seen in the background gas while the mud weight is gradually increased over the same section.

A pressure estimate at 2000 m RKB, in the Shetland Group, suggests a pressure gradient around 1.39 g/cm^3 (EMW = 1.37 g/cm^3). The pressure development through the rest of the Shetland Group below 2075 m RKB is more uncertain.

The d_c -exponent could indicate a drop in pressure gradient through this section by plotting on an increasing trend. However, gas data and the sonic log give reason to believe that the pressure gradient still is increasing. Below 2120 m RKB the background gas rises from 0.16% to 0.35%, as the mud weight is raised from 1.53 g/cm^3 (ECD = 1.55 g/cm^3) to 1.58 g/cm^3 (ECD = 1.60 g/cm^3). The sonic log plots on a close to vertical trend over the discussed interval which in a constant lithology is an indication of increasing pressure gradient. Pressure estimates at 2150 m RKB and 2250 m RKB from the sonic log indicate a gradient of 1.45 g/cm^3 subsea (EMW = 1.43 g/cm^3) and 1.50 g/cm^3 subsea (EMW = 1.48 g/cm^3) respectively.

Over the reservoir section, Hegre Group, several pressure measurements were performed. The shallowest reading at 2509 m RKB gives a gradient of 1.58 g/cm^3 subsea (EMW = 1.56 g/cm^3). Vertical pressure communication exists through the sandy sediments of the Hegre Group, hence the pressure gradient (pressure depth ratio) decreases with depth according to an oil gradient of 0.069 bar/m and a water gradient of 0.099 bar/m. The deepest reading at 2874 m RKB gives a pressure gradient of 1.49 g/cm^3 subsea (EMW = 1.48 g/cm^3).

4.8 Shallow Gas

Two minor shallow gas peaks were observed on the mud gas readings, at 490 m RKB and at 660 m RKB respectively.

On fig. 4.5 mud gas and mud weight information is correlated to the shallow seismic section across the well site. The correlation is not exact due to the linear scale on the mud log and the non linear scale on the seismic section.

The upper gas reading (at 490 m RKB) is found in the lower part of the Quaternary section. The lower reading (at 660 m RKB) correlates to the Intra Pliocene Unconformity which represents a sand layer within the clay dominated Nordland Group.

The two shallow gas observations on the mud log are not significant as there is no increase in resistivity at either of the two levels.

A seismic correlation between the Snorre wells showing the observed shallow gas peaks, is presented in fig. 4.6.

Well 34/4-7

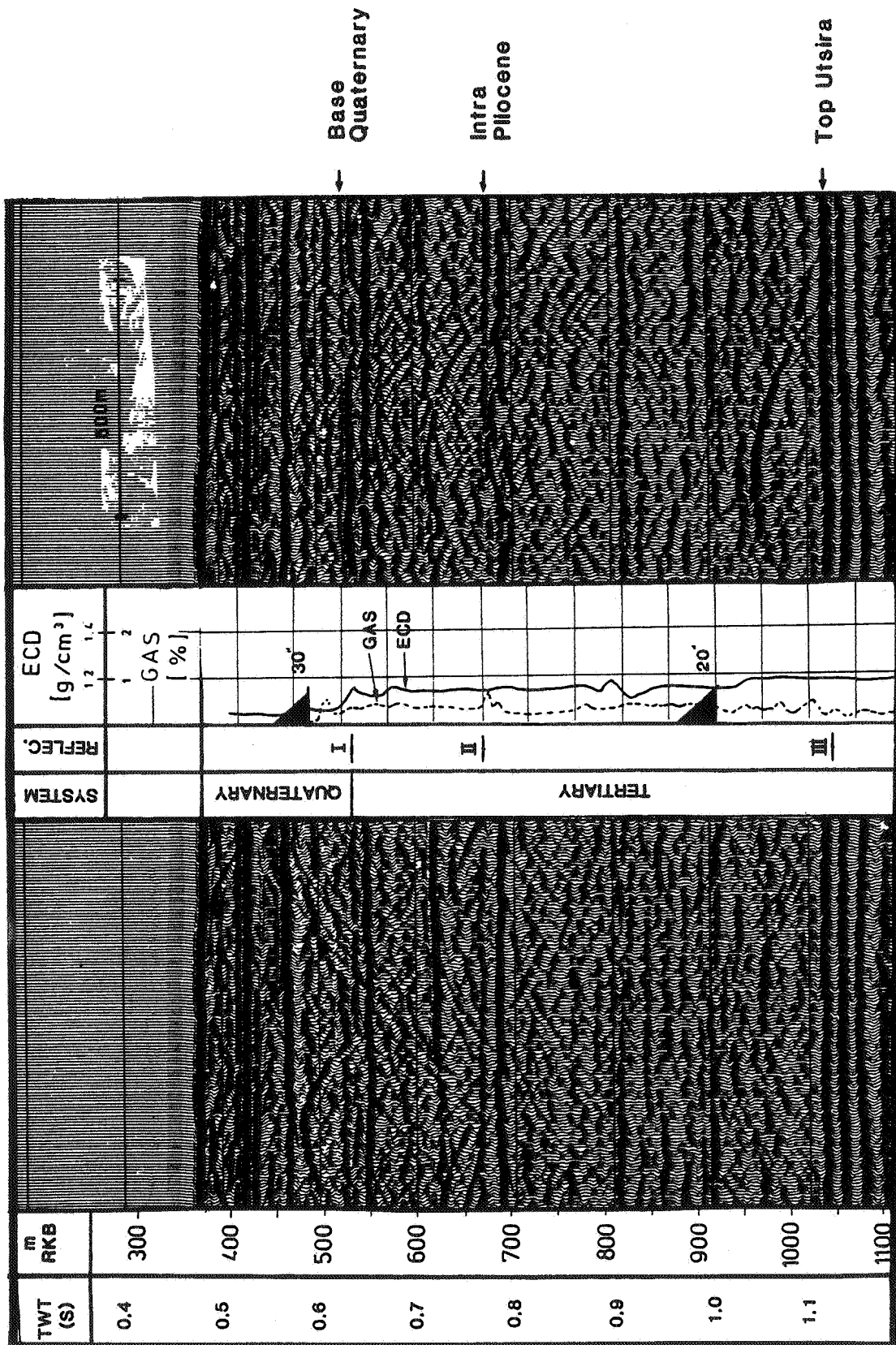


Fig. 4.5: Seismic line SG 8620-2012 and mud gas reading.

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Drawn by	GA	Ref			

SNORRE-Shallow Gas Correlation

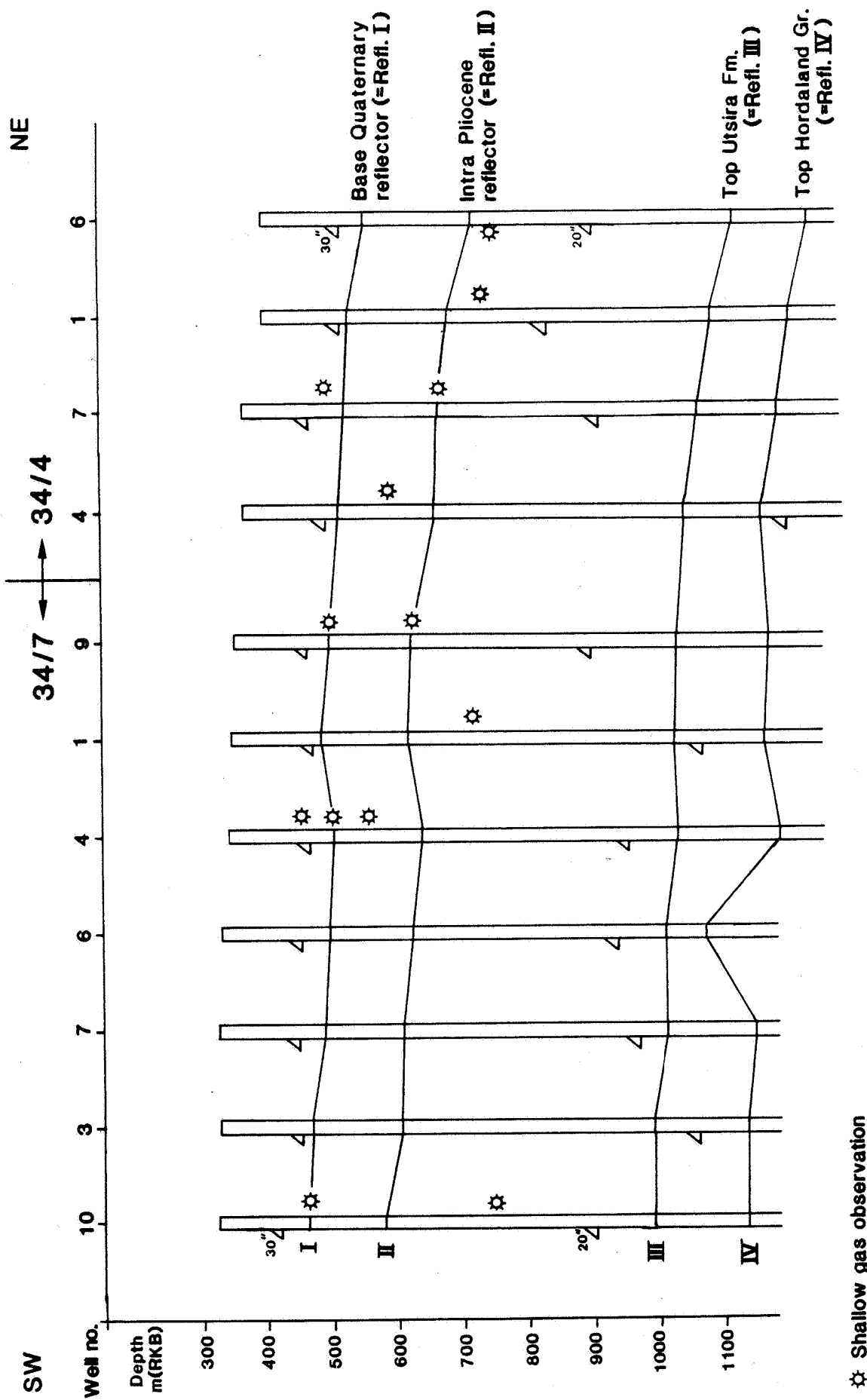


Fig. 4.6:

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4.9 Stratigraphy

4.9.1 Lithostratigraphic Summary

The lithostratigraphic subdivision of well 34/4-7 (table 4.5) is based on wireline log responses, conventional cores, sidewall cores and cutting descriptions, supported by the biostratigraphic breakdown prepared by Robertson Research and Saga.

Table 4.5: Lithostratigraphic Summary, well 34/4-7

Formation Tops	Depths (m RKB)	Thickness m
Nordland Group (Seabed)	380.0	813.0
Utsira Formation	1062.0	131.0
Hordaland Group	1193.0	507.0
Rogaland Group	1700.0	124.0
Balder Formation	1700.0	33.0
Lista/Sele Formation	1733.0	91.0
Shetland Group	1824.0	668.0
Cromer Knoll Group	2492.0	10.0
Hegre Group	2502.0	+448.0
Upper Lunde	2502.0	234.0
Middle Lunde	2736.0	136.5
Lower Lunde	2872.5	+ 77.5
T.D.	2950.0 (driller's depth)	

4.9.2 Biostratigraphic Summary

The biostratigraphic interpretation was prepared by Robertson Research in co-operation with Saga. The following analyses were carried out:

1. Robertson Research:

Lithology:	364 ditch cutting samples, 35 sidewall core samples and 12 core samples.
Micropaleontology:	182 ditch cutting samples and 25 sidewall core samples.
Palynology:	78 ditch cutting samples, 28 sidewall core samples and 11 core samples.
Nannofossil analyses:	3 sidewall core samples.

2. Saga:

Micropaleontology:	19 sidewall core samples.
Palynology:	10 sidewall core samples and 32 core samples.

The biostratigraphic breakdown is given in table 4.6. The Cainozoic and Mesozoic stratigraphic history is given in figs. 4.7 and 4.8.

Table 4.6: Biostratigraphic Summary, well 34/4-7

Age	Depth	Thick- ness	Remarks
	m RKB	m	
Seabed	380.0		
Pleistocene	480.0	+100	Top not seen
Pliocene	540.0	570	
Late Miocene	1150.0	43	
UNCONFORMITY			
Late Oligocene	1193.0	157	Log
Early Oligocene	1350.0	30	
?UNCONFORMITY			
Late Eocene	1380.0	60	
Middle Eocene	1440.0	190	
Early Eocene	1630.0	70	
UNCONFORMITY			
Late Paleocene	1700.0	124	Log
UNCONFORMITY			
Latest Maastrichtian	1824.0	16	Log
Late Maastrichtian	1840.0	30	
Early Maastrichtian	1870.0	55	
Late Campanian	1925.0	75	
Early Campanian	2000.0	320	
Santonian	2320.0	60	Log
Coniacian	2380.0	112	
UNCONFORMITY			
Late Aptian	2492.0	2	Log
Early Aptian	2494.0	1	
UNCONFORMITY			
Early Barremian	2495.0	7	Log
UNCONFORMITY			
?Rhaetian	2502.0	181.6	Log
Early Rhaetian - Norian	2683.6	266.4	
T.D.	2950.0	(driller's depth)	

CAINOZOIC STRATIGRAPHIC HISTORY



PAGE ONE OF TWO

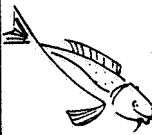
SYS- TEM	SER- IES	STA- GE	MILL. YEAR	DEPTH (m RKB)	THICKNESS	LITH.	GROUP	FORMATION/ MEMBER
				 SEA BED				
TERTIARY	QUAT.	PLEISTOC.	EARLY	380	160		NORDLAND	
				540				
		PLIOCENE	LATE	18				
				3				
			EARLY	4	653			
				5				
				1150				
		MIOCENE	LATE	10			UTSIRA	
				1193				
			EARLY	15				
				20				
				1193				
		OLIGOCENE	LATE	25				
				30				
			EARLY	1350			HORDALAND	
				? 1380	507			
				1440				
	EOCENE	MID-LATE	DLE	45				
				1630				
		EARLY		50				
				1700				
	PALEOC.	LATE		1824	124		ROGALAND	BALDER LISTA/SELE
		EARLY		60				
				65				

Fig. 4.7

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Draw by	RHK	Ref			

MESOZOIC STRATIGRAPHIC HISTORY



PAGE TWO OF TWO

SYS- TEM	SER- IES	STA- GE	MILL. YEAR	DEPTH (m RKB)	THICKNESS	LITH.	GROUP	FORMATION/ MEMBER
CRETACEOUS	LATE	MAA- STR.		1824				
			70	1925				
		CAMPA- NIAN	75	2320	668		SHETLAND	
		SANTO- NIAN	80	2380				
		CONIA- CIAN	85	2492				
		TURON- IAN	90					
		CENO- MAN	95					
	EARLY	ALB.	100	2492				
		APT.	110	2495	10		CROMER KNOLL	
		BARR.	120	2502				
		HAUT.						
		VALA- NG	130					
		BERRI- ASIAN	140					
			150					
JURASSIC	LATE	PORT.	150					
		KIMM.	160					
		OX- FORD	170					
	MIDDLE	CALL.	170					
		BATH.	180					
	EARLY	BA- JOC.	190					
		PLIE.	200	2502	448		HEGRE	LUNDE
		SINE.	210					
TRIASSIC	LATE	HETT- ANG.	220					
		RHAE.	230					
	MID- DLE	NOR.						
		CARN- IAN						
		LADIN						
		ANIS.						
		SCYT- HIAN						

Fig. 4.8

Date	Oct. 87	Auth.	BRF	Appr.	TSo
Draw by	RHK	Ref.			

4.9.3 Hegre Group

Lunde Formation

Lower Lunde

Depth interval: 2872.5 - 2950 m RKB (T.D. driller's depth)

Thickness: Minimum 77.5 m

Age: Norian - Early Rhaetian

The lower Lunde is composed of sandstones with minor claystones and limestone.

The sandstones are clear to white, very fine to medium, predominantly fine, moderately to well sorted and subangular. They are loose to friable in consistency and occasionally calcite cemented.

The claystones are mainly medium grey, occasionally red brown to brown grey. They are soft to firm, subfissile, slightly micro-micaceous, and occasionally very calcareous.

The limestones are argillaceous, white to grey and soft to firm.

Upper boundary

The overlying middle Lunde shows increasing gamma readings on wireline logs. Resistivity and sonic responses are gradually decreasing.

Middle Lunde

Depth interval: 2736 - 2872.5 m RKB

Thickness: 136.5 m

Age: Norian - Early Rhaetian

The lithology of the middle Lunde is interbedded sandstones, claystones and limestones.

The sandstones are occasionally argillaceous and grading to siltstones. They are light grey to light brown grey, very fine to fine, occasionally medium, predominantly well sorted, subangular to subrounded, friable to firm, micaceous and some calcite cemented.

The claystones occasionally consist of thin to medium lamina of limestone. The claystones are medium dark grey to green grey, occasionally red brown. They are soft to firm, subfissile, slightly micro-micaceous and calcareous.

The limestones are argillaceous, white to grey and soft to firm.

Upper boundary

The upper Lunde is recognized on the gamma ray in the changing from the blocky sand character to a more spikey character. There is also a downward increase in the resistivity.

Upper Lunde

Depth interval: 2502 - 2736 m RKB

Thickness: 234 m

Age: Rhaetian

The upper member of the Lunde Formation is mainly composed of sandstones interbedded with siltstones. In the lower part, from about 2650 m RKB, the sandstones are interbedded with shales and with minor siltstones.

The sandstones are translucent to brown orange. In the lower part from 2650 m RKB they are clear to light green in colour. They are fine to medium, occasionally very fine to coarse, moderately to poorly sorted, angular to subrounded, friable to firm and occasionally hard when calcite cemented. The sandstones are frequently laminated by mica and claystones.

The siltstones are variegated dark red brown and medium to light green grey. They are firm to hard, subfissile, very micaceous and slightly to very calcareous.

The shales are silty with trace of calcite nodules. The colour is dark grey and dark red brown. The shales are firm to hard and micro-micaceous.

Upper boundary

The major unconformity between the Hegre Group and the overlying Cromer Knoll Group is defined on wireline logs by a decrease in the resistivity and in the interval transit time in the Cromer Knoll Group.

4.9.4 Cromer Knoll Group

Depth interval: 2492 - 2502 m RKB

Thickness: 10 m

Age: Late Aptian - Early Barremian

Marl with minor limestone are the main lithology of the Cromer Knoll Group.

The marl is dark red brown, occasionally light olive grey and soft to firm.

The limestone is argillaceous, white to light grey brown and soft to firm.

Upper boundary

The overlying Shetland Group is recognized on wireline logs by increasing gamma ray and sonic transit time and the decrease in resistivity.

4.9.5 Shetland Group

Depth interval: 1824 - 2492 m RKB

Thickness: 668 m

Age: Latest Maastrichtian - Coniacian

The Shetland Group consists of a very uniform claystone lithology. It is occasionally silty, especially in the lower section, mainly medium to dark grey, soft to firm, occasionally sticky and non to slightly calcareous.

Throughout the group there are minor stringers of limestone and dolomite. The carbonates are argillaceous, light grey to pale brown and soft to firm.

Minor thin sandstone stringers are seen throughout the section. The sandstones are grading to siltstones towards bottom. They are very fine to fine, moderately to well sorted and subangular to subrounded. They are mainly loose, occasionally firm.

Accessory amounts of glauconite, pyrite and fossiles are present.

Upper boundary

The boundary to the overlying Rogaland Group (Lista/Sele Formation) is seen on wireline logs by decrease in gamma ray and the resistivity and an increase of the sonic transit time.

4.9.6 Rogaland Group

Lista/Sele Formation

Depth interval: 1733 - 1824 m RKB

Thickness: 91 m

Age: Late Paleocene

The Lista/Sele Formation is composed of a silty, green grey to medium dark grey claystone. It is soft to firm and non to slightly calcareous.

Traces of sandstones can be seen. These are mainly very fine to medium, moderately sorted, subangular to subrounded and loose in consistency.

Upper boundary

The boundary to the overlying Balder Formation is well defined on the logs by a decrease in the gamma ray and in the sonic transit time readings, and an increase in the resistivity.

Balder Formation

Depth interval: 1700 - 1733 m RKB

Thickness: 33 m

Age: Late Paleocene

The Balder Formation consists of tuffaceous claystone. It is varicoloured in dark grey, olive grey, grey brown with white and black specs, firm to soft and slightly calcareous.

Upper boundary

The overlying Hordaland Group is marked by an increase in the gamma ray and the sonic transit time and a decrease in the resistivity on the wireline logs.

4.9.7 Hordaland Group

Depth interval: 1193 - 1700 m RKB

Thickness: 507 m

Age: Late Oligocene - Early Eocene

The Hordaland Group is composed of glauconitic sand from the top and down to Intra Oligocene Unconformity at 1216 m RKB. The rest of the sequence is mainly claystone with two thick sandstone layers, about 15 and 7 m thick.

The glauconitic sand in the top is clear to black, very fine to fine, occasionally medium, moderately to well sorted, subrounded and loose.

The claystones are silty, brown grey to olive grey in colour, soft to firm, micro-micaceous and non to slightly calcareous.

The upper 260 m of the Hordaland Group is claystone with trace of thin sandstone layers. The sandstones are very silty, clear, very fine, well sorted, subrounded and loose. Throughout the rest of the

claystone sequence some limestone stringers are observed. The limestone is argillaceous, light grey to pale brown and firm.

The thicker sandstone layers and the sandstones in the lower part of the Hordaland Group are clear, very fine to medium, occasionally coarse, moderately sorted, subangular to subrounded, predominantly loose and occasionally calcite cemented.

Traces of pyrite, glauconite and mica occur throughout the hole group.

Upper boundary

The Utsira Formation of the Nordland Group above is recognized by increase in gamma readings and decrease in sonic transit time.

4.9.8 Nordland Group

Depth interval: 380 (Seabed) - 1193 m RKB
Thickness: 813 m
Age: Pleistocene - Late Miocene

Utsira Formation

Depth interval: 1062 - 1193 m RKB
Thickness: 131 m
Age: Pliocene - Late Miocene

The Utsira Formation is composed of sand with minor clay in the upper and in the lower part. In the middle part it is clay with minor sand.

The sand in the upper part is argillaceous, light grey to green grey, very fine to fine, occasionally medium, well sorted and subangular to subrounded. It is micro-micaceous and slightly calcite cemented.

The clay is arenaceous, medium grey to green grey, sticky, soft and slightly calcareous.

Traces of glauconite, pyrite, mica, shell fragments and rock fragments are common.

The sand in the lowermost 25 m is very glauconitic, else as described above.

Upper boundary

The Nordland Group above is characterized by an increase in gamma and resistivity, and the sonic transition time is decreasing on wireline logs.

Nordland Group above the Utsira Formation

Depth interval: 380 (Seabed) - 1062 m RKB

Thickness: 682 m

Age: Pleistocene - Pliocene

The lithology of the Nordland Group above the Utsira Formation is mainly clay. Some sand horizons are seen.

The clay is arenaceous, medium grey, sticky, soft and slightly calcareous.

The sand is clear, very fine to medium, occasionally coarse, moderately to poorly sorted and angular to subrounded.

There are traces of pyrite, mica, rock and shell fragments, fossils in general and foraminifers.

4.10 Hydrocarbon Indications

From the 30" casing at 465 m RKB and down to 915 m RKB a mud weight of 1.12 g/cc was used to drill the pilot hole, and the mud weight was increased to 1.16 g/cc while opening the hole to 26". Background gas was low in the interval, in average 0.2 - 0.3%, with maximum of 0.63% at 660 m RKB. There was no connection gas. A trip gas of 0.5% was recorded from wiper trip at 708 m RKB.

In accordance with the prognosed pore pressure the mud weight was progressively increased from 1.16 g/cc at 1400 m RKB to 1.70 g/cc at 2350 m RKB. From 2350 m RKB and down to T.D. at 2950 m RKB the mud weight was kept constant at 1.70 g/cc.

Gas values averaged 0.2% down to 1060 m RKB with a peak of 0.33% at 1010 m RKB. Below this depth and down to 1930 m RKB the background gas was very low averaging 0.02 - 0.08%. Down to 2504 m RKB gas levels are higher and more variable from 0.10% to 0.30% with maximum of 0.61% at 2127 m RKB.

C2 was detected from 1740 m RKB, C3 from about 2000 m RKB, and from 2108 m RKB nC4 and iC4 were present in trace amounts. First traces of shows were seen at 2080 m RKB in silty/sandy laminas of the Shetland Group. These are described as yellow fluorescence with slowly to very slowly streaming white yellow cut. From 2270 m RKB the shows are slightly decreasing to a dull yellow fluorescence with very slow streaming light yellow cut, occasionally no cut. Light brown oil stain and good odour are observed from Top Lunde reservoir at 2502 m RKB. The reservoir in general shows strong bright yellow fluorescence, instant blue white cut and pale yellow residue upon evaporation. Below 2586 m RKB both shows and cut became poorer, and from 2610 m RKB there were no shows.

Upon entering the reservoir section gas values rose markedly with a maximum of 8.8%, consisting 35320 ppm C1, 6750 ppm C2, 2200 ppm C3, 160 ppm iC4 and 570 ppm nC4. Average background gas levels fell from 0.4% at top reservoir to 0.11% at T.D. From 2647 m RKB and down to T.D. the gas was composed of C1 and C2 only. Trip gases ranged from 0 - 3.15%, the maximum being recorded from 2591 m RKB.

5. FORMATION EVALUATION

5.1 Log Analyses

The logging programme consisted of 4 runs (ref. section 4). Generally the logs were of good quality. However, the CNL from run No. 2 had to be shifted + 4 limestone porosity units to match the CNL from run No. 3. This is considered to be a shift in the short spacing detector count rate in run No. 2. Due to a thick mudcake and washouts when logging run No. 3, the CNL from run No. 2 has been used in the log analyses.

The logs have been analysed using a complex lithology type computer analysis model. Net sand averages have been calculated using a porosity cutoff of 15% in the upper Lunde. The shale volume cutoff used is 40%.

The oil/water contact has been defined in upper Lunde at 2586 m RKB. For net sand averages of the upper Lunde see fig. 5.1.

There is good agreement between core and log porosities.

5.2 Core Analyses

During drilling of the well, 10 cores were cut in the upper Lunde. The cores were cut in the interval 2506.0 - 2711.5 m RKB (driller's depth). A total of 199.4 m of cores were recovered, which corresponds to an average recovery of 97.0%.

Conventional core analyses were performed on all cores. Horizontal air permeability, helium porosity and grain density were measured every 0.25 m, while vertical air permeability, summation porosity and pore saturation were measured every metre. The analysis results are listed in fig 5.2 as a function of driller's depth.

Cation Exchange Capacity measurements have been performed on 545 coreplugs.

The following special core analyses will be performed:

1. Oil and water centrifuge capillary pressure tests.
2. Amott wettability tests.
3. Water/oil centrifuge relative permeability tests.
4. Relative permeability tests at reservoir and laboratory conditions.
5. Electrical measurements.

5.3 Formation Pressure Measurements

A Dresser Atlas Formation Multi Tester (FMT) with a HP quartz gauge was used for formation pressure measurements (fig. 5.3). One segregated sample was sent to the laboratory for PVT-analyses (ref. chapter 5.5). After evaluating the pressure measurements, 13 points have been used to define the oil/water contact. The pressure vs. depth plot defines the oil/water contact at 2586 m RKB (fig. 5.4). The oil gradient from the plot is 0.069 bar/m and the water gradient is 0.099 bar/m. PLT-logging during production test No. 1 (fig. 5.5) also proved mobile oil down to 2586 m RKB.

5.4 Testing

Two tests were carried out in the upper member of the Lunde Formation.

Before testing was initiated a cement squeeze was performed in the interval 2579 - 2580 m RKB to isolate the oil bearing sands above the perforation intervals of test No. 1.

Test No. 1, the exploration test, was carried out in two sands straddling the oil water contact. The sands were interpreted from the open hole logs to be separated by a 1 m shale section.

The perforated intervals were:

2579 - 2587 m RKB

2590 - 2596 m RKB

The depths refer to the CDL-CNL-GR log of March 13, 1987.

The test objectives were to:

- determine if movable oil exists in the "residual" oil zones and thereby determine the oil water contact,
- obtain formation water samples,
- measure the injectivity in the "residual" oil zone.

After the test a 7" liner was run to isolate the perforations and to give enough rathole to drop the guns in test No. 2.

Test No. 2, the special test, included 18 days of continuous production from five sands. The perforated intervals were:

2506.0 - 2512.5 m RKB

2517.0 - 2529.0 m RKB

2532.5 - 2535.5 m RKB

2544.0 - 2550.5 m RKB

2560.0 - 2566.0 m RKB

The test objectives were to:

- investigate the longer term production behaviour during commingled flow from several sands in the upper Lunde,
- investigate the relative zonal contribution to the total production as well as changes with time in the relative rates,
- qualitatively compare the results with the three dimensional geological/reservoir simulation model predictions,
- investigate the reservoir parameters and possible reservoir heterogeneities,
- obtain reservoir fluid samples,
- define, if possible, the interconnected pore volume drained during the test.

The main components of the test string were:

- Schlumberger tubing conveyed perforating system.
- Gun release with shifting tool.
- Three bundle carriers with pressure and temperature gauges with external and internal sensing.
- Standard Halliburton teststring with a downhole testervave, circulating valves (including OMNI-APR) and retrievable packer.
- 4 1/2 inch IF Mannesmann tubing.
- Flopetrol subsea test tree, lubricator valve and surface test tree.

The main test results are shown in fig. 5.6.

The well has been temporarily abandoned with two memory gauges in the well. They are programmed to record 60-120 days of the final build-up after test No. 2.

Test No. 1, Exploration test:

The well was perforated with 45 bar underbalance to the formation. A 18 minutes initial flow was carried out and followed by a 4.5 hour initial build up period with downhole shut-in. Two clean up periods of 2 and 5 hours duration, respectively, were performed. Unsuccessful attempts to run in the hole with a gun release tool on a slick line were performed during the following build up periods. A thick emulsion or a waxy well fluid prevented the wireline tool from entering the well.

The well produced with a fairly stable rate of $405 \text{ Sm}^3/\text{d}$ during the main flow period of 30 hours. The water cut was 53%. The well was shut in at the downhole tester valve for a 28 hours build up period.

A new clean up flow was carried out. The well fluid was then displaced by seawater, the slick line tool was run in the hole and the gun successfully dropped into the rathole. Finally the production logging tool, PLT, was run in the hole.

Passes with the PLT were made while performing a 6 hours flow period with a rate of $650 \text{ Sm}^3/\text{d}$. After a short build up, filtered seawater treated with scale inhibitor, biocide and oxygen scavenger was injected into the formation at a final rate of $395 \text{ Sm}^3/\text{d}$. The 25 hours injection period was followed by a 6 hours fall off period.

An oil water emulsion was produced during the entire test. The emulsion was broken by injecting demulsifier at the subsea test tree and by running the separator at a high temperature. Small amounts of oil in the produced water were removed by flowing to the tank.

The main test results are listed in fig. 5.7.

The test performance is shown in fig. 5.8.

Test No. 2, Special test:

The well was perforated with 35 bar underbalance to the formation. An initial flow period of 12 minutes was carried out followed by a 3 hours build up with downhole shut-in. The well was then cleaned up for 5 hours and the perforation guns dropped into the rathole by use of a slick line releasing tool. A second 2.5 hours clean up flow was then performed and a production logging tool run in the hole and calibrated.

A multirate pretest flow was then carried out. The purpose of this pretest flow was to define the permeability and skin for each layer and to carry out the following build up with a minimum of cross flow. The spinner was located above each layer and rate changes introduced to measure the rate and pressure transients of the layers below. Before moving the tool to the next layers, logging passes over the perforated intervals were made. The flow rate was varied between 500 and $1740 \text{ Sm}^3/\text{d}$. After the 26 hours pretest flow, the tool was positioned above the uppermost perforations and the well was shut in at the choke manifold for a 34 hours build-up period. A set of logging passes were performed after 3 hours of shut in.

The extended flow period was carried out with the production logging tool located below the lowermost perforations. Logging passes were performed after 1, 6, 13 and 18 days of flow. Except for a 53 minutes shut in period after 65 hours of flow, the well was flowed continuously for 18 days. After a small initial decline in the rate, a fairly constant rate was obtained.

The flowrate decreased from an initial value of 1550 to 1378 Sm³/d with the wellhead pressure dropping from 176 to 161 bar. During the flow period, the wellhead temperature fluctuated between 24 and 35 deg C causing the choke performance to change and the flowrate to vary with up to 4%.

Before the well was shut in at the choke manifold, the PLT was located above the uppermost perforations. The final shut in period lasted for 35 hours and the test was then terminated.

Foaming problems were observed in the test separator and defoamer had to be injected during the entire test to obtain a good separation of the oil.

The main test results are given in fig. 5.9.

The test performance is shown in fig. 5.10.

5.5

Fluid Analyses

FMT sample

One segregated FMT chamber was collected at 2509 m RKB. The chamber contained approximately 2 litres of oil and 1.1 litres of water. Analyses showed the water to be mud filtrate.

Test No. 1

During the different flow periods in test No. 1, water samples were collected at regular intervals at the wellhead. Analyses of some of the ions were performed offshore and used to establish when constant composition of the produced water was reached. In addition water samples were collected and analysed for the tritium concentration since tritium was used as a tracer in the mud when the reservoir interval was drilled. The tritium analyses showed the water produced at the end of the test to be true formation water contaminated with less than 0.1% of mudfiltrate. In fig. 5.11 the formation water composition is listed.

During test No. 1, six sets of separator recombination samples were collected. PVT analyses have been performed on a reservoir fluid recombined from one separator oil and one separator gas sample. The main results are presented in figs. 5.12 and 5.13.

Trace component analyses were performed both offshore and onshore, with the results presented in fig. 5.14.

Test No. 2

During production test No. 2, 12 monophasic oil samples were taken at the wellhead, as the bubble point pressure of the fluid was below the wellhead flowing pressure. Seven sets of separator recombination samples were also taken at regular intervals during this long test.

PVT analyses have been performed on one of the monophasic oil samples, with the main results presented in figs. 5.13 and 5.15.

Trace component analyses were performed both offshore and onshore. The results are presented in fig. 5.14.

Log Analyses, Well 34/4-7



FORMATION	UPPER LUNDE	UPPER LUNDE TO OWC	MIDDLE LUNDE	LOWER LUNDE
TOP MRKB	2502.0	2502.0	2736.0	2872.5
BOTTOM MRKB	2736.0	2586.0	2872.5	2930.0 [*]
GROSS M	234.0	84.0	136.5	57.5
NET SAND M	153.0	42.3	12.3	35.8
N/G	0.65	0.50	0.09	0.64
ϕ %	22.3	23.8	17.3	19.8
Sw %	-	40.2	-	-
CUTOFFS				
ϕ %	15	15	15	15
VSH	0.4	0.4	0.4	0.4
* TD-LOG				

Fig. 5.1 Log analyses results, well 34/4-7

Date	6/87	Auth.	TF	Appr.	BR
Draw by		Ref.	EPF		

Core Data Listing



DEPTH (mRKB)	CORPOR (%)	CORHOR (mD)	CORVER (mD)	GRNDEN (G/CC)
2506.25	27.50	224.00	137.00	2.67
2506.50	27.90	235.00		2.67
2506.75	6.12	0.00		2.70
2507.00	30.00	465.00	332.00	2.66
2507.25	27.30	136.00		2.67
2507.50	30.60	222.00		2.68
2507.75	29.30	448.00		2.69
2508.00	31.60	419.00	441.00	2.67
2508.25	30.70	736.00		2.66
2508.75	29.40	1090.00		2.66
2509.00	28.60	1130.00	1460.00	2.65
2509.25	28.70	1620.00		2.65
2509.50	27.10	353.00		2.66
2509.75	28.80	517.00		2.66
2514.50	21.00	2.35		2.72
2514.75	25.90	91.70		2.66
2515.00	27.90	604.00	684.00	2.66
2515.25	27.90	420.00		2.67
2515.50	28.10	392.00		2.67
2515.75	23.00	228.00		2.69
2516.00	20.60	428.00	260.00	2.77
2516.25	28.10	667.00		2.65
2516.50	29.00	1360.00		2.65
2516.75	29.20	1330.00		2.65
2517.00	25.40	121.00	339.00	2.69
2517.25	28.40	484.00		2.66
2517.50	20.40	145.00		2.66
2517.75	27.00	1360.00		2.67
2518.00	27.70	2050.00	1880.00	2.65
2518.25	28.20	970.00		2.67
2518.50	28.30	1190.00		2.66
2518.75	27.60	592.00		2.67
2519.00	27.60	1040.00	1160.00	2.67
2519.25	26.80	1070.00		2.68
2519.50	25.90	671.00		2.69
2519.75	26.50	395.00		2.73
2520.00	23.00	415.00	65.00	2.65
2520.25	15.10	18.60		2.67
2520.75	26.40	592.00		2.68
2521.00	25.40	82.20	72.00	2.69
2521.50	26.90	1290.00		2.66
2521.75	26.60	3070.00		2.65
2522.00	24.40	1580.00	1740.00	2.65
2522.25	21.70	710.00		2.67
2522.50	25.30	98.20		2.68
2522.75	24.60	86.70		2.68
2523.00	26.70	493.00	65.50	2.69
2523.25	26.40	965.00		2.66
2523.50	28.00	717.00		2.66
2523.75	27.30	1020.00		2.66
2524.00	25.90	778.00	976.00	2.66
2524.25	27.70	1340.00		2.66
2524.75	27.80	952.00		2.66
2525.00	28.10	784.00	995.00	2.64
2525.25	27.40	505.00		2.66
2525.50	27.90	590.00		2.66
2525.75	27.50	646.00	572.00	2.66
2526.00	33.70	680.00		2.87
2526.25	28.40	1010.00		2.65
2526.75	21.70	160.00		2.67
2527.00	20.90	67.70	15.10	2.66
2527.25	26.30	382.00		2.66
2527.75	18.70	3.61		2.70
2528.00	10.40	0.33	54.00	2.71

Fig. 5.2 Core data listing, well 34/4-7

Date 6/87	Auth TF	Appr BR
Draw by TF	Ret	EPF

Core Data Listing



DEPTH (mRKB)	CORPOR (%)	CORHOR (mD)	CORVER (mD)	GRNDEN (G/CC)
2528.25	22.00	46.80		2.68
2529.00	16.80	4.09	4.13	2.72
2529.25	14.00	0.92		2.74
2529.50	15.90	5.40		2.68
2536.25	16.80	0.27	1.47	2.62
2536.50	16.90	0.05		2.69
2536.75	16.90	0.17		2.73
2537.00	20.00	1.55		2.68
2537.25	21.10			2.68
2537.75	18.90			2.70
2538.00	18.20	0.65	4.42	2.67
2538.50	16.50	0.75		2.75
2538.75	12.70	0.04		2.73
2539.00	16.40	0.21	1.13	2.74
2539.25	16.50	0.10		2.74
2540.00	16.60	1.95	5.96	2.76
2540.25	17.10	1.30		2.77
2540.50	12.30	1.60		2.74
2540.75	12.70	1.17		2.69
2541.00	18.40	0.42		2.68
2541.25	15.80	0.41		2.72
2541.50	24.90	122.00		2.66
2541.75	16.80	208.00		2.66
2542.00	18.60	176.00	163.00	2.66
2542.25	24.80	3.70		2.69
2542.50	27.10	37.00		2.67
2542.75	26.20	413.00		2.65
2543.00	25.50	336.00	297.00	2.66
2543.25	23.20	4.05		2.68
2543.50	26.00	387.00		2.65
2543.75	6.70	0.17		2.69
2544.00	27.80	292.00	564.00	2.66
2544.25	27.30	203.00		2.66
2544.50	24.80	47.80		2.67
2544.75	26.70	700.00		2.65
2545.00	27.50	513.00	497.00	2.66
2545.25	27.80	679.00		2.67
2545.50	25.80	103.00		2.72
2545.75	26.40	1090.00		2.65
2546.00	26.50	463.00	444.00	2.67
2546.25	27.20	1180.00		2.65
2546.50	27.70	839.00		2.65
2546.75	25.10	574.00		2.65
2547.00	19.90	282.00	157.00	2.65
2547.25	8.40	0.18		2.67
2547.75	27.50	671.00		2.66
2548.00	27.70	254.00	278.00	2.65
2548.25	25.20	210.00		2.65
2552.00	19.50		26.70	2.75
2552.25	19.50			2.75
2552.50	17.70	1.15		2.77
2552.75	16.10	5.79		2.70
2556.25	22.40	5.51	5.04	2.67
2556.50	22.50	20.50		2.67
2557.25	9.90	0.19	0.34	2.69
2557.75	21.60	1.72		2.70
2558.00	18.80	1.18	0.46	2.72
2558.25	24.30	98.00		2.67
2558.50	25.30	29.50		2.70
2558.75	21.50	80.60		2.67
2559.00	28.10	290.00	181.00	2.67
2559.50	27.80	194.00		2.67
2559.75	27.70	265.00		2.67
2560.00	16.20	14.60	0.81	2.67

Fig. 5.2 Core data listing, well 34/4-7

Date 6/87	Auth TF	Appr BR
Draw by TF	Rel	EPF

Core Data Listing



DEPTH (mRKB)	CORPOR (X)	CORHOR (mD)	CORVER (mD)	GRNDEN (G/CC)
=====				
2560.25	22.60	1.80		2.70
2560.50	23.20	2.74		2.70
2561.00	26.70	189.00	127.00	2.68
2561.25	27.50	155.00		2.67
2561.75	9.30	1.21		2.74
2562.00	22.30	108.00	40.40	2.67
2562.25	11.70	1.38		2.68
2562.75	11.10	0.13		2.69
2563.00	21.10	1.34	1.13	2.70
2563.75	20.60	348.00		2.66
2564.00	26.50	872.00	180.00	2.65
2564.25	24.80	92.60		2.68
2564.50	21.50	159.00		2.67
2566.25	17.90	7.91		2.68
2566.50	19.70	1.67		2.70
2566.75	19.80	0.62		2.73
2567.00	16.60	0.17	1.27	2.69
2567.25	18.60	0.45		2.79
2567.75	9.66	1.93		2.73
2568.00	4.94	0.04	0.04	2.72
2568.25	19.40	0.26		2.76
2568.75	18.40	0.54		2.80
2569.00	18.60	0.05	0.20	2.76
2569.25	21.70			2.67
2569.50	23.10			2.69
2569.75	18.80	0.26		2.70
2570.00	18.00	0.08	0.04	2.79
2570.25	19.20	5.71		2.67
2570.50	17.10	1.32		2.70
2570.75	16.00			2.71
2571.00	17.60	0.73	1.17	2.69
2571.25	14.60	1.08		2.72
2571.50	18.40	0.08		2.76
2571.75	16.20	0.06		2.76
2572.00	17.60	0.07	0.04	2.77
2572.25	19.70	0.31		2.72
2572.50	16.90	0.05		2.79
2573.00	16.20	0.05		2.76
2573.25	16.40	2.13		2.69
2573.50	20.20	1.27		2.69
2573.75	17.20	0.86		2.68
2574.00	22.50	8.84	11.00	2.68
2574.50	24.60	3.66		2.69
2574.75	22.90	4.21		2.68
2575.00	19.10	0.59	1.42	2.68
2575.25	16.40	0.08		2.72
2577.00	16.90	0.25	0.26	2.76
2577.50	7.10	0.09		2.70
2577.75	8.44	0.06		2.75
2578.00	13.70	0.10	0.13	2.78
2578.25	16.40	4.27		2.70
2578.50	24.90	14.90		2.67
2578.75	24.80	9.39		2.68
2579.00	28.30	92.20	97.70	2.69
2579.50	26.80	29.80		2.68
2579.75	27.00	17.90		2.68
2580.00	26.60	18.10	17.70	2.68
2580.25	26.50	18.40		2.68
2580.50	26.60	57.70		2.67
2580.75	26.10	25.90		2.67
2581.00	25.60	17.30	18.40	2.68
2581.25	25.60	73.70		2.67
2581.50	24.10	25.50		2.67
2581.75	27.90	152.00		2.66

Fig. 5.2 Core data listing, well 34/4-7

Date 6/87	Auth TF	Appr BR
Draw by TF	Ref EPF	

Core Data Listing



DEPTH (mRKB)	CORPOR (%)	CORHOR (mD)	CORVER (mD)	GRNDEN (G/CC)
2582.00	26.80	304.00	132.00	2.65
2582.25	27.70	83.30		2.67
2582.50	27.10	664.00		2.65
2582.75	27.40	269.00		2.67
2583.00	26.30	113.00	451.00	2.69
2583.25	20.50	211.00		2.68
2583.50	17.40	615.00		2.66
2583.75	22.50	938.00		2.67
2584.00	26.30	143.00	232.00	2.68
2584.25	27.70	442.00		2.68
2584.50	29.30	2030.00		2.65
2584.75	27.60	1570.00		2.65
2585.00	27.50	275.00	106.00	2.66
2585.25	20.90	179.00		2.66
2585.50	9.35	0.87		2.68
2586.00	14.90	11.40	0.83	2.67
2586.25	12.70	4.56		2.68
2586.50	12.00	2.42		2.68
2586.75	11.30	0.66		2.75
2587.00	14.90	0.06	0.04	2.80
2587.50	21.90	9.77		2.66
2587.75	26.10	85.70		2.66
2588.00	22.60	5.05	2.89	2.67
2588.25	20.50	7.74		2.68
2588.50	23.90	29.50		2.67
2588.75	21.10	10.40		2.67
2589.50	27.80	45.90	55.80	2.67
2591.50	22.20	3.84		2.69
2591.75	20.90	2.16		2.69
2592.00	22.60	5.39	4.55	2.69
2592.25	23.10	13.60		2.67
2592.50	25.80	31.20		2.67
2592.75	25.50	70.50		2.66
2593.00	26.00	81.30	62.30	2.66
2593.25	23.60	62.50		2.67
2593.50	19.20	31.10		2.67
2593.75	24.00	105.00		2.66
2594.00	25.90	126.00	181.00	2.65
2594.25	26.20	166.00		2.66
2594.50	18.20	42.80		2.67
2594.75	9.79	0.82		2.68
2595.00	16.70	0.25		2.72
2595.25	14.80	0.19		2.72
2595.50	16.70			2.75
2595.75	16.00	0.07		2.74
2596.00	10.10	0.09	1.25	2.73
2596.25	17.60	0.17		2.75
2601.50	29.00	500.00		2.66
2601.75	29.50	1040.00		2.65
2602.00	28.30	436.00	542.00	2.66
2602.25	28.80	545.00		2.67
2602.50	30.10	461.00		2.68
2602.75	29.80	487.00		2.67
2604.00	14.20	18.10	15.90	2.67
2604.25	18.90	90.50		2.67
2604.50	11.10	0.41		2.68
2604.75	18.10	2.92		2.70
2605.25	27.10	48.50	36.20	2.67
2605.50	27.60	11.00		2.68
2607.75	17.40	8.90		2.68
2608.00	24.90	266.00	245.00	2.66
2608.25	27.20	85.00		2.67
2608.50	25.50	181.00		2.67
2608.75	24.20	17.90		2.68

Fig. 5.2 Core data listing, well 34/4-7

Date 6/87	Auth TF	Appr BR
Draw by TF	Ref EPF	

Core Data Listing



DEPTH (mRKB)	CORPOR (%)	CORHOR (mD)	CORVER (mD)	GRNDEN (G/CC)
2610.75	22.00	11.60		2.67
2611.75	18.80	3.31		2.67
2612.00	14.40	1.68	2.31	2.68
2612.25	13.10	0.70		2.69
2612.50	8.01	0.04		2.74
2612.75	15.80	0.14		2.72
2615.00	23.70	66.30	71.70	2.65
2615.25	24.80	95.40		2.65
2615.50	18.50	24.30		2.69
2619.25	27.00	121.00		2.68
2619.50	26.80	222.00		2.68
2619.75	23.80	428.00		2.66
2620.00	8.55	0.18	0.25	2.68
2620.25	26.30	144.00		2.66
2620.75	26.20	66.00		2.69
2621.00	26.70	365.00	222.00	2.66
2621.25	26.70	371.00		2.66
2621.50	26.40	213.00		2.66
2621.75	25.70	143.00		2.67
2622.00	24.00	278.00	232.00	2.66
2622.25	22.30	113.00		2.66
2622.50	9.13	0.17		2.71
2622.75	21.10	5.56		2.68
2623.00	21.60	6.23	3.96	2.67
2623.25	22.20	6.75		2.68
2623.50	21.40	3.84		2.68
2623.75	21.20	3.37		2.68
2624.00	20.90	5.15	2.49	2.67
2624.25	20.60	2.38		2.68
2624.50	21.10	5.27		2.67
2624.75	19.50	2.31		2.69
2625.00	18.40	2.58	1.76	2.68
2625.25	15.50	0.87		2.68
2625.50	18.80	2.55		2.68
2625.75	18.20	2.29		2.67
2626.00	19.60	2.47	1.40	2.68
2626.25	18.40	1.38		2.70
2626.75	14.00	1.50		2.67
2627.25	24.90	54.10	54.10	2.67
2627.50	25.20	63.90		2.67
2627.75	25.20	67.70		2.67
2628.00	26.80	47.50	49.50	2.67
2628.50	26.20	22.70		2.68
2628.75	25.90	15.70		2.68
2629.00	26.20		11.40	2.68
2629.25	25.90	51.60		2.67
2629.50	25.80	86.10		2.67
2629.75	24.40	82.50		2.66
2630.00	25.10	45.10	43.40	2.68
2630.25	23.50	24.10		2.68
2631.00	24.90	36.50	54.60	2.67
2631.25	25.40	71.20		2.67
2631.50	24.90	124.00		2.67
2632.00	20.90	55.10	69.30	2.67
2632.25	21.90	65.20		2.67
2632.50	20.90	7.67		2.68
2632.75	24.10	63.30		2.67
2633.00	23.10	41.60	38.00	2.66
2633.25	4.24	0.87		2.71
2633.50	19.40	30.40		2.67
2633.75	22.60	97.00		2.66
2634.00	16.50	29.20	54.40	2.66
2634.25	18.60	74.10		2.66
2634.50	18.50	50.20		2.66

Fig. 5.2

Core data listing, well 34/4-7

Date	6/87	Auth	TF	Appr	BR
Draw by	TF	Ref	EPF		

Core Data Listing



DEPTH (mRKB)	CORPOR (%)	CORHOR (mD)	CORVER (mD)	GRNDEN (G/CC)
2634.75	15.00			2.74
2635.00	18.00	0.34	0.13	2.75
2635.25	19.10			2.83
2635.50	18.50	0.24		2.77
2636.00	18.30	1.74	1.37	2.70
2636.25	17.40	0.13		2.78
2636.50	18.50	0.23		2.77
2636.75	17.20	0.29		2.73
2637.00	17.90	1.11	0.22	2.72
2637.50	12.40	0.83		2.68
2637.75	23.20	36.80		2.66
2638.00	26.10	115.00	138.00	2.67
2638.50	22.80	45.00		2.69
2638.75	23.10	6.00		2.70
2639.00	24.50	16.80	10.20	2.68
2639.25	22.60	110.00		2.66
2639.50	13.90	2.49		2.67
2639.75	22.70	62.30		2.67
2640.00	23.30	71.10	77.60	2.67
2640.75	15.90	2.52		2.70
2641.00	12.40	3.99	2.64	2.68
2641.75	11.50	0.88		2.72
2642.00	20.30	2.07	2.38	2.69
2642.25	23.40	9.61		2.68
2642.75	22.80	52.70		2.68
2643.00	20.70	12.70	7.94	2.67
2643.25	14.80	1.18		2.68
2643.50	23.60	8.79		2.69
2643.75	24.00	21.40		2.69
2644.25	19.80	112.00	92.10	2.66
2644.50	17.70	58.40		2.67
2644.75	22.30	58.20		2.68
2645.75	16.00	6.32		2.66
2646.00	20.70	12.00	6.67	2.66
2646.25	20.30	6.53		2.67
2646.75	18.20	6.78		2.66
2652.75	26.20	49.60		2.67
2653.00	27.10	120.00	60.10	2.66
2653.25	23.80	14.20		2.68
2653.50	27.20	185.00		2.66
2654.75	26.40	724.00		2.65
2655.00	27.30	161.00	129.00	2.67
2655.25	26.70	141.00		2.66
2655.50	27.20	168.00		2.67
2655.75	25.40	40.70		2.67
2656.00	27.40	237.00	77.30	2.66
2656.25	24.00	1190.00		2.64
2657.00	25.20	1520.00	1140.00	2.66
2657.25	25.30	2050.00		2.65
2657.50	23.20	2030.00		2.65
2657.75	22.70	1930.00		2.64
2658.00	18.90	93.70	520.00	2.67
2658.25	12.70	91.40		2.68
2658.50	18.40	614.00		2.67
2660.50	16.30	13.90		2.69
2660.75	20.10	13.90		2.66
2661.00	23.90	3.72	2.69	2.69
2661.25	24.70	25.60		2.66
2661.50	19.60	107.00		2.65
2661.75	24.10	37.10		2.66
2662.00	21.50	0.64	0.44	2.69
2662.25	26.90	314.00		2.65
2662.50	25.10	41.10		2.67
2662.75	26.00	383.00		2.65

Fig. 5.2

Core data listing, well 34/4-7

Date	6/87	Auth	TF	Appr	BR
Drawn by	TF	Ref		EPF	

Core Data Listing



DEPTH (mRKB)	CORPOR (X)	CORHOR (mD)	CORVER (mD)	GRNDEN (G/CC)
2663.00	26.40	229.00	81.70	2.66
2663.25	22.50	40.30		2.67
2663.50	24.50	176.00		2.66
2663.75	25.90	137.00		2.66
2664.00	25.50	416.00	347.00	2.65
2664.50	26.00	348.00		2.65
2664.75	23.90	39.30		2.67
2665.00	24.40	95.20	10.70	2.66
2665.25	27.70	586.00		2.65
2666.00	21.00	32.60	7.36	2.67
2666.25	22.60	187.00		2.65
2666.50	21.50	143.00		2.65
2666.75	21.20	187.00		2.66
2667.00	18.30	20.20	2.45	2.68
2667.25	15.10	3.78		2.69
2667.50	16.60	0.89		2.72
2667.75	19.20	3.83		2.68
2668.00	19.80	3.04	1.78	2.69
2668.25	22.50	20.70		2.67
2668.50	6.09	0.04		2.72
2668.75	12.30	0.55		2.68
2669.00	23.40	18.50	8.36	2.67
2669.25	24.50	73.10		2.66
2669.50	18.60	14.30		2.67
2669.75	12.40	1.48		2.71
2670.75	18.30	1.22		2.70
2671.50	12.80	0.39		2.69
2671.75	22.20	3.92		2.71
2672.00	21.70	6.06	4.79	2.69
2672.25	26.20	185.00		2.67
2672.50	26.30	173.00		2.68
2673.50	14.40	0.49	13.10	2.67
2673.75	18.80	24.20		2.73
2674.50	23.60	146.00	73.40	2.66
2675.00	24.40	247.00	194.00	2.66
2675.25	25.30	421.00		2.66
2675.50	26.80	1090.00		2.65
2675.75	26.00	531.00		2.66
2676.00	8.90	0.28	0.52	2.67
2676.25	9.21	0.33		2.67
2676.50	7.38	0.08		2.68
2676.75	6.72	0.06		2.68
2677.00	24.70	146.00	218.00	2.66
2677.25	26.40	418.00		2.66
2677.50	23.70	1450.00		2.69
2677.75	26.40	696.00		2.65
2678.00	26.10	521.00	295.00	2.65
2678.25	26.60	518.00		2.65
2678.50	24.90	242.00		2.66
2678.75	21.10	49.40		2.66
2679.00	25.50	389.00	264.00	2.65
2679.25	25.60	457.00		2.65
2679.50	25.40	427.00		2.67
2679.75	24.10	407.00		2.67
2680.00	20.70	159.00	224.00	2.67
2680.25	19.50	508.00		2.66
2680.75	27.90	1560.00		2.66
2681.00	28.30	1900.00	564.00	2.65
2681.25	27.10	1150.00		2.65
2681.50	20.50	455.00		2.66
2681.75	22.30	745.00		2.66
2682.00	22.40	822.00	405.00	2.66
2682.50	15.10			2.67
2682.75	15.80			2.67

Fig. 5.2 Core data listing, well 34/4-7

Date 6/87	Auth TF	Appr BR
Drawby TF	Ref EPF	

Core Data Listing



DEPTH (mRKB)	CORPOR (%)	CORHOR (mD)	CORVER (mD)	GRNDEN (G/CC)
2683.00	15.30	1.84	0.72	2.68
2685.00	19.00	0.61	0.09	2.70
2685.25	19.60			2.70
2685.50	16.50	0.92		2.78
2685.75	18.00	1.56		2.72
2686.00	15.60	1.09	1.01	2.72
2686.25	15.90	1.08		2.71
2686.50	22.70	4.48		2.68
2686.75	24.60	28.10		2.66
2687.00	24.10	18.20	13.60	2.66
2687.25	24.60	16.70		2.66
2687.50	22.70	9.74		2.69
2687.75	25.80	31.20		2.66
2688.00	26.20	40.40	29.10	2.66
2688.25	25.00	24.10		2.66
2688.50	24.80	14.90		2.66
2688.75	24.50	22.40		2.65
2689.00	24.70	29.30	26.80	2.66
2689.25	25.60	41.40		2.66
2689.50	22.80	11.40		2.67
2689.75	22.50	12.00		2.67
2690.00	22.20	14.00	12.80	2.67
2690.25	26.80	195.00		2.65
2690.50	27.60	337.00		2.65
2690.75	26.10	95.70		2.67
2691.00	27.30	150.00	62.40	2.67
2692.00	20.20	2.32	2.30	2.68
2692.25	14.70	0.16		2.70
2693.25	16.30	0.39		2.69
2693.50	22.50	21.10		2.67
2693.75	21.30	8.30		2.67
2694.00	22.60	174.00	192.00	2.66
2694.25	23.40	120.00		2.67
2694.50	25.50	419.00		2.66
2694.75	23.30	77.60		2.66
2695.00	23.70	62.80	162.00	2.66
2695.25	24.20	56.00		2.66
2695.50	21.60	6.36		2.67
2695.75	18.40	0.50		2.69
2696.00	25.10	84.90	45.40	2.66
2696.25	24.70	104.00		2.68
2696.50	26.10	437.00		2.67
2696.75	27.40	1530.00		2.65
2697.00	24.70	378.00	7.02	2.69
2697.50	24.00	216.00		2.67
2697.75	21.10	68.40		2.69
2698.00	17.00	11.20	1.57	2.72
2698.25	21.20	55.10		2.70
2698.50	25.80	332.00		2.66
2698.75	26.10	482.00		2.67
2699.00	27.60	1150.00	747.00	2.66
2699.25	26.40	790.00		2.66
2699.50	21.00	385.00		2.66
2699.75	25.90	438.00		2.66
2700.00	19.70	27.20	0.22	2.68
2700.25	17.50	0.38		2.69
2700.50	17.50	0.38		2.71
2700.75	17.70	1.13		2.71
2701.00	19.90	4.27	4.82	2.70
2701.25	19.40	3.52		2.69
2701.50	18.90	3.41		2.69
2701.75	17.90	0.45		2.68
2702.00	19.30	2.40	7.88	2.70
2702.25	18.90	6.07		2.72

Fig. 5.2 Core data listing, well 34/4-7

Date 6/87	Auth TF	Appr BR
Draw by TF	Ref	EPF

Core Data Listing



DEPTH (mRKB)	CORPOR (%)	CORHOR (mD)	CORVER (mD)	GRNDEN (G/CC)
2702.50	19.00	0.62		2.73
2702.75	18.00	3.52		2.73
2703.00	20.30	8.54	11.30	2.71
2703.50	19.60	18.60		2.71
2703.75	21.30	25.70		2.68
2704.00	17.90	6.15	6.07	2.70
2704.25	18.20	10.30		2.68
2704.50	14.80	1.06		2.72
2704.75	15.20	6.08		2.72
2705.00	24.00	70.10	8.53	2.66
2705.25	24.90	51.30		2.65
2705.50	24.20	68.00		2.66
2705.75	22.20	21.10		2.67
2706.00	27.00	983.00	11.00	2.66
2707.50	11.80	0.12		2.74
2708.00	15.60	0.43	0.44	2.71
2708.25	15.50	0.17		2.72
2708.50	24.60	40.20		2.67
2708.75	24.30	130.00		2.67
2709.00	26.10	481.00	367.00	2.67
2709.25	20.40	7.47		2.69
2709.75	27.10	275.00		2.66
2710.00	28.00	650.00	654.00	2.65
2710.25	27.70	362.00		2.65
2710.50	27.60	549.00		2.68
2710.75	26.60	303.00		2.66
2711.00	27.40	684.00	606.00	2.66

Fig. 5.2 Core data listing, well 34/4-7

Date	6/87	Auth	TF	Appr	BR
Draw by	TF	Ref	EPF		

Formation Pressures, Well 34/4-7



Depth <u>mRKB</u>	Hydrostatic mud pressure		Temperature Corrected Formation Pressure	
	before	after		
	<u>PSIA</u>	<u>PSIA</u>	<u>PSIA</u>	<u>BAR</u>
RUN 2A				
2509.0	6151.0	6151.0	5566.4	383.79
2518.6	6174.0	6174.0	5575.6	384.42
2526.0	6192.0	6192.0	5583.0	384.93
2533.5	6211.0	6211.0	5591.0	385.49
2547.0	6243.5	6243.5	5603.7	386.36
2560.4	6276.0	6276.0	5617.1	387.28
2575.4	6314.5	6314.5	5713.7	393.95
2581.0	6327.5	6327.5	5622.7	387.67
2584.1	5974.0	5973.5	5641.3	388.95
2592.0	5996.5	5996.5	5652.7	389.74
2604.5	6025.5	6065.5	5669.5	390.91
2620.5	6065.5	6065.5	5695.0	392.66
2632.5	6096.5	6096.0	5712.7	393.88
2584.0*	5971.0	5971.0	5639.0	388.79
2584.4**	5971.5	5973.5	5638.7	388.77

* Opened 2 3/4 gal chamber, lost seal.

** Segregated sample.

Run 2B

2592.1*	5991.5	5991.5	5651.9	384.68
2592.5**	5996.0	5999.6	5654.3	389.85

* Opened 2 3/4 gal chamber, lost seal.

** Segregated sample.

Fig. 5.3

Formation pressures, well 34/4-7

Date	6/87	Auth.	TF	Appr.	BR
Draw by		Ref	EPF		

Formation Pressures, Well 34/4-7



Depth <u>mRKB</u>	Hydrostatic mud pressure		Temperature Corrected Formation Pressure	
	before	after		
	<u>PSIA</u>	<u>PSIA</u>	<u>PSIA</u>	<u>BAR</u>
Run 3D				
2509.0	5799.1	5798.2	5566.4	383.79
2526.0	5840.2	5838.8	5583.3	384.95
2547.0	5891.1	5889.5	5604.0	386.38
2557.8	5917.7	5914.8	5624.5	387.79
2575.2	5961.0	5958.6	5688.0	392.17
2581.0	5972.8	5971.8	5638.9	388.79
2582.0	5975.2	5974.6	5639.1	388.80
2586.0	5985.8	5985.3	5642.9	389.06
2590.0	5997.2	5663.5	5663.5	390.48
2595.5	6010.7	6010.2	5657.4	390.06
2604.5	6032.7	6032.7	5670.7	390.98
2620.5	6073.6	6073.1	5692.9	392.51
2748.5	6391.0	6390.9	5875.9	405.13
2874.0	6704.0	6703.7	6058.5	417.72
2581.5*	5977.2	5978.4	5639.3	388.82

* Segregated sample. Lost seal when opening 1 gal chamber.

Fig. 5.3

Formation pressures, well 34/4-7

Date 6/87	Auth. TF	Appr BR
Draw by	Ref EPF	

Formation Pressures, Well 34/4-7



Depth	Hydrostatic		Temperature Corrected	
	mud pressure		Formation	Pressure
	before	after		
<u>mRKB</u>	<u>PSIA</u>	<u>PSIA</u>	<u>PSIA</u>	<u>BAR</u>

Run 3E

2581.3*	5974.0	5969.7	5640.6	388.91
2582.1*	5976.4	5974.5	5637.3	388.68
2509.0**	5795.5	5796.5	5567.3	383.85

* Opened 2 3/4 gal chamber, lost seal.

** Segregated sample.

Run 3F

2582.7 ¹	5974.4	5973.8	5640.8	388.91
2581.7 ¹	5973.0	5973.0	5638 ³	388.72
2580.9 ¹	5970.0	5972.0	5641 ³	388.93
2580.2	5970.0	5971.0	5644 ³	389.14
2581.4 ¹	5975.0	5974.0	5642 ³	389.00
2583.3 ²	5978.0	5978.0	5643 ³	389.07
2581.8 ²	5974.0	5974.0	5640 ³	388.86

¹ Opened 2 3/4 gal chamber, lost seal.

² Lost seal when opening 1 gal chamber.

³ Strain gauge.

Fig. 5.3 Formation pressures, well 34/4-7

Date	6/87	Auth.	TF	Appr.	BR
Draw by		Ref	EPF		

Formation Pressures, Well 34/4-7



Formation pressure evaluation

RUN 2A

Depth (mRKB)	Formation (PSIA)	Pressure (BAR)	Quality
2509.0	5566.4	383.79	e
2518.6	5575.6	384.42	e
2526.0	5583.0	384.93	e
2547.0	5603.7	386.36	e
2560.4	5617.1	387.28	e-m
2584.1	5641.3	388.95	e
2592.0	5652.7	389.74	e
2604.5	5669.7	390.91	e
2632.5	5712.7	393.88	e-m

RUN 3 D

Depth (mRKB)	Formation (PSIA)	Pressure (BAR)	Quality
2582.0	5639.1	388.80	e-m
2595.5	5675.4	390.00	e-m
2620.5	5692.9	392.51	e
2748.5	5875.9	405.13	e

e = excellent

m = medium

Fig. 5.3

Formation pressures, well 34/4-7

Date	6/87	Auth.	TF	Appr	BR
Draw by		Ret	EPF		

Formation Pressures, Well 34/4-7



PRESSURE VS. DEPTH, 34/4-7

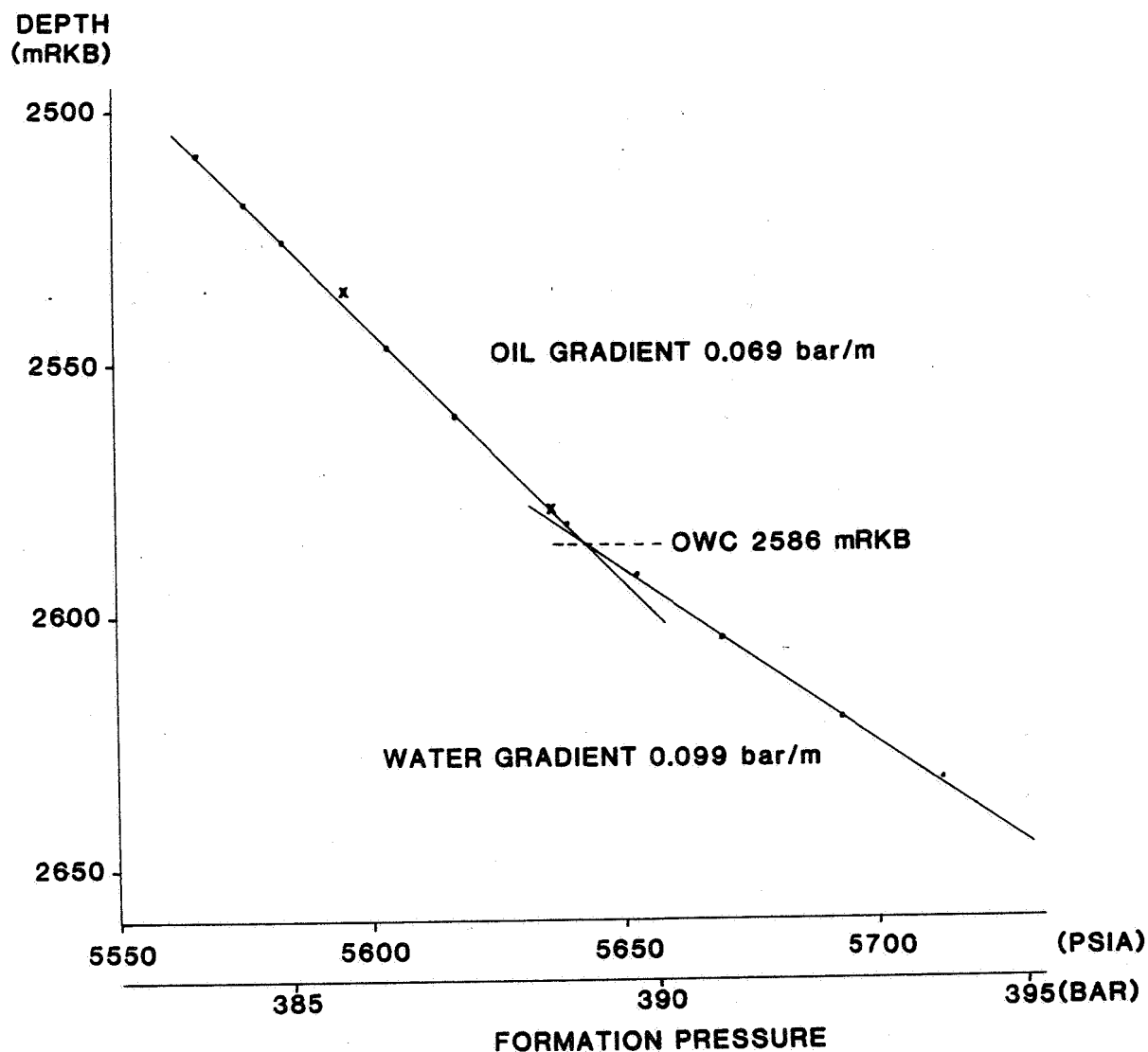


Fig. 5.4 Formation pressure vs depth, well 34/4-7

Date	6/87	Auth.	TF	Appr.	BR
Drawn by		Plot	EPF		

PLT Log Test No 1, Well 34/4 7

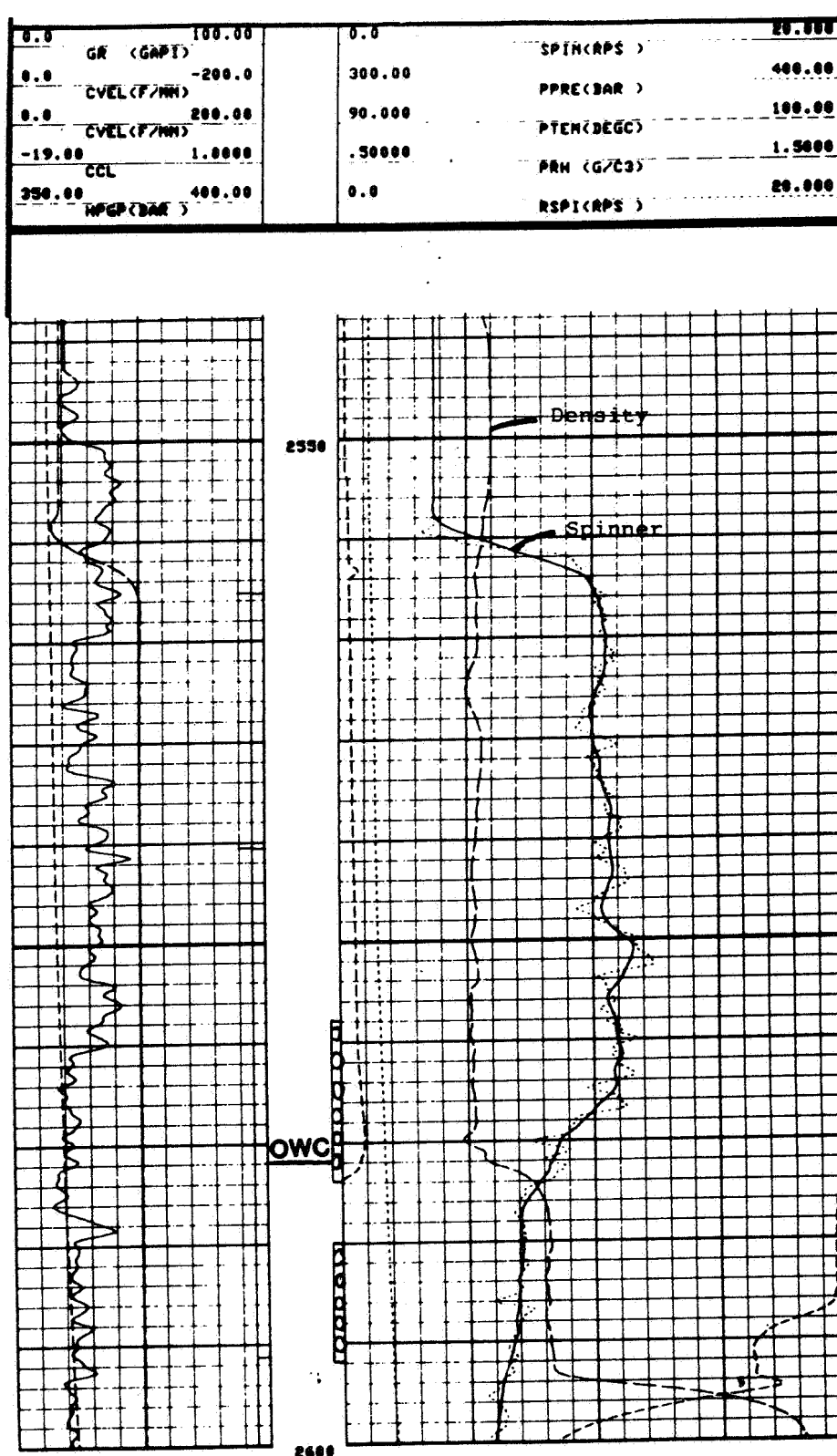


Fig 5.5

PLT-log test No. 1, well 34/4-7

Date	6/87	Auth	IV	Appr
Draw by	AMJO	Ref	EPF	

Well 34/4-7



MAIN RESULTS WELL NO. 34/4-7

+++++				
Test no	1	1	2	
Perforation interval (mRKB)	2579-2587 2590-2596	2579-2587 2590-2596	2506 2517 2532.5-2535.5 2544 2560	-2512.5 -2529 -2550.5 -2566
Test type	Production Injection		Production	
Choke size (mm)	7.9		14.3	
Oil rate (Sm ³ /D)	190		1378	
Water rate (Sm ³ /D)	215		-395	
Wellhead pressure (bar)	126		186	
Wellhead temperature (deg. C)	21		32	
Flowing bottom hole press. (bar)	337.8		441.3	
Reference depth (mRKB)	2518.9		2518.9	
Gas-Oil ratio (Sm ³ /Sm ³)	105		85	
Separator pressure (bar)	24		48	
Separator temperature (deg C)	64		57	
Dead oil density (kg/Sm ³)	833		835	
Gas gravity (Air = 1)	0.81		0.73	

Fig. 5.6 Main test results

Date	6/87	Auth	IV	Appr
Draw by	AMJol	Ref	EPF	

Well 34/4-7, Test No.1



TIME	WHP	WHT	BHP ¹⁾	BHT	TOTAL RATE	WATER CUT	GOR	SEPARATOR PRESS TEMP	PI/II ²⁾
	(bar)	(°C)	(bar)	(°C)	(Sm ³ /D)	(%)	(Sm ³ /Sm ³)	(bar)(°C)	(Sm ³ /D/bar)
31.3.87									
2035 Perforate, initial flow period, chokesize = 3.2 mm									
2048	66.9	7.2	343.3	86.5	645	-	-	-	16.1
2053 Shut in well downhole									
1.4.87									
0320 1st clean up flow period, chokesize increasing from 6.4 mm to 11.1 mm									
0350	52.2	9.8	320.6	92.6	710	-	-	-	11.3
0520 Shut in well downhole									
0930 2nd clean up flow period, chokesize = 11.1 mm									
1035	98.3	17.1	318.5	96.7	786	-	-	-	12.1
1059 Shut in well at surface									
1600 Main flow period, chokesize = 7.9 mm									
2130	126.5	14.1	341.0	97.9	418	53	108	24 64	9.9
2.4.87									
2130	126.0	20.8	337.8	98.8	405	53	105	24 64	8.9
2132 Shut in well downhole									
4.4.87									
0930 3rd clean up flow period, variable chokesizes									
0945	67.0	32.3	275.9	99.6	900 ³⁾ 59 ³⁾	-	-	-	8.4
1059 Shut in well at surface									
Bullhead tubing content with seawater and release the gun									
Run in the hole with PLT									
5.4.87									
1749 PLT flow period, chokesize = 11.1 mm									
2300	100.6	19.9	303.6	99.4	633	46	112	20 63	7.9
2340 Shut in well at surface									
6.4.87									
0108 Injection period									
0130	187.2	-	390.5	96.7	-133				18.5
1604 Increase injection rate									
2330	185.8	-	441.3	43.4	-395				6.8
7.4.87									
0220 Shut in well at surface									

- 1) BHP reference, SDP 85373 at 2518.9 mRKB
- 2) P_i = 383.3 bar at 2518.9 mRKB
- 3) Unstable separator conditions

Fig. 5.7 Main test results

Date	6/87	Auth	IV	Appr
Drawn by	AMJO	Ref	EPF	

Well 34/4-7, Test No. 1

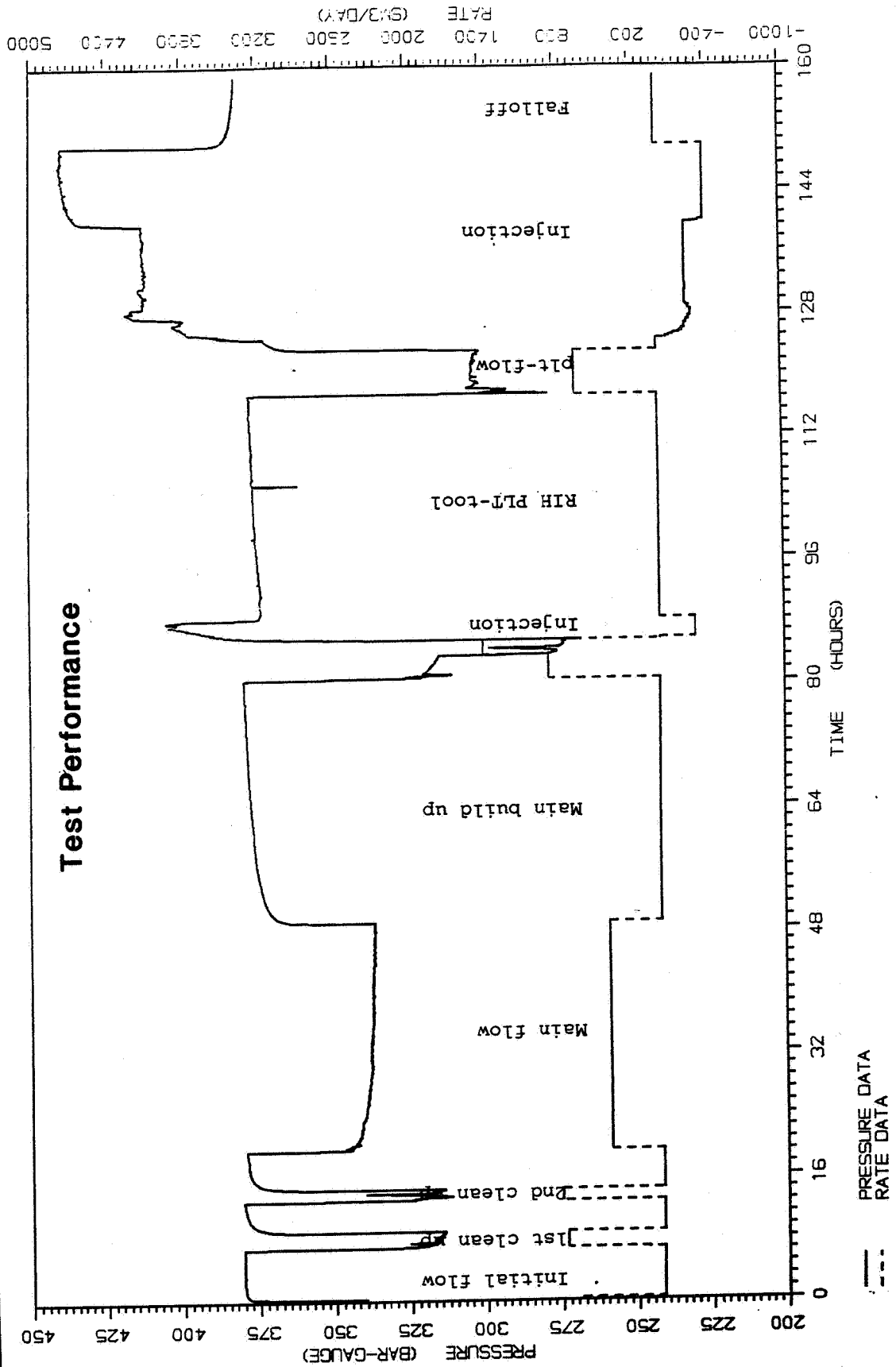


Fig. 5.8 Pressure and and rate vs. time

Date	6/87	Auth	IV	Appr
Drawn by	AMJo	Rev	EPF	

Well 34/4-7, Test No. 2



TIME	WHP (bar)	WHT (°C)	BHP ¹⁾ (bar)	BHT ¹⁾ (°C)	OIL RATE (Sm ³ /D)	GOR (Sm ³ /Sm ³)	SEPARATOR PRESS TEMP (bar)(°C)		PI ²⁾ (Sm ³ /D/bar)
13.4.87									
0143 Perforate, initial flow period, choke size = 15.9 mm									
0150	35.1	8.0			691				
0155 Shut in well downhole									
0457 1st clean up flow, choke size = 12.7 mm									
0900	187.9	20.7	366.1	92.9	1279	94	43	63	109
1001 Shut in well downhole									
Release the gun									
1638 2nd flow, variable choke sizes									
1800	174.9	21.7	362.2	94.1	1743	84	49	55	112
1910 Shut in well at surface									
Run in the hole with PLT									
14.4.87									
0309 Pretest flow, chokesize = 15.9 mm									
0415	172.6.	20.0	362.3	94.5	1721	-	47	60	111
0430 Choke size = 11.1 mm									
0600	192.5	20.1	366.1	94.7	1046	91	45	64	90
0609 Choke size = 15.9 mm									
1000	172.7	30.7	358.6	95.6	1702	80	58	66	89
1033 Choke size = 11.1 mm									
1300	190.3	22.0	363.1	95.5	1049	84	55	67	71
1406 Choke size = 15.9 mm									
1700	171.5	30.6	356.6	96.0	1678	80	58	67	79
1736 Choke size = 7.9 mm									
2100	198.8	15.1	365.7	95.5	517	-	50	66	43
2141 Choke size = 15.9 mm									
15.4.87									
0000	170.5	27.4	355.8	96.3	1007	76	67	67	46
0432 Shut in well at surface									

Fig. 5.9 Main test results

Date	6/87	Auth	IV	Appr
Draw by	AMJ	Ref	EPF	

Well 34/4-7, Test No. 2



TIME	WHP (bar)	WHT (°C)	BHP ¹⁾ (bar)	BHT ¹⁾ (°C)	OIL RATE (Sm ³ /D)	GOR (Sm ³ /Sm ³)	SEPARATOR PRESS TEMP (bar)(°C)	PI ²⁾ (Sm ³ /D/bar)
16.4.87								
1423	Extended flow, chokesize = 14.3 mm							
1800	176.0	23.8	359.9	96.2	1550	74	59 52	87
17.4.87								
0000	174.2	23.2	357.0	96.5	1524	73	60 52	73
1200	172.1	25.9	353.6		1496	74	59 54	62
18.4.87								
0000	170.5	27.5	351.4	96.7	1480	74	61 55	56
0847	Shut in well at surface							
0940	Reopen well							
1200	170.0	29.8	350.0		1452	76	61 58	52
19.4.87								
0000	168.0	24.7	348.6	96.8	1473	74	61 53	50
1200	168.8	27.7	348.4		1442	77	60 58	49
20.4.87								
0000	168.3	29.3	347.4	96.8	1427	76	61 57	47
1200	168.3	33.5	346.9		1406	76	61 57	45
21.4.87								
0000	167.6	33.6	346.3	96.9	1406	75	61 56	45
1200	166.5	31.2	345.6		1420	76	60 57	44
22.4.87								
0000	166.7	30.4	345.3	96.9	1403	76	60 56	43
1200	165.9	28.6	344.7		1417	76	60 56	43
23.4.87								
0000	165.6	30.3	344.3	96.9	1413	75	61 57	42
1200	165.6	31.6	344.1		1399	75	59 55	41
24.4.87								
0000	165.3	33.1	343.7	96.9	1398	75	60 57	41
1200	165.0	32.9	343.5		1395	76	60 57	41
25.4.87								
0000	164.8	33.7	343.2	96.9	1395	76	60 56	40
1200	164.5	34.7	342.9		1391	76	59 56	40

Fig. 5.9 Main test results, continued

Date	6/87	Auth	IV	Appr
Drawn by	AMJo	Ref	EPF	

Well 34/4-7, Test No. 2

TIME	WHP (bar)	WHT (°C)	BHP ¹⁾ (bar)	BHT ¹⁾ (°C)	OIL RATE (Sm ³ /D)	GOR (Sm ³ /Sm ³)	SEPARATOR PRESS TEMP (bar)(°C)		PI ²⁾ (Sm ³ /D/bar)
26.4.87									
0000	164.0	32.9	342.6	96.9	1398	74	61	57	40
1200	163.9	33.4	342.4		1387	86	48	57	39
27.4.87									
0000	163.1	29.9	341.9	96.9	1407	86	47	56	39
1200	163.1	31.7	341.8		1394	86	47	57	39
28.4.87									
0000	162.6	29.5	341.4	96.9	1399	86	48	57	38
1200	162.4	30.3	341.2		1401	86	47	56	38
29.4.87									
0000	162.5	30.8	341.2	96.9	1387	86	47	57	38
1200	162.1	32.3	340.9		1391	86	46	55	38
30.4.87									
0000	162.4	32.7	340.9	96.9	1385	86	48	57	38
1200	162.3	32.7	340.7		1376	87	47	58	37
01.5.87									
0000	162.4	31.4	340.6	96.9	1365	85	49	56	37
1200	162.2	33.2	340.5		1369		48	54	37
02.5.87									
0000	161.9	33.6	340.3	96.9	1380	85	48	57	37
1200	161.5	30.1	340.1		1380	85	47	55	37
03.5.87									
0000	160.0	24.0	339.5	96.6	1424	85	49	57	37
1200	159.7	25.0	339.1		1427	85	48	56	37
04.5.87									
0000	160.2	27.8	339.1	96.7	1393	85	48	56	36
1200	160.8	31.3	339.3		1379	86	48	57	36
1430 Shut in well at surface									

- 1) BHP and BHT reference, SDP 82787 at 2421.8 mRKB
 2) Pi = 377.78 bar at 2421.8 mRKB

Fig. 5.9 Main test results, continued

Date	6/87	Auth	IV	Appr
Draw by	AMJol	Ref	EPF	

Well 34/4-7, Test No. 2

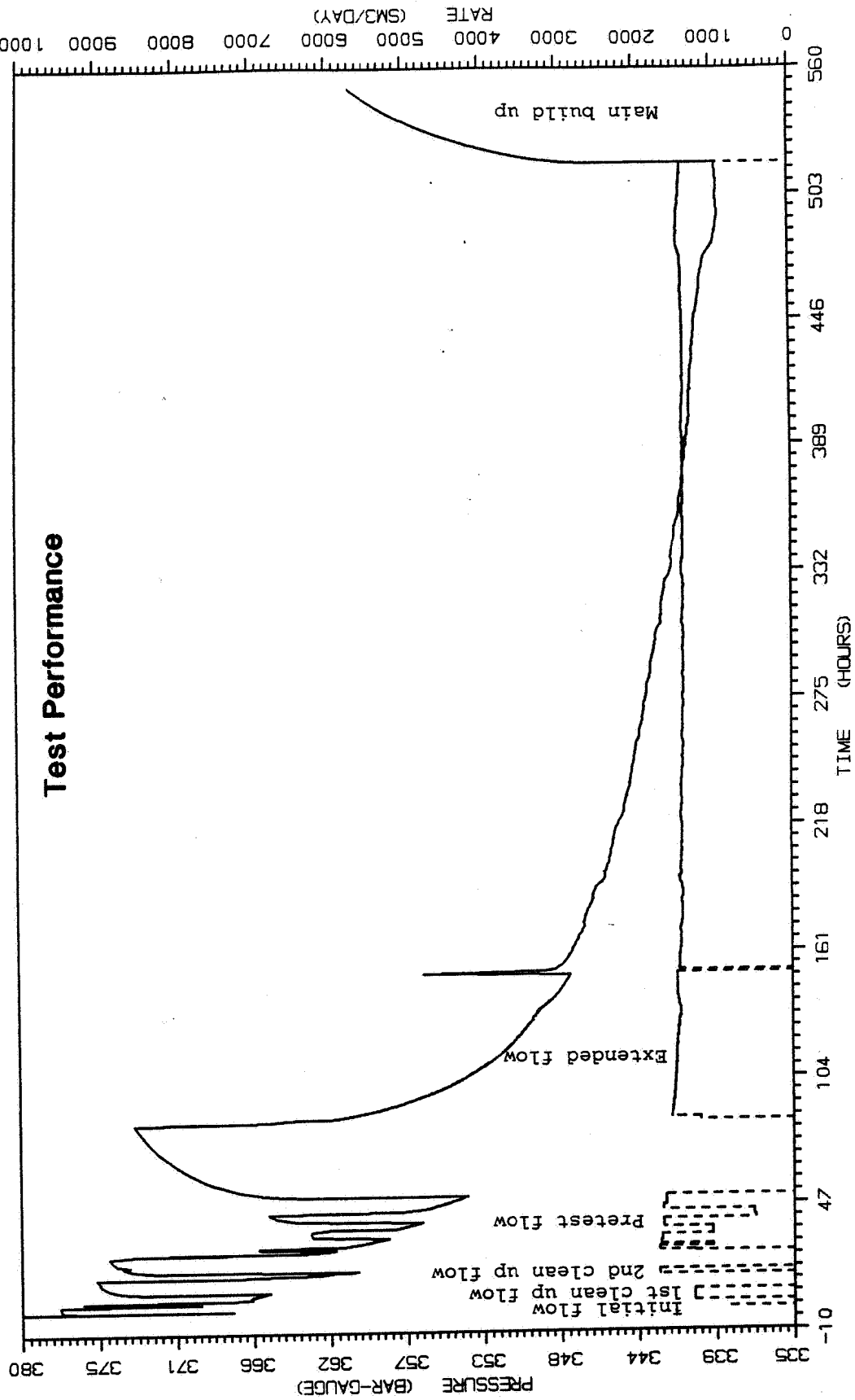


Fig. 5.10 Pressure and rate vs. time

Date	6/87	Auth	IV	Appr
Drawn by	AMJO	Ref	EPF	

Well 34/ 4-7, Test No. 1



FORMATION WATER COMPOSITION

DISSOLVED SOLIDS

	mg/l	me/l
<u>Cations</u>		
Sodium	11700	509
Calcium	2330	116
Magnesium	202	16.6
Barium	3.89	-
Iron (dissolved)	1.02	-
Iron (total)	8.46	-
Potassium	350	8.95
Strontium	274	6.25
<u>Anions</u>		
Chloride	23200	654
Sulfate	82.6	1.72
Carbonate	-	-
Bicarbonate	277	4.54

pH (measured at 18.6°C) : 6.47
 Specific gravity : 1.0288
 Resistivity (ohm-m) at 25°C : 0.171

Figure 5.11 Formation water composition

Date	8/87	Auth	JMH	Appr	JMH
Draw by	AMJo	Rev	EPR		

Well 34/4-7, Test No. 1



Summary of general PVT data

Well : 34/4-7

Fluid: OIL

```
=====
Initial pressure used in analysis : 38900.0      (kPa)
Temperature used in analysis      : 100.20       (deg C)
Saturation pressure               : 17890.0      (kPa)
Reservoir oil density            : 0.689       (g/cc)
Viscosity at initial pressure     : 0.000      (mPa*s)
Viscosity at saturation pressure  : 0.401      (mPa*s)
```

DIFFERENTIAL LIBERATION

```
BO : 1.552      (Rcm/Scm)
GOR : 164.6     (Scm/Scm)
Residual oil dens. : 0.843      (g(ccm))
```

FLASH DATA (const. mass expansion)		SINGLE	MULTI
BO	(Rcm/Scm):	1.47	1.35
GOR	(Scm/Scm):	155.0	122.3
Stock oil density	(g/cc) :	0.8346	0.8210

Separator conditions for single stage flash:

1) 101 kPa 15 degC

Separator conditions for multi stage flash:

1) 6300 kPa 66 degC
 2) 3100 kPa 60 degC
 3) 1100 kPa 54 degC
 4) 100 kPa 15 degC

Figure 5.12 General PVT-data

Date	9/87	For.	JMH	Good	JMH
Tech. by	AMJo	Ref.	EPR		

Well 34/4-7



RESERVOIR FLUID COMPOSITION, TEST NO. 1

Well : 34/4-7
Fluid: OIL

(g/cc)				
Component	mol %	wt %	mol wt	density
CO2	0.22	0.10	0.00	0.000
N2	1.36	0.40	0.00	0.000
C1	35.69	6.07	0.00	0.000
C2	8.26	2.63	0.00	0.000
C3	8.21	3.84	0.00	0.000
i-C4	1.18	0.73	0.00	0.000
n-C4	4.35	2.68	0.00	0.000
i-C5	1.43	1.09	0.00	0.000
n-C5	2.20	1.68	0.00	0.000
C6	2.90	2.59	84.20	0.670
C7	34.20	78.19	215.80	0.849

RESERVOIR FLUID COMPOSITION, TEST NO. 2

Well : 34/4-7
Fluid: OIL

(g/cc)				
Component	mol %	wt %	mol wt	density
CO2	0.22	0.10	0.00	0.000
N2	1.10	0.33	0.00	0.000
C1	36.81	6.33	0.00	0.000
C2	8.69	2.80	0.00	0.000
C3	8.39	3.97	0.00	0.000
i-C4	1.19	0.74	0.00	0.000
n-C4	4.21	2.62	0.00	0.000
i-C5	1.35	1.04	0.00	0.000
n-C5	2.03	1.57	0.00	0.000
C6	2.61	2.36	84.50	0.670
C7	33.40	78.14	219.00	0.817

Figure 5.13 Reservoir fluid composition

Date	9/87	For	JMH	Good	JMH
Technician	AMJo	Ref	EPR		



TRACE ELEMENT ANALYSES

	Production test no. 1	Production test no. 2
<u>Gas phase</u>		
H ₂ S (ppm-mol)	<0.1	<0.1
Mercaptanes (ppm-mol)	<0.1	<0.1
CO ₂ (mol %)	0.30-0.40	0.30
Radon-222 (Bq/l)	0.37	0.03-0.14
H ₂ O (mg/l)		1.9-7.1
Total mercury (µg/m ³)	2.0-2.7	3.7-17.7
Helium (mol %)	0.020	0.010-0.015
<u>Oil phase</u>		
Density (g/cm ³)		0.83
Water (mg/l) at 20°C		1000-2207
Total sulphur (Wt %)		0.15
Polonium-210 (Bq/l)		0.1-0.2
Nickel (ppm-weight)		1.2
Vanadium (ppm-weight)		1.3
Mercury (µg/l)		<0.001-0.004

Figure 5.14 Trace element analyses

Date	8/87	Auth	JMH	Appr	JMH
Drawn by	AMJo	Ref	EPR		

Well 34/4-7, Test No.2



Summary of general PVT data

Well : 34/4-7
Fluid: OIL

```
=====
Initial pressure used in analysis : 38600.0      (kPa)
Temperature used in analysis      : 100.80       (deg C)
Saturation pressure               : 18450.0       (kPa)
Reservoir oil density             : 0.667      (g/cc)
Viscosity at initial pressure     : 0.397     (mPa*s)
Viscosity at saturation pressure  : 0.316     (mPa*s)
=====
```

DIFFERENTIAL LIBERATION

```
BO : 1.573      (Rcm/Scm)
GOR : 170.7     (Scm/Scm)
Residual oil dens. : 0.838 (g(ccm))
```

FLASH DATA (const. mass expansion)		SINGLE	MULTI
BO	(Rcm/Scm):	1.48	1.41
GOR	(Scm/Scm):	150.7	130.8
Stock oil density	(g/cc)	0.8300	0.8210

Separator conditions for single stage flash:

1) 101 kPa 15 degC

Separator conditions for multi stage flash:

1) 6300 kPa 66 degC
2) 3100 kPa 60 degC
3) 1100 kPa 54 degC
4) 100 kPa 15 degC

Figure 5.15 General PVT-data

Date	9/87	For	JMH	Code	JMH
Technician	AMJo	Rel.	EPR		

6. DRILLING DATA

If not otherwise mentioned, all depths in this chapter refer to
m RKB (Rotary Kelly Bushing).

Date	Stop	Operational Description
14.02.87	2400	On tow from Averøya to location 34/4-7. Total distance: 195 nm. Tug in bridle: Nordfonn.
15.02.87	2400	On tow to location 34/4-7. Distance made: 148 nm. Distance to go: 49 nm.
16.02.87	0730 2400	On tow to location. Anchorhandling. Ran anchors 1,2,4,5,6,7 and 8. Had to reset anchor no. 5. Piggy backed anchors 1,2,4,5,6 and 8.
17.02.87	0200 0630 0800 1400 1500 1700 2130 2200 2230 2300 2400	Anchorhandling. Ran anchor no.3 and piggy backed same. Positioned rig and pretensioned anchors to 100 T. Pretensioned anchors to 160-200 tons. Anchors 6&8 slipped. Reset anchors no. 6 and 8 with double piggy backs. Pretensioned anchors to 160 tons, ok. Landed TGB with 1 deg. RKB-seabed 380 m. Pulled running tool. Made up and ran 36" BHA to seabed. Spudded well at 1700 hrs. Drilled 36" hole from 380 to 400 m. Took magnetic single shot survey - 0.75 deg. Drilled 36" hole from 400 to 409 m. Took magnetic single shot survey - 0.75 deg. Drilled 36" hole from 409 to 422 m.
18.02.87	0230 0300 0830 0900 0930 1000 1100 1700 1930 2030 2400	Drilled 36" hole from 422 to 438 m. Took magnetic single shot survey - 0.5 deg. Drilled 36" hole from 438 to 470 m. Circulated and swept hole with 8 m3 hi-vis pill. Dropped magnetic single shot. POOH to seabed. Retrieved survey. RIH to bottom. Displaced hole with 87 m3 hi-vis mud. POOH. Made up 30" running tool and set back. Rigged up and ran 7 joints of 30" casing. Ran drillpipe stinger. Landed PGB in TGB with shoe at 465 m. PGB angle - 1 deg. Circulated 24 m3 seawater with rig pumps. Cemented casing with 28.5 MT lead slurry at 1.56 s.g. and 21.3 MT tail slurry at 1.92 s.g. Displaced with 6.4 m3 seawater. Backed out running tool and pulled same. Rigged up to and ran Seabed Diverter. Ran 2 joints of riser. Tested kill- and choke lines to 69 bar.

Date	Stop	Operational Description
19.02.87	0100	Attempted to test choke and kill lines on riser joint no.2, leaking.
	0500	Pulled Seabed Diverter, changed packing on choke and kill lines, still leaking. Changed out riser joint no.2.
	1500	Ran Seabed Diverter and riser. Tested every 3rd joint, ok.
	1530	Landed Seabed Diverter. Made 10 tons overpull test
	1630	Installed diverter.
	1700	Laid down 36" BHA.
	1930	Made up and RIH with 17 1/2" bit and 26" under-reamer.
	2030	Pressure tested Seabed Diverter and 30" casing to 34 bar, ok. Tested dumpvalve and bag from above to 34 bar, ok.
	2300	Attempted to test surface diverter system. Repaired pneumatic transmitter on starboard over-board line.
	2330	Function tested surface diverter system, ok. RIH.
	2400	Drilled cement from 461 to 462 m.
20.02.87	0230	Drilled cement from 462 to 465 m and reamed rat-hole from 465 to 470 m.
	0330	Drilled 26" hole from 470 to 475 m.
	0430	Circulated hi-vis pills around.
	0500	Pulled monel collar into Seabed Diverter.
	0530	Performed leak off test, EMW = 1.16 s.g.
	0730	POOH and laid down 9 1/2" drillcollars and 26" under reamer.
	1100	RIH with 17 1/2" BHA.
	1130	Reamed rathole.
	2400	Drilled 17 1/2" pilot hole from 475 to 680 m.
21.02.87	0130	Drilled 17 1/2" pilot hole from 680 to 708 m.
	0230	Circulated.
	0300	POOH to shoe, no drag.
	0330	Slipped drillline and RIH.
	1400	Drilled 17 1/2" pilot hole from 708 to 915 m. The last 6 m was drilled with only one pump due to washout between crosshead and pulsation damper on mud pump no.2.
	1530	Circulated with one mud pump only.
	1600	Flowchecked with closed bag and open dumpvalve,ok. Mudweight during flowcheck, 1.13 s.g.
	1730	Circulated with one mud pump only.
	1800	Dropped magnetic single shot survey.
	2000	POOH. Retrieved survey. Laid down MWD tool.
	2230	RIH with 17 1/2" bit and 26" underreamer.
	2300	Washed and reamed shoe and rathole area.
	2400	Opened hole to 26" from 475 to 493 m.

Date	Stop	Operational Description
22.02.87	0830	Opened hole to 26" from 493 to 672 m.
	0930	Changed washpipe on swivel.
	1700	Opened hole to 26" from 672 to 789 m.
	1930	P00H due to heavy leak on boosterline. Weather too rough for repair. Gooseneck on boosterline half way out of box on slipjoint.
	2400	W.O.W. to reinstall gooseneck on boosterline.
		Time Wind (kts) Waves (m) Heave (m)
	1800	50 11 3.5
	2200	50 12 3.6
	2400	44 13.5 2.8
23.02.87	0500	WOW to reinstall gooseneck on boosterline.
		Time Wind(kts) Waves(m) Heave(m)
	0000	44 13.5 2.8
	0400	43 7.7 2.8
	0600	RIH with 17-1/2" bit and 26" underreamer to shoe.
	0630	Reinstalled gooseneck on boosterline.
	0700	Continued to RIH to bottom.
	1500	Opened hole to 26" from 789-915m.
	1700	Circulated to clean hole. Pumped 16 cum hi-vis mud around.
	1730	P00H to 388m.
	1800	Flowchecked with closed bag and open dump valve.
	1830	Displaced riser to seawater.
	2000	P00H and laid down underreamer.
	2400	Prepared and pulled seabed diverter.
24.02.87	0330	Pulled seabed diverter.
	0530	Made up 18-3/4" housing with cement plug and running tool. Racked same in derrick.
	1030	RIH with 26" bit to bottom. Hole OK. P00H. Stopped at 394m and refilled hole with mud. Continued to P00H.
	1930	Rigged up and ran 20" casing. Picked up housing, and continued to RIH with landing string. Held casing in suspension 1m above landing point.
	2030	Made up cementing head and circulated 16 cum mud. Pressure tested cement line to 172 bar.
	2230	Pumped 3.2 cum water. Mixed and pumped 98 ton Lead slurry and 21.4 ton tail slurry.
	2400	Displaced cement with seawater. Got no indications that dart sheared wiper plug. Good returns during job.

Date	Stop	Operational Description
25.02.87	0200	Displaced cement with 92.8 cum water. Did not bump plug. Landed 18-3/4" housing and pulled tested with 10 ton. Released running tool, washed wellhead area and POOH.
	0230	Laid down slip joint from derrick.
	1730	Rigged up and ran BOP.
	1930	Landed BOP and overpulled with 15 ton. Installed diverter and cleared floor.
	2000	Closed shear ram with acoustics and presurre tested casing to 100 bar while RIH with BOP test plug.
	2100	Attempted to test BOP. Test plug not properly landed. POOH.
	2200	Made up stinger below test plug and RIH.
	2400	Tested BOP to 100 bar.
26.02.87	0300	Pulled test plug and ran seat protector. Tested kelly cocks to 345 bar.
	0630	Made up new BHA, tested MWD and RIH. Tagged cement at 886m.
	1200	Drilled cement and collars from 886-902m.
	1230	Pumped 8 cum of hi-vis pill and displaced hole to gyp-polymer mud. Reamed rathole from 902-915m.
	1300	Drilled 17-1/2" hole from 915-920m.
	1400	Circulated and conditioned mud prior to leak off test. Pulled into 20" casing.
	1430	Performed leak off test. Equivalent mudweight 1.59 SG.
	2400	Drilled 17-1/2" hole from 920-1113m.
27.02.87	0800	Drilled 17-1/2" hole from 1113-1304m.
	0900	Circulated to clean hole.
	1100	Made wiper trip to 20" casing shoe. Max overpull-65 ton. RIH to 1075m.
	1130	Picked up kelly and reamed tight hole from 1075-1113m.
	1200	Continued to RIH to bottom.
	2400	Drilled 17-1/2" hole from 1304-1480m.
28.02.87	0100	Drilled 17-1/2" hole from 1480-1500m.
	0330	Circulated and increased mudweight to 1.25 SG.
	0500	Pulled to 20" casing shoe. Max overpull-50ton. RIH to bottom.
	1230	Drilled 17-1/2" hole from 1500-1644m. Increased mudweight to 1.3 spgr.
	1500	Circulated hole clean.
	1800	POOH for bit change. Max overpull-50ton. Laid down 68 joints of excess DP.
	2000	Repair and secure standlift block.
	2400	Changed bit and 5 8"DC, tested MWD tool and RIH.

Date	Stop	Operational Description
01.03.87	0100	RIH to 1644m. Filled pipe at 1000m.
	1800	Drilled 17-1/2" hole from 1644-1887m.
	2000	Circulated with one pump while changing washed-out suction module on mud pump no 2.
	2230	Circulated hole clean.
	2400	POOH to 20" casing shoe. Hole OK.
02.03.87	0830	W.O.W. Circulated inside 20" casing. Slipped and cut drillline. Filled kill-, choke- and surface lines with diesel.
		Max weather: Wind-38 m/s, waves-11 m, heave-4.1 m, roll-5.0 deg., pitch-6.2 deg.
	1000	RIH to 1887 m.
	1330	Circulated to clean hole. Dropped magnetic single shot survey.
	1530	POOH.
	1600	Retrieved survey, 0.75 deg.
	1630	Broke out bit and bit sub. L/D MWD tool.
	2400	Rigged up Dresser Atlas for logging.
		Run no.1: DIFL-LSBHC-GR-CDL-CAL
		Run no.2: Sidewall cores.
03.03.87	0300	Logging.
		Run no.2: Sidewall cores. Recovered 47, 2 misfire and lost 1. Rigged down Dresser Atlas.
	0400	Made up 13 3/8" casing hanger, pack off and running tool. Stood back in derrick.
	0630	RIH with 17 1/2" bit to check hole prior to running 13 3/8" casing.
	0900	Circulated and conditioned mud.
	1130	POOH.
	1330	RIH and retrieved wearbushing. Washed wellhead area.
	2400	Rigged up and ran 13 3/8" casing.

Date	Stop	Operational Description
04.03.87	0400	Continued running 13 3/8" casing. Landed casing on drillpipe with shoe at 1872 m. Circulated casing volume + 25%. Pressure tested cement lines to 280 bar.
	0630	Pumped 3.2 m3 drillwater as spacer. Dropped ball. Mixed and pumped 64.8 m3 of 1.56 s.g. lead slurry followed by 16.3 m3 of 1.90 s.g. tail slurry. Dropped dart. Displaced 3.3 m3 with BJ to shear top plug. Displaced cement with rig pumps.
	0730	Bumped plug and pressure tested casing to 280 bar. Bled off pressure and checked that floats were holding, ok. Set seal assembly.
	1130	Tested BOP stack to 280 bar. Upper annular tested to 240 bar. POOH with 13 3/8" csg. running tool.
	1400	RIH and set wearbushing. Tested kelly cocks to 345 bar.
	1800	Made up new BHA and RIH to 1848 m. Tested MWD tool on surface, ok.
	1830	Slipped 56 ft of drillline.
	2400	Drilled cement plugs, float collar and cement to 1863 m.
05.03.87	0200	Drilled cement inside 13 3/8" casing. Worked string and reamed to get middle stabilizer through float collar area. Drilled out float shoe and cleaned rat hole to 1887 m.
	0230	Drilled 12 1/4" hole from 1887 to 1892 m.
	0400	Circulated 15 mins. Pulled into shoe and performed leak off test, EMW = 1.83 s.g.
	0430	Had problems to open lower annular. Opened annular from Koomeyroom due to malfunction of remote manipulator arm. Closing function ok.
	1830	Drilled 12 1/4" hole from 1892 to 2100 m.
	1900	Circulated to clean hole.
	2000	Made wiper trip to 13 3/8" casing shoe.
	2400	Drilled 12 1/4" hole from 2100 to 2145 m.
06.03.87	0030	Repaired Exlog's kelly height/depth sensor due to broken hose.
	0830	Drilled 12 1/4" hole from 2145 to 2243 m.
	0900	Circulated due to power failure.
	1730	Drilled 12 1/4" hole from 2243 to 2298 m.
	1900	Circulated to clean hole.
	2130	POOH to change bit. When bit above BOP stack, closed shear ram, bled off pilot pressure and started working on manipulatorvalve for lower annular.
	2300	Changed bit. Checked MWD tool and RIH with BHA.
	2400	Worked on manipulatorvalve for lower annular.

Date	Stop	Operational Description
07.03.87	0130	Continued working on manipulator valve for lower annular. Reinstalled same. Opened shear ram with operating pilot pressure.
	0400	RIH with drillpipe through BOP. Closed/opened lower annular to test remote operation from drillers panel, ok. RIH to TD. Filled pipe half-way.
	2400	Drilled 12 1/4" hole from 2298 to 2407 m.
08.03.87	0330	Drilled 12 1/4" hole from 2407 to 2423 m.
	0400	Displaced open hole section to 1.71 s.g. KCL-mud.
	0630	POOH to 13 3/8" casing shoe. Max overpull 65 tons after pulled 4 stands. Picked up kelly and pumped out 2 singles. POOH to shoe in stands.
	0900	Displaced hole to 1.71 s.g. KCL-mud.
	1000	RIH to TD, hole ok.
	1300	Drilled 12 1/4" hole from 2423 to 2441 m. Lost 3.2 m ³ mud.
	1630	Observed well, stable. Drilled to 2443 m, lost 19 m ³ mud. Displaced riser to seawater and prepared LCM-pill. Observed well for 30 mins, stable. Pumped 6 m ³ LCM-pill and placed same in annulus. Observed well for 30 mins, stable.
	1930	Circulated 1.66 s.g. KCL-mud around. Max gas when circulating 7.1 % corresponding with bottoms up.
	2400	Drilled 12 1/4" hole from 2441 to 2471 m. Weighted up mud in steps to 1.70 s.g. Monitored pit level closely, no losses.
09.03.87	0230	Drilled 12-1/4" hole from 2471-2490m,
	0300	Anadrills Geolographwire broke. Repaired same.
	0600	Drilled 12-1/4" hole from 2490-2506m. Drilling break. Flowchecked well, OK.
	0830	Circulated for sample and to clean hole prior to coring.
	1130	POOH. Max overpull 35ton. Serviced MWD and racked back same.
	1500	Made up core assembly (90 feet fibreglass) and RIH to 750m.
	1600	Slipped and cut drillline.
	1700	RIH. Took weight at 2470m.
	1830	Reamed/washed to bottom. Spaced out and dropped ball.
	2100	Cut core no 1 from 2506-2512m. Erratic pump pressure. Pulled off bottom and attempted to restart coring. Negative.
	2400	POOH.

Date	Stop	Operational Description
10.03.87	0100	Recovered core no 1.(83 % recovery) and serviced corebarrel.
	0300	RIH to 2495m.
	0330	Reamed/washed from 2495 to 2512m.
	0400	Circulated,spaced out and dropped ball.
	1030	Cut core no 2 from 2512-2536m.Core jammed.
	1300	POOH.
	1430	Recovered core no 2 (80 % recovery) and serviced core barrel.
	1630	RIH to bottom.
	1700	Circulated,spaced out and dropped ball.
	2400	Cut core no 3 from 2536-2563.5m.
11.03.87	0230	POOH with core no.3.
	0430	Recovered core no.3, 100 % recovery. Serviced core barrel. Made up new bit.
	0700	RIH. Changed hydraulic jar section (damaged wiper). RIH to 13 3/8" csg. shoe.
	0730	Slipped drillline.
	0830	RIH to 2545 m.
	0900	Washed down to 2563.5 m. Circulated. Spaced out and dropped ball. Took SCR.
	1400	Cut core no. 4 from 2563.5 to 2591.3 m.
	1630	POOH with core no.4.
	1830	Recovered core no. 4, 100 % recovery. Serviced core barrel and set back in derrick.
	2230	RIH with jet sub and washed wellhead area. Pulled out 6 stands and made up testplug to the string. RIH and tested BOP stack to 280 bar, upper annular to 240 bar. POOH with test plug.
	2330	Tested kelly hose, upper and lower kelly cock to 345 bar.
	2400	RIH with corebarrel to cut core no.5.
12.03.87	0230	RIH with corebarrel to bottom.
	0300	Circulated and dropped ball.
	0930	Cut core no 5 from 2591.3-2619.3m.
	1300	POOH and recovered core no 5,(100 % recovery). Serviced core barrel.
	1500	RIH to 2585m,tight hole.
	1530	Reamed/washed from 2585 to TD.
	1600	Circulated,spaced out and dropped ball.
	2100	Cut core no 6 from 2619.3-2647m.
	2300	Circulated bottoms up.
	2400	POOH.

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Date	Stop	Operational Description
13.03.87	0200	P00H with core no 6.
	0230	Recovered core no 6,(100 % recovery).
	1100	Logging. Run no 1 : DLL-MLL-GR in 0300 hrs,out 0555 hrs. un no 2 : CDL-CNL-GR in 0645 hrs,out 1005 hrs.
	1530	Logging, run no 3 : FMT. In 1200 hrs. Tool stuck at 2340m while RIH.Pulled loose and P00H. Found pad activated.Serviced tool.
	2400	Logging.Run no 4 : FMT. In 1536 hrs. Took pressure readings.Tool got stuck at 2581m.Displaced riser to seawater and pulled tool free.Continued logging.Took sample at 2584.4m.
14.03.87	0530	Logging. FMT sample no 1 out at 0020hrs. Took sample no 2 at 2592.5m. In at 0140,out at 0410 hrs.Rigged down Dresser Atlas.
	0830	Made up 8-1/2" oriented coring assembly (30 feet)
	1030	RIH to casing shoe.
	1130	Slipped 56 feet and cut 112 feet of drillline.
	1230	Continued to RIH.Pipe took weight.
	1500	Tight hole at 2620m.Pulled back one single.Pipe got stuck at 2613m (12-1/4" stabilizer at 2593m) Circulated and worked string,displaced riser to seawater and pulled string free. Max overpull 160 ton.
	1530	Displaced riser back to seawater.
	1800	P00H.
	1830	Serviced core barrel.
	2100	Made up 12-1/4" bit and RIH.
	2300	Washed/reamed from 2546-2647m.
	2330	Circulated.
	2400	Started to P00H.
15.03.87	0230	P00H.
	0300	Picked up and dressed core barrel.
	0600	RIH to 2620m.Hole tight.
	0700	Reamed from 2620 to bottom.
	0730	Circulated and dropped ball.
	0930	Cut 8-1/2" oriented core from 2647-2656.5m.
	1400	P00H,recovered core no 7 (100 % recovery) and picked up another core barrel section.
	1630	Made up corehead and RIH to 2641m.
	1700	Washed/reamed from 2641 to bottom.
	1730	Circulated and dropped ball.
	2030	Cut 8-1/2" oriented core from 2656.5-2675m.
	2130	P00H.
	2200	Repaired elevator air hose.
	2400	Continued to P00H.Recovered core no 8 (100m % recovery).

Date	Stop	Operational Description
16.03.87	0230	Recovered core no 8,(100 % recovery).Serviced core barrel.
	0530	RIH to 2660m.
	0600	Washed down to 2675m,circulated and dropped ball.
	1000	Cut core no 9 (8-1/2" oriented) from 2675-2693m.
	1030	Removed one kelly bushing drive pin due to stuck locking mechanism.
	1330	POOH.
	1500	Recovered core no 9 (98% recovery).Serviced core barrel.
	1730	RIH to 2680m.
	1800	Washed down to bottom,circulated and dropped ball.
	2030	Cut core no 10 (8-1/2" oriented) from 2693-2711.5m
	2130	POOH to casing shoe.
	2230	Slipped 112 feet and cut 112 feet of drillline.
	2400	Continued to POOH.
17.03.87	0130	Recovered core no 10 (100 % recovery).
	0300	Laid down 6-1/2" DC and corebarrels.
	0500	Repaired brakeout cathead.
	0830	Made up BHA,tested MWD tool and RIH to 2630m.
	0930	Picked up kelly and washed/reamed from 2630-2647m.
	1430	Open 8-1/2" coring rathole to 12-1/4" from 2647 to 2711.5m.
	2400	Drilled 12-1/4" hole from 2711.5-2792m.
18.03.87	2230	Drilled 12-1/4" hole from 2792-2950m.
	2400	Circulated bottoms up.
19.03.87	0030	Circulated.
	0100	Started to POOH.
	0200	Tight hole from 2792-2726m.Picked up kelly,worked pipe and circulated.Pulled 2 moore stands.
	0630	Pipe got stuck at 2667m.Picked up kelly,circulated and worked pipe.Jarred pipe free.Max overpull : 160 ton. Worked/pumped out 6 joints.
	0800	Continued to POOH to 13-3/8" casing shoe.
	0900	Circulated and spinned pipe to clean BHA.RIH to 2570m.
	1100	Picked up kelly and reamed from 2570-2670m.
	1200	RIH to bottom.
	1430	Circulated to clean hole.
	1730	POOH and laid down 12-1/4" stabilizers,monel and MWD tool.
	2400	Logging.
		Run no 1 : DIFL-LSBHC-GR-ACBL. In 1815 hrs.
20.03.87	2230	Logging.
		Run no 1:DIFL-LSBHC-GR-CBL out 0030hrs
		Run no 2:CDL-CNL-GR in 0130 hrs,out 040hrs
		Run no 3:DIPLOG, in 0616 hrs,out 0955hrs
		Run no 4:VSP, in 1036 hrs,out 2215hrs
	2400	Made up bit,changed upper jar and started to RIH.

Date	Stop	Operational Description
21.03.87	0100	RIH to 13-3/8" casing shoe.
	0130	Slipped 56 feet drillline.
	0200	Continued to RIH to 2930m.
	0230	Reamed/washed from 2930-2950m.
	0430	Circulated to clean hole.
	0700	POOH.
	1930	Rigged up Dresser, displ riser to seawt and run FMT Run no 1 :Pressure readings and sample at 2581.5m. In 0747,out 1310 hrs. Run no 2 :Sample at 2509m. In 1410,out 1603 hrs. Run no 3 :Sample at 2582m. In 1650,out 19100 hrs.
	2400	Ran 50 shot sidewall coregun.In 2005,out 2340 hrs. Upper half section of gun did not fire. 10 barrels left in hole,3 empty.
22.03.87	1100	Logging. Sidewallcores no.2 - 50 shots: Recovered 26, lost 17 and 7 empty. Sidewallcores no.3 - 50 shots: Recovered 9, lost 13 and 3 misfire. Upper gun did not fire.
	1130	Made up 9 5/8" casing hanger with cement plugs and set same back in derrick.
	1300	RIH to 13 3/8" csg. shoe.
	1400	Slipped 56 ft and cut 112 ft of drillline.
	1500	RIH to 2940 m.
	1830	Washed down to bottom and circulated two hole volumes.
	2030	Pulled out into BOP stack.
	2100	Washed wellhead area.
	2200	Continued POOH.
	2230	RIH with jet sub and wearbushing running tool.
	2400	Attempted to release wearbushing.

Date	Stop	Operational Description
23.03.87	0030	Attempted to release wearbushing, max overpull 25 tons.
	0130	POOH to inspect running tool. Running tool found to be ok. RIH and washed wellhead area.
	0230	Attempted to release wearbushing, max overpull 25 tons.
	0400	POOH. Made up fishing bumper sub. RIH. Checked make-up torque on every connections.
	0600	Worked on stuck wearbushing with bumper sub, no go. Pulled 90 tons and sheared pins on wearbushing. POOH with running tool and wearbushing.
	1900	Rigged up and ran 9 5/8" casing. Ran a total of 212 joints + hanger. Landed casing with shoe at 2921 m.
	2130	Circulated 2700 strokes with mud. Started to loose mud to formation at a rate of 80 SPM. Reduced pump rate to 30 SPM, still losing mud. Lost 17.8 m3 of mud. Pumped 260 bbls of corrosion inhibited mud. Lost 28.9 m3 mud to formation.
	2330	Tested surface lines to 400 bars. Pumped 8 m3 of corrosion inhibited freshwater as spacer. Mixed and pumped 1.90 s.g. cement slurry. Lost 54 m3 of mud to formation while pumping cement. Dropped dart and sheared top plug with 140 bars.
	2400	Displaced cement using rig pumps at a rate of 30 SPM. Monitored returns with trip tank.
24.03.87	0230	Displaced cement with rig pumps. Bumped plug with 138 bars. Lost 77 m3 of mud to formation while displacing cement. Pressure tested 9 5/8" csg. to 400 bars. Set seal assembly.
	0500	Pressure tested BOP stack to 400 bar.
	0600	Washed wellhead. L/D cement kelly, changed bails and POOH.
	0730	RIH and set wear bushing.
	0900	Tested upper and lower kelly valves and kelly hose
	1130	L/D 8" drillcollars, jars and nearbit stabilizer.
	1400	Rigged up Dresser Atlas and ran temprature log. Found top of cement at approximately 2086 m. Rigged down Dresser Atlas.
	1600	Picked up and made up Flopetrol flowhead, EZ-tree and lubricator.
	2400	RIH with bit and casing scraper on 5" tubing.

Date	Stop	Operational Description
25.03.87	0200	RIH with tubing and scraper.
	0400	Worked scraper over intervals 2450 to 2480m, from 2520 to 2550 m, from 2560 to 2580 m and from 2720 to 2740m. Continued RIH, tagged cement at 2869 m.
	0430	Slipped 56 ft of drillline.
	0730	P00H.
	1200	Rigged up Dresser Atlas and ran CBL-GR-CCL log. Rigged down Dresser Atlas.
	1400	Made dummy run with fluted hanger to wellhead.
	1700	Rigged up Dresser Atlas. RIH and perforated from 2579 to 2580 m with 4" perf. gun, 4 spf - 120 deg. phasing. Rigged down Dresser Atlas.
	1930	RIH with 3 1/2" tubing and 5" drillpipe to 2600 m.
	2100	Circulated string volume. Switched to BJ and pressure tested cement lines to 275 bars. Set 100 m balanced cement plug from 2600 to 2500 m.
	2200	Pulled out to 2470 m, reverse circulated string volume + 20%.
	2400	Attempted to squeeze using hesitation method. Pumped 0.95 m3 with a final pressure of 275 bars. Held backpressure on cement.
26.03.87	0100	Held backpressure on cement.
	0130	Rigged down cement hose, slugged pipe.
	0500	P00H. L/D 12 jts of 5" drillpipe.
	0900	Made up bit, 3 x 6 1/2" drillcollars and RIH. Tagged cement at 2514 m.
	1230	Drilled cement from 2514 to 2605 m.
	1400	RIH to 2720 m, worked casing scraper from 2720 to 2740 m. Circulated bottoms up.
	1630	P00H. Worked casing scraper from 2560 to 2580 m, from 2520 to 2550 m and from 2450 to 2480 m.
	1900	Rigged up Dresser Atlas. Ran CBL from 2600 to 2500 m. Rigged down Dresser Atlas.
	2330	Made up bitsub, RTTS packer, x-over, safety joint, RTTS circ. valve, jar, 15x6 1/2" DC, 5" tubing and 5" drillpipe. RIH to 2575 m.
	2400	Made up circulating head and hooked up to BJ. Displaced string with 22.4 m3 seawater.

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Date	Stop	Operational Description
27.03.87	0030	Displaced string to seawater.
	0200	Set packer and pressured up annulus to 35 bar. Bled off pressure in tubing, got 0.32 m3 back. Started flow check at 0115 hrs, shut in at 0127 hrs due to increasing flow, got 1.1 m3 back. Shut in pressure 124 bar.
	0300	Released packer at 0202 hrs. Reverse circulated string volume through choke manifold. Returns contained oil. Max gas 0.58 %.
	0330	Flow checked, ok.
	0630	Picked up kelly and circulated bottoms up twice at 2585 m. Max gas 0.28 %.
	0700	RIH. Tagged bottom at 2866 m.
	0800	Slipped 56 ft and cut 112 ft of drillline.
	0900	Flushed all surface lines with seawater.
	2400	Displaced riser to seawater. Reverse circulated 8 m3 spacer 3000, 8 m3 HEC pill and 8 m3 chemical wash followed by 1.72 s.g. CaBr2 brine. Flow check No losses. Cleaned all surface lines and shaker pits. Filtered brine while reverse circulating.
28.03.87	0130	Pumped filtered brine into well.
	0400	Filtered surface brine volume. Pumped seawater down booster line to clean riser.
	0730	Pumped 8 m3 HEC pill down choke line. Displaced riser to brine.
	0800	Checked for flow, ok.
	1530	POOH. L/D packer assembly.
	2000	W.O.W. Max weather: Wind 30 m/s, waves 13.8 m, heave 2.5m roll 5 deg. and pitch 5 deg.
	2200	Started to RIH with teststring.
	2330	W.O.W.
	2400	Continued RIH with teststring.
29.03.87	0200	RIH with teststring for DST # 1.
	0300	Lost 1 hour due to summer time.
	0400	Made up and pressure tested bundle carriers to 345 bar.
	0900	Continued to run teststring.
	1000	Attempted to pressure test downhole test tools, leak in teststring.
	1200	Pulled out and found leak in connection between APR-M locknut and x-over.
	1500	Attempted to pressure test from APR-M valve and down, leak. Pulled out and found leak in LPR-N service connection between ballvalve and power section. Checked packer and reset gauges.
	2400	RIH with teststring, checked every connection on downhole tools. Pressure tested bundle carriers to 345 bar. Pressure tested downhole tools to 415 bar. Filled string with seawater cushion. RIH with 5" tubing. Pressure tested after 30 stands. RIH.

Date	Stop	Operational Description																								
30.03.87	0230	RIH with teststring. Landed fluted hanger in well-head. Closed MPR.																								
	0530	Rigged up run Dresser Atlas GR-CCL for depth correlation. CCL malfunction. Found spaceout to be 2.2 m too long.																								
	0700	POOH to fluted hanger. Changed pup joint below fluted hanger.																								
	0830	Made up SSTT. Function tested latch mechanism. Pressure tested control lines to working pressure. Pressure tested string to 415 bar. Closed SSTT and checked for backpressure.																								
	1100	RIH with landing string and lubricator.																								
	1330	Changed bails and picked up flowhead. Hooked up flow- and killlines. Set packer at 1330 hrs. Attempted to pressure test killline against fail-safe valves.																								
	1530	Pressure tested MPR against packer to 100 bar for 35 mins. Pressure tested killline failsafe valves from below to 100 bar for 20 mins. Pressure tested killline against MPR and packer to 100 bars for 20 mins, ok.																								
	2400	Released packer. Pressure tested surface equipment Packer set twice, 0.3 m off on second attempt. R/D Dresser Atlas. Rigged up Flopetrol wireline BOP and stuffing box. Rigged up Schlumberger TCP activating bar on Flopetrol wireline. Leak in w/l BOP.																								
31.03.87	0100	Changed o-ring on wireline stuffing box. Reset TCP activating bar.																								
	1730	W.O.W. <table><tr><td>Time</td><td>Wind (m/s)</td><td>Waves (m)</td><td>Heave (m)</td><td>Roll</td><td>Pitch</td></tr><tr><td>0400</td><td>20</td><td>4.9</td><td>0.7</td><td>1.6</td><td>1.2</td></tr><tr><td>1000</td><td>30</td><td>6.6</td><td>0.8</td><td>3.0</td><td>4.0</td></tr><tr><td>1600</td><td>28</td><td>10.0</td><td>1.4</td><td>4.0</td><td>4.0</td></tr></table>	Time	Wind (m/s)	Waves (m)	Heave (m)	Roll	Pitch	0400	20	4.9	0.7	1.6	1.2	1000	30	6.6	0.8	3.0	4.0	1600	28	10.0	1.4	4.0	4.0
	Time	Wind (m/s)	Waves (m)	Heave (m)	Roll	Pitch																				
	0400	20	4.9	0.7	1.6	1.2																				
	1000	30	6.6	0.8	3.0	4.0																				
1600	28	10.0	1.4	4.0	4.0																					
2030	Rigged up wireline lubricator. Installed TCP activating bar. Pressure tested lubricator. Equalized pressure across lubr. valve and opened same. RIH with TCP activating bar. Pressured up annulus to open LPR-N valve. Opened choke manifold.																									
2400	Perforated at 2034 hrs intervals 2579-2587 m and from 2590 to 2596 m. Flowed well for clean-up. Closed LPR-N valve. Pulled out with TCP activating bar. Installed TCP shifting tool in lubricator and pressure tested wireline lubricator to 275 bar.																									

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Date	Stop	Operational Description
01.04.87	0300	Equalized pressure across lubricator valve and opened same. RIH with TCP shifting tool. Not able to pass 2386 m. Opened LPR-N valve and attempted to run further in. Not able to pass 2389 m. POOH with TCP shifting tool. Close lubricator valve.
	0530	Opened lubricator valve. Opened well on 3.2 mm adjustable choke for clean-up. Increased choke size slowly to 11.1 mm. Switched to 11.1 mm fixed choke. Closed LPR-N valve. Produced 75 m3 water and oil at a rate of 800 m3/day, oil content 20 %.
	0930	Rigged up TCP shifting tool. Pressure tested wire-line stuffing box and RIH. Not able to pass 51 m. Pulled out and hung off wireline equipment. Found thick oil emulsion in string.
	1100	Opened LPR-N valve. Flowed well on 11.1 mm choke to clean well. Injected glycol, deemulsifier and defoamer at SSTT.
	1600	Shut in well at choke manifold. Rigged up TCP shifting tool. Pressure tested stuffing box and RIH with TCP shifting tool. Not able to pass 2270 m. POOH and hung off wireline equipment.
	2400	Opened well on 7.9 mm fixed choke. Injected de-emulsifier and defoamer at SSTT and standpipe. Switched to 11.1 mm fixed choke for main flow. Flow rate: 400 m3/day, oil content 45 % and well-head pressure 127 bar.
02.04.87	2130	Main flow on 7.9 mm fixed choke. Time WHP(bar) WHT(C) Oil(m3/d) Water(m3/d) GOR 0000 126.9 13.1 188.9 219 108 0800 126.5 16.1 189.2 201 107 2000 126.3 20.3 188.0 194 104
	2400	Shut in well for main build up by closing LPR-N valve. Closed choke manifold.
03.04.87	2400	Well shut in for main build-up.

Date	Stop	Operational Description
04.04.87	0100	Well shut in for main build-up. Closed lubricator valve at 0047 hrs.
	0500	Attempted to RIH with TCP shifting tool. Not able to pass 38 m. Pumped 1 m3 water to check for trapped pressure in stuffing box. Attempted to RIH Not able to pass 118 m. POOH and closed lubricator valve. R/D TCP shifting tool.
	1000	Opened lubricator valve. Opened LPR-N valve and flowed well to clean string. Injected glycol.
	1300	Shut in well at choke manifold. Bullheaded test string with filtered and treated water. Closed lubricator valve.
	1700	Rigged up TCP shifting tool. Opened lubricator valve and RIH with TCP shifting tool. Released guns at 1529 hrs. Checked that guns were dropped. POOH. Closed lubricator valve. R/D slick-line equipment, lubricator section and wireline BOP.
	2400	R/U wireline pressure control equipment. Made up PLT to wireline. Installed PLT in stuffing box. Opened lubricator valve and RIH with PLT. Detected powerfailure at 2300 hrs with PLT at 1600 m. Checked collector at Flopetrol unit. POOH with PLT
05.04.87	0600	POOH with PLT. Closed lubricator valve. Checked plt, cable head, rope socket termination and collector at Flopetrol unit. Cut cable and reterminated. Checked power supply to unit. Rigged up and positioned PLT in wireline lubricator.
	1100	Opened lubricator valve. RIH with PLT. Lost signal from tool at 850 m. POOH. Closed lubricator valve. Changed PLT and RIH. Lost signal from PLT at 1450m POOH. R/D PLT.
	1400	Cut off 2800 m of monoconductor cable.
	1800	Rigged up PLT. RIH. Performed calibration passes. Opened well on choke manifold and flowed well on 11.1 mm fixed choke.
	2400	Continued flowing well on 11.1 mm fixed choke. Logged with PLT over perforated intervals. Well flowed 353.1 m3 oil/day, 295.7 m3 water/day, GOR at 113.1, WHT at 20.5 deg.C and WHP at 99.9 bar before well was shut in at 2340 hrs.
06.04.87	0100	Completed PLT running. Pressure tested injection lines.
	2400	Performed injection test.
	Time	WHP(bar) BHP(bar) Qinj(m3/d)
	0200	187.8 406.9 214
	1200	158.9 423.4 232
	2400	185.7 443.9 397

Date	Stop	Operational Description
07.04.87	0230	Continued injection test.
	0900	Stopped injection and performed fall off test.
		Time WHP(bar) BHP(bar) BHT(deg C)
	0230	169.9 443.0 40.9
	0430	129.5 388.1 51.9
	0800	128.6 386.7 62.8
	0930	Attempted to pull PLT.Lost signal and weight at 2475m.
	1330	Bullheaded 7 m3 calsium carbonate pill followed by brine.Applied 14 bar on perforations,OK.
	1400	Flowchecked,OK.
	1630	Pulled wireline and rigged down wireline equipment Found wireline broken at weak point.
	1730	Sheared APR-M and reversed circulated string volume.
	1800	Attempted to release packer.Max overpull 40 ton.
	2000	Rigged down flow-and killhoses and flowhead. Changed bails and made up one tubing joint.
	2330	Released packer-max overpull 55 ton.Landed fluted hanger,closed MPR and reversed circulated two string volumes.Opened MPR.Annulus U-tubed,circulated brine down string.
	2400	Flowchecked,OK.
08.04.87	0930	P00H with test string.Flowchecked 1/2 and 2/3 way out.Laid down test tools.
	1330	Made up 8-1/2 " bit,9-5/8 " casing scraper and gauge ring and RIH.Tagged lost PLT tool at 2792m.
	1630	P00H.Laid down bit,scraper and gauge ring.
	1830	Rigged up Dresser Atlas and sat bridge plug at 2784m.
	2400	Rigged up and ran 7" Liner.Filled Liner with 1.72 sp.gr brine.Made up hanger and ran same on 24 jts of HWDP and DP.

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Date	Stop	Operational Description
09.04.87	0330	Continued to run 7" Liner on DP. Tagged bridge plug at 2784m. Picked up 3m.
	0500	Circulated string volume, dropped ball, pumped up to 110 bar and slacked off 18 ton weight to set slips. Pressured up to 170 bar and sheared ball seat. Released running tool and picked up to check for free movement.
	0700	Hooked up cement line, pumped 4.8m ³ freshwater followed by 4.8m ³ 1.9 sp.gr. slurry. Dropped dart sheared plug and displaced cement with brine. Bumped plug with 110 bar and checked for backflow. Sat packer, pulled up 15m, and reversed circulated.
	0830	POOH to 1120m.
	0900	Slipped 56 feet drillline.
	0930	Continued to POOH.
	1130	Made up 8-1/2" bit and scraper and RIH. Tagged liner top at 2571m.
	1400	Circulated to clean hole.
	1700	POOH.
	2100	Made up 5-7/8" bit, 4-3/4" DC, 3-1/2" DP and RIH to 2571m.
	2130	Reamed/washed from 2571-2576m.
	2230	Continued to RIH to 2722m. Took weight.
	2400	Reamed/washed from 2722-2738m.
10.04.87	0100	Hooked up to cement unit and pressure tested liner to 275 bar against middle pipe ram.
	0230	Circulated to clean hole.
	0430	POOH.
	0900	Ran test plug and tested BOP to 400/240 bar. Pulled test plug.
	2230	Made up down hole test tools and pressure tested to 414 bar. RIH with tubing. Experienced back flow through tubing after 52 stands.
	2400	Sat packer and pressure tested annulus to 28 bar, OK. Suspect LPR-N open due to sheared pins. Pressured annulus up to 83 bar to equalize nitrogen pressure.
11.04.87	0800	Unseated packer, ran 6 stands. LPR-N opened. Cycled OMNI to blank position. RIH, made up EZ-tree and tested to 414 bar, OK. Ran 5 stands, got backflow. Recycled OMNI and pressure tested to 414 bar, leaking
	1900	POOH. Test above EZ-tree, neg. POOH and tested after 26 stands, neg. POOH and tested on top of slip jts, neg. POOH and laid down test tools. Found leak in OMNI valve reversing ports. Checked guns, OK.
	2000	Slipped and cut drillline.
	2400	Made up test tools with new LPR-N and OMNI valve. Pressure tested tools above slip joints, neg.

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Date	Stop	Operational Description
12.04.87	0300	POOH with test string. Pressure tested below slip joints and below APR-M, both negative. Pressure tested below OMNI, OK. Found connection between OMNI and pressure relief sub not properly made up. Made up same and tested to 414 bar, OK.
	1300	RIH with tubing. Tasted half way, OK. Made up EZ-tree functioned and pressure tested same, OK.
	1600	Ran landing string. Made up lubricator valve and flowhead. Landed fluted hanger in wellhead.
	1800	Pressure tested string. Found lubricator valve leaking.
	1930	Changed lubricator valve.
	2200	Pressure tested string and surface equipment according to program.
	2400	Rigged up Dresser Atlas and ran GR for depth correlation. Sat packer at 2451.7m. Checked depths with GR. Pulled wireline and rigged down Dresser.
13.04.87	0030	Rigged down Dresser Atlas.
	0200	Opened LPR-N and monitored annulus/tubing pressure for 20 minutes to check for packer/liner lap leak. Pressured up string to 290 bar and perforated from 2506-2566.5m at 0143 hrs. Flowed well for 12 min. Produced 8 m3. Closed well in at LPR-N.
	0500	Build up.
	1000	Opened well for clean up flow. Produced through 36/64" choke.
	1430	Build up.
	1630	Rigged up wireline equipment and RIH with shifting tool. Dropped guns and pulled wireline.
	1930	Opened well for second clean up flow. Flowed through 24/64" choke increasing in steps to 40/64" Shut well in at 1910 hrs. Closed lubricator valve.
	2400	Rigged up wireline unit and RIH with PLT.
14.04.87	0300	RIH with PLT. Performed calibration passes across perforations.
	2400	Flowed well.
		Time Choke(/64") WHP(bar) Qoil(Sm3/D) GOR(m3/m3)
	0800	40 173.7 1701 81
	1600	40 171.8 1674 81
	2000	20 198.7 517 87
15.04.87	0430	Flowed well.
		Time Choke(mm) WHP(bar) Qoil(sm3/d) GOR(m3/m3)
	0000	15.9 170.5 1648 70
	0200	15.9 169.9 1641 70
	0400	15.9 169.3 1632 77
	2400	Shut in well at choke manifold at 0432 hrs for build up. Wellhead pressure at 0600 hrs - 201.2 bar and at 2400 hrs - 203.4 bar. Lost anchortension on anchor no.2 at 1415 hrs. Attempted to tension up anchor no. 2 without success.

Date	Stop	Operational Description
16.04.87	0430	Shut in well for pretest build up. WHP at 0000 hrs 203.4 bar and at 0400 hrs - 203.7 bar.
	1430	Extended build up while resetting anchor no. 2 with 3 piggy back anchors.
	2400	Opened well at 1423 hrs on 12.7 mm choke. Changed to 14.3 mm choke at 1530 hrs.
		Time Choke(mm) WHP(bar) . Qoil(sm3/d) GOR(m3/m3)
		1600 14.3 175.9 1555 80
		2400 14.3 174.3 1512 74
17.04.87	2400	Flowed well on 14.3 mm choke.
		Time WHP(bar) BHP(bar)/Depth Qoil(sm3/d) GOR(m3/m3)
		0800 172.7 366.6 / 2569 1493 74
		1600 171.4 364.8 / 2569 1481 75
		2400 170.5 363.3 / 2569 1469 74
18.04.87	2400	Flowed well on 14.3 mm choke.
		Time WHP(bar) BHP(bar)/Depth Qoil(sm3/d) GOR(m3/m3)
		0800 170.2 362.3 / 2569 1451 76
		1600 169.8 361.3 / 2569 1427 77
		2400 168.0 360.3 / 2569 1463 74
19.04.87	0830	Flowed well on 14.3 mm choke.
		Time WHP(bar) BHP(bar)/Depth Qoil(sm3/d) GOR(m3/m3)
		0000 168.0 360.3 / 2569 1463 74
		0400 167.4 359.8 / 2569 1463 73
		0800 167.2 359.5 / 2569 1468 74
	0930	Shut in well on choke manifold at 0847 hrs due to accidental lifting of teststring. Pulled PLT above LPR-N and OMNI-valves. Landed teststring in fluted hanger while attempting to keep constant pressure on annulus. Ran back and positioned PLT at 2569 m.
	2400	Opened well at 0940 hrs for flow on 14.3 mm choke.
		Time WHP(bar) BHP(bar)/Depth Qoil(sm3/d) GOR(m3/m3)
		1200 168.8 360.0 / 2569 1440 78
		2000 168.3 359.1 / 2569 1446 75
		2400 168.3 358.9 / 2569 1440 75
20.04.87	2400	Flowed well on 14.3 mm choke.
		Time WHP(bar) BHP(bar)/Depth Qoil(sm3/d) GOR(m3/m3)
		0800 168.3 358.4 / 2569 1426 76
		1600 167.7 358.0 / 2569 1422 76
		2400 167.6 357.6 / 2569 1419 75
21.04.87	2400	Flowed well on 14.3 mm choke.
		Time WHP(bar) BHP(bar)/Depth Qoil(sm3/d) GOR(m3/m3)
		0800 166.6 357.0 / 2569 1438 75
		2000 166.5 356.6 / 2569 1443 74
		2400 166.7 356.5 / 2569 1434 74

Date	Stop	Operational Description				
22.04.87	2400	Time	WHP(bar)	BHP(bar)	Depth	GOR(m3/m3)
		0400	166.4	356.4	2569	1441
		1200	165.9	356.0	2569	1447
		2000	165.5	Passes w/PLT.	1448	74
		2400	165.6	355.7	2569	1444
23.04.87	2400	Flowed well on 14.3 mm choke.				
		Time	WHP(bar)	BHP(bar)	Depth	GOR(m3/m3)
		0800	165.7	355.5	2569	1435
		1600	165.6	355.2	2569	1424
		2400	165.3	355.2	2569	1429
24.04.87	2400	Flowed well on 14.3 mm choke.				
		Time	WHP(bar)	BHP(bar)	Depth	GOR(m3/m3)
		0800	165.1	354.9	2569	1406
		1600	165.1	354.8	2569	1401
		2400	164.8	354.5	2569	1405
25.04.87	2400	Flowed well on 14.3 mm choke.				
		Time	WHP(bar)	BHP(bar)	Depth	GOR(m3/m3)
		0800	164.6	354.4	2569	1395
		1600	164.7	354.3	2569	1395
		2400	164.0	354.1	2569	1398
26.04.87	1200	Flowed well on 14.3 mm choke.				
		Time	WHP(bar)	BHP(bar)	Depth	GOR(m3/m3)
		0400	164.3	353.8	2569	1394
		1200	163.9	353.8	2569	1387
		Changed separator pressure from 61 to 48 bars.				
	2400	Flowed well on 14.3 mm choke.				
		Time	WHP(bar)	BHP(bar)	Depth	GOR(m3/m3)
		1600	164.1	353.7	2569	1384
		2000	163.2	353.4	2569	1403
		2400	163.1	353.4	2569	1408
27.04.87	2400	Flowed well on 14.3 mm choke.				
		Time	WHP(bar)	BHP(bar)	Depth	GOR(m3/m3)
		0800	163.4	353.2	2569	1380
		1600	163.3	353.1	2569	1388
		2400	162.6	352.9	2569	1393
28.04.87	2400	Flowed well through 14.3 mm choke.				
		Time	WHP(bar)	BHP(bar)	at(m)	GOR(m3/m3)
		0800	162.8	352.8	2569	1390
		1600	162.8	352.7	2569	1389
		2400	162.5	352.7	2569	1387
29.04.87	2400	Flowed well on 14.3 mm choke. Ran PLT(1300-1500hr)				
		Time	WHP(bar)	BHP(bar)	at(m)	GOR(m3/m3)
		0800	162.7	352.4	2569	1388
		1600	162.4			1394
		2400	162.4	352.3	2569	1385

Date	Stop	Operational Description			
30.04.87	2400	Flowed well through 14.3 mm choke.			
		Time	WHP(bar)	BHP(bar)/(m)	Qoil(Sm3/D) GOR(m3/m3)
		0800	162.5	352.2/2569	1373 87
		1600	162.6	352.2/2569	1366 87
		2400	162.4	352.1/2569	1371 85
01.05.87	2400	Flowed well through 14.3 mm choke.			
		Time	WHP(bar)	BHP(bar)/(m)	Qoil(Sm3/D) GOR(m3/m3)
		0800	162.5	352.0/2569	1368 86
		1600	162.2	351.9/2569	1369 86
		2400	161.9	351.7/2569	1380 85
02.05.87	2400	Flowed well through 14.3 mm choke.			
		Time	WHP(bar)	BHP(bar)/(m)	Qoil(Sm3/D) GOR(m3/m3)
		0800	162.7	352.4/2569	1383 86
		1600	162.4		1394 85.6
		2400	162.4	352.3/2569	1385 85.6
03.05.87	2400	Flowed well through 14.3 mm choke.			
		Time	WHP(bar)	BHP(bar)/(m)	Qoil(Sm3/D) GOR(m3/m3)
		0800	159.6	350.8/2569	1434 84
		1600	159.7	350.7/2569	1425 85
		2400	160.2	350.7/2569	1401 85
04.05.87	1430	Flowed well on 14.3 mm choke.			
		Time	WHP(bar)	BHP(bar)/Depth	Qoil(sm3/d) GOR(m3/m3)
		0400	160.2	350.7 / 2569	1397 85
		1200	160.8	PLT passes	1378 86
		1400	160.8	344.8 / 2480	1378 85
	2400	Shut in well at 1430 hrs for final build up.			
		Time	WHP(bar)	BHP(bar)/Depth(m)	
		1500	185.0	351.6 / 2480	
		2000	187.3	355.7 / 2480	
		2400	188.6	357.6 / 2480	
05.05.87	2400	Well shut in for final build up.			
		Time	WHP(bar)	BHP(bar)/Depth(m)	
		0400	189.7	359.2 / 2480	
		1200	-	361.5 / 2480	
		2400	-	364.1 / 2480	

Date	Stop	Operational Description
06.05.87	0100	Shut in well for final build up.
	0300	Equalized pressure across flowhead killvalve. Opened same and bullheaded 8 m3 hi-vis pill and 0.8 m3 brine. Pressure increased after 23.4 m3 was pumped indicating hi-vis pill hit perforations. Held 35 bar for 5 mins. Checked for backflow, neg.
	0530	Pulled out with PLT. Rigged down PLT and wireline equipment. Flushed through surface testlines with seawater.
	0600	Pressured up annulus to 283 bar and sheared APR-M valve. Reverse circulated string volume. Had to close in well after 850 strokes due to high oil-content in return flow.
	1400	Conditioned mudvolume on surface. Pumped returned mud from brine pit to surge tank for separation. When adding bentonite to mud system mud got heavy flocculated. Continued to treat mud.
	1600	Had to modify surface mud system to save return brine.
	1730	Pumped hi-vis pill and displaced riser to seawater
	1830	Reverse circulated until clean brine returns.
	2000	Weighted up brine in pit to 1,70 s.g. Conditioned brine.
	2400	Circulated brine down string and up killline. Monitored returns closely. Weight of brine going in steady at 1.67 s.g. Diluted and treated flocculated mud.
07.05.87	0530	Circulated brine down string and via choke while treating and building mud at surface.
	0700	Pumped 6.4 m3 hi-vis pill and displaced hole to 1.7 sp.gr mud. Transferred brine to boat.
	0800	Displaced riser to mud.
	0830	Released packer with 50 ton overpull. Landed fluted hanger in wellhead, closed middle pipe ram and attempted to bullhead, negative. Max applied pressure-35 bar.
	1000	Circulated bottoms up. Max gas 2.05%.
	1530	Pumped slug, laid down flowhead and lubricator. POOH with landing string.
	1730	Got backflow. Conditioned mud and pumped new slug.
	2400	Continued to POOH with teststring. Flowchecked halfway out, OK.

Date	Stop	Operational Description
08.05.87	0630	P00H with teststring and layed down same.
	0800	Made up Baker retrievable bridge plug with gauges below, RTTS packer with safety joint and one stand of 6 1/2" drillcollars above.
	1200	RIH to set bridge plug.
	1300	Attempted to set bridge plug and release from ame with left handed torque, no success. Lost torque on third attempt. Suspected that string had backed off.
	1600	P00H. Found string backed off in fine threaded connection on safety joint.
	1830	Layed down 4 stands of tubing from derrick while preparing fishing assembly. Made up fishing assembly with 8 1/8" overshot, 6 1/4" spiral grapple and one stand of 6 1/2" drillcollars and bumpersub above.
	2030	RIH with fishing assembly.
	2130	Tagged top of fish at 2537 m, set down 5 tons weight and waited for 5 mins to let grapple set. Tensioned up, no weight increase observed. Made two more attempts to engage fish.
	2400	P00H to check if fishing job was successful.
09.05.87	0100	P00H and recovered fish. L/D fish.
	0400	Made up new retrievable bridge plug. Checked running tool. Checked gauges and set same in F-nipple. Made up gauge assembly to bridge plug.
	0800	RIH to set retrievable bridge plug.
	0830	Set bridge plug at 2500.4 m.
	1530	Circulated and conditioned mud. Added corrosion inhibitor while circulating. Max gas readings while circulating 35.3 %. Circulated until gas readings was down to 1.3 %.
	1800	P00H.
	1900	Made up RTTS packer with safety joint and 1 stand of 6 1/2" drillcollars below and RIH.
	1930	Slipped drillline.
	2130	Continued RIH with RTTS packer to perform inflow test.
	2400	Displaced drillpipe with seawater. Set RTTS packer at 2464 m while holding drillpipe pressure constant. Closed bag and pressured up annulus to 35 bar. Attempted to bleed off drillpipe pressure from 162 bar to 0 to test plug from below.

Date	Stop	Operational Description
10.05.87	0030	Bled off annulus, pressured up string and released RTTS packer.
	0230	Reverse circulated.
	0430	Circulated long way. Checked for flow.
	0700	POOH with RTTS packer.
	1130	Made up and RIH with Baker retrievable bridge plug
	1200	Set bridge plug at 2493 m.
	1430	POOH with running tool.
	1800	RIH with RTTS packer.
	1830	Displaced string to seawater.
	1900	Set packer while holding constant drillpipe pressure. Closed annulus. Pressured up annulus to 35 bar. Bled off drillpipe pressure.
	1930	Tested Baker plug from below, ok.
	2130	Bled off annulus pressure. Pressured up string and released RTTS packer. Reverse circulated.
	2400	POOH with RTTS packer.
11.05.87	0400	Made up baker plug and RIH.
	0430	Sat plug at 2485m and tested same to 70 bar,OK.
	0600	Pumped and displaced 5m of sand on top of plug.
	0830	Circulated and conditioned mud.
	1130	POOH laying down excess pipe.
	1300	Made up and RIH with baker plug.
	1330	Sat plug at 632m.
	1430	Pumped and displaced 5m of sand on top of plug. Pressure tested plug to 70 bar,OK.
	1600	POOH laying down excess DP.
	1800	Retrieved wear bushing.
	2400	Rigged up and pulled BOP.
12.05.87	0430	Continued to pull BOP.Sat same back on carrier.
	0630	Prepared,made up and RIH with corrosion cap with attached beacon.
	1130	Filled hydraulic hose with oil,skidded rig to enable stabbing of corrosion cap.Pumped down oil to protect mandrel and sealing area.
	1700	Anchorhandling. No 3 on bolster at 1310 hrs. No 7 on bolster at 1335 hrs. No 2 on bolster at 1442 hrs. No 6 on bolster at 1638 hrs. No 4 on bolster at 1645 hrs.
	2130	Anchorhandling. No 8 on bolster at 1834 hrs. No 1 on bolster at 1951 hrs. No 5 on bolster at 2130 hrs.
		Laid down excess pipe while anchorhandling.Cut guide/TV lines with ROV.Marked location with buoy.

SAGA PETROLEUM A.S.

6.1.1 BIT RECORD PART 1
Well no: 34/4-7

No	Size	Make	Type	Ser.no.	Jets 32 inch	Depth out	Drld depth	Hrs	m/HR	WOB tons	RPM	PUMP l/m	PUMP bar	Dull.cond. T B G	Other	Bitactivity	Rem
1	26	VAREL	L2JM	18640	24-24-24	470.0	90.0	14.0	6.5	5/9	80/80	4100	128	2 2	I	DRILLING	*
2	17-1/2	TSK	3SSZ	23444	T 22-22-22	475.0	5.0	4.0	1.3	0/0	0/0	0	0	2 3	I	DRLG CMT	*
2	RR 17-1/2	TSK	3SSZ	23444	T 22-22-22	915.0	440.0	24.5	18.0	2/10	100/100	3937	172	4 4	I	DRILLING	*
2	RR 17-1/2	TSK	3SSZ	23444	T 22-22-22	798.0	323.0	17.0	19.0	0/5	100/100	3937	172	4 5	I	U REAMING	*
2	RR 17-1/2	TSK	3SSZ	23444	T 22-22-22	915.0	117.0	8.0	14.7	0/5	110/110	3937	190	5 6	I	U REAMING	*
1	RR 26	VAREL	L2JM	18640	24-24-24	.0	.0	.0	.0	0/0	0/0	0	0			CIRC	*
3	17-1/2	HTC	X3A	439EK	24-24-24	1644.0	729.0	38.5	19.0	7/14	120/120	3770	228	4 5	I	DRILLING	*
4	17-1/2	HTC	X3A	438EK	24-24-28	1887.0	243.0	17.0	14.3	7/14	120/120	3420	234	7 3	I	DRILLING	*
3	RR 17-1/2	HTC	X3A	439EK	OPEN	.0	.0	.0	.0	0/0	0/0	0	0	4 5	I	CIRC	*
5	12-1/4	HTC	XDV	324FL	18-18-18	2298.0	411.0	35.5	11.6	15/20	120/120	2240	221	6 6	1/16	DRILLING	
6	12-1/4	REED	HP51	C84948	18-18-20	2506.0	208.0	36.5	5.7	14/17	120/120	2235	221	2 3	I	DRILLING	
7	12-1/4	D.BOAR	CT 303	7860335		2512.0	6.0	2.5	2.4	15/20	120/120	1220	107			CORING	15%
7	RR 12-1/4	D.BOAR	CT 303	7860335		2536.0	24.0	6.5	3.7	12/16	120/130	1220	110			CORING	50%
8	RR 12-1/4	D.BOAR	CT 303	7860133		2563.5	27.5	7.0	4.0	12/16	120/130	1220	110			CORING	40%
9	12-1/4	D.BOAR	CT 303	7870101		2591.3	27.8	5.0	5.6	14/17	130/130	1220	110			CORING	10%
9	RR 12-1/4	D.BOAR	CT 303	7870101		2619.3	28.0	6.5	4.4	14/17	130/130	1220	110			CORING	25%
9	RR 12-1/4	D.BOAR	CT 303	7870101		2647.0	27.7	5.0	5.6	10/16	80/140	1220	115			CORING	40%
10	8-1/2	D.BOAR	CT 303	7860499		2647.0	.0	.0	.0	0/0	0/0	0	0			CORING	*
6	RR 12-1/4	REED	HP51	C84948	18-18-20	2647.0	.0	.0	.0	0/0	0/0	0	0			CIRC	*
10RR	8-1/2	D.BOAR	CT 303	7860499		2656.5	9.5	2.0	4.8	10/15	120/120	1017	98			CORING	10%
10RR	8-1/2	D.BOAR	CT 303	7860499		2675.0	18.5	3.0	6.2	10/15	120/120	1017	98			CORING	25%
10RR	8-1/2	D.BOAR	CT 303	7860499		2693.0	18.0	4.0	4.5	12/16	100/140	1017	98			CORING	50%
11	8-1/2	D.BOAR	CT 303	7860502		2711.5	18.5	2.5	7.4	12/16	100/140	1017	98			CORING	15%
12	12-1/4	REED	HP51	C84946	18-18-18	2950.0	238.5	32.0	7.5	10/25	90/135	2233	220	3 4	I	DRILLING	
12RR	12-1/4	REED	HP51	C84946	OPEN	.0	.0	.0	.0	0/0	0/0	0	0			CIRC	*
12RR	12-1/4	REED	HP51	C84946	OPEN	.0	.0	.0	.0	0/0	0/0	0	0			CIRC	*
13RR	8-1/2	SMITH	F2	XD6314	OPEN	.0	.0	.0	.0	0/0	0/0	0	0			CIRC	*
14	8-1/2	REED	S21GJ	AA139	18-18-14	.0	.0	.0	.0	0/0	0/0	0	0			DRLG CMT	*
14RR	8-1/2	REED	S21GJ	AA139	OPEN	.0	.0	.0	.0	0/0	0/0	0	0			CIRC	*
15	5-7/8	HTC	OWV/J	419KL	OPEN	.0	.0	.0	.0	0/0	0/0	0	0			CIRC	*

SAGA PETROLEUM A.S

6.1.1 BIT RECORD PART 2

Remarks

Well no: 34/4-7

No	Size	Make	Type	Ser.no.	Remarks
1	26	VAREL	L2JM	18640	Run with 36" hole opener (SMITH).
2	17-1/2	TSK	3SSZ	23444 T	Run with 26" under reamer (ROTARY LWA).
2 RR	17-1/2	TSK	3SSZ	23444 T	Drilled 17 1/2" pilot hole.
2 RR	17-1/2	TSK	3SSZ	23444 T	Pulled due to leak in booster line.
2 RR	17-1/2	TSK	3SSZ	23444 T	Run with 26" under reamer (ROTARY LWA).
1 RR	26	VAREL	L2JM	18640	Check trip prior to 20" casing job.
3 RR	17-1/2	HTC	X3A	439EK	Check trip prior to 13 3/8" casing job.
8 RR	12-1/4	D.BOART	CT 303	7860133	Rerun from well 6507/6-1 10% worn (11.5 m / 8 hrs)
10	8-1/2	D.BOART	CT 303	7860499	Pipe stuck.
6 RR	12-1/4	REED	HP51	C84948	Reaming from 2546 to 2647 m.
12RR	12-1/4	REED	HP51	C84946	Clean up trip before FMT logging.
12RR	12-1/4	REED	HP51	C84946	Check trip prior to 9 5/8" casing job.
13RR	8-1/2	SMITH	F2	XD6314	Run with casing scraper.
14	8-1/2	REED	S21GJ	AA139	Drilling cement plugs.
14RR	8-1/2	REED	S21GJ	AA139	Run with casing scraper.
15	5-7/8	HTC	OMV/J	419KL	Cleaned 7" liner lap area.



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6.1.2. Bottom Hole Assemblies
Well no: 34/4-7

BIT SIZE	DEPTH INTERVAL (m)	DESCRIPTION	COMMENTS
26/36"	380 - 470	26" BIT - 36" H.O - BIT SUB - 9 1/2" MONEL - 2 x 9 1/2" DC - XO - 15 x 8" DC - XO - 15 x HWDP	Drilled cmt. in 30" casing + 5 m new formation Pilotheole
17 1/2"/26	461 - 475	17 1/2" BIT - 26" U.R. - BIT SUB - 9 1/2" MONEL - 2 x 9 1/2" DC - XO - 15 x 8" DC - XO - 15 x HWDP	
17 1/2"	475 - 915	BIT - BIT SUB W/FLOAT - MWD - XO - 8" MONEL - STAB - 12 x 8" DC - JAR - 3 x 8" DC - XO - 15 x HWDP	
17 1/2"/26	475 - 915	17 1/2" BIT - 26" U.R. - BIT SUB - XO - 8" MONEL - STAB - 12 x 8" DC - JAR - 3 x 8" DC - XO - 15 x HWDP	
26"	475 - 915	BIT - BIT SUB - 8" MONEL - 12 x 8" DC - JAR - 3 x 8" DC - XO - 15 HWDP	
17 1/2"	886 - 1887	BIT - BIT SUB - 9" MWD - XO - 8" MONEL - STAB - 12 x 8" DC - JAR - 3 x 8" DC - XO - HWDP - DART SUB - 14 - HWDP	



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6.1.2. Bottom Hole Assemblies
Well no: 34/4-7

BIT SIZE	DEPTH INTERVAL (m)	DESCRIPTION	COMMENTS
12 1/4"	1848 - 2506	BIT - NB STAB W/FLOAT - 8" MWD - STAB - 8" MONEL - 8" DC - STAB - 15 x 8" DC - 7 3/4" JAR - 3 x 8" DC - HWDP - DART SUB - 14 x HWDP	
12 1/4"	2506 - 2647	COREHEAD - 90' COREBBL. - 2 x 8 DC - STAB - 13 x 8" DC - JAR - 3 x 8" DC - XO - HWDP - DART SUB - 14 HWDP	
12 1/4"	2646 - 2647	BIT - NB STAB - 15 x 8" DC - JAR - 3 x 8" DC - XO - HWDP - DART SUB - 14 x HWDP	Check trip during coring.
8 1/2"	2647 - 2656.5	COREHEAD - 60' COREBBL. - XO - 12 1/4" STAB - 15 x 8" - DC - JAR - 3 x 8" DC - HWDP - DART SUB - 14 x HWDP	
8 1/2"	2656.5 - 2675	COREHEAD - 90' COREBBL. - 6 1/2" DC - XO - 15 x 8" DC - JAR - 3 x 8" DC - XO - HWDP - DART SUB - 14 x HWDP	
8 1/2"	2675 - 2693	COREHEAD - 90' COREBBL. - 3 x 6 1/2" DC - XO - 15 x 8" DC - JAR - 3 x 8" DC - XO - HWDP - DART SUB - 14 x HWDP	
8 1/2"	2693 - 2711.5	COREHEAD - 90" COREBBL. - 5 x 6 1/2" DC - XO - 15 x 8" DC - JAR - 3 x 8" DC - XO - HWDP - DART SUB - 14 x HWDP	



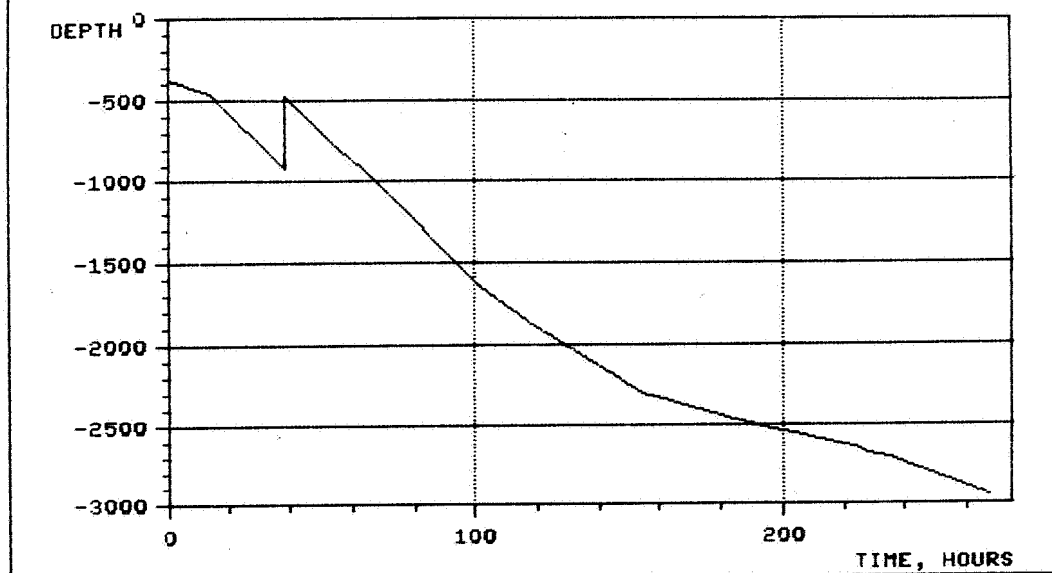
6.1.2. Bottom Hole Assemblies
 34 / 4-7
Well no:

BIT SIZE	DEPTH INTERVAL (m)	DESCRIPTION	COMMENTS
12 1/4"	2711.5 - 2950	BIT NB STAB W/FLOAT - MWD - STAB - MONEL - 8" DC - STAB - 15 x 8" DC - JAR - 3 x 8" DC - XO - HWDP - DART SUB - 14 x HWDP	
12 1/4	-	BIT - NB STAB - 16 x 8" DC - JAR - 3 x 8" DC - XO - HWDP - DART SUB - 14 x HWDP	Check trip during logging and prior to 9 5/8" casing job.



6.1.3 Drilled depth vs. rotating hours.

Well no.
34/4-7



DATE 27.9.87	AUTH. FL
DRAW. BY FL	APPR. TSØ
REF 6.1.3	34/4-7

6.2.1 MUD PROPERTIES, DAILY REPORT
Well no: 34/4-7

SAGA PETROLEUM A.S.

Date	Hole size	Hole depth	Mud weight	PV	YP	Gel strength	pH	Alkalinity Pf / Mf	Ca++ mg/l	Cl- mg/l	Sand %	Solids %	Mudtype
870214		.0	1.03										WATER BASED
870215		.0	1.03										WATER BASED
870216		.0	1.03										WATER BASED
870217	36	422.0	1.06										SPUD MUD
870218	36	470.0	1.06										SPUD MUD
870219	36	470.0	1.06										GEL MUD
870220	17-1/2	680.0	1.12	4	25		9.0						GEL MUD
870221	17-1/2	915.0	1.14	4	26	13/24	9.0						GEL MUD
870222	26	915.0	1.14	7	34	16/24	9.0						GEL MUD
870223	26	915.0	1.16	6	31	19/28	8.5						GEL MUD
870224	26	915.0	1.03										SPUD MUD
870225	17-1/2	915.0	1.03										SPUD MUD
870226	17-1/2	1113.0	1.16										GYP/POLYMER MUD
870227	17-1/2	1480.0	1.20	20	22	2/4	8.0	0.0/0.2		1200	0.8	5.0	GYP/POLYMER MUD
870228	17-1/2	1644.0	1.30	20	21	5/6	8.5	0.0/0.2		1800	1.4	7.0	GYP/POLYMER MUD
870301	17-1/2	1887.0	1.47	25	23	5/7	8.0	0.0/0.2		1700	1.2	11.5	GYP/POLYMER MUD
870302	17-1/2	1887.0	1.47	24	22	6/14	9.0	0.2/0.5		1600	0.8	16.0	GYP/POLYMER MUD
870303	17-1/2	1887.0	1.47	24	20	6/15	9.0	0.1/0.4		1800	0.8	16.0	GYP/POLYMER MUD
870304	17-1/2	1887.0	1.47	21	15	6/13	9.0	0.0/0.2		1700	0.9	15.5	GYP/POLYMER MUD
870305	12-1/4	2145.0	1.58	21	17	6/16	9.0	0.1/0.5		1800	0.9	15.5	GYP/POLYMER MUD
870306	12-1/4	2298.0	1.68	23	21	7/35	10.0	0.2/0.6		2100	0.5	19.5	GYP/POLYMER MUD
870307	12-1/4	2407.0	1.70	26	24	4/56	10.0	0.2/0.6		2800	0.5	23.0	GYP/POLYMER MUD
870308	12-1/4	2471.0	1.70	26	27	13/72	10.0	0.3/0.9		3000	0.5	25.0	GYP/POLYMER MUD
870309	12-1/4	2512.0	1.70	23	16	4/7	8.0	0.1/0.2		65000	0.5	19.5	KCL MUD
870310	12-1/4	2563.5	1.70	23	18	4/6	9.0	0.1/0.8		65000	0.5	24.0	KCL MUD
870311	12-1/4	2591.3	1.70	26	18	4/6	8.5	0.1/0.4		65000	1.0	24.0	KCL MUD
870312	12-1/4	2647.0	1.70	24	16	4/7	8.5	0.1/0.7		63000	0.3	24.0	KCL MUD
870313	12-1/4	2647.0	1.70	25	18	5/11	8.5	0.1/0.7		63000	1.0	24.0	KCL MUD
870314	12-1/4	2647.0	1.70	25	18	5/10	8.5	0.1/0.7	480	63000	1.0	24.0	KCL MUD
870315	8-1/2	2675.0	1.70	27	17	4/9	8.5	0.1/0.8	400	63000	0.5	24.0	KCL MUD
870316	8-1/2	2711.5	1.70	25	17	4/11	8.0	0.1/0.6	400	63000	0.8	24.5	KCL MUD
				25	17	5/11	9.0	0.2/0.9	320	63000	0.8	25.0	KCL MUD

6.2.1 MUD PROPERTIES, DAILY REPORT

Well no: 34/4-7

[illegible]

SAGA PETROLEUM A.S.

6.2.2 MUD MATERIALS USED

Well no: 34/4-7

Materials	Unit	36 in hole	26 in hole	17-1/2 hole	12-1/4 hole	8-1/2 hole	Total
BARITE	M/T	0	36	404	952	242	1634
BICARBONATE	50 KG	0	0	0	9	6	15
CAUSTIC SODA	25 KG	5	9	20	30	33	97
GYP SUM	50 KG	0	0	434	9	0	443
LIME	40 KG	18	10	0	0	0	28
KCL-powder	50 kg	0	0	0	586	0	586
KwickSeal F/M	40 lb	0	0	0	21	0	21
KOH -POTASS.	50KG	0	0	0	45	1	46
SODA ASH	50 KG	0	0	0	1	0	1
BENTONITE	M/T	25	30	5	7	8	75
BENTONITE	50 KG	0	0	40	0	0	40
ANTISOL FL 10	25 KG	0	0	63	147	0	210
ANTISOL FL 30	25 KG	0	0	219	87	17	323
BORREWELL C	25KG	0	0	0	52	87	139
DOWICIL 75	55GAL	0	0	0	1	2	3
MAGCO 101 INH	55 GA	0	0	0	3	16	19
OS-1L	55GAL	0	0	0	1	0	1
XC-POLYMER	25 KG	0	0	7	28	12	47
KCL - BRINE	BBL	0	0	0	1110	0	1110
XP-20	50 LB	0	0	0	26	5	31
Ammonium Bisu	55 ga	0	0	0	0	2	2
MPOC-freeing	55 ga	0	0	0	4	0	4



6.3. Casing Data
Well no: 34/4-7

SIZE inches	DATE RUN	GRADE	NO OF JOINTS	TOTAL LENGTH m	WEIGHT kg/m (lbs/ft)	COUPLINGS	SHOE DEPTH m-RKB	FLOAT COLL DEPTH m-RKB	CENTRALIZERS		REMARKS
									type	depth m	
30	18.2.87	B	7	87.68	(309)	ST-2 RB	465	-	-	-	
20	24.2.87	X-56	44	526	(133)	RL4S	902	889	rigid	386	
									bow	446	
										828	
										840	
										852	
										864	
										876	
										898	
13 3/8	4.3.87	N-80	129	1494.7	(72)	Buttress		1849.8	rigid	882	
										894	
									bow	1803	
										1814	
										1825	
										1837	
										1849	
										1869	
9 5/8	23.3.87	N-80	212	2544	(47)	Buttress	2921	2869	rigid	1851	
										1862	
									bow	2449	
									2462	2474	
									2487	2499	
									2512	2524	
									2537	2549	
									2562	2574	
									2587	2599	
									2612	2624	
									2637	2837	
									2850	2863	
									2876	2888	
									2902	2917	



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6.3. Casing Data

Well no: 34/4-7

SIZE inches	DATE RUN	GRADE	NO OF JOINTS	TOTAL LENGTH m	WEIGHT kg/m (lbs/ft)	COUPLINGS	SHOE DEPTH m-RKB	FLOAT COLL DEPTH m-RKB	CENTRALIZERS		REMARKS
									type	depth m	
7	9.4.87	P-110	20	210.4	(32)	Buttress	2781	-	rigid	2631 2654 2678 2702 2726 2750 2774	



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6.4. Cement Data
Well no: 34/4-7

DATE	JOB DESCRIPTION	SHOE DEPTH m-RKB	CEMENT TYPE	SLURRY WEIGHT SG	SLURRY VOLUME USED m³	ADDITIVES L/100kg CEMENT	MIX WATER L/100 kg CEMENT	LOSSES m³	REMARKS
18.02.87	30" csg	465	G	Lead: 1.56 Tail: 1.92	36.9	A-3L: 4.0	SW: 93.65	-	
24.02.87	20" csg	902	G	Lead: 1.56 Tail: 1.92	125.4 16.2	A-7L: 3.55 A-3L: 3.55 R-12L: 1.78	SW: 41.1 SW: 91.39 SW: 44.0	-	
04.03.87	13 3/8" csg	1872	G	Lead: 1.56 Tail: 1.90	64.7	D-31LN: 1.78 Bent: 2.25 % D-31LN: 0.89 R-12L: 0.40	FW: 90.12 FW: 43.09	-	
23.03.87	9 5/8" csg	2921	G	Tail: 1.89	54.4	D-19LN: 2.66 D-47L: 0.18 R-12L: 0.62	FW: 41.42	-	
25.03.87	9 5/8" csg squeeze	2579- 2580	G	Tail: 1.89	3.8	D-19LN: 1.51 R-12L : 0.62	FW: 42.28	-	
09.04.87	7" liner	2781	G	Tail: 1.90	4.75	D-19LN: 1.25 R-12L : 0.62	FW: 42.4	-	

SAGA PETROLEUM A.S.

6.5 DEVIATION DATA

Well no: 34/4-7

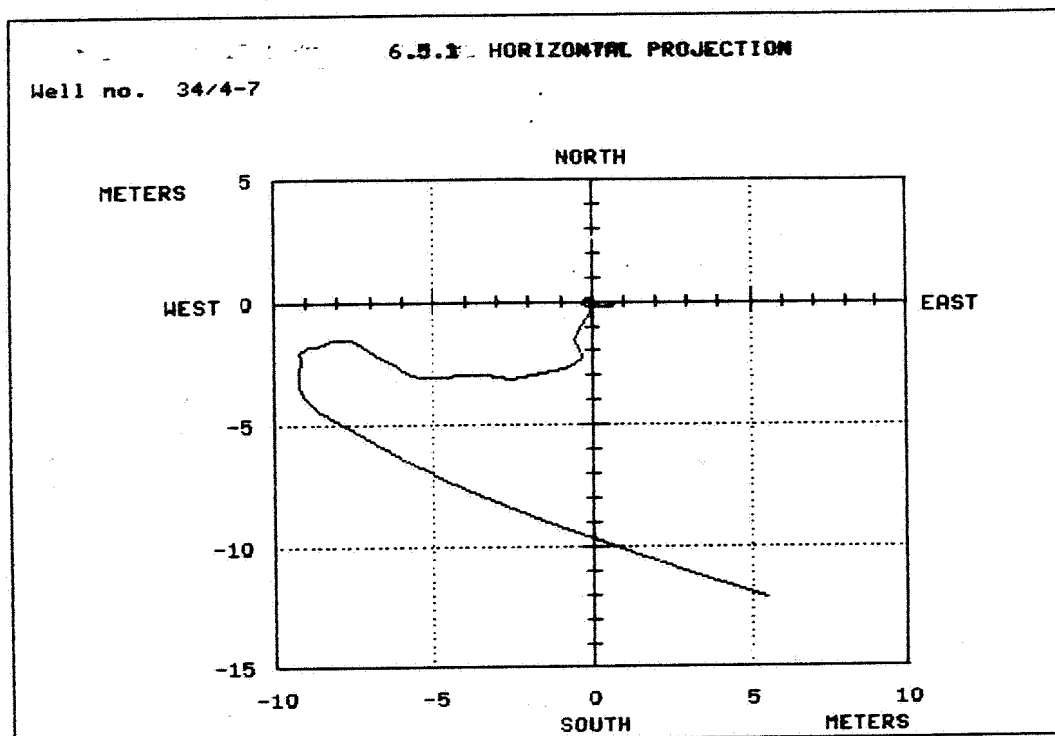
MD meter	TVD meter	INCLIN. deg.	AZIMUT deg.	DOGLEG deg/30m	+N,-S meter	+E,-W meter
392.0	392.0	.75	158.0	.00	.00	.00
401.0	401.0	.75	138.0	.87	-.10	-.06
430.0	430.0	.50	88.0	.59	-.02	.34
461.0	461.0	.50	178.0	.68	-.15	.52
479.0	479.0	.10	172.0	.67	-.24	.53
537.0	537.0	.20	283.0	.13	-.15	.63
595.0	595.0	.30	262.0	.07	-.16	.37
653.0	653.0	.30	251.0	.03	-.23	-.08
707.0	707.0	.30	306.0	.15	-.19	-.19
737.0	737.0	.00	311.5	.30	-.15	-.25
794.0	794.0	.40	322.0	.21	.00	-.39
850.0	850.0	.50	176.0	.46	.12	-.08
872.0	872.0	.40	187.0	.18	-.05	-.07
906.0	906.0	.60	307.0	.77	-.04	-.30
932.0	932.0	.33	142.8	1.06	.14	-.20
961.0	961.0	.31	144.6	.02	-.02	-.10
989.0	989.0	.36	159.5	.11	-.13	-.03
1036.0	1036.0	.18	180.4	.13	-.35	-.07
1085.0	1085.0	.41	219.5	.18	-.58	-.15
1132.0	1132.0	.60	187.2	.21	-.95	-.31
1181.0	1181.0	.86	227.5	.34	-1.50	-.59
1227.0	1227.0	.41	177.0	.44	-1.95	-.41
1275.0	1275.0	.50	207.3	.16	-2.32	-.33
1323.0	1323.0	.70	247.3	.28	-2.65	-.69
1371.0	1371.0	.74	260.2	.10	-2.82	-1.27
1419.0	1419.0	.83	259.2	.06	-2.94	-1.92
1466.0	1466.0	.75	247.4	.12	-3.13	-2.53
1524.0	1524.0	.82	270.6	.17	-2.98	-3.31
1572.0	1572.0	.81	266.5	.04	-2.96	-3.99
1620.0	1619.9	1.15	255.5	.24	-3.09	-4.80
1668.0	1667.9	.49	278.2	.45	-3.05	-5.49
1718.0	1717.9	.54	312.5	.18	-2.86	-5.89
1764.0	1763.9	.91	312.5	.24	-2.47	-6.32
1811.0	1810.9	.65	291.2	.25	-2.13	-6.86
1859.0	1858.9	.57	324.3	.22	-1.82	-7.26
1868.0	1867.9	.75	340.0	.85	-1.73	-7.30
1906.0	1905.9	.30	279.3	.52	-1.52	-7.56
1963.0	1962.9	.40	256.0	.09	-1.50	-7.90
2010.0	2009.9	.27	250.6	.09	-1.58	-8.17
2069.0	2068.9	.36	248.0	.05	-1.70	-8.47
2107.0	2106.9	.31	252.5	.04	-1.77	-8.68
2154.0	2153.9	.31	261.2	.03	-1.83	-8.93
2213.0	2212.9	.33	200.0	.17	-2.03	-9.17
2261.0	2260.9	.52	169.4	.18	-2.38	-9.14
2317.0	2316.9	.47	183.5	.07	-2.86	-9.17
2375.0	2374.9	.52	171.2	.06	-3.35	-9.19
2421.0	2420.9	.67	157.1	.14	-3.81	-9.06
2470.0	2469.9	1.00	130.8	.30	-4.39	-8.64
2495.0	2494.9	1.04	130.3	.05	-4.68	-8.31
2633.0	2632.9	1.25	123.0	.06	-6.32	-6.10

SAGA PETROLEUM A.S.

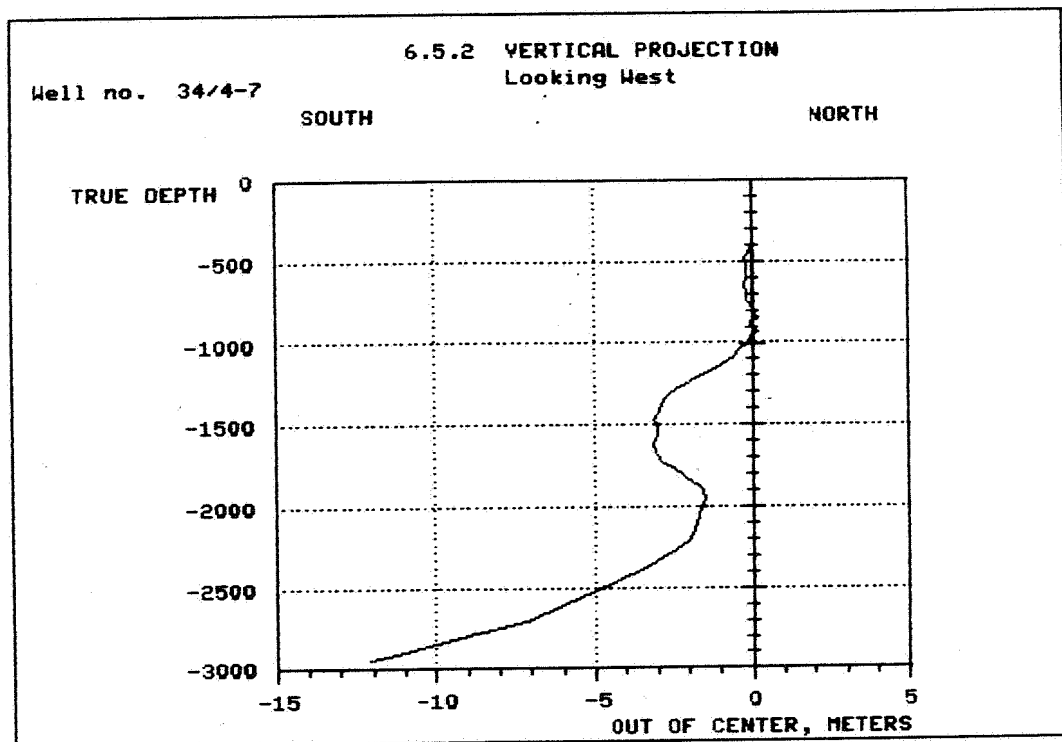
6.5 DEVIATION DATA

Well no: 34/4-7

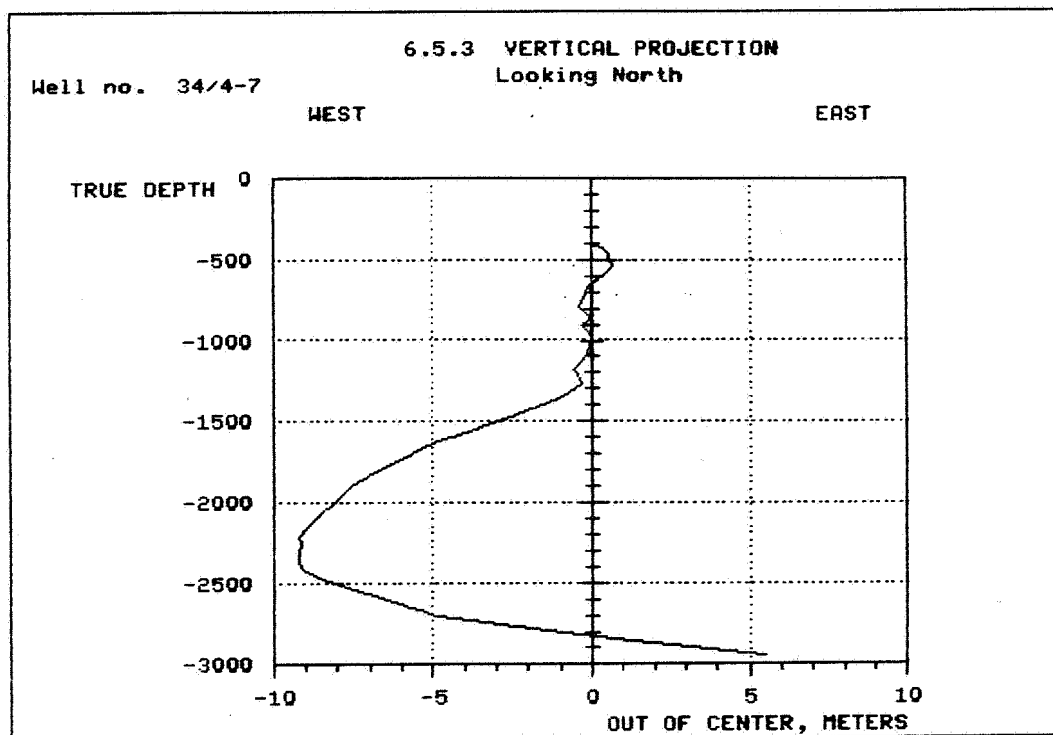
MD meter	TVD meter	INCLIN. deg.	AZIMUT deg.	DOGLEG deg/30m	+N,-S meter	+E,-W meter
2652.0	2651.9	1.21	128.0	.18	-6.56	-5.77
2669.0	2668.9	1.31	113.0	.61	-6.74	-5.45
2687.0	2686.9	1.19	131.0	.68	-6.95	-5.12
2700.5	2700.4	1.91	118.0	1.77	-7.16	-4.82
2747.5	2747.3	2.18	121.0	.19	-7.98	-3.36
2797.3	2797.1	2.77	115.0	.39	-8.99	-1.46
2845.0	2844.7	2.97	115.0	.13	-10.00	.71
2895.0	2894.7	3.09	114.0	.08	-11.10	3.11
2939.0	2938.6	3.60	114.0	.35	-12.14	5.46



DATE 27.9.87	AUTH. FL
DRAW.BY FL	APPR. TSO
REF 6.5.1 34/4-7	

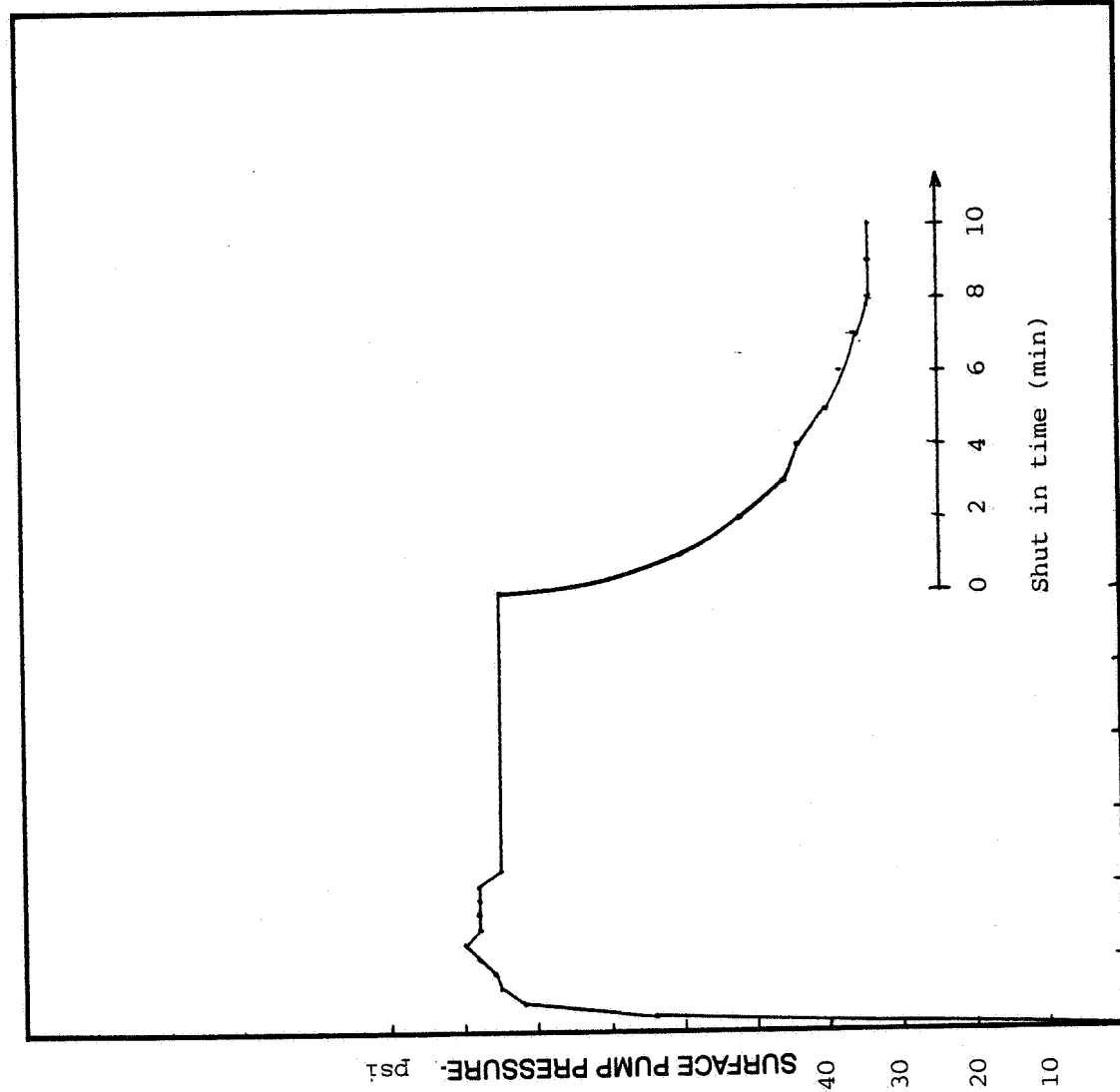


DATE 27.9.87	AUTH. FL
DRAW BY FL	APPR. TSO
REF 6.5.2	34/4-7



DATE	27.9.87	AUTH.	FL
DRAW.BY	FL	APPR.	TSØ
REF	6.5.3	34/4-7	

6.6. Formation Leak off Test Data
Well no: 34/4-7



VOLUME OF MUD PUMPED - bbl

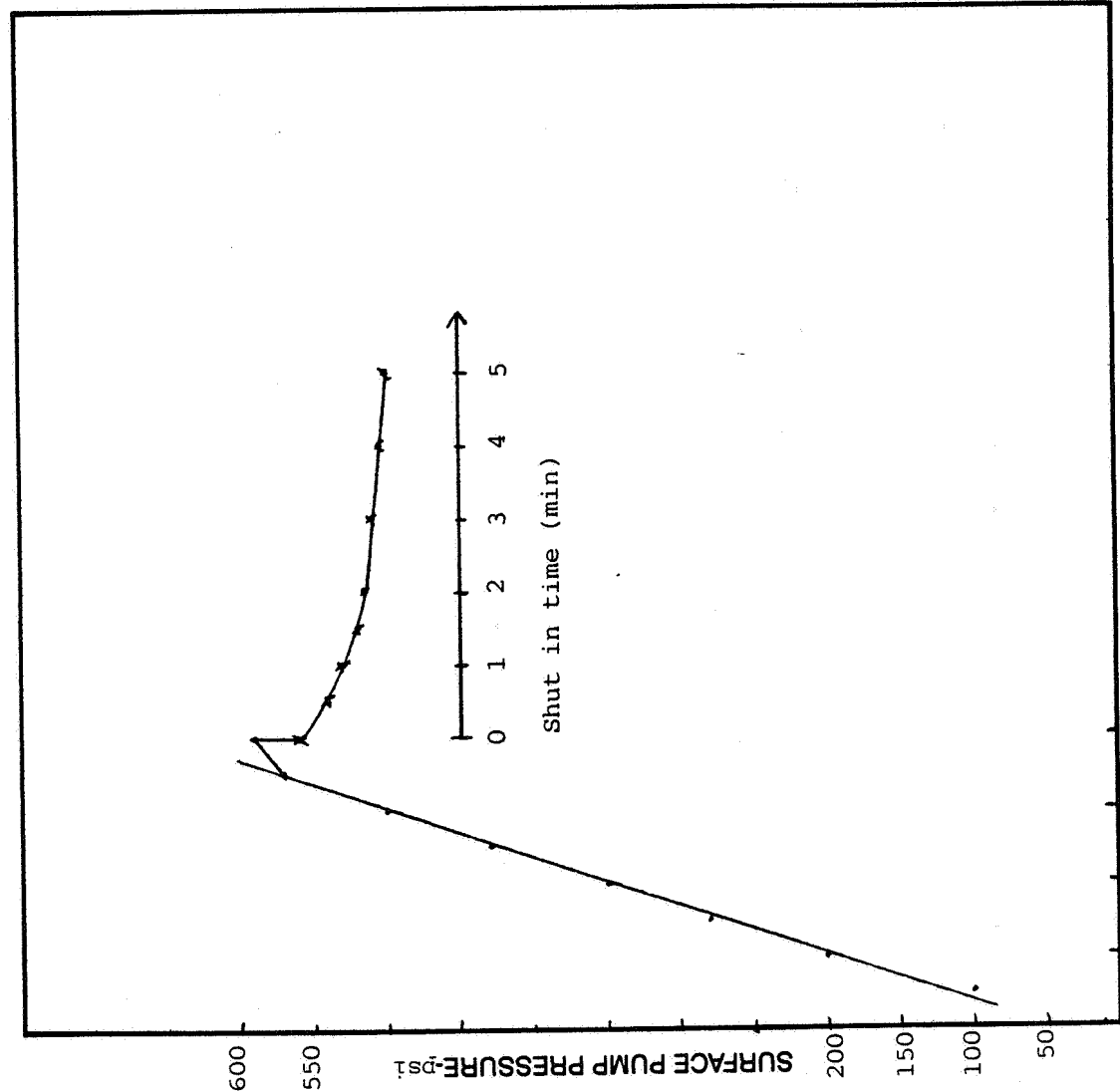
WELL	34/4-7	DATE	19.2.87
------	--------	------	---------

CSG. SIZE	30"	VOLUME PUMPED	3 bbl
CSG. SHOE DEPTH	465 m	VOLUME RECOVERED	-
WATER DEPTH	354 m	FORMATION TYPE	Clay
HOLE SIZE	26"	LEAK OFF PRESSURE	> 85 psi
HOLE DEPTH	475 m	SHUT-IN PRESSURE	34 psi
MUD WEIGHT	1.03	SHUT-IN TIME	10 min
PUMP RATE	1/4 bbl/min		

EQV. MUD WEIGHT AT CSG. SHOE:	> 1.16	SG	
-------------------------------	--------	----	--

bbl/psi	bbl/psi	min/psi	min/psi
0.1 / 64	0.7 / 88	1 / 60	7 / 36
0.2 / 82	0.8 / 88	2 / 52	8 / 34
0.3 / 85	0.9 / 88	3 / 46	9 / 34
0.4 / 86	1.0 / 88	4 / 44	10 / 34
0.5 / 88	1.1-3.0 / 85	5 / 40	
0.6 / 90		6 / 38	

6.6. Formation Leak off Test Data
34/4-7
Well no:



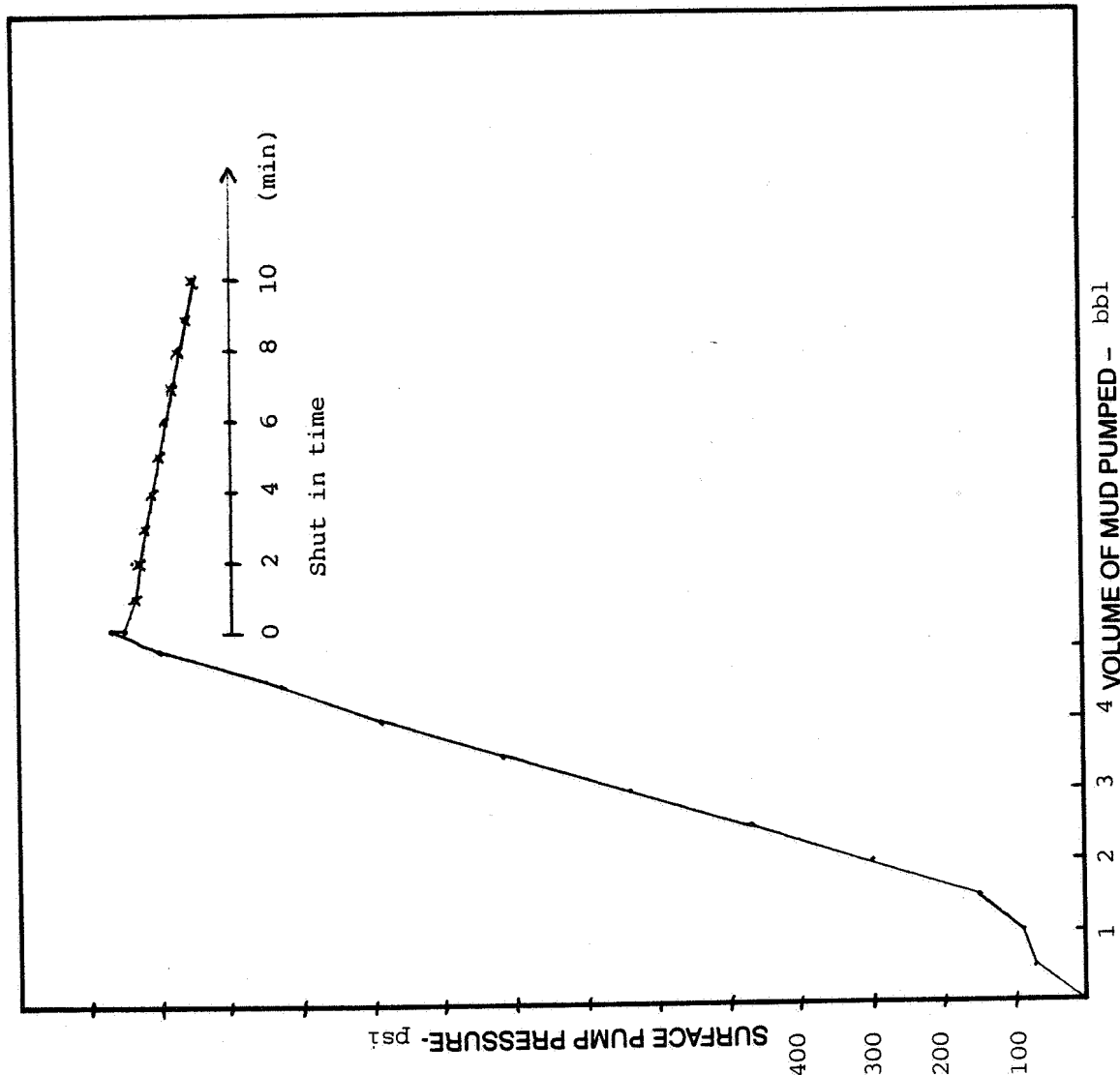
WELL	34/4-7	DATE	26.2.87
CSG. SIZE	20"	VOLUME PUMPED	2 bbl
CSG. SHOE DEPTH	902	VOLUME RECOVERED	1 1/2 bbl
WATER DEPTH	354	FORMATION TYPE	Clay
HOLE SIZE	17 1/2"	LEAK OFF PRESSURE	570 psi
HOLE DEPTH	920 m	SHUT-IN PRESSURE	590 psi
MUD WEIGHT	1.10 SG	SHUT-IN TIME	5 min
PUMP RATE	1/4 bbl/min		

EQV. MUD WEIGHT AT CSG. SHOE:	1.59	SG
-------------------------------	------	----

bbl/psi	bbl/psi	min/psi	min/psi
0 / 10	1.50 / 500	0 / 560	4.0 / 505
0.25 / 100	1.75 / 570	0.5 / 540	5.0 / 500
0.50 / 200	2.00 / 590	1.0 / 530	
0.75 / 280		1.5 / 520	
1.00 / 350		2.0 / 515	
1.25 / 430		3.0 / 510	

0.5 1.0 1.5 2.0 VOLUME OF MUD PUMPED - 'bbl

6.6. Formation Leak off Test Data
Well no: 34/4-7



WELL	DATE
34/4-7	5.3.87

CSG. SIZE	VOLUME PUMPED
13 3/8"	5 1/4 bbl
CSG. SHOE DEPTH	VOLUME RECOVERED
1872	3 1/4 bbl
WATER DEPTH	FORMATION TYPE
354	CRETACEOUS SHALE
HOLE SIZE	LEAK OFF PRESSURE
12 1/4"	1300 psi
HOLE DEPTH	SHUT-IN PRESSURE
1892	1350 psi
MUD WEIGHT	SHUT-IN TIME
1.47 SG	10 min
PUMP RATE	
1/4 bbl/min	

EQV. MUD WEIGHT AT CSG. SHOE: 1.83	SG
------------------------------------	----

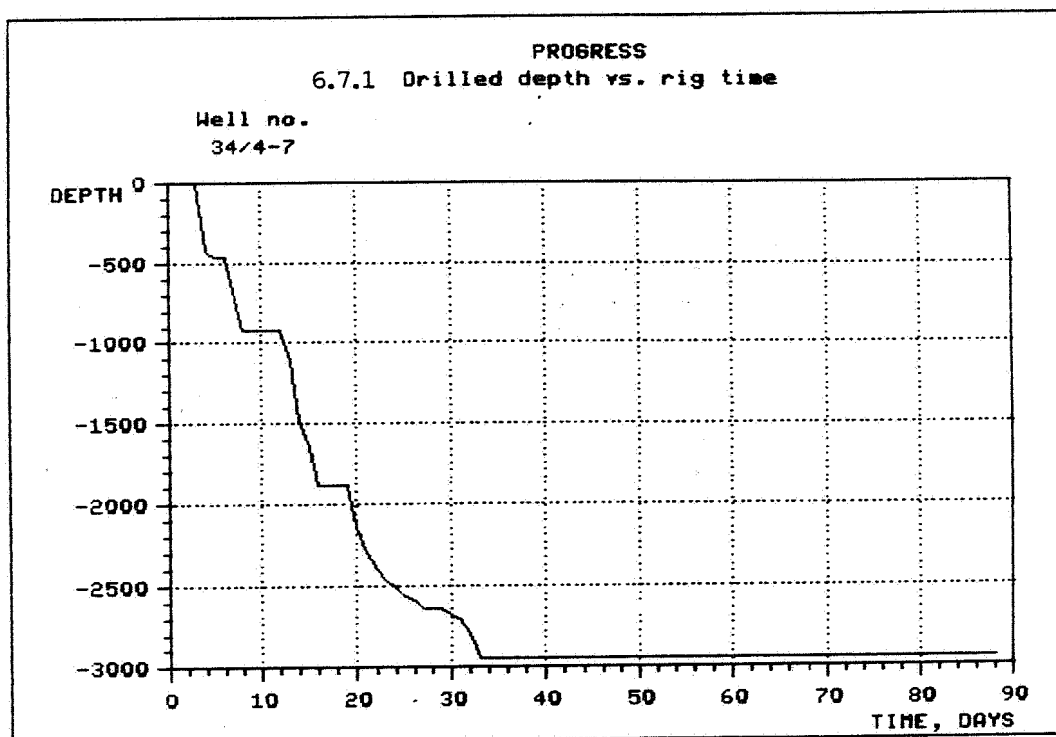
bbl/psi	bbl/psi	min/psi	min/psi
0.5 / 70	3.5 / 820	0 / 1350	6 / 1290
1.0 / 85	4.0 / 990	1 / 1340	7 / 1280
1.5 / 150	4.5 / 1130	2 / 1330	8 / 1270
2.0 / 300	5.0 / 1300	3 / 1320	9 / 1260
2.5 / 470	5.25 / 1370	4 / 1310	10 / 1250
3.0 / 640		5 / 1300	

SAGA PETROLEUM A.S.

6.7. RIG TIME DISTRIBUTION

Well no: 34/4-7

Mainoperation	Suboperation	Hours	% of total rig time	
MOVING	ANCHOR	40.5	1.9	
MOVING	TRANSIT	35.0	1.7	
Sum :		75.5		3.6
DRILLING	BOP ACTIVITIES	48.5	2.3	
DRILLING	BOP/WELLHEAD EQ	39.5	1.9	
DRILLING	CASING	115.5	5.5	
DRILLING	CIRC/COND	38.5	1.8	
DRILLING	DRILL	198.5	9.5	
DRILLING	OTHER	2.5	0.1	
DRILLING	PRESS DETECTION	3.5	0.2	
DRILLING	REAM	9.5	0.5	
DRILLING	SURVEY	2.5	0.1	
DRILLING	TRIP	90.0	4.3	
DRILLING	UNDERREAM	25.0	1.2	
Sum :		573.5		27.5
FORMATION EVAL	CIRC SAMPLES	2.5	0.1	
FORMATION EVAL	CIRC/COND	71.5	3.4	
FORMATION EVAL	CORE	55.0	2.6	
FORMATION EVAL	DST	241.5	11.6	
FORMATION EVAL	LOG	68.0	3.3	
FORMATION EVAL	OTHER	6.5	0.3	
FORMATION EVAL	PROD TEST	545.0	26.1	
FORMATION EVAL	RFT/FIT	31.0	1.5	
FORMATION EVAL	TRIP	265.5	12.7	
Sum :		1286.5		61.6
INTERRUPTION	FISH	16.0	0.8	
INTERRUPTION	LOST CIRC	6.5	0.3	
INTERRUPTION	MAINTAIN/REP	13.5	0.6	
INTERRUPTION	OTHER	1.0	0.0	
INTERRUPTION	SUBSEA EQ/F	39.5	1.9	
INTERRUPTION	SURFACE EQ/F	13.5	0.6	
INTERRUPTION	WAIT	40.5	1.9	
Sum :		130.5		6.2
PLUG & ABANDON	CIRC/COND	2.5	0.1	
PLUG & ABANDON	MECHANICAL PLUG	5.0	0.2	
PLUG & ABANDON	OTHER	5.0	0.2	
PLUG & ABANDON	TRIP	10.5	0.5	
Sum :		23.0		1.1
Total rig time :		2089.0	100.0	



DATE 27.9.87	AUTH. FL
DRAW. BY FL	APPR. TSQ
REF 6.7.1	34/4-7

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DAILY RIG TIME DISTRIBUTION

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Well no: 34/4-7

Dato	Mainoperation	Suboperation	Hours
14.02.87	MOVING	TRANSIT	3.5
	Sum :		3.5
15.02.87	MOVING	TRANSIT	24.0
	Sum :		24.0
16.02.87	MOVING	ANCHOR	16.5
	MOVING	TRANSIT	7.5
	Sum :		24.0
17.02.87	DRILLING	BOP/WELLHEAD EQ	1.0
	DRILLING	DRILL	6.0
	DRILLING	SURVEY	1.0
	DRILLING	TRIP	2.0
	MOVING	ANCHOR	14.0
	Sum :		24.0
18.02.87	DRILLING	BOP/WELLHEAD EQ	3.5
	DRILLING	CASING	9.5
	DRILLING	CIRC/COND	1.0
	DRILLING	DRILL	8.0
	DRILLING	SURVEY	0.5
	DRILLING	TRIP	1.5
	Sum :		24.0
19.02.87	DRILLING	BOP ACTIVITIES	1.0
	DRILLING	BOP/WELLHEAD EQ	12.5
	DRILLING	CASING	0.5
	DRILLING	TRIP	3.5
	INTERRUPTION	SUBSEA EQ/F	4.0
	INTERRUPTION	SURFACE EQ/F	2.5
	Sum :		24.0
20.02.87	DRILLING	CASING	2.5
	DRILLING	CIRC/COND	1.0
	DRILLING	DRILL	13.5
	DRILLING	PRESS DETECTION	0.5
	DRILLING	REAM	0.5
	DRILLING	TRIP	6.0
	Sum :		24.0
21.02.87	DRILLING	CIRC/COND	4.0
	DRILLING	DRILL	12.0
	DRILLING	PRESS DETECTION	0.5
	DRILLING	REAM	0.5
	DRILLING	SURVEY	0.5
	DRILLING	TRIP	5.5
	DRILLING	UNDERREAM	1.0
	Sum :		24.0
22.02.87	DRILLING	TRIP	2.5
	DRILLING	UNDERREAM	16.0
	INTERRUPTION	SURFACE EQ/F	1.0
	INTERRUPTION	WAIT	4.5
	Sum :		24.0
23.02.87	DRILLING	BOP ACTIVITIES	4.0
	DRILLING	CIRC/COND	2.5
	DRILLING	PRESS DETECTION	0.5
	DRILLING	TRIP	3.5
	DRILLING	UNDERREAM	8.0
	INTERRUPTION	MAINTAIN/REP	0.5
	INTERRUPTION	WAIT	5.0
	Sum :		24.0

SAGA PETROLEUM A.S.

6.7.2. DAILY RIG TIME DISTRIBUTION

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Dato	Mainoperation	Suboperation	Hours
24.02.87	DRILLING	BOP ACTIVITIES	3.5
	DRILLING	CASING	15.5
	DRILLING	TRIP	5.0
	Sum :		24.0
25.02.87	DRILLING	BOP ACTIVITIES	22.0
	DRILLING	CASING	2.0
	Sum :		24.0
26.02.87	DRILLING	BOP ACTIVITIES	3.0
	DRILLING	CASING	5.5
	DRILLING	CIRC/COND	1.5
	DRILLING	DRILL	10.0
	DRILLING	PRESS DETECTION	0.5
	DRILLING	TRIP	3.5
	Sum :		24.0
27.02.87	DRILLING	CIRC/COND	1.0
	DRILLING	DRILL	20.0
	DRILLING	REAM	0.5
	DRILLING	TRIP	2.5
	Sum :		24.0
28.02.87	DRILLING	CIRC/COND	5.0
	DRILLING	DRILL	8.5
	DRILLING	TRIP	8.5
	INTERRUPTION	MAINTAIN/REP	2.0
	Sum :		24.0
01.03.87	DRILLING	CIRC/COND	2.5
	DRILLING	DRILL	17.0
	DRILLING	TRIP	2.5
	INTERRUPTION	MAINTAIN/REP	2.0
	Sum :		24.0
02.03.87	DRILLING	CIRC/COND	3.5
	DRILLING	SURVEY	0.5
	DRILLING	TRIP	4.0
	FORMATION EVAL	LOG	7.5
	INTERRUPTION	WAIT	8.5
	Sum :		24.0
03.03.87	DRILLING	BOP/WELLHEAD EQ	2.0
	DRILLING	CASING	11.5
	DRILLING	CIRC/COND	2.5
	DRILLING	TRIP	5.0
	FORMATION EVAL	LOG	3.0
	Sum :		24.0
04.03.87	DRILLING	BOP ACTIVITIES	4.0
	DRILLING	BOP/WELLHEAD EQ	2.5
	DRILLING	CASING	13.0
	DRILLING	TRIP	4.0
	INTERRUPTION	MAINTAIN/REP	0.5
	Sum :		24.0
05.03.87	DRILLING	CASING	2.0
	DRILLING	CIRC/COND	0.5
	DRILLING	DRILL	18.5
	DRILLING	PRESS DETECTION	1.5
	DRILLING	TRIP	1.0
	INTERRUPTION	SURFACE EQ/F	0.5
	Sum :		24.0

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DAILY RIG TIME DISTRIBUTION

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Dato	Mainoperation	Suboperation	Hours
06.03.87	DRILLING	CIRC/COND	2.0
	DRILLING	DRILL	16.5
	DRILLING	TRIP	4.0
	INTERRUPTION	SURFACE EQ/F	1.5
	Sum :		24.0
07.03.87	DRILLING	DRILL	20.0
	DRILLING	TRIP	2.5
	INTERRUPTION	SURFACE EQ/F	1.5
	Sum :		24.0
08.03.87	DRILLING	CIRC/COND	3.0
	DRILLING	DRILL	11.0
	DRILLING	TRIP	3.5
	INTERRUPTION	LOST CIRC	6.5
	Sum :		24.0
09.03.87	DRILLING	DRILL	5.5
	FORMATION EVAL	CIRC SAMPLES	2.5
	FORMATION EVAL	CORE	2.5
	FORMATION EVAL	TRIP	12.0
	INTERRUPTION	MAINTAIN/REP	1.0
	INTERRUPTION	SURFACE EQ/F	0.5
	Sum :		24.0
10.03.87	FORMATION EVAL	CORE	16.0
	FORMATION EVAL	TRIP	8.0
	Sum :		24.0
11.03.87	DRILLING	BOP ACTIVITIES	4.0
	DRILLING	OTHER	1.0
	FORMATION EVAL	CIRC/COND	0.5
	FORMATION EVAL	CORE	9.0
	FORMATION EVAL	TRIP	9.0
	INTERRUPTION	MAINTAIN/REP	0.5
	Sum :		24.0
12.03.87	FORMATION EVAL	CIRC/COND	3.0
	FORMATION EVAL	CORE	11.5
	FORMATION EVAL	TRIP	9.5
	Sum :		24.0
13.03.87	FORMATION EVAL	CORE	0.5
	FORMATION EVAL	LOG	8.5
	FORMATION EVAL	RFT/FIT	13.0
	FORMATION EVAL	TRIP	2.0
	Sum :		24.0
14.03.87	FORMATION EVAL	CIRC/COND	3.0
	FORMATION EVAL	RFT/FIT	5.5
	FORMATION EVAL	TRIP	12.0
	INTERRUPTION	FISH	2.5
	INTERRUPTION	MAINTAIN/REP	1.0
	Sum :		24.0
15.03.87	FORMATION EVAL	CIRC/COND	1.5
	FORMATION EVAL	CORE	5.0
	FORMATION EVAL	TRIP	17.0
	INTERRUPTION	SURFACE EQ/F	0.5
	Sum :		24.0

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DAILY RIG TIME DISTRIBUTION

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Dato	Mainoperation	Suboperation	Hours
16.03.87	FORMATION EVAL	CIRC/COND	1.0
	FORMATION EVAL	CORE	9.0
	FORMATION EVAL	TRIP	12.5
	INTERRUPTION	MAINTAIN/REP	1.0
	INTERRUPTION	SURFACE EQ/F	0.5
	Sum :		24.0
17.03.87	DRILLING	DRILL	9.5
	DRILLING	REAM	6.0
	DRILLING	TRIP	3.5
	FORMATION EVAL	CORE	1.5
	FORMATION EVAL	TRIP	1.5
	INTERRUPTION	SURFACE EQ/F	2.0
	Sum :		24.0
18.03.87	DRILLING	CIRC/COND	1.5
	DRILLING	DRILL	22.5
	Sum :		24.0
19.03.87	DRILLING	CIRC/COND	3.0
	DRILLING	REAM	2.0
	DRILLING	TRIP	8.0
	FORMATION EVAL	LOG	6.5
	INTERRUPTION	FISH	4.5
	Sum :		24.0
20.03.87	FORMATION EVAL	LOG	22.5
	FORMATION EVAL	TRIP	1.5
	Sum :		24.0
21.03.87	FORMATION EVAL	CIRC/COND	2.5
	FORMATION EVAL	LOG	4.5
	FORMATION EVAL	RFT/FIT	12.5
	FORMATION EVAL	TRIP	4.0
	INTERRUPTION	MAINTAIN/REP	0.5
	Sum :		24.0
22.03.87	DRILLING	BOP/WELLHEAD EQ	2.0
	DRILLING	CASING	0.5
	DRILLING	CIRC/COND	4.0
	DRILLING	TRIP	5.5
	FORMATION EVAL	LOG	11.0
	INTERRUPTION	MAINTAIN/REP	1.0
	Sum :		24.0
23.03.87	DRILLING	BOP/WELLHEAD EQ	2.0
	DRILLING	CASING	18.0
	INTERRUPTION	SUBSEA EQ/F	4.0
	Sum :		24.0
24.03.87	DRILLING	BOP ACTIVITIES	2.5
	DRILLING	BOP/WELLHEAD EQ	1.5
	DRILLING	CASING	6.0
	DRILLING	OTHER	1.5
	DRILLING	TRIP	2.5
	FORMATION EVAL	TRIP	10.0
	Sum :		24.0
25.03.87	DRILLING	CASING	10.0
	FORMATION EVAL	LOG	4.5
	FORMATION EVAL	TRIP	9.0
	INTERRUPTION	MAINTAIN/REP	0.5
	Sum :		24.0

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Well no: 34/4-7

Dato	Mainoperation	Suboperation	Hours
26.03.87	DRILLING	CASING	19.0
	FORMATION EVAL	CIRC/COND	0.5
	FORMATION EVAL	TRIP	4.5
	Sum :		24.0
27.03.87	FORMATION EVAL	CIRC/COND	20.5
	FORMATION EVAL	OTHER	2.0
	FORMATION EVAL	TRIP	0.5
	INTERRUPTION	MAINTAIN/REP	1.0
	Sum :		24.0
28.03.87	FORMATION EVAL	CIRC/COND	7.5
	FORMATION EVAL	OTHER	0.5
	FORMATION EVAL	TRIP	10.0
	INTERRUPTION	WAIT	6.0
	Sum :		24.0
29.03.87	FORMATION EVAL	TRIP	23.0
	INTERRUPTION	OTHER	1.0
	Sum :		24.0
30.03.87	FORMATION EVAL	TRIP	24.0
	Sum :		24.0
31.03.87	FORMATION EVAL	DST	3.5
	FORMATION EVAL	TRIP	4.0
	INTERRUPTION	WAIT	16.5
	Sum :		24.0
01.04.87	FORMATION EVAL	DST	24.0
	Sum :		24.0
02.04.87	FORMATION EVAL	DST	24.0
	Sum :		24.0
03.04.87	FORMATION EVAL	DST	24.0
	Sum :		24.0
04.04.87	FORMATION EVAL	DST	24.0
	Sum :		24.0
05.04.87	FORMATION EVAL	DST	21.0
	INTERRUPTION	SURFACE EQ/F	3.0
	Sum :		24.0
06.04.87	FORMATION EVAL	DST	24.0
	Sum :		24.0
07.04.87	FORMATION EVAL	DST	22.0
	FORMATION EVAL	TRIP	2.0
	Sum :		24.0
08.04.87	FORMATION EVAL	DST	17.0
	FORMATION EVAL	TRIP	7.0
	Sum :		24.0
09.04.87	FORMATION EVAL	CIRC/COND	4.5
	FORMATION EVAL	DST	7.0
	FORMATION EVAL	TRIP	12.0
	INTERRUPTION	MAINTAIN/REP	0.5
	Sum :		24.0
10.04.87	DRILLING	BOP ACTIVITIES	4.5
	FORMATION EVAL	CIRC/COND	1.5
	FORMATION EVAL	DST	1.0
	FORMATION EVAL	TRIP	17.0
	Sum :		24.0

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DAILY RIG TIME DISTRIBUTION

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Dato	Mainoperation	Suboperation	Hours
11.04.87	FORMATION EVAL	TRIP	8.0
	INTERRUPTION	MAINTAIN/REP	1.0
	INTERRUPTION	SUBSEA EQ/F	15.0
	Sum :		24.0
12.04.87	FORMATION EVAL	DST	2.0
	FORMATION EVAL	TRIP	5.5
	INTERRUPTION	SUBSEA EQ/F	16.5
	Sum :		24.0
13.04.87	FORMATION EVAL	DST	24.0
	Sum :		24.0
14.04.87	FORMATION EVAL	DST	24.0
	Sum :		24.0
15.04.87	FORMATION EVAL	PROD TEST	24.0
	Sum :		24.0
16.04.87	FORMATION EVAL	PROD TEST	24.0
	Sum :		24.0
17.04.87	FORMATION EVAL	PROD TEST	24.0
	Sum :		24.0
18.04.87	FORMATION EVAL	PROD TEST	24.0
	Sum :		24.0
19.04.87	FORMATION EVAL	PROD TEST	24.0
	Sum :		24.0
20.04.87	FORMATION EVAL	PROD TEST	24.0
	Sum :		24.0
21.04.87	FORMATION EVAL	PROD TEST	24.0
	Sum :		24.0
22.04.87	FORMATION EVAL	PROD TEST	24.0
	Sum :		24.0
23.04.87	FORMATION EVAL	PROD TEST	24.0
	Sum :		24.0
24.04.87	FORMATION EVAL	PROD TEST	24.0
	Sum :		24.0
25.04.87	FORMATION EVAL	PROD TEST	24.0
	Sum :		24.0
26.04.87	FORMATION EVAL	PROD TEST	24.0
	Sum :		24.0
27.04.87	FORMATION EVAL	PROD TEST	24.0
	Sum :		24.0
28.04.87	FORMATION EVAL	PROD TEST	24.0
	Sum :		24.0
29.04.87	FORMATION EVAL	PROD TEST	24.0
	Sum :		24.0
30.04.87	FORMATION EVAL	PROD TEST	24.0
	Sum :		24.0
01.05.87	FORMATION EVAL	PROD TEST	24.0
	Sum :		24.0
02.05.87	FORMATION EVAL	PROD TEST	24.0
	Sum :		24.0
03.05.87	FORMATION EVAL	PROD TEST	24.0
	Sum :		24.0
04.05.87	FORMATION EVAL	PROD TEST	24.0
	Sum :		24.0
05.05.87	FORMATION EVAL	PROD TEST	24.0
	Sum :		24.0

SAGA PETROLEUM A.S.

6.7.2.

DAILY RIG TIME DISTRIBUTION

Page

7

of

7

Well no: 34/4-7

Dato	Mainoperation	Suboperation	Hours
06.05.87	FORMATION EVAL	PROD TEST	24.0
	Sum :		24.0
07.05.87	FORMATION EVAL	CIRC/COND	12.0
	FORMATION EVAL	TRIP	12.0
	Sum :		24.0
08.05.87	FORMATION EVAL	PROD TEST	9.5
	FORMATION EVAL	TRIP	6.5
	INTERRUPTION	FISH	8.0
	Sum :		24.0
09.05.87	FORMATION EVAL	CIRC/COND	7.0
	FORMATION EVAL	OTHER	2.5
	FORMATION EVAL	PROD TEST	7.5
	FORMATION EVAL	TRIP	5.5
	INTERRUPTION	FISH	1.0
	INTERRUPTION	MAINTAIN/REP	0.5
	Sum :		24.0
10.05.87	FORMATION EVAL	CIRC/COND	6.5
	FORMATION EVAL	OTHER	1.5
	FORMATION EVAL	TRIP	16.0
	Sum :		24.0
11.05.87	DRILLING	BOP/WELLHEAD EQ	8.0
	PLUG & ABANDON	CIRC/COND	2.5
	PLUG & ABANDON	MECHANICAL PLUG	5.0
	PLUG & ABANDON	TRIP	8.5
	Sum :		24.0
12.05.87	DRILLING	BOP/WELLHEAD EQ	4.5
	MOVING	ANCHOR	10.0
	PLUG & ABANDON	OTHER	5.0
	PLUG & ABANDON	TRIP	2.0
	Sum :		21.5

7. OPERATIONAL DATA

If not otherwise mentioned, all depths in this chapter refer to m RKB (Rotary Kelly Bushing).

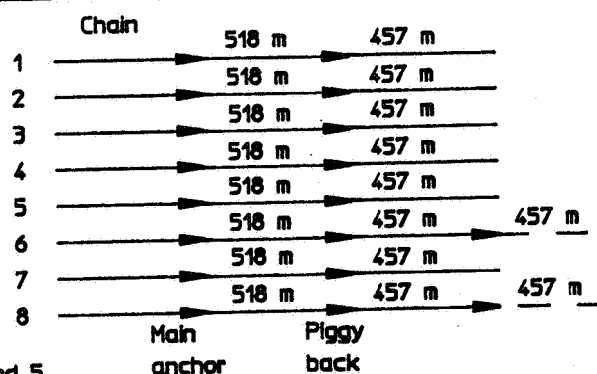
Saga
Petroleum a.s.



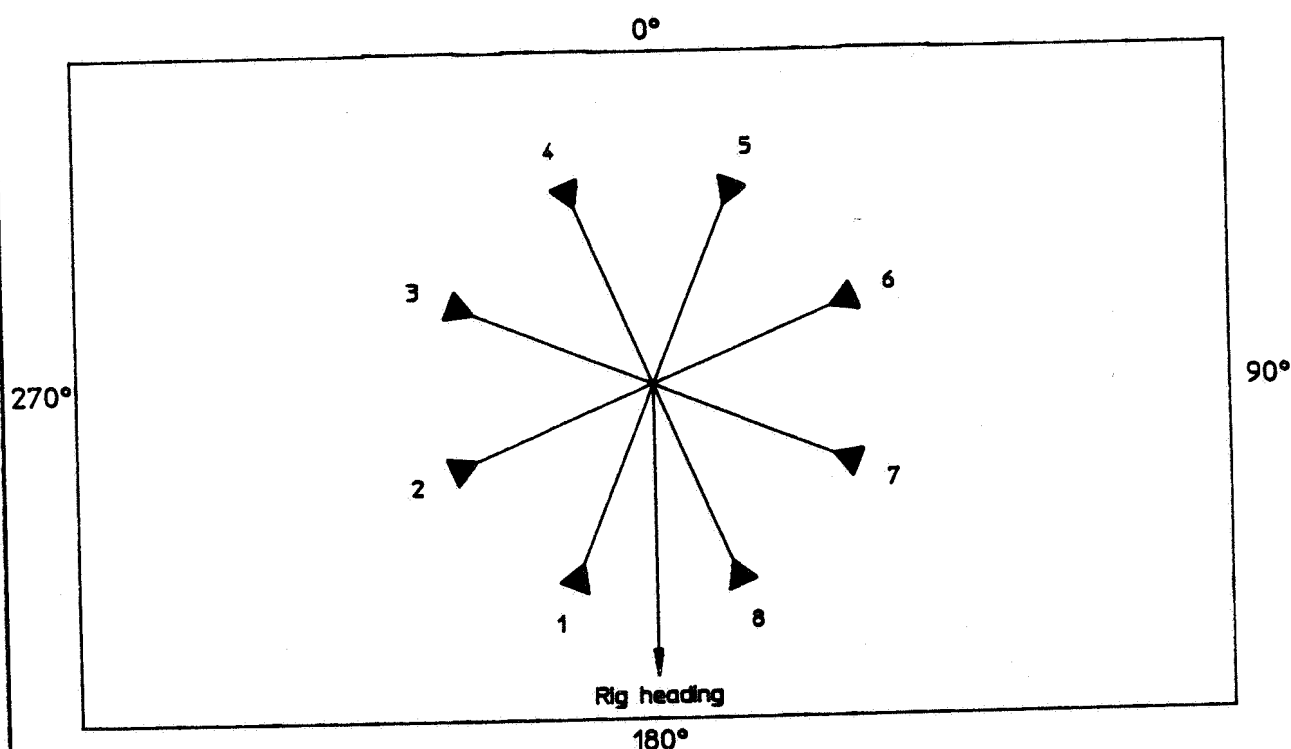
7.1 Anchor Pattern

Anchor no :	1	2	3	4	5	6	7	8
Compass direction :	202	247	292	337	022	067	112	157
Length of chain out (m) :	1346	1434	1385	1422	1373	1458	1438	1461
Max. initial tension (MT) :	160	160	160	160	160	160	160	160

Remarks :



Chaser in anchor no 4 and 5.



DATE 27.9.87	AUTH. FL
DRAWBY FL	APPR. TSØ
REF. 7.1 34/4-7	

Industriestrykh 31/25



Incident Skadehendelse	Profession Yrke		Administration - Administrasjon	Roughneck - Boredekkarbeider	Driller - Borer	Electrician - Elektriker	Catering - Forpleining	Roustabout - Hjelpearbeider	Electronic technician - Instrumenttekniker	Crane operator - Kranfører	Derrickman - Tårnmann	Painter Sandblaster worker - Sandblåser	Mechanic/ Mekaniker/Motormann/ Repairer - Reparatør	Operator - Operatør	Plumber - Rørlegger	Service technician - Servicetekniker	Scaffolding worker - Stillasbygger	Welder - Sveiser	Unspecified - Uspesifisert	Total - Totalt	%	Year - år
Contact with machinery in motion Kontakt med maskin del i bevegelse																						
Fire, explosion, etc. Brann, eksplosjon e.l.																						
Fall to same level Fall til samme nivå																						
False step Tråkk på ujevnheter, feiltråkk																						
Falling objects Fallende gjenstander																						
Contact with stationary objects Kontakt med gjenstander i ro																						
Accident of handling mobile units Håndteringsulykker																						
Chemicals Kontakt med kjemiske forbindelser																						
Body overload Overbelastning av kroppsdelar																						
Splinter, spurt Splinter, sprut																						
Electricity Elektrisk strøm																						
Extreme temperatures Ekstreme temperaturer																						
Occupational disease Yrkessykdommer																						
Man overboard Mann overbord																						
Other Annet																						
Total Totalt																					0	



Injured part of the body Skadet legemsdel	Incident Skadehendelse	Eye - Øye	Back - Rygg	Toe/foot - Tå/foot	Hip/leg - Høfte/bein	Abdomen/chest - Mage/bryst	Arm/shoulder - Arm/skulder	Head - Hode	Tooth - Tann	Hand/finger - Hånd/finger	Other - Annet	Total - Totalt	%	Year - År
	Contact with machinery in motion Kontakt med maskindel i bevegelse													
	Fire, explosion, etc. Brann, eksplosjon e.l.													
	Fall to lower level Fall til lavere nivå													
	Fall to the same level Fall til samme nivå													
	False step Tråkk på ujevnheter, feiltråkk													
	Falling objects Fallende gjenstander													
	Contact with stationary objects Kontakt med gjenstander i ro													
	Accident of handling mobile units Håndteringsulykker													
	Chemicals Kontakt med kjemiske forbindelser													
	Bodily overload Overbelastning av kroppsdelar													
	Splinter, spurt Splinter, sprut													
	Electricity Elektrisk strøm													
	Extreme temperatures Ekstreme temperaturer													
	Occupational disease Yrkessykdommer													
	Man overboard Mann overbord													
	Other Annet													
	Total Totalt											0		

Industritrykk 3172



Incident Skadehendelse	External influence Ytre faktor												
	Chemical, physical, biological influence Kjemisk, fysisk, biologisk faktor	Cooling, pressure, wormth, ventilation Kjøling, trykk, varme, ventilasjon	Material, goods, packing Materiale, gods, emballasje	Electric equipment Elektrisk utrustning	Other machine Annen maskin	Drilling tools Boretenger	Handcraft tool, machines, instruments Håndverktøy, maskiner, instrumenter	Movable/fixed arrangements of the constr. Løsfast innretning på bygning, konstruksjon	Lifting-transport equipment Løfte-transport anordning	Other Annet	Total Totalt	%	Year År
Contact with machinery in motion Kontakt med maskindel i bevegelse													
Fire, explosion, etc. Brann, eksplosjon e.l.													
Fall to lower level Fall til lavere nivå													
Fall to same level Fall til samme nivå													
False step Tråkk på ujevnheter, feiltråkk													
Falling objects Fallende gjenstander													
Contact with stationary objects Kontakt med gjenstander i ro													
Accident of handling mobile units Håndteringsulykker													
Chemicals Kontakt med kjemiske forbindelser													
Bodity overload Overbelastning av kroppsdelar													
Splinter, spurt Splinter, sprut													
Electricity Elektrisk strøm													
Extreme tempratures Ekstreme temperaturer													
Occupational disease Yrkessykdommer													
Man overboard Mann overbord													
Other Annet													
Total Totalt											0		

Well no: 34/4-7

Date	WIND		SEAS		SWELL		RIG MOVEMENT				ANCHOR		RISER		Remarks
	speed m/s	dir deg	height m	dir deg	height m	dir deg	periode sec	heave m	roll deg	pitch deg	head deg	min	max	tons max	
870216	14	300	1.0		0						180	0	0	0	
870217	9	315	5.0	315				0.8	1.7	1.6	180	106	125	0	
870218	5	315	1.8	315				0.4	1.6	0.8	180	106	128	0	
870219	6	225	1.6	225				0.6	1.2	0.8	180	106	120	137	
870220	17	225	5.0	225				0.5	2.0	1.6	180	106	122	137	
870221	15	315	4.6	315				0.4	2.4	2.0	180	102	125	72	
870222	22	335	13.5	325				2.8	3.6	3.6	180	100	121	72	
870223	5	315	2.9	315				1.2	1.8	2.0	180	102	121	72	
870224	17	270	3.1	270				0.6	4.0	4.0	180	101	120	0	
870225	10	225	2.8	250				0.4	1.4	1.0	180	110	124	109	
870226	19	150	8.0	150				1.0	3.6	2.8	180	110	124	109	
870227	7	110	4.0	110				1.7	1.6	2.0	180	110	123	109	
870228	28	180	9.0	180				1.5	3.4	4.2	180	110	124	113	
870301	42	155	11.0	155				4.4	5.0	6.0	180	110	121	131	
870302	19	200	4.7	200				1.6	3.4	2.8	180	110	119	135	
870303	7	180	2.1	180				0.4	2.4	2.0	180	110	119	138	
870304	9	180	2.2	180				0.7	2.0	1.4	180	110	119	132	
870305	25	165	5.0	160				0.7	2.6	3.2	180	110	120	141	
870306	25	166	8.5	180				2.7	4.2	3.2	180	110	117	144	
870307	11	137	4.4	140				1.5	2.8	2.4	180	110	117	0	
870308	15	180	3.8	180				0.9	2.8	2.2	180	110	119	145	
870309	12	180	2.5	180				0.4	1.6	1.8	180	110	121	144	
870310	10	180	1.8	180				0.3	1.2	2.0	180	110	118	146	
870311	6	200	1.8	200				0.5	1.2	1.0	180	110	119	146	
870312	7	140	.9	90				0.3	0.8	0.4	180	110	117	146	
870313	31	185	10.0	185				1.3	3.0	4.4	180	110	118	146	
870314	21	250	3.9	235				1.1	3.6	2.2	180	110	116	144	
870315	21	315	5.0	315				1.6	4.8	2.8	180	110	125	142	
870316	6	315	3.0	315				0.9	2.6	2.0	180	110	120	142	
870317	9	160	4.3	90				1.3	2.8	3.2	180	110	116	145	
870318	8	340	3.5	300				1.4	2.6	2.8	180	110	127	141	
870319	10	180	2.4	120				1.0	2.0	1.4	180	100	122	144	

7.4 DAILY OPERATING CONDITIONS

SAGA PETROLEUM A.S.

Well no: 34/4-7

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Date	WIND		SEAS		SWELL		RIG MOVEMENT				ANCHOR		RISER		Remarks
	speed m/s	dir deg	height m	dir deg	height m	dir deg	heave m	roll deg	pitch deg	head deg	min	max	tons max	max	
870320	9	270	2.0	270		270	0.6	2.4	1.6	180	100	120	140		
870321	10	130	1.8	120		120	0.4	2.0	0.8	180	100	120	141		
870322	16	180	4.1	180		180	0.5	4.0	2.6	180	100	116	140		
870323	3	180	3.4	180		180	0.7	2.0	1.2	180	100	120	141		
870324	10	165	1.7	160		160	0.6	1.2	1.4	180	100	120	142		
870325	17	90	3.9	90		90	1.0	2.0	2.1	180	100	119	143		
870326	13	180	2.9	180		180	0.8	2.0	2.1	180	100	116	145		
870327	20	45	5.0	45		45	1.0	3.0	2.6	180	100	122	152		
870328	27	330	11.0	325		325	2.7	6.0	4.0	180	100	136	147		
870329	10	315	6.0	315		315	1.4	3.0	3.0	180	100	121	146		
870330	27	225	4.0	180		180	0.6	2.0	1.0	180	100	117	144		
870331	11	270	6.5	225		225	1.2	4.0	2.2	180	100	113	144		
870401	25	115	5.8	115		115	0.9	3.6	2.8	180	100	121	142		
870402	5	160	5.2	135		135	0.7	1.4	2.0	180	100	116	145		
870403	12	360	2.4	360		360	0.3	1.4	2.0	180	100	116	145		
870404	13	25	2.2	25		25	0.2	1.8	1.1	180	100	113	145		
870405	19	360	5.4	360		360	0.2	2.0	2.2	180	100	120	142		
870406	7	340	1.9	360		360	0.1	0.8	0.8	180	100	116	142		
870407	13	360	2.4	360		360	0.2	0.8	1.4	180	100	117	143		
870408	8	90	2.0	90		90	0.2	1.8	0.8	180	100	117	144		
870409	22	150	4.5	160		160	0.7	2.5	2.8	180	121	100	141		
870410	15	150	3.5	160		160	0.8	2.6	2.4	180	100	121	141		
870411	6	270	1.0	270		270	0.1	1.0	0.8	180	100	121	144		
870412	12	235	2.0	230		230	0.2	1.4	1.2	180	100	118	144		
870413	7	340	2.0	340		340	0.2	1.8	1.4	180	100	119	143		
870414	22	230	4.5	230		230	0.5	4.0	2.5	180	100	125	142		
870415	18	260	4.0	260		260	0.8	4.0	2.0	180	80	118	141		
870416	17	270	4.0	270		270	1.0	3.5	1.8	180	100	118	143		
870417	3	45	2.0	360		360	0.3	0.8	0.6	180	100	128	143		
870418	17	180	2.0	180		180	0.3	1.6	1.0	180	100	120	150		
870419	17	180	4.0	180		180	0.6	1.2	1.8	180	100	118	143		
870420	7	230	1.5	230		230	0.2	0.6	0.6	180	100	122	145		

7.4 DAILY OPERATING CONDITIONS

SAGA PETROLEUM A.S.

Well no: 34/4-7

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Date	WIND		SEAS		SWELL		RIG MOVEMENT				ANCHOR		RISER		Remarks
	speed m/s	dir deg	height m	dir deg	height m	dir deg	heave m	roll deg	pitch deg	head deg	min	max	tons max	max	
870421	13	225	1.3	225			0.3	1.2	0.6	180	100	120	141		
870422	10	185	2.0	180			0.6	1.4	2.2	180	100	123	143		
870423	8	200	1.2	200			0.5	1.6	1.8	180	100	125	143		
870424	5	270	.5	270			0.3	1.0	1.0	180	100	125	144		
870425	2	230	.5	240			0.2	0.5	0.5	180	100	125	144		
870426	9	240	2.0	240			0.3	1.0	1.2	180	100	125	144		
870427	13	240	3.1	240			0.5	1.2	1.1	180	100	120	144		
870428	12	240	3.4	240			0.5	1.3	1.0	180	100	120	144		
870429	12	180	.6	180			0.6	1.0	1.0	180	100	120	143		
870430	10	0	.6	315			0.6	1.0	1.0	180	100	130	143		
870501	4	270	.5	270			0.2	0.8	0.5	180	100	120	145		
870502	25	360	4.0	360			1.0	2.0	2.0	180	100	130	144		
870503	8	360	3.0	360			1.0	1.5	1.5	180	100	130	143		
870504	9	225	2.0	225			0.6	1.0	1.0	180	100	120	144		
870505	15	270	4.0	270			0.6	1.0	2.0	180	100	130	143		
870506	2	270	1.4	315			0.4	0.8	0.8	180	100	122	146		
870507	11	245	1.2	245			0.5	0.6	0.5	180	100	122	144		
870508	14	250	3.4	250			2.0	1.8	1.0	180	100	130	143		
870509	11	315	1.6	315			0.5	1.0	0.8	180	100	133	141		
870510	9	315	2.5	300			1.0	1.2	1.0	180	100	134	143		
870511	2	0	.8	315			0.3	0.6	0.4	180	100	134	0		
870512	7	360	1.2	360						180	0	0	0		

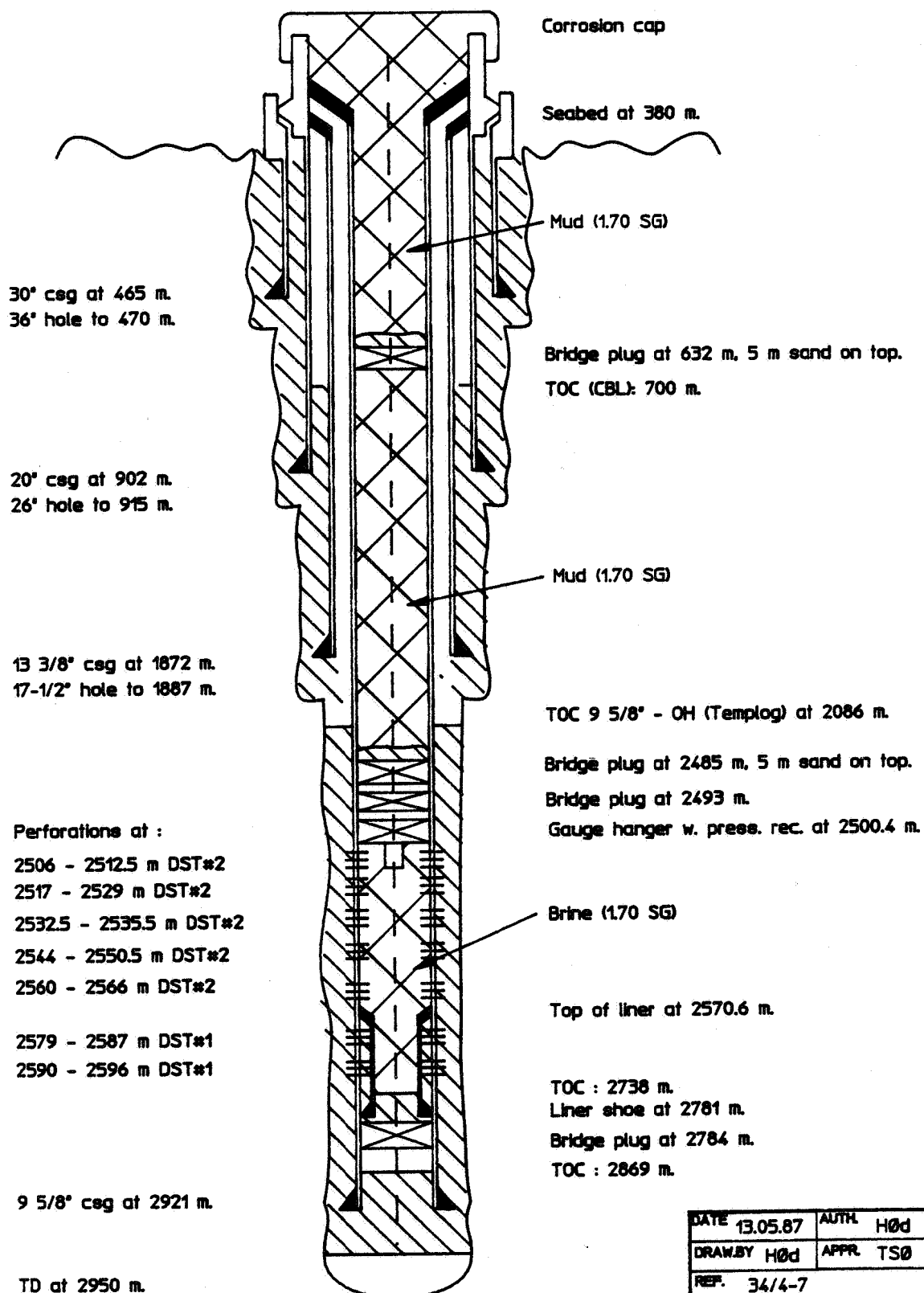
8. WELL PROFILES

If not otherwise mentioned, all depths in this chapter refer to m RKB (Rotary Kelly Bushing).

Saga
Petroleum a.s.



8.1 Temporary Abandonment Profile (1 of 2)



Saga
Petroleum a.s.



8.1 Temporary Abandonment Profile (2 of 2)

DEPTH (meter)		LENGTH (meter)	DESCRIPTION			
Top plug 2500.40						
2502.33		1.93	BAKER MODEL C RETRIEVABLE BRIDGE PLUG			
2504.94		2.61	2 7/8" EUE TUBING			
2505.515		0.135	0.575	BAKER F-NIPPLE W/ CROSSOVERS		
		0.285				
		0.155				
2505.995		0.48	7.03	SHOCK ABSORBER		PERFORATED 2 7/8" EUE TUBING
2506.04		0.045		CROSSOVER		
2506.16		0.12		PRESSURE SENSOR GAUGE NO 1496 B		
2509.02		2.86		MEMORY SECTION 1361		
				BATTERY PACK		
				CROSSOVER		
2509.065		0.045		PRESSURE SENSOR GAUGE NO 1501 B		
2509.185		0.12				
2512.045		2.86		MEMORY SECTION 1362		
				BATTERY PACK		
				CENTRALIZER		
2512.185		0.14				
2512.555		0.37				

DATE 13.05.87	AUTH HØd
DRAW BY HØd	APPR TSØ
REF. 34/4-7	

SAGA PETROLEUM

Enclosure III

WELLSITE CORE DESCRIPTION

SCALE: 1:50

CORE NO: 1-10

WELL NO: 34/4-7

FIELD: Snorre

97 %

CORED: 205.5 m REC: 199.4 m

TO: 2711.5m

FROM: 2506m

DATE: 10-17.3.1987

GEOL: BRF/CWC/TLL

FORMATION: U.LUNDE

CORING RATE	LITHOLOGY GRAIN SIZE	CORRECTION	POROSITY	STAIN	FLUOR	CUT	DESCRIPTION
8 6 4 2	mp sl vf f m c uc	10 20 30	25 50 75	25 50 75	25 50 75		
B.No1 CT 303	M						Top core no 1: 2506 m
2507	M						<u>Sandstone</u> Ss: qtz, trnsl, orgn brn, vf-m pred f, mod-w srid, ang-sbarg, fri-frm occ hd, occ tl cmt, occ calc cmt, v mica, p-fr por
2508	M					fast strong bl-wh cut	<u>Shows</u> Strong hc od, exc brn o sdn, 100% strong-mod yel flor, fast strong, strong bl-wh cut, yel res upon evap
2509	M						
2510	M						<u>Siltstone</u> Siltst: dk rd brn, frm-hd, sbfis, sl calc, v mica

27m Corebarrel

2511

2512

RRB
NO 1

2513

2514

2515

2516

2517

2518

2519

2520

Bottom core no 1: 2512 m (Rec: 83%)

Top core no. 2: 2512 m

SILTSTONE 2512-2514, 5m

slts: dk rd brn, frm-hd, v mic mica, sl calc

SANDSTONE 2514, 5-2520. 5m

SS: qtz, clr-trnsl, occ orng brn, vf-c occ vc
 -pbl, p-mod srtd, sbang, fri occ hd, sl
 mica, sl calc occ tt calc cmt, fr-g por.

SHOWS: strong od, g-exc brn o stn, 100%
 strong yel flor, fast strmg bl-wh
 cut, pale yel res.

SANDSTONE 2520, 5-2529, 5m

SS: qtz, clr-trnsl, occ orng brn, vf-c occ vc
 -pbl, p-mod srtd, sbang, fri occ hd, sl
 mica, sl calc occ tt calc cmt, fr-g por.

SANDSTONE 2520,5-2529,5m

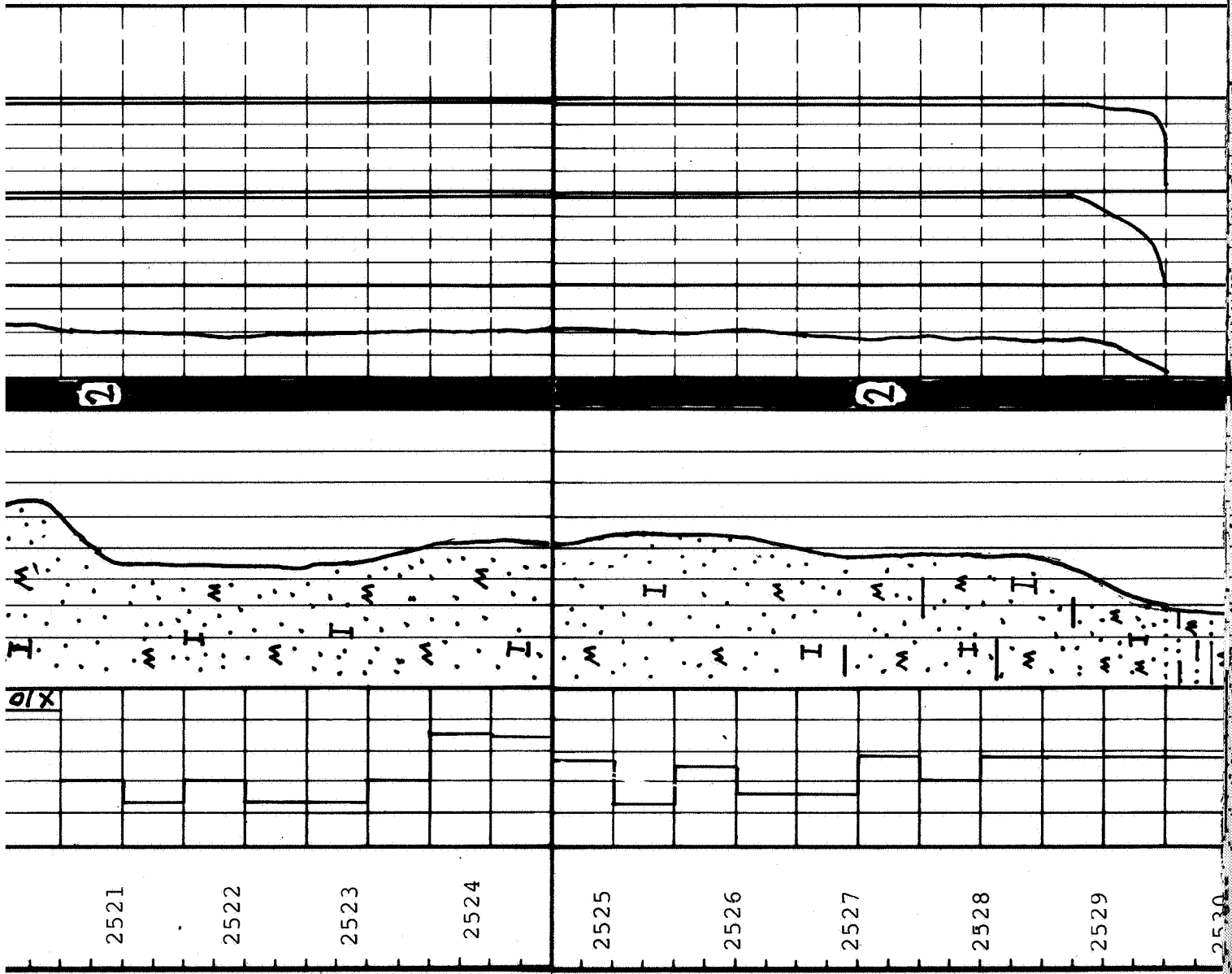
SS:vf-m,mod-w srted,sbang,mica v mica-
towards btm,else A/A.

SHOWS: A/A

From 2527m ss becoming more arg.

SILTSTONE 2529,5-2531,2m

SLTS:shyon top,nod at btm,gy-rd,v mic



mica, firm and calc on top, pred
hd and v calc at btm.

2531

2532

2533

2534

2535

2536

REC 19, 2m BTM CORE NO 2=2536m

Top core no 3: 2536 m

SILTSTONE (2536 - 2542 m)

Siltst: sdy - v sdy, dk rd brn occ lt gn gy, frm - hd,
mic - mica, v mica at btm, calc

2537

2538

2539

2540

3

2540

2541

2542

2543

2544

2545

2546

2547

2548

2549

from 2542 m:
sltst grdg to ss, v hd, tt calc cnt, mica
tr of shows

SANDSTONE (2543 - 2549.7 m)

Ss: qtz, clr, lt brn orng o stn, pred f-m occ c, mod srted,
ang-sbang, fri-hd, occ calc cnt, mica

SHOWS

Strong HC od, exc brn o stn, 100% strong flor, fast
strong bl-wh cut, yel wh res upon evap

3

CLAYSTONE (2549.7 - 2551.2 m)

Cyst: var col dk rd brn - gn gy, frm, sbfis, mic-mica, calc

SILTSTONE (2551.2 - 2558.5 m)

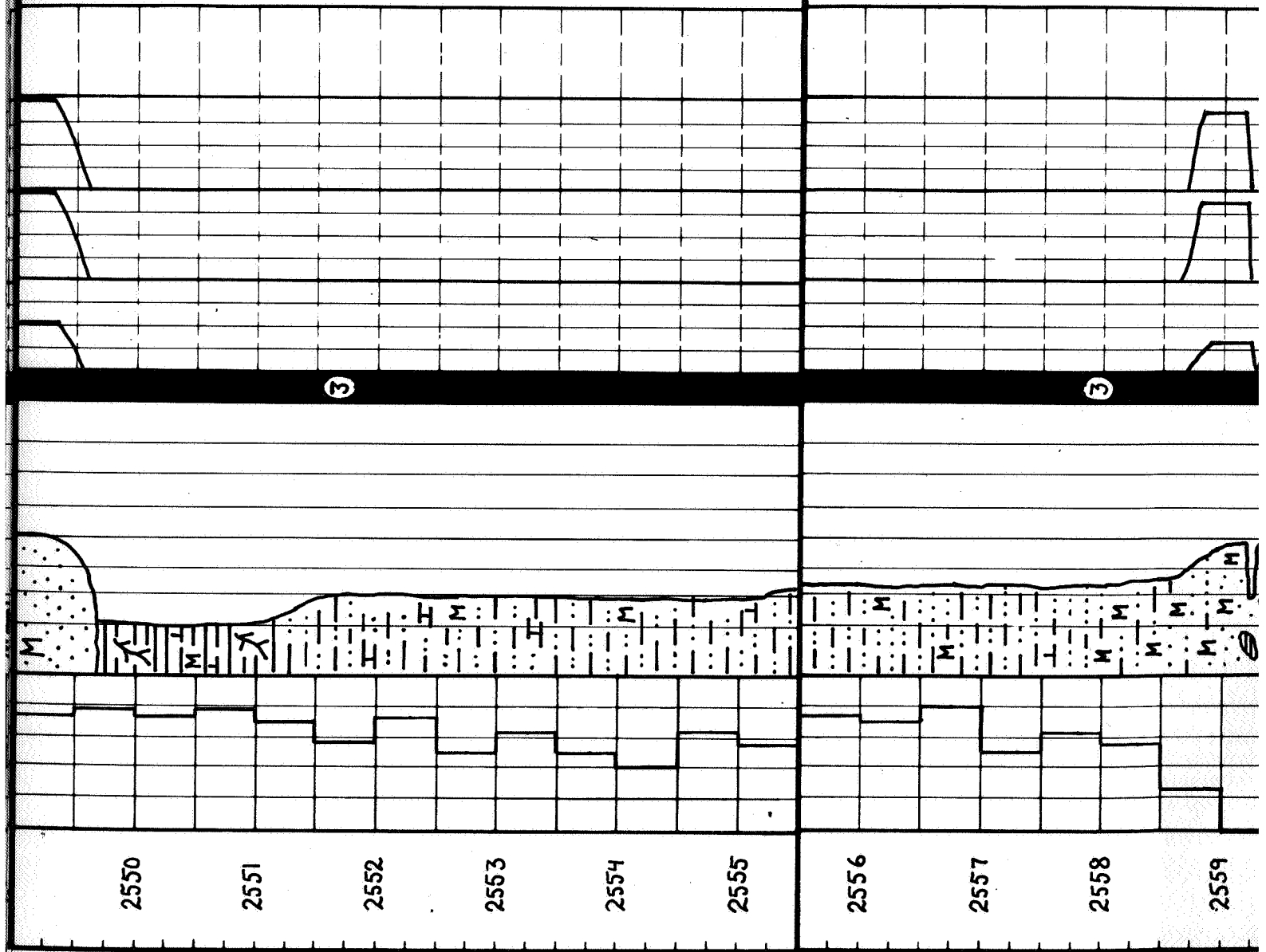
Siltst: dk rd brn occ lt gn gy, frm occ hd, sl calc, mica

Siltst: bec sdy from 2550 m

Siltst bec v mic-mica at 2558 m

SANDSTONE (2558.5 - 2563.5 m)

Ss: arg, qtz, clr, lt brn o stn, vf-m pred f, mod srt'd, sbang, frm occ hd, calc cnt, frequent lam by mica and siltst



core no 3: 2563.5 m (100% rec)

SANDSTONE (2558.5 - 2563.5 m)

Ss: arg, qtz, clt, lt brn o strn, vf-m pred f, mod strtd, spang, frm occ hd, calc cnt, frequent lam by mica and clyst

SHOWS

Strong hc od, g-exc lt brn o strn, 75-90% mod yel flor, slow-fast strng bl wh cut, pale yel res

Bottom core no 3: 2563.5 m (100% rec)

Top core no 4: 2563.5 m

SANDSTONE (2563.5 - 2565 m)

Ss: arg, lt gngy - lt brn, vf-f pred f, occ m, mod strtd, spang, fr on top else frm - hd, mica, calc-v calc

SHOWS

fr-g od, g-pale brn o strn, 90% mod - strong yel flor, slow-fast strng bl-wh cut, pale yel res upon evap

SILTSTONE (2565 - 2574 m)

siltst: pred sdy, pred dk rd brn - gngy else gngy, frm, mic-mica - v mic-mica



2568

2569

2570

2571

2572

2573

2574

2575

2576

2577

SANDSTONE (2574-2575 m)

ss: v slty, pred vf, else as ss above

SHOWS

fr od, slow strmg cut, else A/A

SILTSTONE (2575-2577 m)

sltst: dk rd brn, frm, v mic-mica, sl calc-calc

SANDSTONE (2577-2586.5 m)

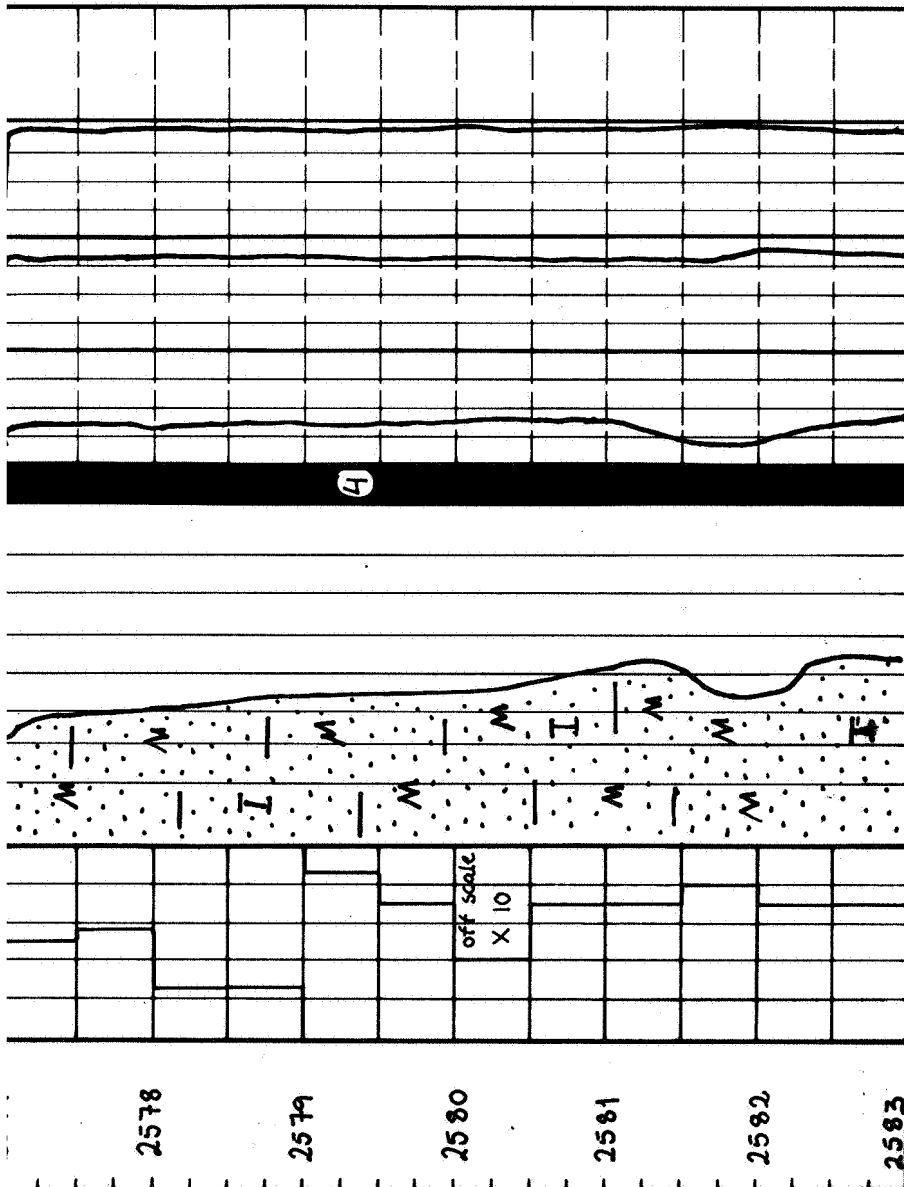
ss: (2577-2582 m) slty, arg, lt gn gy-lt brn, vf-m
occ c, mod strtd, gbang, fri-frm, v mica,

SANDSTONE (2577-2586.5 m)

ss: (2577-2582 m) slty, arg, lt gn gy - lt brn, vf-m
occ C, mod srted, bband, fri - frm, v mica,
sl calc - calc, fr por

SHOWS

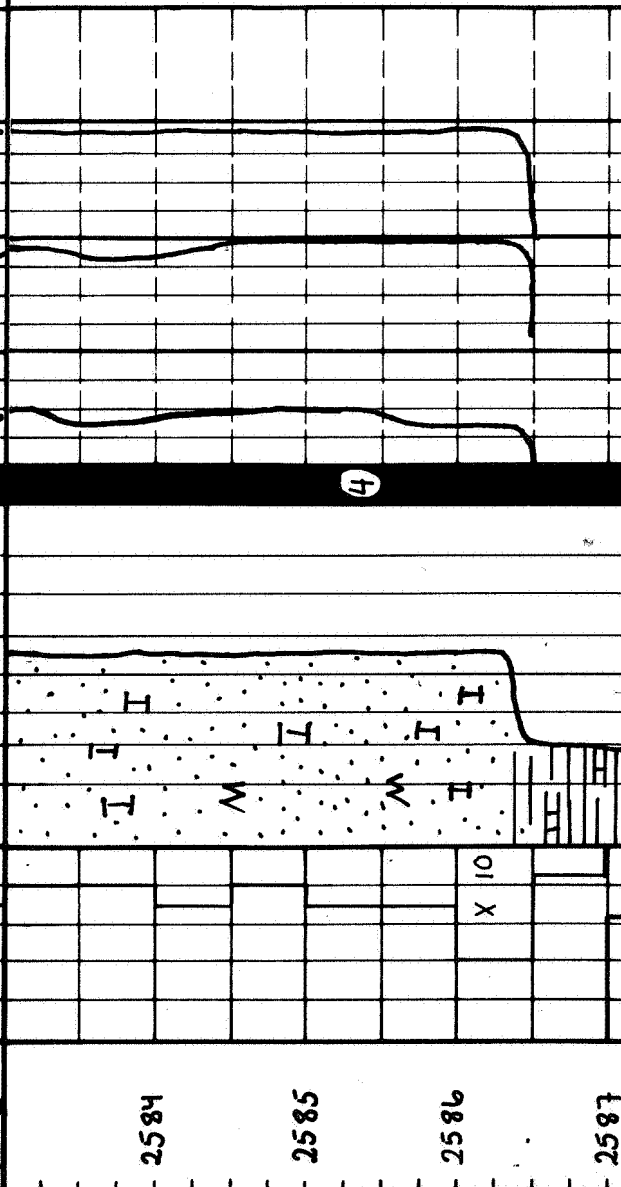
fr hc od, g-pale brn o stn, 90% mod yel - lt brn
ptchy flor, slow - fast strmg bl wh cut, pale yel
res upon evap



ss: (2582 - 2586.5m) qtz, clt, f-m occ C, occ hd,
sl mica, sl-v calc, else A/A

SHOWS

80-90% mod-strang yel flor, pred fast strmg
bl wh cut, else A/A



CLAYSTONE (2586.5-2587.5 m)

clst: slty, gn gy, frm-hd, sl mica, v calc

SANDSTONE (2587.5-2591.3 m)

ss: alternating the two types of ss descr above

SHOWS

more variable, else A/A

Bottom core no 4: 2591.3 m, rec 27.8 m (100%)

Top Core no 5 = 2591.3 m

SANDSTONE (2591.3-2595.5 m)

ss: slty on btm, olvgg-lt gngy, grtz clt-trnsl
vf-m pred f, fri-frm, mod srtd, sbang
mica, Calc Occ v calc, fr-g par.

SHOWS: p-fr od, p-g pale brn o str,
pred 80% mod yel flor, slow-
fast strng wh-blwn cut, pale yel-
yel brn res.

SILTSTONE (2595.5-2601.5 m)

siltst: sl sdy, pred dk-rd-brn, occ gngn,
frm occ hol, sl calc - calc, v mic mica.

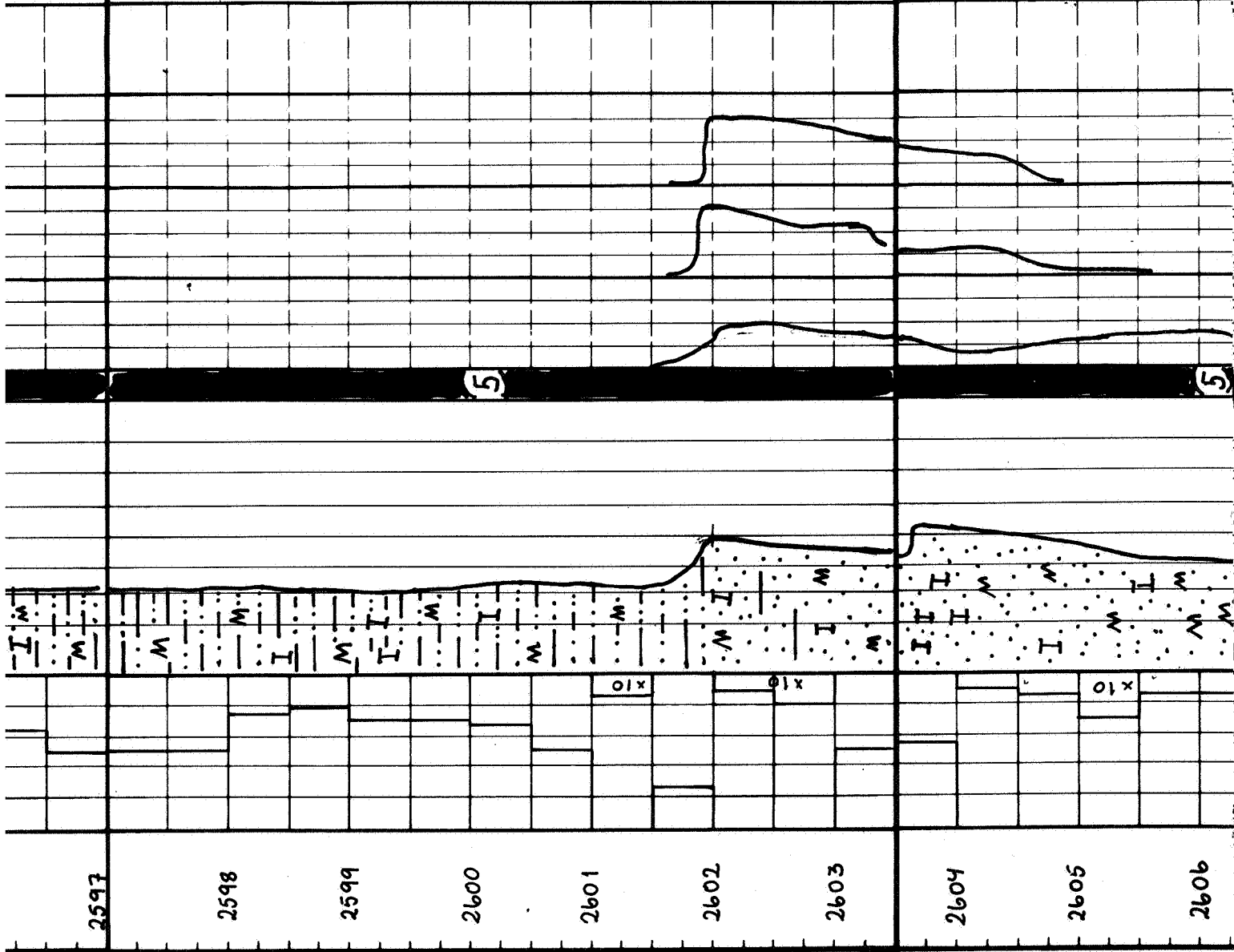
from occ hd, sl calc - calc, v mic mica.

SANDSTONE WITH TRACE OF SILTSTONE
(2601.5 - 2609.5m)

SS: Occ v sity, pred gy gn, qtz clr-trnsl
occ org brn, occ hd, occ v mica
sl calc - v calc else H/A

SHOWS: v variable, gen decr towards
btm

Up part: P od, fr-g pale brn
O strn, 20-100% mod-
yel flor, pred slow
occ fast strng wh-blwh
cut, pale yel-lt brn res.



Siltst: arg, gy gn
frm, v mic
mica, calc.

Low part: p pale brn o sin, 50-80%
dull yel-lt brn flor
else #1/2

INTERLAMINATED SANDSTONE AND
SILTSTONE (2609.5-2612.5m)

SS: slty, fri-frm, v mica else #1/2
siltst: gn gy, frm, calc, v mic mica.

SILTSTONE (2612.5-2614.5m)

Siltst: pred dk rd brn, frm-hd, v mic mica.
calc, occ nod.

SANDSTONE (2614.5-2619.3m)

SS: slsly, lt gn gy-ol v gy, gr cl-tinsl
occ org bfn, vt on top pred f towards
btm, mod srted, sb ang, mica-v mica, calc
gr-a por

Occ o'ing b'n, ~Vt on top pred f towards
btm, mod srt'd, sbang, mica-V mica, Calc
fr-g por.

SS HS ABOVE

Rec 28m coring time 5.5 hrs BTM core No 5: 2619.3m

Top Core no 6: 2619.3 m RKB

2619.3 - 2624.5 m RKB:

SANDSTONE

Ss: lt dlv gy, pred m, occ s-m, w srt'd.
sbang - sbrnd, lse-gr, occ mica

No shows

2624.5 - 2626.5 m: SHALE

Sh: mgy, sm, occ irregular foliation

2626.5 - 2635 mrvb: SANDSTONE

Ss: a/a

No shows

2626.5 - 2635 mrvb: SANDSTONE

2635 - 2638.5m: SILTSTONE

Siltst: rd, brit, micnica

Ss: a/a

Conglomerate: angular pebbles of quartzite and lt gy, vf-f ss upto 1 cm in diam and elongate slices of gy shale upto 2 cm in length in a f-m sand stone matrix.

2641.5 - 2642.5 m: Shale, m gy, firm

2642.5 - 2644.5 m: SANDSTONE

Ss: lt olv gy-lt gy, f-m, w srt'd, lse-fri, sbang-sbnd, occ mic

2644.5 - 2645.5 m: SILTSTONE
Siltst: dk-m rd, brit, mic mica

2645.5 - 2647 m:
Sandstone ala

BOTTOM OF CORE # 6: 2647 m

CORE DIAMETER = 4 inches TOP CORE NO 7 - 2647 m

SANDSTONE (2647-2647.5 m)

SS: lt olv gy-gn gy, f-m, w srtd, sbang-sbrnd,
pred fri, sl mica, calc, g por

SILTSTONE (2647.5 - 2651 m)

Siltst: OCC sdy, dk rd brn-gy brn, frm
occ hd, v mic mica, calc.

SANDSTONE (2651-2656.5 m)

SS: (up part) sily, gn gy-lt olv gy, qtz
clr-trnsL Occ omg brn, fri-frm, pred
fri, mod srtd, sbang-sbrnd, mica occ
v mica, calc, occ occurrences of ls-
precipitations, fr-g por.

SS: (low. part) Lt olv gy-gn gy, f-m
occ c-vc, mod-w srtd, mica, calc

Hand-drawn geological cross-section on a grid. The section shows various geological features: a top layer with a wavy line, a middle layer with a large dome-like structure, and a bottom layer with a rectangular feature. The grid is labeled with numbers 2654 through 2663. A vertical line is labeled "18m core barrel".

Cored 9.5m, rec 9.5m. BTM core no 7 = 2656.5m

Slitst: dk rd brn, brit, micnica, calc

Ss: Lt olvg, m-c, occ vc, w-mod srtld,
sbang-sbrnd, gri-grm, calc

Sitst ala

Ss: lt dngy, g-m, w sstd, sbmd, sl calc
Sh: m gngy, mica, brit

Ss: lt olv gy, g-m, w srt d, sbang - sbund, leri - liron el nira - nira nom - sl - sl.

fine grained mica, non calc

and

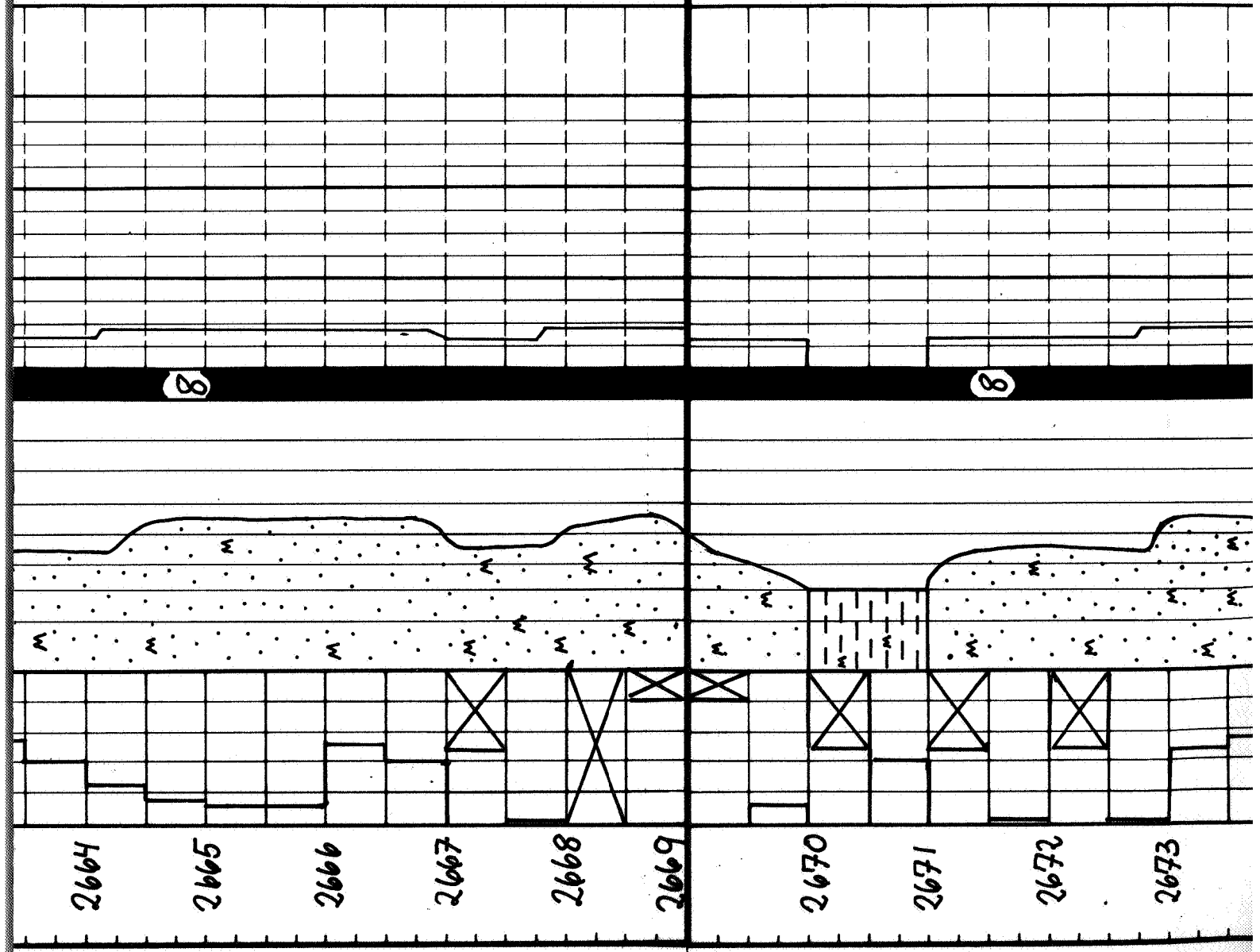
slty, m lt gy, v g-f, w srt d, sbond - rnd,
grm, mica - v mica, non calc

2670-71m: SHALE

Sh: m gy, bit, non calc, mic mica

2671-74m: SANDSTONE

Ss: ala



2673

2674

2675

2676

2677

2678

2679

2680

2681

2682

2674 - 74.5 m: SHALE
Sh: a/a

2674.5 - 75: SS a/a BOTTOM OF CORE NO. 8: 2675 m

Top core no 9 = 2675m

SANDSTONE (2675 - 2683m)

SS: pred lt olv gy, $9\frac{1}{2}\%$ clr-tmsl occ omg
brn, f-m, w srtd, sbang, fri-frn
occ hd, SL mica, Calc occ $\frac{1}{2}$ Calc.
pred g por.

3. RR
BCT-303

SHALE (2683-2685m)

SH: Slt'y, dk gy, frm occ hd, mic mica
sl calc.

SANDSTONE (2685-2692.5m)

SS: (2685-2688m) vs lty, sl arg, pred lt olv
gy, qtz clv-trnsl occ org brn,
slt-vf, mod srt'd, sbnd, frm-hd
sl mica calc-v calc, pred p por.

SS: (2688-2691m): Lt olv gy,
vf-f, mod-w srt'd, fri-frm,
calc, fr-g por, else #1#.

SS: (2691-2692.5m) grd to sltst towards
btm, gn gy, vf, mod srt'd, pred fr
v mica, calc. pred p por, else #1#.

SILTSTONE (2692.5-2692.7m)

Sltst: dk rd brn, frm, sl calc, v mic mica

SILTSTONE (2692.5-2692.7m)
 Siltst: dk rd brn, fgm, sl calc, v mic mica
 Cored 18m, rec. 17.7m BTM core no 9 = 2693m

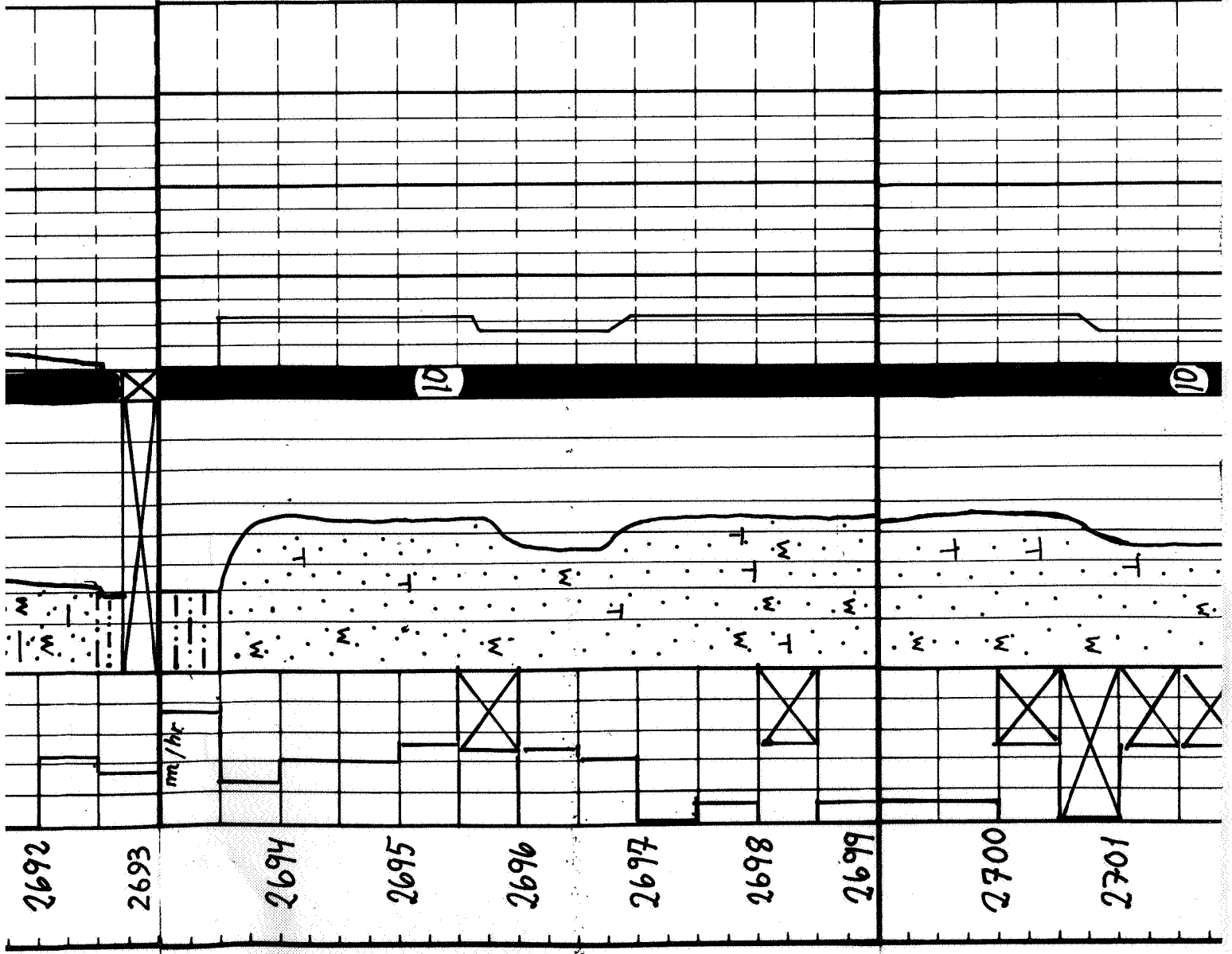
TOP OF CORE # 10: 2693.0m
 SHALE (2693.0 - 2693.5m)

Sh: slty, dk rd brn, brit, mic mica, non calc

SANDSTONE (2693.5 - 2711.5 m)

Ss: occ slty, lt olv gy - m gy,
 vf - f and f - m, w srted, sbang -
 sbund, gri - fgm, mica,
 med. sl calc - calc, occ v calc

Ss a/a



2702

2703

2704

2705

2706

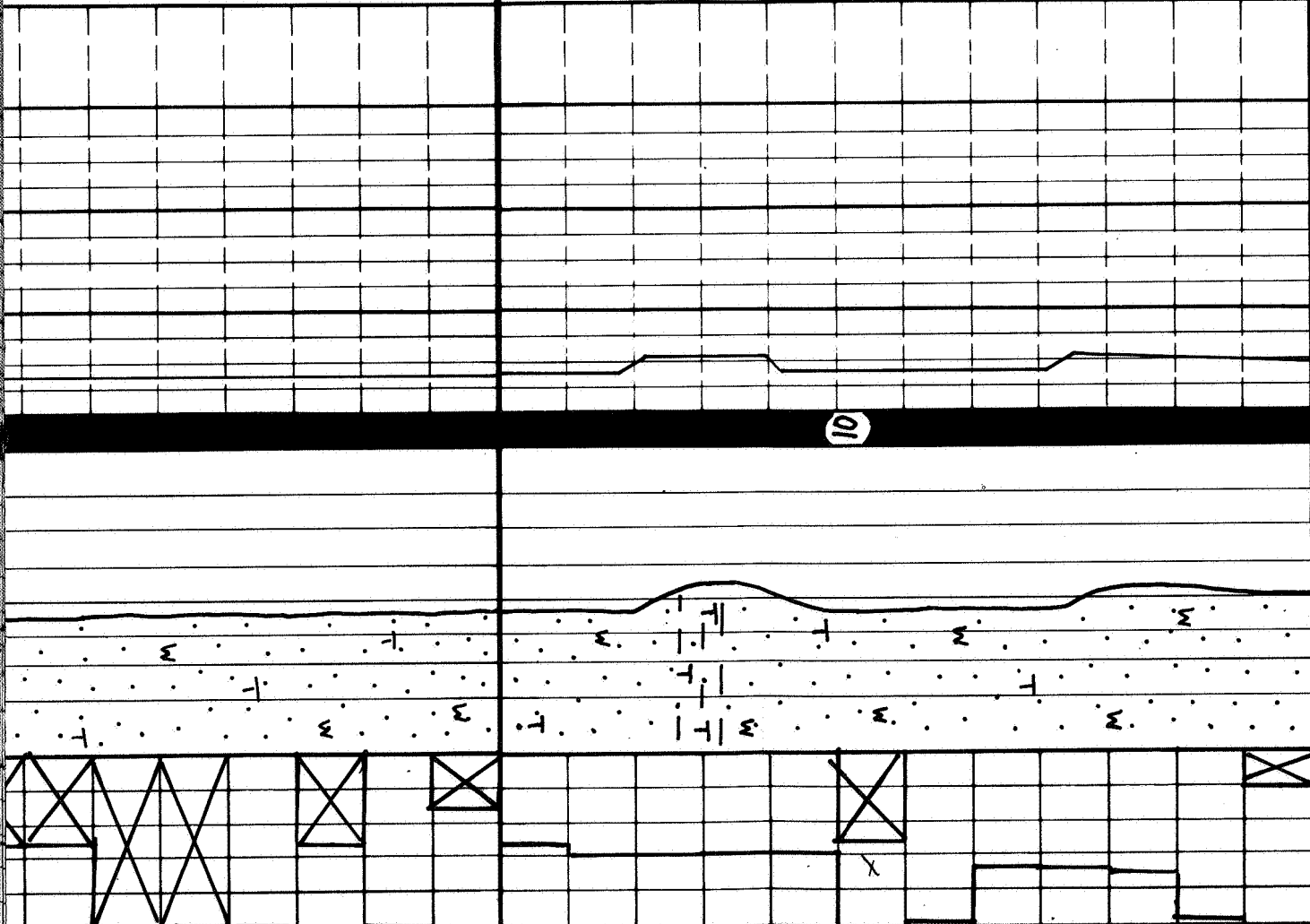
2707

2708

2709

2710

2711



At 2707 m:

Inter laminated Sandstone / Shale

Ss: ala

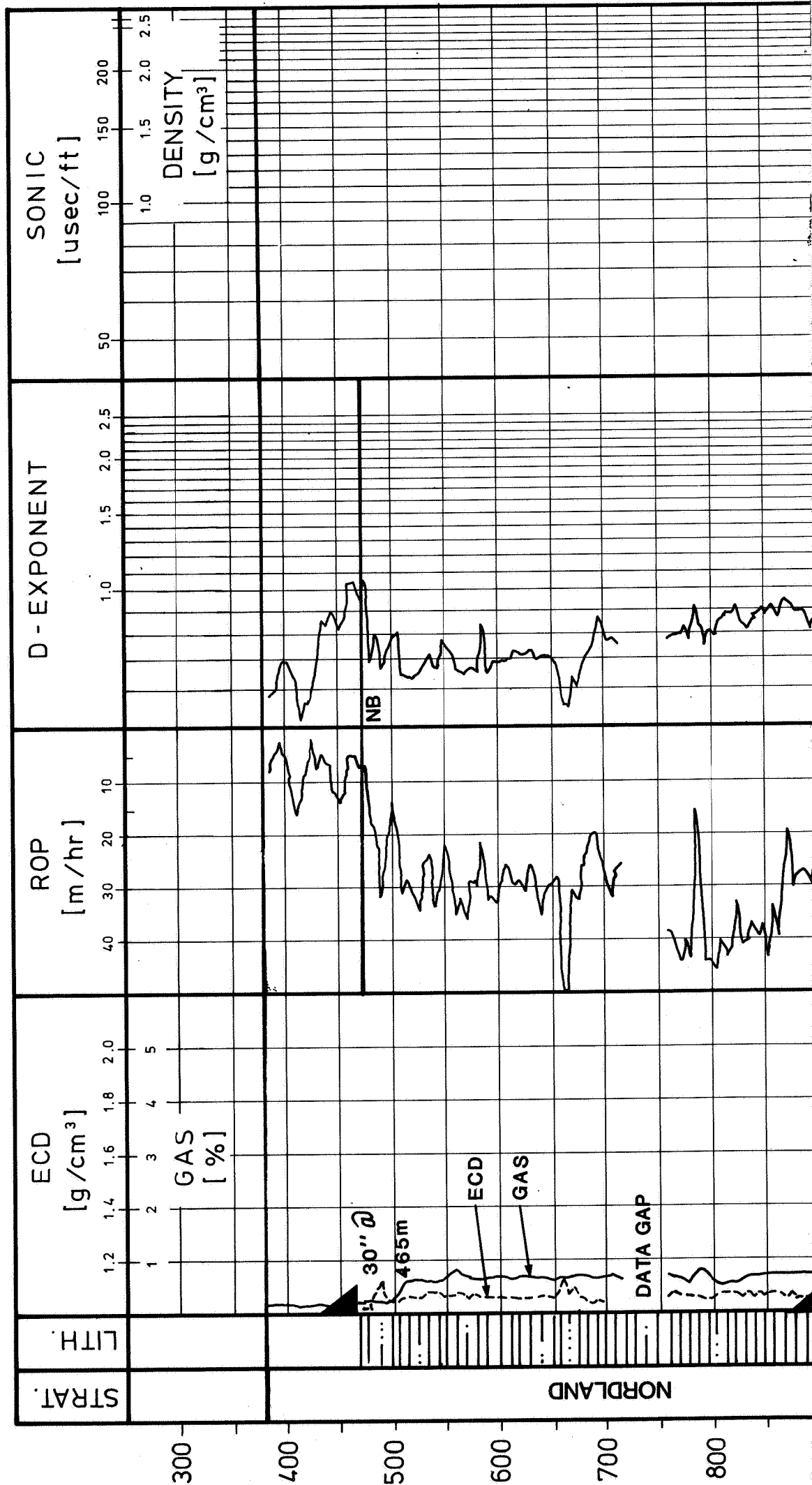
Sh: dk gy, brit, non calc

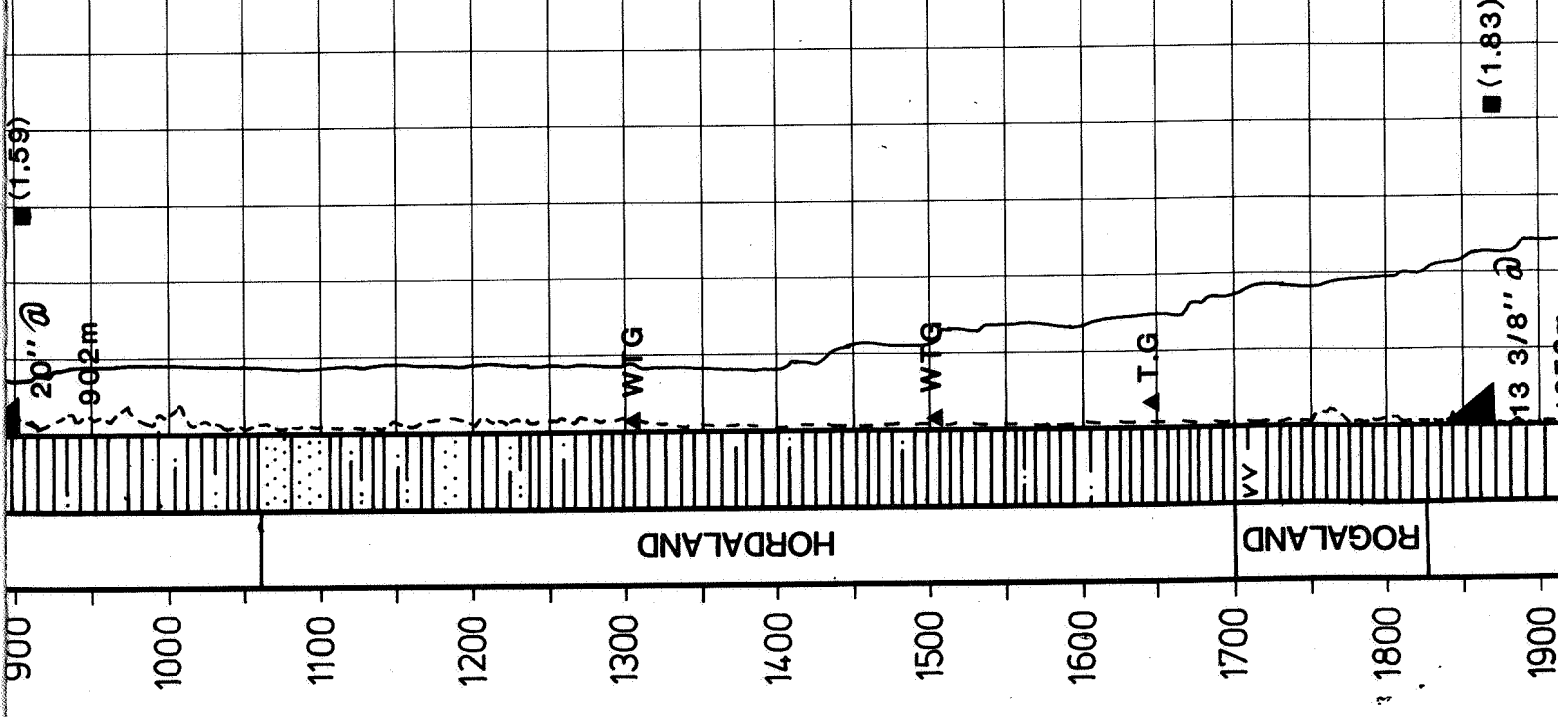
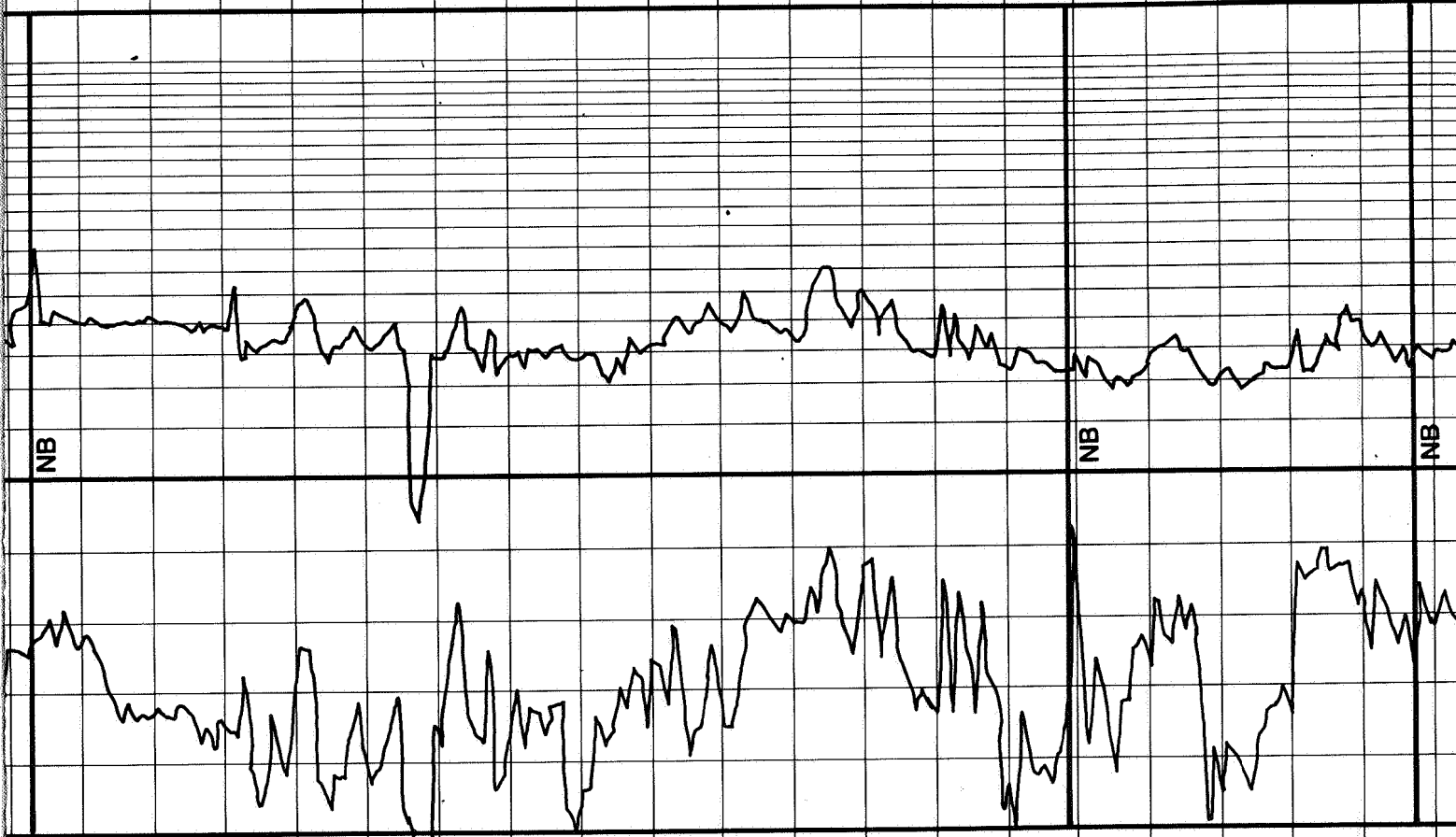
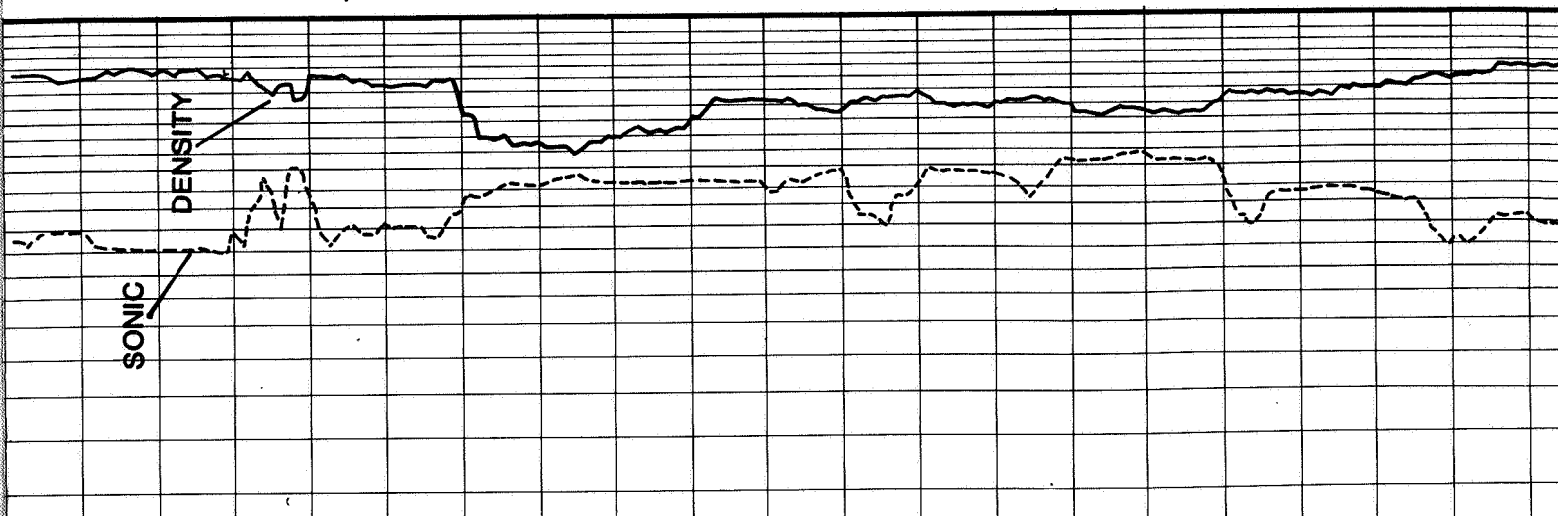
Ss ala

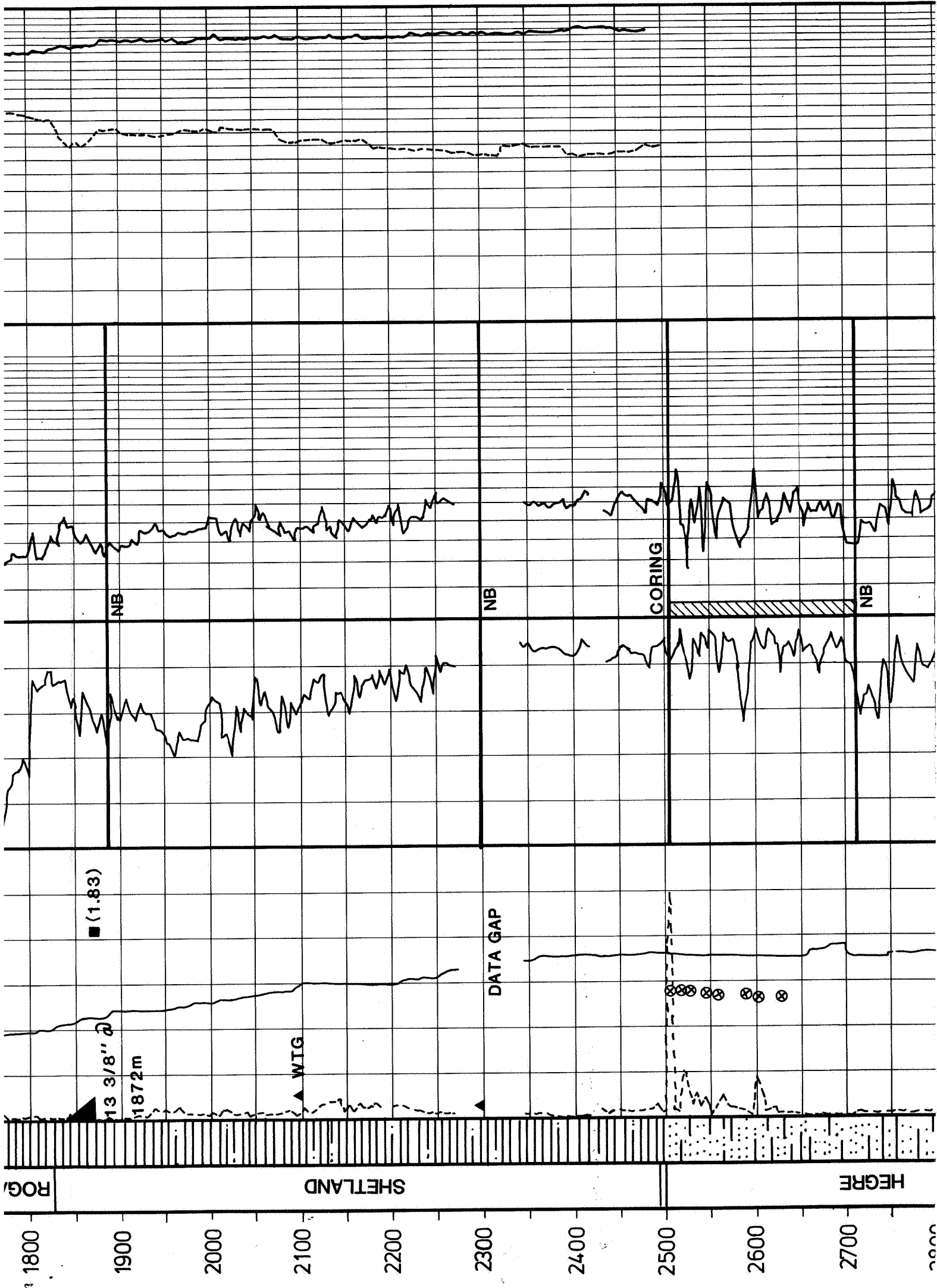
Bottom of Core no. 10 : 2711.5 m

FORMATION PRESSURE EVALUATION SHEET

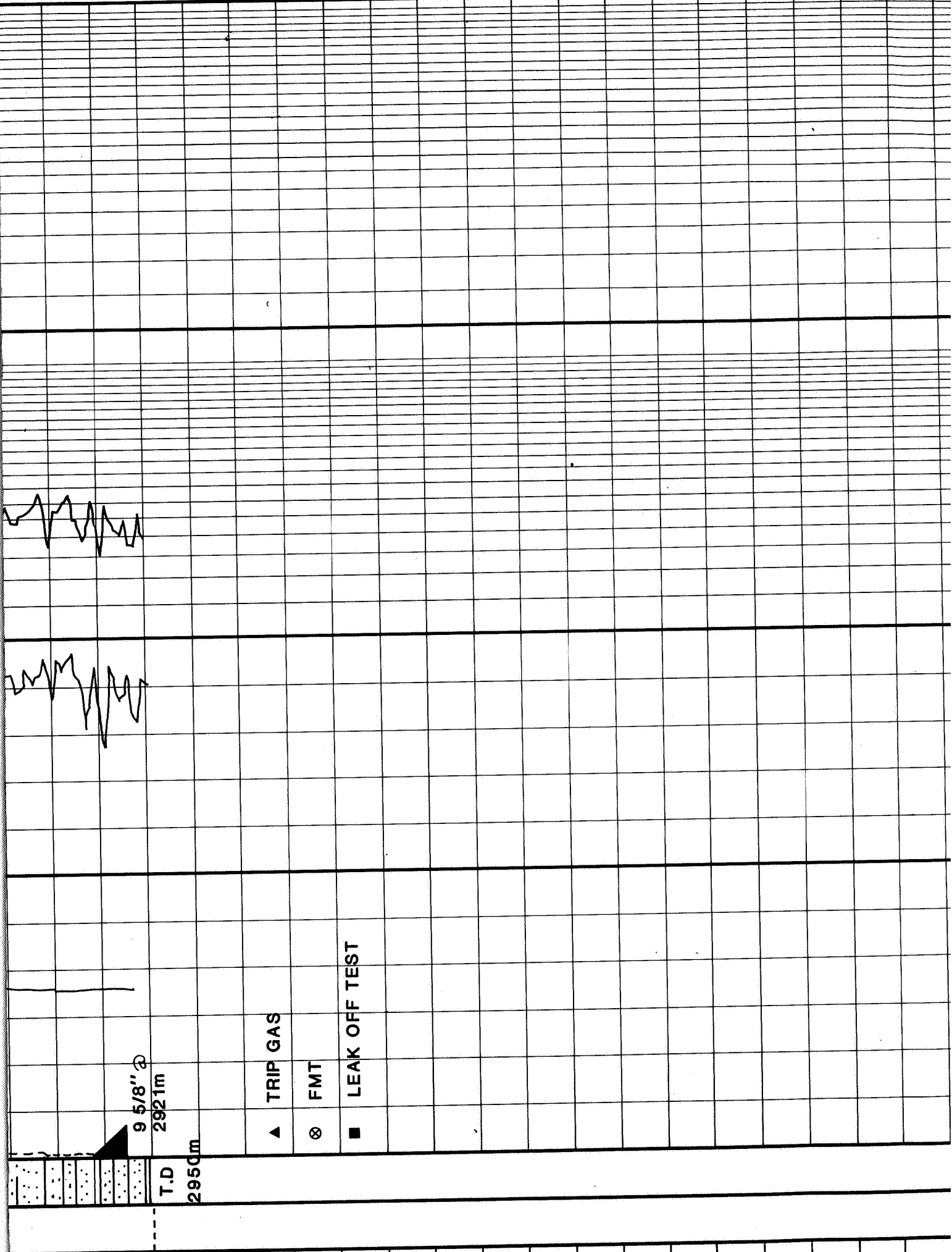
WELL : 34/4-7







2800
2900
3000
3100
3200
3300
3400
3500
3600
3700
3800



—

T.D
2950m

9 5/8" ϕ
2921m

▲ TRIP GAS

⊗ FMT

■ LEAK OFF TEST

